



Electrical Engineering

UPS System & Battery Chargers: Maintenance & Troubleshooting

Course Introduction

In industrial process today, reliability of equipment is very important. Power supply must be able to cater the need of industrial process. In case of power failure, backup power supply system must be able to support the main process plant. This is to ensure smooth operation and product quality. In order to do this, uninterruptible power supply (UPS) system can be used to ensure the reliability, power quality (PQ), stability and consistency of the entire system.

There are often cases that the power back-up system is not well selected, incorrectly installed, operated, maintained, and in other cases do not work properly when needed and this failure caused losses in term of time and money to industries. A system that be able to monitor this power back-up system can detect any abnormal activities occurred to the system. In addition, the system can prevent any fault that may affect the whole operations.

UPS System

The main purpose of this training course is to provide a practical detailed guidance for facilities engineers in selecting, installing, troubleshooting, and maintaining an uninterruptible power supply (UPS) system.

Target Audience

- Power Systems Engineer
- Project Engineer
- Test Engineer

Learning Objectives

- UPS and control engineers and technicians.
- Plant Maintenance / Operators / Supervisor / Superintendent.
- Industrial Engineers.
- Technical maintenance employees.
- Electrical Engineer / Supervisor,
- Instrument Engineer / Supervisor, and
- Professional power system Engineers.

Course Outline

• DAY 01

Module (01) Improving Reliability and Power Quality with Standby Power Supplies

- 1.1 Introduction
- 1.2 Power supply Reliability
- 1.3 Classification of Power Quality Disturbances
- 1.4 Standby power supply devices
 - 1.4.1 Duplicate Feeder from the Grid
 - 1.4.2 Engine generating sets (EGS)
 - 1.4.3 Battery storage
 - 1.4.4 Uninterruptible power supply (UPS) systems
 - 1.4.5 Energy sources

Module (02) UPS Configurations for 7 X 24 Continuous Power Facilities

- 2.1 Separating the Essential and Nonessential Loads

- 2.2 Special equipment to support continuous operation
- 2.3 Defining failure in a 7 × 24 facility
- 2.4 Reliability and availability as tools in evaluation of critical facilities
- 2.5 Critical distribution system configurations
- 2.6 Reliability and availability of critical distribution system configurations

• **Day 02**

Module (03) UPS Configurations for 7 X 24 Continuous Power Plants

- 3.1 Introduction
- 3.2 Typical configurations of UPS systems for power generating station loads

Module (04) Application Considerations

- 4.1 Charging Methods
- 4.2 Service Conditions
- 4.3 Equipment Rating
- 4.4 Output Ripple
- 4.5 Output Regulation
- 4.6 Fusing
- 4.7 Surge Voltage Withstand Capability

Module (05) UPS Selection

- 5.1 Determine the general need for an UPS.

- 5.2 Determine the purpose of the UPS.
- 5.3 Determine the power requirements.
- 5.4 Select the Type of UPS.
- 5.5 Determine if the safety of the selected UPS is acceptable.
- 5.6 Determine if the availability of the selected UPS is acceptable.
- 5.7 Determine if the selected UPS is maintainable.
- 5.8 Determine if the selected UPS is affordable

• **Day 03**

Module (06) Static UPS system ratings and size selection

- 6.1 Determining static UPS system rating.
- 6.2 Battery sizing
- 6.3 Computation sheets.
- 6.4 Static UPS system selection criteria.

Module (07) Rotary UPS system ratings and size selection

- 7.1 Determining rotary UPS system rating.
- 7.2 Motor and generator ratings.
- 7.3 Flywheel sizing.
- 7.4 Rotary UPS system selection criteria.

Module (08) Construction and installation of static UPS systems

- 8.1 Construction features of static systems.
- 8.2 Installation requirements.

Module (09) Construction and installation of rotary UPS systems

- 9.1 Construction features of rotary systems.
- 9.2 Installation requirements for rotary systems.

• Day 04

Module (10) Power distribution and equipment grounding and shielding requirements

- 10.1 Power distribution equipment.
- 10.2 Grounding.
- 10.3 Computer power centers.
- 10.4 Shielding.
- 10.5 Radio frequency interference (RFI).
- 10.6 Noise and noise reduction methods.

Module (11) Testing and start-up

- 11.1 Installation inspection.
- 11.2 Individual component testing.
- 11.3 Visual and electrical wiring inspections.
- 11.4 Energizing and test of the UPS system.
- 11.5 Test forms.
- 11.6 Troubleshooting - Possible failures and corrective actions.

• Day 05

Module (12) Test equipment

- 12.1 Use of maintenance personnel.

- 12.2 Use of diagnostics.
- 12.3 Suggested lists of test equipment and accessories.

Module (13) Types of Maintenance

- 13.1 Maintenance for UPS systems
 - 13.1.1 Safety.
 - 13.1.2 Preventive maintenance.
 - 13.1.3 Corrective maintenance
 - 13.1.4 Recognizing impending problems.
 - 13.1.5 Troubleshooting.
 - 13.1.6 Spare parts availability.
- 13.2 UPS battery maintenance
 - 13.2.1 Maintenance costs.
 - 13.2.2 Maintenance access.
 - 13.2.3 Preventive maintenance.
 - 13.2.4 Maintenance procedures.
 - 13.2.5 Maintaining flooded lead-acid cells.
 - 13.2.6 Maintenance considerations.
 - 13.2.7 Maintaining valve-regulated lead-acid cells.
 - 13.2.8 Ni-cad cells.
 - 13.2.9 Safety.

Confirmed Sessions

FROM	TO	DURATION	FEES	LOCATION
June 16, 2025	June 20, 2025	5 days	4250.00 \$	UAE - Abu Dhabi
Aug. 24, 2025	Aug. 28, 2025	5 days	4250.00 \$	Bahrain - Manama

FROM	TO	DURATION	FEEs	LOCATION
Dec. 22, 2025	Dec. 26, 2025	5 days	4250.00 \$	UAE - Dubai