Quality of Electrical Supply
Continuing Professional Development Course
4 – 5 July 2019, University of Wollongong

A professional development course in power engineering presented by the Australian Power Quality and Reliability Centre, School of Electrical, Computer and Telecommunications Engineering, University of Wollongong

COURSE OBJECTIVES

The rapidly increasing installation of electronic equipment such as digital controls, computers and sensitive process control equipment has increased the susceptibility of utility customers to supply disturbances. In addition, the application of power electronic equipment such as variable speed drives and renewable energy systems has in turn often increased the level of disturbances that may impact operation of customer equipment. The Quality of Electrical Supply course will give a practical understanding of the principles, practices and problems associated with electricity supply quality.

This course will cover all power quality problems including voltage sags, harmonics, transients and flicker. Attendees will learn the characteristics of power quality disturbances, analysis fundamentals, instrumentation techniques and methods of improving power quality by both network and plant modifications. A feature of the course will be a number of hands-on computer investigations for "what-if" scenarios. Course participants will also be presented with practical case studies of power quality problems and solutions from local industry experts

COURSE BENEFITS

Following the course you will have gained knowledge and skills to assist you in the following:

- A systematic understanding of the various power quality problems, including the causes of power disturbances and the types of load affected.
- The estimation of the orders of magnitude of problem situations through computer simulation.
- Knowledge of the standards for particular types of disturbances and actions if standard limits are exceeded.
- Distinguishing the different types of available power quality monitoring equipment and their particular applications.
- Knowledge of how utilities and customers can improve their power quality.

WHO SHOULD ATTEND

This introductory course is suitable for all individuals working in the electrical power engineering industry. This include managers, utility specialists and technical staff who wish to advise customers on power quality concerns, or who service large customers or who wish to understand aspects of network design, construction and maintenance techniques for maximising quality of supply. Personnel working in all areas of power system design who wish to know how the system interacts with the end-user will also gain from this course.

COURSE OUTLINE

The course is conducted over two days commencing at 8:30 am on Thursday 4 July 2019 and comprises lectures, computer laboratories and demonstrations. The course outline is as follows:

DAY 1

- *Introduction*: Overview of power quality issues and their increasing significance, definitions, problems and causes.
- *Modelling and Calculations*: Review of power system analytical techniques including harmonic calculations.
- *Load Behaviour*: Typical nonlinear loads (e.g. VSDs, rectifiers, AC phase control, computers, etc.), how they affect power quality and how they are affected by power quality problems.
- *Voltage Fluctuations*: Causes, effects on loads, measurement and limits, mitigation.
- *Transient Overvoltages*: Types, causes, effects on loads, mitigation, analysis methods.
- *Long Duration Voltage Variations & Voltage Unbalance:* Effects on connected equipment, voltage regulation and its improvement by capacitors, SVCs, etc, causes of voltage unbalance and its effects.
- *Voltage sags and Interruptions*: Causes, effects, fault & motor starting considerations, customer & network solutions.

DAY 2

- *Harmonics*: Relationship between voltage and current distortion, sequence properties of harmonics, causes of harmonic production, harmonic calculation methods, effects on electrical equipment, mitigation.
- *Case Studies*: Power quality case studies and solutions given by industry experts.
- *Panel Session*: Open forum for course participants to ask specific power quality questions of industry experts.
- *Standards*: Philosophy behind standards, voltage fluctuation and harmonic standards from Australia, IEC & IEEE, state codes & regulations.
- *Power Quality Monitoring*: Power quality instrumentation, surveying practices, data evaluation and power quality indices.
- *Power Quality Demonstrations:* Laboratory demonstration of different power quality phenomena and instrumentation.

TRAINING INVESTMENT

The course investment provides for an inclusive industry related training package with course notes, lunches and morning and afternoon tea. Course fee per person is **AUD$1600 including GST**. Participants may count course hours towards their continuing professional development requirements.

NOTE: Arrangements for accommodation are the responsibility of participants and costs are not included in the course fee. A list of hotels and motels in the Wollongong area will be supplied to participants upon registration.

REGISTRATION

To register please click on the link: https://uow.onestopsecure.com/OneStopWeb/ElectricalSupplyCourse

Note: There is no guarantee that economic participation levels for this course can be achieved. Registrants will be notified 2 weeks prior to course if the course cannot proceed due to insufficient numbers. The program may be changed at any time due to unforeseen circumstances. If the course cannot proceed for any reason, UOW will not accept liability of whatsoever kind for expenses incurred by any person or corporation with the sole exception of the course investment, which will be refunded in full

ENQUIRES

Please call **Ms Raina Lewis** at the
Australian Power Quality and Reliability Centre, University of Wollongong.
Phone: (02) 4221 3335 Email:raina_lewis@uow.edu.au

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