Lightning Protection Technologies and Applications for Power Distribution Systems, Facilities and Sensitive Electronic Equipment

Sponsored by the IEEE PES Surge Protective Devices Committee

Figure source: http://www.photolib.noaa.gov/nssl/lightning1.html

Obtain the Latest Information on Surge Protective Device Technologies, Applications, Electrical System Integration Issues and Recommended Practices

As long as there are overhead power systems, and interconnected sensitive electronic equipment – they will be disturbed by lightning. Protecting various elements of these systems is not always straight forward and generally becomes a tradeoff between protection performance and cost. This one-day workshop is designed to help energy service professionals, and electricity users understand lighting protection from a practical applications perspective. The workshop will provide a very broad background on the subject matter as taught by some of the noted experts in the field.

Attendees will learn about the various SPD technologies and applications through real world case studies as well as intermediate and advanced level technical discussions. The workshop summarizes the latest IEEE Surge Protective Devices Committee developed standards, information, methodologies and techniques for evaluating, specifying and applying surge protective devices. The first half of the workshop focuses on up-to-date methods of power system protection with the use of surge arresters for high voltage (HV) applications. The second half will focus on Surge Protective Devices (SPDs) for low voltage (LV) applications. This course will help the novice understand the fundamentals, and the experienced engineer better understand the details. Attendees come mainly from system design, maintenance, and planning groups with engineering backgrounds.

Select High Voltage (HV) and Low Voltage (LV) topics from this one day workshop include:

1. Fundamentals and Theory
   - Nature of Lightning and Overvoltage
   - Terms and Definitions
   - Overvoltage of Systems Origin
   - Traveling Waves
2. HV – Insulation and Arrester Characteristics
   - Overhead Line Insulation
   - Underground Circuits
   - Equipment Insulation
   - Shield Wires
3. HV –Application and Protection Details
   - Arrester Function and Selection
   - Arrester Locations and Connections
   - Overhead Line Protection
   - Underground Circuit Protection
   - Apparatus Protection
   - Equipment in a Substation
   - Review of HV SPD Standards
4. LV – Lighting Propagation into Structures
   - Direct vs Near vs Far Strike
   - AC Power Lines
   - Communication Lines
   - Other Exposed Lightning Attractors

5 LV – Protection and Mitigation Concepts
   - Grounding System Topologies
   - Voltage Limiting
   - Minimizing Surge Current Flow
   - Zones or Circles of protection

6 LV – Application Considerations
   - Review of LV SPD Standards
   - SPD Specifications
   - SPD Application Considerations
   - Lead length considerations
   - Coordination with upstream protection
   - Coordination of multiple SPDs
   - Case Studies

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Instructors:

The instructors for this course will include noted subject matter experts who are heavily involved with the IEEE Surge Protective Devices Committee and have served in such capacities as Working Group Chairs or as Committee Officers.

Presently two instructors have committed to develop and present the material including Jon Woodworth (Past SPDC Chair 2002-2004 and Doug Dorr – SPDC Chair 2006-2008. Additional subject matter experts may be added to this commitment

Jon Woodworth –SM is the Arrester Engineering Manager at Cooper Power Systems in Olean NY. He holds the EE degree from Ohio Institute of Technology (1972), and has an MBA from St. Bonaventure University (1995). Mr. Woodworth has been involved in arrester design, production and marketing for over 28 years. He is a Past Chair of the IEEE Surge Protective Devices Committee and is Vice Chair of IEC TC37 Maintenance Group 4 responsible for Metal-oxide arresters for AC systems. Mr. Woodworth also Chairs The NEMA High Voltage Arrester Section of Power Equipment Division. Additionally Jon is a holder of several arrester patents worldwide.

Douglas S. Dorr - (M'1992, SM'2004) is a project manager with EPRI. He holds the Bachelor of Science degree in Engineering from Indiana Institute of Technology in Fort Wayne, Indiana (1989). Mr. Dorr manages and supports many of the EPRI research initiatives surrounding power quality, surge protective devices and power protection. He has been involved with power quality and distributed generation projects for the past 17 years including power conditioning device testing/application, surge/lightning protection, and monitoring/field demonstration of distributed resources. Mr. Dorr Chaired the 2005 revision of the IEEE Emerald Book, is the 2006-08 Chair of the IEEE Surge Protective Devices Committee and is a member of the IEEE 1695 Working Group on Voltages at Publicly and Privately Accessible Locations. He has authored over 50 technical publications in the above mentioned research areas.