Applied Power Quality: Harmonics, Unbalance & Voltage Sags

Continuing Professional Development Course

26–27 September 2019, 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. Electricity supply businesses need to have an ongoing awareness of problems and solutions in the power quality area. This course is an advanced course which builds on the introductory course Quality of Electrical Supply and is designed to expand the coverage of selected power quality topics in order to give participants practical skills in the analysis and mitigation of specific problems. The selected topics for this course are harmonics, voltage unbalance, voltage sags and interruptions, power electronic mitigation techniques, power quality monitoring and reporting

COURSE BENEFITS

Following the course, participants will be able to:

- Calculate distortion levels, evaluate resonance problems, apply the AS/NZS 61000.3.6 Technical Report methodologies and assess the effectiveness of mitigation methods.
- Apply symmetrical component theory to the calculation of unbalance factors, understand the effects of unbalance on various loads and appreciate the essentials of voltage unbalance standards.
- Determine sag depth at a site depending on fault location or motor start characteristics.
- Assess options for sag mitigation and determine whether they should be applied within the plant or network.
- Understand how power electronic devices can be used to mitigate power quality problems.
- Better understand PQ monitoring methodology including disturbances to be measured, how they should be characterised and reported, and their acceptable levels.

Participants will learn advanced analysis techniques and methods of improving power quality by both network and plant modifications. Course participants will have the opportunity to develop their knowledge and skills through discussion and laboratory sessions.

AUSTRALIAN POWER QUALITY AND RELIABILITY CENTRE
APQRC

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WHO SHOULD ATTEND?

This applied course is aimed at utility specialists, consultants, engineers and senior 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.

The course assumes the participants will have an understanding of phasor calculations, simultaneous equations and Fourier analysis.

COURSE OUTLINE

The course is conducted over two days commencing at 8:25 am on Thursday 26 September 2019 and comprises lectures and computer laboratories:

DAY 1

- *Harmonics*: Overview of harmonics and Fourier analysis, definitions, estimation of harmonic currents due to load types, effect of system impedance, modelling harmonic loads, resonance effects, standards including AS/NZS 61000.3.6, practical mitigation techniques.
- *Voltage unbalance*: Sequence components, IEEE & IEC standard definitions of unbalance factor, load behavior, IEC 61000-3-13 Technical Report.
- *Power electronic mitigation techniques*: Application of power electronic systems to the mitigation of voltage problems in distribution systems.

DAY 2

- *Voltage sags*: Application of symmetrical components to fault calculations, sag characterisation, sag aggregation, equipment susceptibility, assessing sag distribution, influence of network design, practical mitigation techniques.
- *Power quality monitoring and reporting*: Monitoring imperatives, characterising events, instrumentation, benchmarking practices, site indices.

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/PowerQualityCourse

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

ENQUIRIES

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