



Power Systems Engineering Research Center

Advancement in Arc Flash Related Hazard Research and Safety by Design

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Public Tele-Seminar
Tuesday, Feb. 3, 2009
2:00-3:00 Eastern Time (11:00-Noon Pacific Time)

One of the most significant engineering accomplishments of the 20th century was the electrification of our modern world. While progress has been made in making people aware of the hazards of electricity, approximately five arc flash incidents still occur each day in the United States causing serious injury and/or fatality.

Arcing faults can cause serious injuries or death through a number of energy transfer mechanisms such as heat, pressure, sound, shrapnel and electromagnetic radiation. Accurately estimating the available thermal energy is one of the most critical aspects of assessing the severity of the arc flash hazard. Over the past few years, a number of researchers have worked to quantify the thermal energy present during an arc flash exposure. This presentation will address various aspects of thermal energy exposures, discussing in detail the three categories of incident energy calculations that have been developed: theory based models, statistically developed models, and semi-empirically derived models. Because of the limitations and discrepancies observed using the different techniques, no standard approach has been agreed upon by the scientific community. One of the objectives of this research was to develop a new set of semi-empirically derived incident energy equations for low- and medium-voltage systems for open air (applicable to medium voltage distribution systems) and arc-in-box (applicable to industrial and commercial power systems) exposures.

This research will help advance the electrical safety culture from a number of perspectives and has been performed as an integral part of the IEEE/NFPA Arc Flash Phenomena Collaborative Research Project and will provide the direction for future arc testing and modeling.

Lastly, this research has provided the motivation and pedagogical framework to develop an electrical safety training program for young engineering students and technical personnel. Education is the crucial factor; helping people to better understand the hazards of electricity, thereby empowering them to take the necessary precautions to work safely.

Biography: P.K. Sen, P.E. has over 42 years of combined teaching, research, and consulting engineering experience. Prior to joining Colorado School of Mines in 2000, Dr. Sen taught for 21 years at the University of Colorado. He has published over 140 technical papers on a variety of

subjects and has supervised over 140 graduate students. He is a Senior Member of the IEEE, and a Registered Professional Engineer in the State of Colorado. His current research interests include a variety of application problems (safety, protection, equipment life, energy economics, and asset management and policy issues) in power systems engineering, renewable energy applications and distributed generation, and engineering education.

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Registration for Webcast Participation: None required. There is no charge for participating!

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PSERC's Tele-Seminar Coordinator

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Shmuel welcomes feedback on the tele-seminars and suggestions for future ones.