
Program Contents

Introduction to Power Quality	<ul style="list-style-type: none">• What is Power Quality• Structuring Concepts• Cause & Effect Analysis• Acute vs. Chronic Problems• Analytical Philosophy and Approach
Sine Waves: Voltage, Current & Power	<ul style="list-style-type: none">• Peak, Average & RMS Values• Crest Factors & Form Factors• Power Definitions and Calculations
Network Reactive Components	<ul style="list-style-type: none">• Inductors: Steady State Response• Inductors: Transient Response• Capacitors: Steady State Response• Capacitors: Transient Response
Wiring & Grounding Fundamentals	<ul style="list-style-type: none">• Definitions: Grounding & Bonding• Why Grounding & Bonding• The Neutral to Ground Bond• Single Point Grounding• Grounding & Sensitive Loads• Case Studies
Power Disturbances: RMS Variations	<ul style="list-style-type: none">• Classification of Power Disturbances• Standards & Guidelines• Electronic Equipment Voltage Tolerance• Typical Causes of Voltage Sags• Case Studies
Power Disturbances: Transient Activity	<ul style="list-style-type: none">• Definition & Classification of Transients• Capacitor Switching Transients• Load Sensitivity: VFD's, Computers, etc..• Commutation Notches• The IEEE 519-2014 Limits• Case Studies
Introduction to Harmonics	<ul style="list-style-type: none">• Definition of Linear & Nonlinear Loads• Current Distortion Mechanism• Voltage Distortion Mechanism• Analysis of Distorted Waveforms• Harmonic Distortion Indexes• Harmonics & Resonance• Effects of Harmonics on Loads and Networks• The IEEE-519-2014 Standard• Harmonic Studies
Power Quality Surveys & Monitoring Basics	<ul style="list-style-type: none">• Organizing the Survey• Inspection of Equipment, Grounding & Wiring• Equipment Maintenance & Performance History• Selection & Setup of Monitoring Equipment• Thresholds and Monitoring by Exception• Event & Data Correlation

Seminar Description: This one-day training seminar covers all the essential concepts of Power Quality analysis as well as the strategic thinking needed to establish a sound root-cause-analysis approach to problems. The range of topics spans from key sine wave markers all the way up to harmonics, transient analysis and monitoring.

Instructor: Pietro Manni, P.Eng.
PQ Logic Corporation

About the Instructor: Pietro Manni is the founder of PQ Logic Corporation, a PEO registered engineering firm based in Toronto, Canada. Since 1996 he has devoted his practice to the study of Power Quality. He has extensive experience in innovative computer-based modelling techniques, needed to understand and solve complex problems. His most recent projects include: Harvesting energy from DC transit systems as an integral part of a Micro-Grid network and mitigating the effect of utility capacitor switching transients on large industrial variable frequency drives. With over 200 major projects under his supervision, his firm has provided consulting services for clients in the industrial, commercial, medical, government, military and nuclear areas worldwide. Parallel to his consulting work, Mr. Manni conducts advanced engineering training and delivers lectures in power systems to audiences and other consultants all around the globe. Mr. Manni is a registered professional engineer in the province of Ontario, Canada.

Seminar Schedule:	08:00 AM to 09:00 AM	Breakfast & Registration
	09:00 AM to 10:30 AM	Seminar Lectures
	10:30 AM to 10:45 AM	Coffee Break
	10:45 AM to 12:00 PM	Seminar Lectures
	12:00 PM to 01:00 PM	Lunch Break
	01:00 PM to 02:30 PM	Seminar Lectures
	02:30 PM to 02:45 PM	Coffee Break
	02:45 PM to 05:00 PM	Seminar Lectures
	05:00 PM	Cocktails