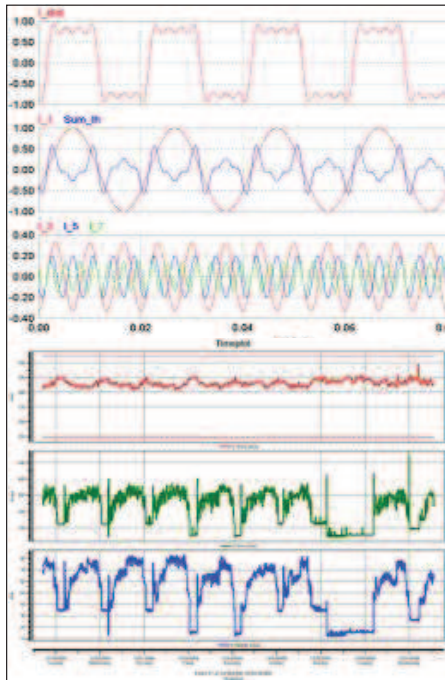

POWER QUALITY PROBLEMS & SOLUTIONS FOR ENGINEERS AND TECHNICIANS



YOU WILL LEARN HOW TO:

- Develop a sound working knowledge of earthing and harmonics
- Gain practical knowledge of surge and transient protection
- Design electrical and electronic systems correctly by applying knowledge of harmonics and earthing principles
- Describe applications for the latest technologies in correcting earthing, harmonics, surge, and transient problems
- Troubleshoot electrical and electronic systems
- Isolate and rectify power quality problems

WHO SHOULD ATTEND:

- Instrumentation and Control Engineers
- Consulting Engineers
- Electrical Engineers
- Project Engineers
- Maintenance Engineers
- Building Service Designers
- Power System Protection and Control Engineers
- Data Systems Planners and Managers
- Electrical and Instrumentation Technicians

The Workshop

Monitoring power quality in industrial environments is essential to the health and stability of your plant and equipment.

This hands-on workshop examines the procedures for design and installation for earthing and neutral systems, while reviewing the fundamentals of power quality and EMC. Common misconceptions about noise are discussed and reviewed along with surge and transient protection, you will walk away with practical steps outlined to minimise or even eliminate these problems. The two days are rounded off with realistic case studies covering a wide variety of industries ranging from manufacturing and process control to telecommunications. The material is covered by means of an interactive learning style, with plenty of practical examples and realistic case studies.

Pre-requisites

Some working knowledge of basic electrical engineering principles is required, although this will be revised at the beginning of the course. Real-life experience with earthing and harmonics problems will enable the workshop to be placed in context.

The Program

INTRODUCTION TO POWER QUALITY AND EMC

- What is Power Quality and EMC?
- The IEC/IEEE and FIPS standards
- Interfacing with electrical utilities

RECOMMENDED DESIGN AND INSTALLATION PRACTICE

- Wiring and earthing for safety and performance
- Wiring and distribution systems
- Dedicated and derived neutral systems
- Earthing and bonding equipment

EARTHING AND NOISE CONTROL

- Site Auditing for noise control
- Misconceptions in performance grounding
- "Single Point" versus "Multi Point" techniques
- Noise and the zero signal reference grid
- Avoiding non-recommended practices

SURGE AND TRANSIENT PROTECTION

- Basics of lightning phenomena
- Power system faults and switching surges
- Mitigation techniques and case study review

CONDUCTING A SITE ANALYSIS

- Overview of sources of power quality problems
- Site survey procedures
- Monitoring and analysis instrumentation

HARMONIC SOURCES AND THEIR EFFECTS

- Principles of harmonic analysis
- Variable speed drives
- Power conversion equipment – and apparatus deterioration
- Controllers, power supplies, PCs and lighting equipment

POWER SYSTEM CAPACITIVE/INDUCTIVE RELATIONSHIPS

- Displacement and distortion power factor
- Reactive power relationships
- Power factor efficiencies

HARMONIC SITE ANALYSIS PROCEDURES

- Measurement fundamentals and true RMS/predictive analysis
- Instrumentation and procedures
- Harmonic order and sequences and resonances
- Voltage and current waveforms (signatures)
- Harmonic interaction auditing

POWER CONDITIONING

- Power conditioners
- Uninterruptible power systems
- Power quality source alternatives
- Power disturbance cost comparisons

CASE STUDIES

- Checklist for powering, earthing and communications
- Commercial buildings
- Manufacturing and process control
- Medical facilities
- Computers and data processing environments
- Telecommunications

SUMMARY, OPEN FORUM AND CLOSING