

Power Quality Interest Group

The growing use of electronic loads in industrial and commercial networks has substantially increased concerns about power quality. Throughout the world, leading utilities are reviewing their policies concerning damage or economic impact caused by power quality problems, revising their planning and operation standard practices and investigating new avenues for providing enhanced types of service to their customers. At the same time, electricity distribution regulators are increasingly utilizing performance-based tariffs as a tool to ensure and promote quality and efficiency of distribution services. These regulations often include monitoring and compliance with defined power quality targets.

The need for well established power quality standards that would allow power utilities and manufacturers to coordinate development and guarantee of equipment electromagnetic compatibility (EMC) with utility systems is imperative. Equally imperative is the need to develop and establish design guidelines that would assist power utilities and consulting engineers in the integration of new connection facilities into power systems without adverse impact on reliability and power quality. An extensive Power Quality Survey, which has gained international recognition, provides utilities with the most advanced tools and knowledge to address the EMC problems. The objective of this Interest Group is to build on CEATI's established excellence in the field of power quality. Identification of new business opportunities, such as the offering of different levels of electricity supply quality with differentiated rates, is only one example of the practical application of this research. The information and experience sharing gained from the program also provides the technical back-up knowledge required to support or influence the development of standards in this key area.

Topics & Issues

Power Quality Monitoring and Measurement Standards

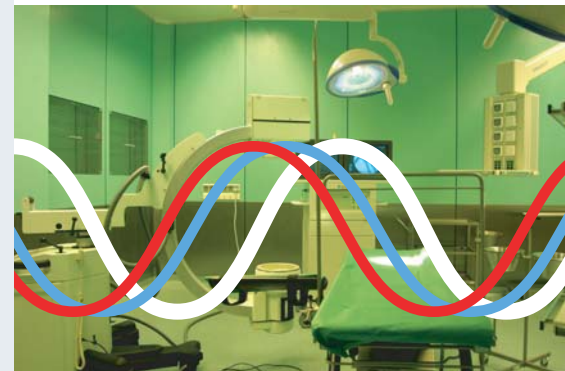
System Disturbances Baseline

Mitigation at System Level

Equipment Characterization

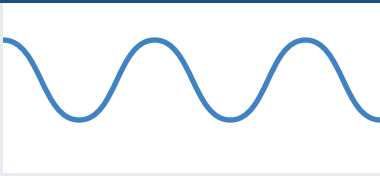
Mitigation at Equipment Level

Survey of Methodologies and Metrics used in Performance Based Regulations



Technology Coordinator

Mr. Jerry Lepka leads the Power Quality Interest Group (PQIG). A graduate of the University of Manitoba, Mr. Lepka has worked both abroad and in Canada managing complex technical operations and implementing new technologies. His most recent project was with the Gestore Rete Trasmissione Nazionale in Italy, where he was a member of the Advisory Committee analyzing the causes of the September 2003 Italian system blackout and recommending preventive measures. At Ontario Power Generation, Jerry was involved in development of the performance-based Protection and Control Technical Training Program as well as maintenance strategies for their high voltage equipment. Mr. Lepka's career also includes time with Ontario Hydro (now Hydro One), where as a Manager of their Transmission Company Toronto District he was responsible for the City of Toronto high voltage transmission facilities. He also led Ontario Hydro's province-wide power quality monitoring program aimed at reducing system disturbances and their impact on electrical supply to major customers. He also spent several years in Ghana, West Africa, where he organized and established a new Transmission System Division for the Volta River Authority.



Projects for a complete project listing, please visit: www.ceatech.ca/pqig

- Uniform Practices in Reporting Momentary Outages and their Relationship With Power Quality
- State of the Art Sensors Suitable for Distribution Automation Applications
- Practical Guidelines for Evaluating the Impact of Transients on Utility Customers
- Tools to Assess PQ Impact of Large Penetrations of Modestly Rated DG on Distribution Feeders
- Survey of Utility Practices in Dealing with Most Common Power Quality Issues for Large Customers
- Electrical Utility Guide for Uniform and Consistent Practices in Defining, Monitoring and Reporting Compliance with Steady-State Voltage Levels at Points of Common Coupling
- Interharmonics: A Tutorial on Their Sources, Characteristics, Measurement and Troubleshooting
- Monitoring and Analysis of Power Quality Problems Associated with Distribution Capacitor Banks
- Power Quality at Supply Points to Distribution Companies
- Stray Voltages in Higher Load Density Environments – Causes, Effects and Measurement and Mitigation Techniques
- Aligning Utility “Stray Voltage at Farm Sites” Standards and Mitigation Techniques with State-of-the-Art Practices
- Method to Discriminate Between the Contributions of the Customer and the Power System to the Harmonic Disturbance
- Distribution Network Impedance
- Customer Power Factor Correction Capacitor Application Guide
- Factors Affecting High Grade Power Costs
- Incentives and Penalties for Electrical Power Quality Under Performance-Based Regulations
- PQ Impact Assessment of Distributed Wind Generation
- Survey and Assessment of Techniques for Locating the Sources of Voltage Sag Disturbances
- Assessing PQ Disturbances Using PQ Features of Distribution Network Equipment
- Review of Flicker Measurement of the CEA PQ Survey 2000
- A New Approach To Power Quality Measurement Protocol
- Defining Grades of Power Quality
- Impact of Harmonics on Utility Equipment: A Survey and Review of Published Work
- Solutions to PQ Disturbance Problems of Sensitive Equipment
- Establishing Power Quality Guidelines
- Sag, Swell and Short Interruption Evaluation from the Canadian PQ Survey 2000
- Case Studies of Utility-Scale Power Quality Mitigation Devices
- Approaches for Embedded Solutions
- An Automated Method for Assessment of Harmonics from Distributed Generators
- Techniques to Assess Harmonic Distortions for Systems with Distributed Harmonic Sources
- Indices to Assess Voltage Sag Performance
- Revenue Meter Errors Due to Harmonic Distortions
- Power Quality Survey 1999-2000
- Impact of the Introduction of the Electromagnetic Compatibility (EMC) Concept in the North American Electric Industry
- Options and Devices Available for the Prevention, Correction and Mitigation of Electric Power Quality Disturbances



Annual Activities

2 Meetings

Technology Watch Workshop

5-7 Conference Calls

Weekly Information Exchange

Participation is open to:

Utilities

Independent Power Distributors

Government Agencies

Universities

Project Reports

Over the years more than 1300 projects have been completed and published in the fields of:

**Generation; Transmission
Distribution; Utilization**

For a complete listing, please consult our website.

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