



Arabian Institute For Training

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# Uninterruptible Power Supply (UPS)

## INTRODUCTION

- Uninterruptible power supply (UPS) is a battery-powered electronic device that continues to supply electricity to the load for a certain period of time during a utility failure or when the line voltage varies outside the normal limits. It is a typical application. Besides the backup, most UPS also provide surge protection. Modern UPS can either be of the static type or the rotary type.
- This exclusive training course on the importance of Uninterruptible Power Supply (UPS) is of great interest where electrical installations require continuous power supply. Today's reliance of power from the grid sometimes poses new issues like power quality and interruptions. This training course will address issues pertaining to power quality and mitigation techniques. A closer look at the uninterruptible power supply components and functionalities will be discussed. The battery system which forms the integral part of the uninterruptible power supply will be scrutinised in view of its construction, characteristics, merits and demerits. The-state-of-the-art diesel rotary uninterruptible power supply will be deliberated in details.

Delegates attending the Uninterruptible Power Supply (UPS) training course will develop the following competencies:

- Understand the importance of a UPS system
  - Awareness of the types, care and maintenance of batteries
  - Comprehend the construction and functionalities of the static UPS system
  - Exposed to the operation, construction and characteristics of the diesel rotary uninterruptible power systems
  - Determine the maintenance strategies for the UPS systems
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## **PROGRAMME OBJECTIVES**

Importance of Uninterruptible Power Supply course aims to assist delegates to achieve the following objectives:

- Define the roles of the roles of an uninterruptible power supply with regards to the types of loads it should protect
- Understand the different types and construction of batteries installed in an uninterruptible power supply
- To appreciate the merits of the fully automated battery monitoring system
- Identify the components in the uninterruptible power supply
- Understand the functionalities and operations of each component of the uninterruptible power supply
- Competence to perform maintenance by switching on to the bypass mode
- Be able to interpret the alarms and execute troubleshooting techniques
- To identify the particular type of uninterruptible power supply unit installed at your premises

## **WHO SHOULD ATTEND?**

Uninterruptible Power Supply (UPS) training course will enable the technicians and maintenance staff to perform correct maintenance procedures and troubleshooting of the UPS and battery systems. This training course is suitable to a wide range of professionals, but will greatly benefit:

- Electrical Engineers
- Maintenance Technicians
- Management Professionals
- Project Engineers

## **TRAINING METHODOLOGY**

- The goals of each participant are discussed to ensure their needs are fulfilled, as far as possible. Questions are encouraged throughout, particularly at the daily wrap up sessions. This provides opportunities for participants to discuss specific issues and, if possible, find appropriate solutions. Case studies are employed to highlight particular points and appropriate video materials used to illustrate particular conditions.

## **PROGRAMME SUMMARY**

- This unique training course on Importance of Uninterruptible Power Supply will expose the various topologies to the delegates. Upon completion of the course delegates will improve the maintenance strategies of their existing systems, hence will optimize the operations of the uninterruptible power supply units.
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## PROGRAM OUTLINE

### Fundamentals of Uninterruptible Power Supply

- Uninterruptible power system concepts and resilient systems
- Single input and double input uninterruptible power systems
- Merits of installing an uninterruptible power system
- Power quality issues and outages
- Simple uninterruptible power system designs
- Uninterruptible power supply system versus standby diesel generators

### Types and Construction of Batteries and Battery Chargers

- Different types of battery technologies and characteristics
- Construction and characteristics of lead acid batteries
- Construction and characteristics of nickel cadmium batteries
- Battery monitoring systems
- Types, construction and characteristics of battery chargers

### Characteristics and Functionalities of Various Uninterruptible Supply Systems

- The online and offline uninterruptible power systems
- Uninterruptible power supply components and functionalities of filters
- Double conversion uninterruptible power systems
- Transformer base and transformer-less uninterruptible power systems
- Uninterruptible power systems operation modes
- Parallel systems and redundancy

### Construction and Operation of the Diesel Rotary Uninterruptible Power System

- Concept of the diesel rotary uninterruptible power system or DRUPS
- Construction of DRUPS
- Operation of DRUPS
- Types and characteristics of DRUPS
- Merits of DRUPS
- Challenges facing DRUPS

### Installation, Applications, Protection and Maintenance of Uninterruptible Power Systems

- Safety and care of uninterruptible power systems
  - Importance of battery and uninterruptible power systems maintenance
  - Uninterruptible power system protection
  - Troubleshooting uninterruptible power systems
  - Condition monitoring of uninterruptible power systems
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