UCF | Electrical and Computer Engineering

Dr. Babu Chalamala
Manager of the Energy Storage Technology and Systems Department, Sandia National Laboratories

Title
Emerging eT&D Grids: Energy Storage, Electrification, and the Increasing Role of Power Electronics
Wednesday, February 12, 2020
11:00 a.m. – 12:00 p.m.
HEC 101AB

Abstract

Emerging electronic transmission and distribution (eT&D) grids will evolve rapidly accommodating the changes in generation mix and load profile that are associated with increasing renewable and distributed generation, electrification and bidirectional power flows. For eT&D grids to operate reliably with a high degree of autonomy, there is a greater need for energy storage systems and intelligent power conversion systems with advanced circuit topologies and high speed communication infrastructure. Current challenges for the future eT&D grids include limited scale of energy storage deployments along with low penetration of power electronics in the current grid infrastructure. As we look into a future with 70–80% renewables in the generation mix and higher amounts of dc loads including electric vehicles and appliances, the load profile and operational aspects of the grid will experience changes that are not well forecast. In this presentation, I will review state of eT&D grid development, expected developmental pathways, and projections for eT&D grid in the distant future.

Sandia National Laboratories is a multi-mission laboratory managed and operated by National Technology & Engineering Solutions of Sandia, LLC, a wholly owned subsidiary of Honeywell International Inc., for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-NA0003525.

Biography

Dr. Babu Chalamala is Head of the Energy Storage Technology and Systems Department and Laboratory Program Manager for Grid Energy Storage at Sandia National Laboratories, Albuquerque, NM. Prior to joining Sandia in 2015, he spent twenty years in industry R&D, mostly recently as a Corporate Fellow at MEMC Electronic Materials/SunEdison where he led R&D and product development in grid scale energy storage. Before that, he was involved in two startup companies for eight years. He spent early part of his research career at Motorola and Texas Instruments where he made contributions to electronic materials and display technologies. He has a B.Tech. in Electronics and Communications Engineering from Sri Venkateswara University and a PhD in Physics from the University of North Texas. An IEEE Fellow, he served on the editorial boards of Proceedings of the IEEE, IEEE Access and IEEE Journal of Display Technology. He currently serves on the as Vice Chair of IEEE PES Energy Storage and Stationary Battery Committee and as a Member of the IEEE Fellow Committee. He has also been active in the Materials Research Society, where he served as a General Chair of the 2006 MRS Fall meeting. He currently serves on the MRS Government Affairs and Award Committees. Author of over 120 papers, several edited volumes, and awarded 10 US patents.