

IEEE PES PowerAfrica 2017  
Tutorial Sessions, Day 3, Friday 30<sup>th</sup> June 2017



1PM-5PM\_TU-2A: Fundamentals of Micro-Grid Operation and Management with  
Cyber Security Issues

Objectives:

The tutorial will develop the fundamentals of Micro Grid Systems (MGS) development, operation and management for a sustainable development. The tutorial will cover the different phases of micro grid construction the architecture and components of a flexible design for optimal performance. The cost proposition and the special features of micro grid over central generation in terms of resilience and flexibility of energy resources, sustainability and affordability will be discussed. Cyber Security threats and design for security will also be covered. Furthermore, we plan to provide a maintenance guide and pathways for development and knowledge base for stakeholders will be available. In addition, different automation functions such as Voltage / Var, power quality reconfiguration, restoration scheme will be discussed. The impact on society and development will be evaluated for well-established MGS.

Instructor:



Prof James A. Momoh is a professor and former chair (1990-2000) of the Department of Electrical Engineering as well as the founder and director of the Center for Energy Systems and Controls at Howard University, Washington D.C. Dr. Momoh received the B.S.E.E. degree (1975) with honors from Howard University, Washington, D.C.; the M.S.E.E. degree (1976) in electrical engineering from Carnegie Mellon University, Pittsburgh, PA; the M.S.E.E. degree (1980) in systems engineering from the University of Pennsylvania, Philadelphia; and the Ph.D. degree (1983) in electrical engineering from Howard University, Washington, D.C. Dr. Momoh has authored *Electric Power System Applications of Optimization*, a best seller book on Optimization and co-authored several others including *Smart Grid: Fundamentals and Application*, *Electric Systems, Dynamics and Stability with Artificial Intelligence Applications* (Marcel Dekker, Inc.) etc. He is an associate editor of the journals '**Power Letters**' and '**Electric Machines and Power Systems**'. Dr. Momoh is the Founder and Leader of US-Africa collaboration, widely known as International Conference on Power Systems Operation and Planning (ICPSOP), in research between US-Africa professors in energy and power sustainability. He was recently appointed the chairman of the Nigerian Electricity Regulatory Commission (NERC).