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**TWO-DAY\* STATIONARY BATTERY WORKSHOP (ESA-0201)**

**1.4 CEUs Awarded**

**OUTLINE**

**DAY 1**

<b><u>TIME**</u></b>	<b><u>SUBJECT</u></b>
8:30 AM - 8:45 AM	Course introduction
8:45 AM - 9:45 AM	Review of stationary battery selection & sizing
9:45 AM - 10:30 AM	Case study on selection and sizing
10:30 AM - 11:00 AM	Review of battery installation
11:00 AM - 11:30 AM	Case study on installation
11:30 AM - 12:30 PM	***** LUNCH *****
12:30 PM - 1:00 PM	Review of battery discharge curves
1:00 PM - 1:30 PM	Problems using discharge curves
1:30 PM - 2:30 PM	Review battery maintenance and testing
2:30 PM - 4:30 PM	Case studies on maintenance and testing

**DAY 2**

<b><u>TIME</u></b>	<b><u>SUBJECT</u></b>
8:30 AM - 8:45 AM	Review of day 1/questions
8:45 AM - 11:30 AM	Work various case studies
11:30 AM - 12:30 PM	***** LUNCH *****
12:30 PM - 4:30 PM	Work various case studies (Test - optional)

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\* A two and one-half or three-day expanded version of the workshop is also available

\*\* Workshop start and end times can be modified to suit a client's schedule

# **STATIONARY BATTERY WORKSHOP COURSE DESCRIPTION**

## **STATIONARY BATTERY WORKSHOP OBJECTIVE, SKILLS & TARGET POPULATION**

### **OBJECTIVE**

The objective of the Stationary Battery Workshop is to provide additional skills in stationary battery: selection and sizing; installation design and installation; and maintenance and testing, to personnel with experience in stationary batteries. Although case studies on selection and sizing, and installation design and installation will be included, the emphasis of the workshop is on maintenance and testing. The workshop focuses on problem solving real stationary battery case studies, taken from the many years of experience of the workshop developer. It provides a “hands-on” approach to analysis and evaluation of real stationary battery data to enable the participants to develop a solution to the problem presented. It provides the experienced user an opportunity to become exposed to battery problems that he/she may have never encountered in the field.

### **SKILLS**

After completing the workshop, the participant will be able to work with battery manufacturer's data to size or test a stationary battery. The participant will be able to recognize various types of stationary batteries by their construction characteristics and will be able to identify the discharge characteristics of different types of cells. The participant will understand the key elements of a procurement specification for a stationary battery including selection of acceptance criteria for a factory acceptance test. The participant will be able to design a capacity discharge test that will most effectively test a stationary battery, based upon its duty cycle. The participant will be able to analyze data from a battery discharge test, determine whether the test is valid and understand the requirements for determining when the battery must be tested again. The participant will understand the importance of baseline data and will be able to calculate some of the baseline data, should it not be available. The participant will be able to analyze various types of stationary battery data to determine the state-of-health of a battery (or cell) and will be able to recommend the necessary corrective actions. The participant will be able to determine whether a battery may be operated after a number of cells have been removed due to problems (e.g., a cell fire, a cracked jar). The participant will become familiar with considerations for the use of batteries with parallel strings and much more.

### **TARGET POPULATION**

Experienced maintenance personnel, technicians, electricians and engineers wishing to become proficient in the analysis and evaluation of stationary battery information and data related to: selection and sizing; installation design; installation; maintenance; troubleshooting; and testing. The course is designed for the experienced user. A prerequisite for the course should be a battery seminar or a minimum of 5 years experience sizing, installing, maintaining and testing stationary batteries.

# STATIONARY BATTERY WORKSHOP

## COURSE DESCRIPTION

### THE WORKSHOP

The workshop was developed as a follow-on course to the Stationary Battery Seminar. It provides the participants with a unique opportunity to analyze a number of real life case studies. There are more than 45 separate case studies to examine, with the bulk of these case studies in the area of maintenance and testing. Unlike the Stationary Battery Seminar, the participants at the Workshop work as teams, with coaching provided by the instructor. The participants are encouraged to share ideas as they analyze data and develop recommendations for the case study under review. On Day 1 there is a review of: selection and sizing; installation design and installation; stationary battery discharge curves; and maintenance and testing. Each of these reviews is thorough and is designed to stimulate the participants for the task of solving the case studies. After each review, there is a case study assigned that will be worked by the participants.

Once the reviews and the initial case studies are completed, additional case studies will be assigned in various areas of sizing, installation, maintenance and testing. The participants, working in teams are assigned different case studies for evaluation and development of recommendations. Once the case study is completed, the team will be required to present its approach, solution and recommendations for the assigned case study. Since there are likely twice as many case studies as can be examined in two days, the material selected for further study is dependent upon the makeup of the participants of the workshop and their interests. Even if a particular case study is not worked during the workshop, each participant will receive a set of suggested solutions and recommendations for each of the case studies in the workbook. Day 2 of the workshop continues with more case studies.

The workshop has been regularly presented for more than 30 years to hundreds of experienced stationary battery personnel from a wide variety of industries. More than 700 companies worldwide, including battery manufacturers, utilities, telecommunications companies, telecommunications equipment manufacturers, battery test equipment manufacturers, securities companies, industrial companies, government agencies, armed forces, national laboratories, battery maintenance companies, etc., have sent their most experienced personnel to the workshop. The strength of the workshop is in the large number of case studies that enable participants with diverse backgrounds to learn about stationary batteries to a level they never thought possible.

Additionally, the workshop has been recognized as providing **Continuing Education** which has become important as more states require evidence of such courses before renewal of an individual's electrician, professional engineer or other license or certification is granted. Depending upon the state or province, participants that successfully complete the Workshop may be able to satisfy all, or a portion, of those requirements.

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