Training Program:

Power Supply For Protection & Control Systems

Introduction:

The objective of this course is to stress the importance of uninterruptible power supplies for protection and control circuits, and to look at different means of achieving this. The provision of both continuous AC and continuous DC power supply is discussed and attention is paid to individual power supplies for electronic equipment. Some time is devoted to studying operation and maintenance of the common storage battery. This area often seems to be neglected, even though it is after all, the heart of uninterruptible power supplies.

Who Should Attend?

Technical personnel involved in project work, personnel involved in construction activities, mechanical, electrical, instrumentation, maintenance, design and HSE technical personnel

Course Objectives:

By the end of this course delegates will be able to:

- Understand the meaning of lead acid cell, lead antimony and lead calcium
- Know the different voltage level requirements
- Develop and understanding of the significance of specific gravity and output voltage per cell
- Understand the meaning of sulfating
- Know and apply safety precautions against acid

- Gain a thorough understanding of Charger adjustments: float voltage, equalization voltage, programmed equalization, output slope, and current limiter
- Learn about the controlled ferroresonant battery charger
- Discover the advantages and the need for off-line UPS system and on-line UPS system and the triport UPS system
- Learn about the importance of shield connecting leads
- Gain knowledge of the filter capacitor usage and its features
- Understand the need for "reliable" continuous power supplies to operate protection and control relays and circuits

Course Outline:

- Different voltage level requirements
- The lead acid cell
- Lead antimony
- Lead calcium
- Connection of cells in series to form a storage battery
- Ampere hour rating
- Battery charge rate
- Overcharging
- Hydrogen release
- Significance of specific gravity and output voltage per cell
- Equalization procedure
- Sulfation

- Safety precautions against acid
- The nickel cadmium cell
- Supply to the DC bus
- The SCR battery charger
- Control of SCR firing
- DC output filter circuit
- Charger adjustments
- Float voltage
- Equalization voltage
- Programmed equalization
- Output slope
- Current limiter
- The controlled ferroresonant battery charger
- The need for uninterruptible AC power supply
- The DC to AC inverter
- Pulse generation and pulse width modulation
- The off-line UPS system
- The on-line UPS system
- The reverse transfer UPS
- The triport UPS system
- Power supplies for electronic equipment
- The need for clean DC power
- The need to shield connecting leads

- The transformer rectifier circuit
- Features of the filter capacitor
- Regulation of DC voltage supply
- The series pass transistor regulator
- Interference from VHF radios
- The switching transistor voltage regulator

Accreditation:

BTS attendance certificate will be issued to all attendees completing a minimum of 80% of the total course duration.