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GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS

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RESEARCH DESIGNS AND STANDARDS ORGANISATION

GENERAL GUIDELINES ON BATTERY SECTION

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PRINCIPAL EXECUTIVE DIRECTOR PS & EMU

Prepared By	Verified by
JE/Battery	DSE/Metro

General Guidelines On Battery Section

1. Battery Section for VRLA Batteries

With the proliferation of VRLA batteries (sealed batteries) and the voltage stability of modern electronics, electrolyte spills have been reduced. Normal ventilation is required for VRLA batteries and room should be not exposed to direct sun light, rain, dust, storm etc. It is strongly recommended that battery should never be installed in an airtight enclosure/room. However, minimum facilities & requirement for VRLA batteries should be as per RDSO SMI No. RDSO/PE/SMI/TL/0024-2012 (Rev.2).

2. Battery Section for LMLA Batteries

2.1 Minimum Facilities Requirement at depots

- **I.** CVCC charger with 20% current limit for full bank of 56 cells.
- **II.** CVCC charger with 20% current limit for 1 to 6 cells in step of one.
- **III.** Drive to test alternator / RRU / ERRU.
- **IV.** Infrared temperature sensor.
- **V.** Torque wrenches with suitable sockets.
- **VI.** Adequate charging 1 pre-cooling points with 70sq mm copper cable.
- **VII.** Clamp on meters, digital multi-meters, digital temperature indicator etc.
- **VIII.** Trolleys for carrying batteries.
- **IX.** Puller for lifting individual cells.
- **X.** Hydrometer for flooded lead acid battery

2.2 Minimum Facilities Requirement at workshop

In addition to above facilities mentioned at depot, following facilities are also required at workshop

- **I.** Fork lift
- **II.** Puller for lifting individual cell.
- **III.** Integrated charge / discharge unit regenerative type, suitable for constant current and constant voltage charging/discharging, 220 Amp (max.) charging and 110Amp. discharging for 1100Ah battery and with suitable current and voltage setting for 120Ah battery.
- **IV.** Distilled water manufacturing plant.
- **V.** CVCC charger, with 20% current limit for 6 to 12 cells in step of one.

2.3 Protective Equipment

The following equipment for safe handling of the battery and protection of personal should be available.

- **I.** Acid resistant gloves
- **II.** Adequately insulated tools
- **III.** Class C fire extinguisher
- **IV.** Protective aprons and safety shoes

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V. Bicarbonate of soda mixed approximately 0.1 kg/L (1 lb to 1 gal) of water to neutralize acid spillage

2.4 Lighting

Lighting should be sufficient for maintenance technicians to be able to see the complete battery without difficulty.

2.5 Ventilation

I. It is important to ensure adequate ventilation by natural (Ventilation size) or mechanical means. Clean air should enter through an inlet in a low position and exit through an outlet positioned at the highest possible point.
II. Minimum exhaust rate should be 1.5 cfm/sq.ft. as per ASHRE standard 62.1-2004
III. Charging platform shall be located near to exhaust fan. This area can be separated from the main section with adequate opening for movement of trolleys.

2.6 Drainage

I. Covered drainage with acid resistant lining shall be provided in the section.
II. Battery charging platform must be surrounded with drainage system so that filling of D.M. water and washing of battery do not make dirty battery section area.
III. Portable or stationary water facilities should be provided for rinsing spilled electrolyte. Provisions for neutralizing, containing, and safely disposing of acid electrolyte.

2.7 Flooring

I. Size of tiles should be chosen such as to reduce number of joints**.**
II. Floor finish in all battery rooms and enclosures shall be slip-resistant and acid or alkali resistant.
III. Floor tiles should have high PH resistance, good anti-corrosive effect to the acid, low water absorption and the face of tiles will not retain liquids, absorbs fumes, odor or smoke.
IV. Tiles should be completely fire-proof at any temperature and will not burn nor fuel a fire.
V. The battery charging bench should be made up of hard rubber or polypropylene plastic material to support the batteries.
VI. Physical and chemical properties for tiles shall be as per IS 4457.

2.8 Other Features

I. It is important to keep the temperature as low as possible and not establish battery room near power transformer, boiler or any other exothermic/heat-releasing industrial equipment because extreme temperatures should be avoided, prolonged high temperatures shorten battery life and increase maintenance cost. Room should be not exposed to direct sun light, rain, dust, storm etc.
II. Battery rooms are a hazardous place, appropriate signage must be applied to the door.
III. All doors to the battery room must be wide and open outwards.

IV. The general battery area should be clean, dry, and well ventilated and has adequate space. The charger and main distribution board should be as close as practical to the battery

V. Skylights and false ceilings shall not be used.

VI. The Battery room flooring should be acid resistant and room size is to be decided based on workshop/depot's handling capacity and housing the recommendation facilities mentioned in RDSO SMI No. RDSO/PE/SMI/TL/0024-2012 (Rev.2).

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