



## **BATTERY AND UPS SYSTEMS**

To dependably operate and maintain Battery and UPS systems requires some key resources, such as skilled and knowledgeable personnel, and is the basis of technical development for anyone working in this field. Without the knowledge of these concepts the dependable operation of the equipment and the personnel themselves are at risk.

This course is designed to present and enhance an understanding of the systems and develop a knowledge of the common electrical components. Inherent dangers exist with the operation distribution maintenance, and repair of battery systems and electrical apparatus. The safety and protection of those components and the people who maintain them is presented along with the tools and resources necessary for maintenance and troubleshooting. The training will use the considerable expertise of the instructor to provide a flexible approach, within the subject matter to adjust to the student's particular needs within each subtopic. This will allow the maximum transfer of knowledge and skills within the time allowed.

### **INTRODUCTION**

Review of Electrical Safety  
Functions of UPS Systems  
Basic Battery and UPS Systems

### **BATTERY CONSTRUCTION**

Lead Acid  
Nickel Cadmium (Ni-Cad)  
Case Configurations  
Fault Current Capacities

### **BATTERY TESTING**

Specific Gravity  
Volts per cell  
Cell Temperature

### **BATTERY LOAD TESTING**

Acceptance Test  
Performance Test  
Service Test  
Impedance Test

### **BATTERY CHARGING**

Charge/Discharge Equation  
Electro-Chemical Reaction  
Surface Charge  
Float Charge  
Equalize Charge

### **BATTERY SAFETY**

Cleaning  
Hydrogen Gassing/Ventilation  
Personnel Protective Equipment  
Eye Wash Stations

### **UPS OPERATIONS**

Overview/Introduction  
Theory of Operation  
Design and Capabilities  
Testing

- Acceptance Tests
- Performance Tests
- Load/No Load tests

Maintenance and Inspections