

4.1 EMERGENCY LIGHTING

BCA: E4.2, E4.4
Reference: AS 22939

PURPOSE

To safeguard occupants from injury by providing sufficient lighting to allow safe occupant evacuation in an emergency.

REQUIREMENTS OF THE EQUIPMENT

An emergency lighting system must:-

- a) Be installed to AS 2293.1; and
- b) Be automatic in operation in the event of failure of power supply to the main lighting system; and
- c) Provide a level of luminance appropriate to:
 - i. The use and size in floor area of the building; and
 - ii. The distance required to reach exits.

METHOD OF OPERATION

CENTRAL LIGHTING SYSTEM

This type of system will be set up to operate in one of two modes:-

- Where the emergency lighting is energised at all times when the building is occupied; or
- Where the emergency lighting is energised only when power to the normal lighting system fails.

SINGLE POINT LIGHT SYSTEM

Each unit 'stands alone' and illuminates when normal lighting fails. Power is supplied from a built-in battery which is continuously under charge while normal lighting operates.

MAINTENANCE CHECKS

It is recommended that the relevant building surveyor should require maintenance at least every six months. It should be noted that this is the lowest level of maintenance required by the Standard and more rigorous routines are also required as noted below. The owner may delegate this function to another person or body where necessary or appropriate.

CENTRAL LIGHTING SYSTEM

Checks should be undertaken on the following elements of the system:-

- Batteries.
- Battery chargers.
- Inverters.
- Distribution and control equipment.
- Lights and exit signs.
- The complete system.

SINGLE POINT LIGHTING SYSTEM

SIX-MONTHLY PROCEDURES

- a) Operate the self-contained emergency lights from their battery supply by turning off the normal lighting power supply.
- b) The lights must remain alight for at least 90 minutes.
- c) Replace any faulty lamps.
- d) Turn on the normal lighting power supply and check that the battery charger indicator functions properly.

Record the test and correct operation of the system.

Record the replacement of faulty lamps.

TWELVE-MONTHLY PROCEDURES

- a) Carry out the six-monthly procedures; and
- b) Clean down all light emitting and reflecting surfaces.

Record the testing and cleaning.

SIX-MONTHLY TEST

Batteries

- a) Lead-acid batteries – using a hydrometer and referring to the maintenance manual, test randomly selected cells for:–
 - i. Electrolyte density.
 - ii. State of charge.

Record the result of this test.

- a) All batteries, including lead-acid batteries.
 - i. Visually check electrolyte level of each cell. Record those cells that require topping up.
 - ii. Visually inspect all cell containers for electrolyte leakage. Have leaking cells repaired or replaced by a qualified person.

Record any repairs or replacement.

Battery chargers

- a) Visually inspect the unit.
- b) Clean unit and cubicle of dust and dirt.
- c) Check battery voltage reading is within normal limits.
- d) Check all connections are tight. Record the carrying out of these checks.

Record battery voltage reading.

Inverters

- a) Visually inspect all components.
- b) Record the inspection.
- c) Record D.C. input voltage and current.
- d) Record A.C. output voltage and current.

Distribution and control equipment

- a) Visually inspect relays, contactors, circuit breakers and fuses. Record inspection and any problems identified.
- b) Check all connections for tightness. Record the check.
- c) Remove any dust and dirt accumulated within the distribution and control equipment enclosures. Record the cleaning.
- d) Check that sensing equipment operates the system when isolated from A.C. mains supply. Record the check and any problems identified.

Emergency lights and exit signs

- a) Check all lights and exit signs for correct operation.
- b) Replace any faulty lamps. Record the check and any lamps replaced.

Total system

- a) Check for correct operation when battery charger turned off and mains failure simulated.
- b) Check satisfactory operation of the charger-failure alarm while carrying out above check.
- c) Record these checks and any problems identified.

Restore the system to normal operation, and check correct charging of batteries.

TWELVE-MONTHLY TEST

Batteries – for any battery requiring maintenance of electrolyte above a specified level.

Lead-acid batteries only – for each cell

Using a hydrometer and referring to the maintenance manual,

- a) Check electrolyte density.
- b) Check state of charge.

Record the results of these checks.

All types of batteries – (including lead-acid)

- a) Visually check electrolyte level in all cells. Record level for each cell.
- b) Visually inspect all cells for electrolyte leakage. Mop up and neutralise any spilt liquid using baking powder dissolved in water. Record the inspection and any faults found.
- c) Inspect all cell connections for corrosion and tighten any loose joints.
- d) Treat all exposed metal surfaces with petroleum jelly or other recognised battery terminal preservative. Record the inspection and treatment.
- e) Measure overall battery voltage and individual cell voltages, using a finely calibrated voltmeter. Record any cell with a voltage difference from average of more than + 0.03 volts.

Battery charger

- a) Carry out tests required in six-monthly test.
Record the test.
- b) Check voltmeter calibration.
Record the check and result.
- c) Check satisfactory operation of battery earth-fault detection system, if fitted.
Record the check.
- d) Check satisfactory operation of the battery low-voltage alarm, if fitted.
Record the check.

Inverter

- a) Carry out tests on items required in six-monthly test.
Record the tests.
- b) Check voltmeter calibration.
Record the check and result.

Lights and exit signs

- a) Carry out all checks required in the six-monthly test.
Record the tests.
- b) Clean all light emitting and reflecting surfaces.
Record the cleaning.

Total system

1. Check battery voltage on completion of discharge test, by the following method:–
 - a. Turn off battery charger.
 - b. Simulate mains failure (turn off power).
 - c. Using all the installed emergency lighting, test discharge for at least 90 minutes.

Record battery voltage on completion of this test. If battery voltage is below acceptable limits after completion of this test, re-service or replace the battery.

Record re-service or replacement.

2. Measure the time taken for the battery charger to change over automatically to the 'float charge' mode, after;
 - Disconnecting the load,
 - Turning on the battery charger,
 - Manually selecting 'boost charge' mode.

Record the time taken.

The above testing procedures are detailed in AS 2293.2. These procedures must be available to the designated tester. This information must be provided by the installer of the system.

MAINTENANCE RECORDS

A manufacturers' hard bound log book, or an alternative system (this would include this manual), is recommended for the recording of maintenance information.

Sheets for this purpose are included in the log book provided in Appendix C of this manual.