



**Maintenance Planning, Process  
Engineering & Instrumentation**



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# Course: UPS Systems & Battery Chargers: Maintenance & Troubleshooting

Code	City	hotel	Start	End	price	Hours
550	Copenhagen (Denmark)	Hotel Meeting Room	2024-07-08	2024-07-12	5950 €	25

## Introduction

A sudden loss of power will disrupt most business operations and could lead to a company being unable to trade.

Where a company regards electrical power as critical then there will be a need for a continuous or back up power system. The installation of a UPS will provide the necessary continuity. There are however problems with these installations when there is a need for maintenance especially the use of by-pass. Power Quality compatibility problems may cause failure, which was the reason for the original UPS installation.

## Seminar Objectives

The seminar is intended to develop knowledge of the need for a UPS, types available, UPS components, batteries, generators and maintenance.

## Training Methodology

The seminar is conducted as modular lectures with encouragement for the delegate to interact. Case studies are included to illustrate how the UPS can provide reliability and create possible problems when not installed and maintained correctly.

Questions are welcome throughout the course and during the break sessions.

## Organisational Impact

Delegates will return to their organizations equipped with new knowledge and skills that will enable them to understand more fully the requirements, roles and maintenance of UPS and battery systems.

Your standby and backup systems can be refined to ensure maximum resilience at minimum cost.

## Personal Impact



**On successful completion of this course, delegates will:**

- Understand the basis for the use of a UPS
- Understand Critical Load Applications
- Have an appreciation of Power Problems
- Be able to review the installation and maintenance requirements of a UPS and Stand-by power installation
- Be able to improve reliability by improving the resilience of an electrical installation

## **Competencies Emphasized**

**This programme aims to enable participants to develop the following competencies:**

- Understanding of the reasons for, and benefits of, a UPS and its battery system.
- Understanding how a UPS works.
- Analysis of critical loads and the benefits of supporting them with a UPS.
- Power Quality analysis; maintenance of electrical installations.
- Understanding of resilience and reliability issues relating to power quality.

## **Who Should Attend?**

This seminar is directed at electrical technicians, electrical supervisors, maintenance professionals and electrical engineers who would like to expand their knowledge of UPS systems.

## **Programme Outline**



**Day 1 - Introduction to the Resilient System**A sudden loss of power causes disruption to any business where there is no stand-by or safety service, the course introduces the term resilience.

Introduction  
Regulations  
Critical loads  
Purpose of an Installation  
Compatibility  
Protection and Devices  
UPS or Generator  
Maintenance

**Day 2 - What is a UPS?**After identifying an item of load is critical then there is a need to protect or back-up the supply, a UPS is a solution.

UPS Rating  
Parallel systems  
What is available  
Maintenance by-pass  
Off Line systems  
Redundancy  
On Line systems  
Interactive systems

**Day 3 - UPS Components**How does it work? A question often asked and in this module the method of operation is examined.

Transformer methods  
Harmonics  
Invertors  
Twelve pulse rectifier  
Phase control  
Power factor  
Six pulse rectifier  
Static switch

**Day 4 - Batteries**Batteries are essential as an alternative store of energy providing the reserve power needed by the UPS after a mains failure. They are also dangerous especially during installation and maintenance.

What is a battery?  
Storage and Care  
VLRA  
Choosing a battery size  
Size and location  
Charging



Configuration

Battery safety

**Day 5 - Generators and Site Planning** If a power failure exceeds the reserve battery capacity the system will fail but using a generator will ensure continuous power. Planning the site and considering the load will ensure a successful installation and careful maintenance planning will ensure reliability.

Do I need a Generator?

Environmental Constraints

Mains failure

Monitoring power

UPS Compatibility

Installing the UPS

Generator size considerations

Maintaining the UPS



**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.