



**Maintenance Planning, Process
Engineering & Instrumentation**



SCANDINAVIAN ACADEMY
For Training and Development

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Course: Power Quality and Reliability

Code	City	hotel	Start	End	price	Hours
792	Frankfurt (Germany)	Hotel Meeting	2024-07-22	2024-07-26	5950 €	25

Introduction

Power quality determines reliability of electrical equipment operation, performance of the assigned functions by it, service life. Problems of power quality attracted increased attention because of power quality degradation and not meeting customer expectations. Poor power quality has been shown to lead to reduced efficiencies, increased risk of downtime and higher energy and operating costs.

When it comes to power quality issues, the easiest and most effective solution to avoid unplanned shutdowns is the correction of voltage anomalies coming from the grid. This can be accomplished using harmonic filters, capacitors and other protective equipment.

Rises in non-linear and other challenging loads in modern electrical networks present unique power quality challenges. Sensitive operations, irregular loads and isolated or weaker grids demand stricter grid codes and power quality standards to safeguard the reliability of an electrical system for smooth industrial and commercial processes. Harmonics distortions, voltage variations, poor power factor and load unbalance are among the key elements that not only test the reliability of modern electrical systems but also induce overall greater system losses. This Power Quality and Reliability training course will ensure that your Power Systems Meet Customer Expectations.

This training course will feature

- Basic terminology and definitions
- Voltage sags and interruptions
- Effects of fault clearing on voltage
- Reliability indices
- Transient overvoltage's and arresters
- Understanding and mitigating harmonics
- Analysis of AC power and steady-state voltage regulation

What are the goals?

- Understand common power quality and reliability terms
- Know how to assess the impact of voltage sags on sensitive electrical equipment
- Comprehend the influence of fault clearing on voltage stability
- Calculate and use standardized reliability indices
- Understand the sources of transient overvoltage's and be able to specify arresters



- Know why harmonics are produced and be able to implement mitigation methods
- Analyze the components of AC power and understand the relationship with voltage regulation

Who is this training course for?

- Engineers and technicians new to the power industry
- Intermediate-level engineers and technicians who seek to improve system reliability
- Professionals involved with the assessment of power quality
- Facility engineers and consultants responsible for mitigating power quality issues
- Engineers tasked with monitoring system performance and reliability

Course Outline

- **Day One: Introduction and Power Quality Issues:**
 - Power quality definition and basics
 - Importance of good and reliable power quality
 - Quantifying power quality
 - ITI curve
 - Causes of voltage sags
 - Causes of interruptions
- **Day Two: Transient Voltage Excursions:**
 - Motor starting
 - Switching and traveling waves
 - Capacitor switching
 - Lightning
 - Lightning shielding and grounding
 - Ferro resonance
- **Day Three: Reliability Indices, Effects of Fault Clearing on Power Quality:**
 - IEEE-defined reliability indices
 - Interpreting reliability indices
 - Fault clearing
 - Reclosing strategies
 - Fuse saving philosophy
 - Fuse blowing philosophy
- **Day Four: Insulation Coordination, Arresters, and Steady-State Voltage Regulation:**
 - Basic impulse level
 - Insulation systems
 - Insulation testing
 - Arrester selection and application
 - Load tap changers and voltage regulators
 - Effects of steady-state voltage on system operation
- **Day Five: Harmonics and Mitigation Techniques:**



- Fundamentals of harmonics
- Causes and effects of harmonics
- AC power and power factor
- Mitigating harmonic effects
- K-factor transformers
- Harmonic filters



The Scandinavian Academy employs modern methods in training and skills development, enhancing the efficiency of human resource development. We follow these practices:

- **Theoretical Lectures:**
 - We deliver knowledge through advanced presentations such as PowerPoint and visual materials, including videos and short films.
- **Scientific Assessment:**
 - We evaluate trainees skills before and after the course to ensure their progress.
- **Brainstorming and Interaction:**
 - We encourage active participation through brainstorming sessions and applying concepts through role play.
- **Practical Cases:**
 - We provide practical cases that align with the scientific content and the participants specific needs.
- **Examinations:**
 - Tests are conducted at the end of the program to assess knowledge retention.
- **Educational Materials:**
 - We provide both printed and digital scientific and practical materials to participants.
- **Attendance and Final Result Reports:**
 - We prepare detailed attendance reports for participants and offer a comprehensive program evaluation.
- **Professionals and Experts:**
 - The programs scientific content is prepared by the best professors and trainers in various fields.
- **Professional Completion Certificate:**
 - Participants receive a professional completion certificate issued by the Scandinavian Academy for Training and Development in the Kingdom of Sweden, with the option for international authentication.
- **Program Timings:**
 - Training programs are held from 10:00 AM to 2:00 PM and include buffet sessions for light meals during lectures.