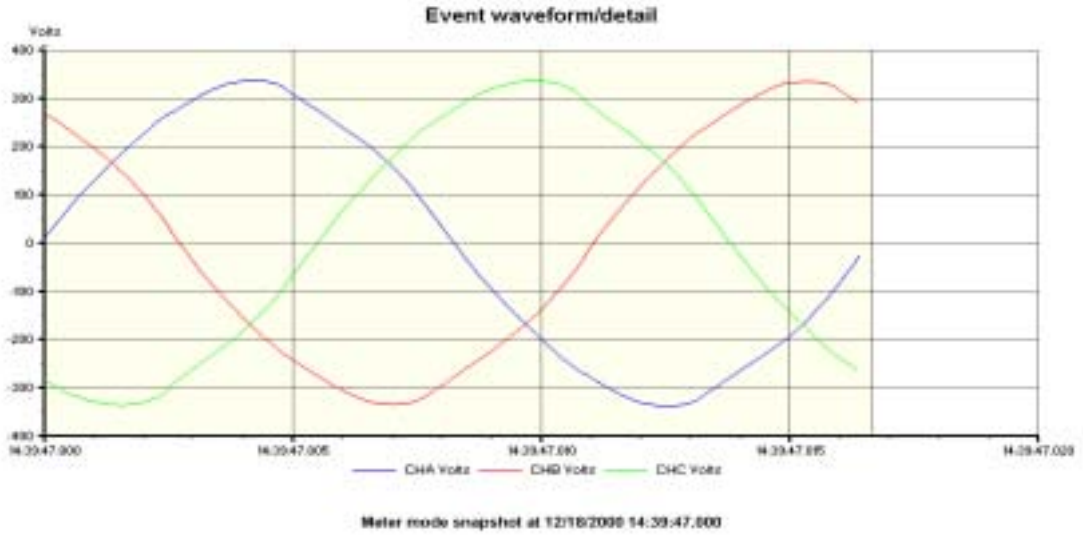
The Iowa-Illinois Section Presents

Power Quality and Harmonics Workshop

Thursday, October 23 and Friday, October 24, 2003
Radisson Quad City Plaza Hotel and Conference Center
111 East Second St.
Davenport, Iowa



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Power Quality and Harmonics Workshop

IEEE Iowa-Illinois Section

October 23-24, 2003

SYNOPSIS

This workshop, provided by Electrotek Concepts, will:

- Provide the background and information needed to investigate and solve power quality problems involving possible interaction between events on the power system and the response of equipment within end user facilities.
- Address important concerns within customer facilities that can often be mistaken for problems with the electric supply system (for example, wiring and grounding problems, local harmonic problems within the facility, voltage variations caused by loads within the facility, etc.).
- Focus on the full range of solutions that can be implemented for the various types of power quality problems that can be encountered.

Topics will include the basics of power quality investigations, site audits, monitoring power quality, analyzing power quality concerns, and developing solutions.

WHO SHOULD ATTEND?

The workshop is designed for utility engineers, industrial end users, and commercial end-users that deal with power quality issues.

INFORMATION ABOUT THE INSTRUCTOR

Mark McGranaghan, of Electrotek Concepts, will present this workshop. He has helped develop the most advanced power quality monitoring database management and reporting system in the world. This system is sold and supported by Electrotek in cooperation with EPRI. Mark also supports products and studies related to distribution system simulation and analysis, dispersed generation applications and optimal power quality solutions.

Mark has worked in the power quality field for 20 years, performing studies, teaching seminars, and developing products related to the analysis of power quality concerns. He worked closely with EPRI to support their power quality program, performed power quality case studies throughout the world, helped benchmark utility distribution system power quality in the U.S. in the EPRI DPQ project, and has helped more than 25 utilities implement extensive power quality monitoring systems.

He has been chairman of IEEE 519A, developing an application guide for applying harmonic limits. He has also worked on a number of IEC standards. Mark is currently

active in defining indices for characterizing the reliability and power quality performance of power systems. He is the vice-chairman of the IEEE Power Quality Standards Coordinating Committee SCC 22. In this role, he helps coordinate standards development work between IEEE and other organizations around the world, such as IEC.

Mark has written numerous technical papers and articles on all aspects of power quality and power system analysis. Mark, along with Roger Dugan, Surya Santoso, and Wayne Beaty, recently completed the second edition of the textbook Electrical Power Systems Quality, upon which this workshop is based. The book is described on the Web at: www.electrotek.com/pqbook/.

Mark has BSEE and MSEE degrees from the University of Toledo and an MBA degree from the University of Pittsburgh.

Power Quality and Harmonics Workshop Outline

Day 1 October 23, 8:00 a.m. – 5:00 p.m.

Introduction and Definitions

- Objective of the course
- Why power quality keeps growing in importance
- IEEE definitions for different types of PQ variations
- Examples of the different types of problems

The Power Quality Evaluation Procedure

- A procedure for evaluating power quality concerns
- Role of measurements, monitoring projects
- Role of simulations, analytical tools
- Who needs to be involved

Flicker and Voltage Regulation Problems

- Voltage regulation procedures and guidelines
- Motor starting issues
- Effect of DG on voltage regulation
- Concerns for unbalance
- Concerns for flicker
- Controlling flicker

Harmonics Problems

- Sources of harmonic distortion
- Evaluation with respect to IEEE 519 limits
- Rules for identifying possible problem situations
- System analysis procedures (identifying resonance problems)
- Harmonic issues in commercial facilities
- Solutions to harmonic distortion problems

Transient Overvoltage Problems

- Transient overvoltages caused by lightning
- Transient caused by capacitor switching
- Special problems with capacitor switching transients
- Surge protection procedures
- Grounding considerations

Day 2, October 24, 8:00 a.m. – 5:00 p.m.

Voltage Sags and Momentary Interruptions

- Causes of voltage sags and voltage sag characteristics
- Characterizing system voltage sag performance
- Benchmarking results of voltage sag performance from around the world
- Characterizing equipment sensitivity
- Solutions for improving voltage sag performance
- Finding the most economical solution

Monitoring Power Quality

- Performing site surveys
- Monitoring to benchmark system performance
- Advanced applications for power quality monitoring systems
- Monitoring equipment requirements
- Managing a power quality monitoring database
- Data analysis software
- Reporting and web-based applications

Example Cases

- Notching problem example
- Capacitor switching problem example
- Voltage sag ride through improvement example

Where Do We Go From Here?

- Action plans for utilities
- Action plans for end users
- Action plans for manufacturers
- Action plans for regulators

REGISTRATION AND LOCATION INFORMATION

Workshop location

Radisson Quad City Plaza Hotel and Conference Center
111East Second St.
Davenport, Iowa

For hotel reservations, call 1-800-333-3333 or 563-322-2200. Mention the workshop to receive the group rate. Please make your room reservation well in advance.

Cost of the Workshop is $150, payable by check to *IEEE IA-IL Section.*

For more information, contact:
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Fax: 563-333-8112
E-mail: iowa-illinoischair@ieee.org

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REGISTRATION FORM

Name _____Title_____

E-mail address _____ Fax _____

Company _____Phone_____

Address_____

City _____ State____ ZIP _____

Registration deadline is August 18. Full refund of Workshop fee available only until September 1. Half refund fee available until September15. No refunds after September 15.

Please return this form, along with your check made payable to *IEEE IA-IL Section,* to:

IEEE Workshop, ATTN. Karen Pedersen, MidAmerican Energy, P.O. Box 4350, Davenport, IA 52808