**MOTORS AND MOTOR PROTECTION**

Presented by Don Reimert

**Agenda:** The presentation will focus on large induction motors and includes discussions of motor theory, ratings, applications, and protection. The commonly used equivalent circuit will be derived and used to explain motor torque and current characteristics. A discussion of the NEMA rating structure will include temperature ratings of insulation and operating limitations imposed by the standard. These limitations include allowable voltage and frequency deviations, voltage unbalance and starting limitations.

NEMA motors have designations that define their unique torque characteristics. The proper matching of motor and load torque is discussed. This includes starting capability and starting methods. Motor protection is addressed including application of thermal and standard overcurrent relay schemes.

**Biography:** Donald Reimert is a registered professional engineer who graduated from Penn State University more than 50 years ago. His professional career has been focused on the application of protective relays and relay systems. This includes distribution, transmission, and generation system facilities. In addition to protective relaying, he has design experience in substation and electrical systems associated with fossil, nuclear, and hydro-generation facilities. As a system planner, he developed regional projects to meet future load requirements. He has developed and presented protection related courses for the University of Wisconsin-Milwaukee and IEEE.

His book, “Protective Relaying of Power Generation Systems” published by Taylor & Frances in 2006, is a detailed guide to understanding system conditions that threaten medium to large generators and the protective elements that protect them. The book also addresses protection of induction motors.