

Direct Current and Microgrids

Panel Organizers:

David Geary, Dr. Rajendra Singh

Thursday, March 10th from 8:00-10:00 am

Duration: Two Hours

The battle between direct current (dc) and alternating current (ac) goes back to the time of Thomas Edison, Nikola Tesla and George Westinghouse. Through history the debate too often has tried to position the argument to define a winner and a loser. A more balanced approach would be to look at electricity as the energy which best serves mankind. Utilization of dc has been evolving in use within ac powered devices for decades to provide more efficient and reliable utilization of electricity within electronic based loads. This has created an even greater demand for electricity to serve mankind not only with lights and motors but now to the inclusion of almost every aspect of our daily lives. Recent studies have estimated that 85% of the power used in a commercial buildings goes through some form of power electronics which in essence is dc. The grid in the United States has expanded regionally and has not only aged but has become increasingly more unreliable. To address these issues a new microgrid industry is developing.

A microgrid is a localized power system with the ability to self-supply and operate independently (island mode), or in concert with, and connected to, the main utility grid to meet the energy needs of connected loads. Microgrids offer enhanced grid reliability, resiliency, efficiency and flexibility. Microgrids diminish the impact of power outages resulting from severe weather or other disruptions. Another area of concern and focus is the resiliency against high impact threats to the utility grid such as solar storms and EMP. It is widely believed that microgrids, and specifically dc powered microgrids, would help to address these concerns partly because microgrids will also allow for easier integration of alternative energy sources as well as energy storage.

This panel of industry experts will provide a dc microgrid industry update and answer questions associated with this developing industry!

- *The Transition Path to Direct Current (dc)*
David E. Geary, dcFUSION, llc
- *380VDC Eco system – current status of development*
BJ Sonnenberg, Emerson Network Power
- *The Commercialization of DC, applying DC products to an office building retrofit*
Denise Dihle, 360 Engineering
Jon Brooks, Architectural Engineering Design Group
- *Ultra-Low Cost and Solar Storm Secured Local DC Electricity to Address Climate Change Challenges for All Economies*
Amir A. Asif, Rajendra Singh and Ganesh K Venayagamoorthy, Clemson University