

INTRODUCTION



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TERMINAL OBJECTIVE

Upon completion of this training, the participant will obtain:

An overview of the many uses for stationary batteries and the industries they are applied in



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STATIONARY BATTERY PARAMETERS



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TERMINAL OBJECTIVE

Upon completion of this training, the participant will:

Understand the basic types of storage batteries used in stationary applications, their chemistry, plate materials, expected life, standard ratings and the distinction between vented and valve regulated lead-acid (VRLA) cells.



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ENABLING OBJECTIVES

The standard for each of the following objectives is the material contained in the course materials provided to the participant.

Given the course materials the participant shall be able to:

- **P01** Identify the types of stationary batteries and their applications.
- **P02** Describe the differences between vented and VRLA cells and name the two types of VRLA cells.
- **P03** Recall the standard rating parameters for a stationary battery, including the standard discharge rate, temperature, electrolyte specific gravity and end-of-discharge voltage.
- **P04** Recall the various plate types and the functions of the plate grid and active materials.
- **P05** Discuss the charging methods used for stationary batteries.
- **P06** Recall the definitions for open circuit voltage, float voltage, equalize voltage, end voltage, float charge, trickle charge, equalize charge, mixing charge, boost charge, activation charge and freshening charge.



STATIONARY BATTERY INSTALLATION



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TERMINAL OBJECTIVE

Upon completion of this training, the participant will understand:

The safety equipment required for installing stationary batteries; the safety procedures to be followed during installation; the requirements for receiving and storing a battery, including application of charges during storage; the procedure to be followed during storage; the initial testing and baseline measurements for the battery; and the requirements for maintaining records



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ENABLING OBJECTIVES

The standard for each of the following objectives is the material contained in the course materials provided to the participant.

Given the course materials the participant shall be able to:

- **I01** State the safety equipment that is required when installing stationary batteries.
- **I02** Recall the safety procedures that are followed during stationary battery installation.
- **I03** Recall the procedures for receiving and storing a stationary battery and for applying a charge to the battery, if necessary, during storage.
- **I04** Identify the steps that are followed when installing a stationary battery.
- **I05** Identify the requirements for acceptance testing and obtaining baseline measurements for a newly installed stationary battery.
- **I06** Recall the requirements for battery disposal, if the newly installed battery is a replacement for an existing battery.



STATIONARY BATTERY MAINTENANCE



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TERMINAL OBJECTIVE

Upon completion of this training, the participant will understand:

The safety equipment required for maintaining stationary batteries; the safety procedures to be followed during maintenance; the requirements for periodic inspections and corrective actions; the visual checks necessary and how to perform them; the requirements for measurements including, voltage, electrolyte specific gravity, charge current, intercell connection resistance and internal resistance; the types of cell problems that may be encountered, their identification and their corrective actions; and the requirements for maintaining records.



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ENABLING OBJECTIVES

The standard for each of the following objectives is the material contained in the course materials provided to the participant.

Given the course materials the participant shall be able to:

- **M01** State the safety equipment that is required when maintaining stationary batteries.
- **M02** Recall the safety procedures that are followed during stationary battery maintenance.
- **M03** Recall the inspection frequencies for stationary batteries and the types of inspections performed for each.
- **M04** Recall the visual checks to be made on a battery and battery rack.
- **M05** Recall the types of measurements to be made on a battery, including correction to the standard reference, and the test equipment used for each.



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ENABLING OBJECTIVES

(Continued)

- **M06** Recall the corrective actions to be taken for conditions that are found to be outside of established limits for the cells or battery.
- **M07** Discuss the requirements and procedures for single cell charging.
- **M08** Recall the common types of battery problems, their cause and the corrective action that may be taken for each.



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BATTERY DISCHARGE TESTING



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TERMINAL OBJECTIVE

Upon completion of this training, the participant will understand:

The safety equipment required for discharge testing stationary batteries; the safety procedures to be followed during capacity testing; the requirements for the types of capacity tests to be performed and their frequency; the identification of signs of degradation that may be identified with capacity testing; the criteria used to determine the need for battery replacement; the selection of the test current/power; and the requirements for maintaining records



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ENABLING OBJECTIVES

The standard for each of the following objectives is the material contained in the course materials provided to the participant.

Given the course materials the participant shall be able to:

- **T01** State the safety equipment that is required when testing stationary batteries.
- **T02** Recall the safety procedures that are followed during stationary battery testing.
- **T03** Recall the types of capacity tests for stationary batteries, their frequencies and the signs of degradation that would cause the testing interval to be decreased.
- **T04** Recall the criteria for determining battery replacement, based on the results of a capacity test.
- **T05** Discuss the DOs and DON'Ts of battery capacity testing.

