

Training and Education Department Training Course Description

Stationary Battery Basics



Course Name

Stationary Battery Basics

Course Length

2 Days

Course Description

Alber has been conducting its well-known seminar, *Stationary Battery Basics* for nearly 25 years and has helped thousands of people learn more about their batteries so they can improve the reliability of their mission critical systems. The seminar begins with the fundamentals of batteries and explains the electrochemical characteristics of lead-acid batteries in a way that makes the learning process easy. On day one, we will also cover subjects including types of lead-acid batteries, construction, selection, causes for failure and electrical ratings of batteries. Once the fundamentals have been covered in day one, day two deals directly with what owners, users, field technicians and engineers need to know about installing, operating and maintaining their batteries. As the seminar progresses, a chapter on capacity testing is presented that takes the mystery out of discharge testing batteries and relates how industry standards apply to proper testing procedures. The seminar wraps up day two with a presentation and discussion about ohmic testing, which has become more popular in recent years. Measurement of resistance, conductance and impedance are discussed and the way these ohmic measurements work. In total, five chapters are presented over the two day period.

Our instructors have extensive knowledge and experience in a variety of applications and can usually answer all questions directed to them, help students with application-specific problems that ultimately help them to improve system reliability. Our instructors have a combined experience of 60+ years in the battery industry.

Each student is provided with a complete set of handout materials.

A total of 1.6 CEU's (continuing education units) are awarded on the certificate of completion. Certificates are mailed within 30 days of the ending date of the seminar. The student must attend the entire seminar to qualify for CEU's.

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**Stationary Battery Basics Seminar
Course Outline
Course time – 2 days**

Chapter 1 – Day 1

- Battery Applications
- Electrochemistry Basics
- Types of Plates and Grid Materials
- Battery Selection Criteria
- Battery Construction
- Understanding Battery Life
- Voltage and Current Terminology
- Premature Battery Failure and Causes
- Major Failure Modes
- Battery Racks and Stands
- Understanding the Electrical Ratings of a Battery

Chapter 2 – Day 2

- Safety & Training Note
- IEEE Stationary Battery Committee
- Delivery inspection
- Storage considerations
- Spill containment
- Assembly and loading of racks
- Cell handling techniques
- Making cell-to-cell connections

Chapter 2 – Day 2

- Interisle, interrack and intertier cable groups
- Verifying connection integrity
- Commissioning
- Documentation
- Battery cleaning
- Acceptance testing

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Chapter 3 – Day 2

- Goals of a Maintenance Program
- Specific Recommendations
- IEEE Standards
- What Needs to be Done
- Safety
- Battery Disconnects
- Conditions Affecting Service Life
- Failure Modes
- Preventing System Failures
- Flooded Battery Visual Inspection Criteria
- Internal Resistance Measurements Case Study
- Failures of Monoblock Batteries and Resistance
- Water Additions
- Benefits of Proper Maintenance
- Example Battery Readings in Interpretation

Chapter 4 – Day 2

- Defining Capacity Tests
- Why Testing is Needed
- Who Recommends Testing
- Defining Battery Capacity
- Types of Tests
- Equipment Requirements
- How the Testing Process Works
- Calculation of Battery Capacity

Chapter 5 – Day 2

- Understanding Ohmic Measurements
- Schematic of a Lead-Acid Cell
- Measurement Methods
- Detection of Cell Problems
- Ohmic Problems and Cell Performance
- Metallic vs. Electrochemical Problems
- Problem Evaluation
- Measurement Intervals