

₹ 500/-

5K SUBSCRIBERS

B Proactive

ASK
EHS

RNI Reference No.: 1290385 Title Code:GUJENG16148

EHS Magazine

04 **What the Experts have to Say**
Mandatory Safety Procedures

14 **Topic in Focus**
Safety Standards for EOT Cranes
in Integrated Steel Plants



Industry Common Issues 28
Safety Challenges in Construction

Health & Wellness 70
Know your Cooking Oil

Compliance & Ethics 76
Fostering Ethical Cultures

66 **Environment**
Causes and effects of
Oil Spills

A large number of lead acid batteries are used for stationary applications in high-capacity UPS systems to power the load in case of a power outage. Such large UPS systems with a lot of batteries can be found in hospitals, offices, large industries, power sub stations, nuclear power installations, railways, and defence organizations where power outages are not acceptable or quality power is an absolute requirement.

A lot of lead acid batteries are used for motive power applications in industries, airports, nuclear power stations, railways, docks, ordnance factories, godowns, ports, warehouses, etc., where heavy materials are handled. These motive power batteries known as traction batteries are used to power forklifts, pallet trucks, platform trucks, scrubbers, industrial sweepers, and automated guided vehicles or die loaders.

In both the above instances, where stationary or traction batteries are used, the batteries are usually allotted dedicated battery rooms. The stationary batteries, as the name implies, are housed in rooms, and used in these rooms at the time of charge as well as during discharge.



Mr. Ramesh Natarajan
 Author of Amazon Bestseller Book
 'Batteries Demystified' |
 Expert in Lead Acid Battery
 Manufacturing
 Processes and Machines |
 Podcaster



Battery Room Recommendations



[Static Batteries]

In the case of traction batteries, these are generally used on vehicles, but usually charged in a location wherein, all the batteries return at the end of a shift for a recharge. Thus, these batteries also have a dedicated battery room for charging.

[Traction Batteries]

The users of batteries, often times, look up to the battery manufacturer for recommendations, regarding battery room design. The engineer who visit the site and interacts with the user, must also be preferably aware of the battery room design.

A good battery room must be designed to adequately take care of:

- Corrosion related Problems
- Ventilation Requirements
- Lighting Issues
- Drainage & Effluent Collection
- Safety w.r.t. Fire & Explosion
- Emergency Exits
- First Aid facilities specially to attend to Acid Splash in Eyes

The electrolyte, sulphuric acid being highly corrosive, the flooring is likely to get damaged due to acid spills. Hence it is highly recommended that acid resistant, Skid Proof special Vinyl (**PVC – Poly Vinyl Chloride**) flooring is used. Please note that the thin decorative vinyl flooring, with joints at various places, is not suitable. The flooring required is of industrial

grade, in roll form. It has to be laid with minimal joints & with a possibility of sealing of joints. This has to be stuck to flooring with sufficient gradient, sloping towards drains, so that, the flooring can be washed, to allow the waste water to flow into a collection tank. The drains and tanks also need to be fused to the flooring by welding.

As regards to ventilation requirements, the room must have sufficient windows or exhaust fans to ensure that the gases evolved during charging are vented out. Care must be taken to ensure that the windows are kept closed, if the exhaust fans are fitted to the windows. This will ensure that the fresh air coming in from the windows are not exhausted out, thereby leaving the gases evolved from the batteries, to remain in the room. The windows with glasses may be required for natural lighting and can remain closed in normal times, when the exhaust is ON. These windows can be opened to remove the gases evolved from the batteries, when the exhaust fans are not installed or are not working due to some reason.

The room must have a fresh air inlet (this air comes in from an area opposite to that of the exhaust location). It is highly



recommended that hydrogen sensing alarms are installed in battery rooms, since the hydrogen gases evolved during charging of the batteries, is explosive in nature and is the main cause of battery fires. A concentration of over **4%** hydrogen is the cause of fires and an audio-visual alarm can alert the user of batteries, much in advance. Such an alarm annunciation, enables the user to do the needful to avert the fire, by stopping the charging or clearing the room of Hydrogen. The user can operate additional exhaust fans or take necessary measures as deemed fit. In certain organizations the exhaust is connected to the hydrogen sensors such that they operate intermittently with an arrangement that these fans are switched ON only when the hydrogen gas accumulates to a preset level – much below the **4%** danger level.



Battery rooms need to be sufficiently lit since the readings of voltage, specific gravity & electrolyte level needs to be taken periodically and recorded – to obtain long life from the battery. This being a requirement, the lighting used in the rooms needs to be adequate and corrosion resistant too. The acid fumes must not corrode the fittings. Hence, the lights must be in such a way that they have PVC covers with no possibility of acid fume ingress. There has to be a light arrangement of the portable type to enable the maintenance engineer to check the batteries. Additionally, torches have to be available for checking electrolyte level in the cells or for inspecting the cell through the vent holes.

Battery rooms need to be washed periodically to keep the floor clean and at all those times when the acid spills on the floor. Since the wash water, which is bound to be acidic in such instances, has to be drained out, without stagnating and being a cause of accident due to slippage on a wet floor, the design of the battery room floor has to be made, with a slope towards the drain. Gutters need to be made with a slope towards a collection tank. All these, the drains, gutters and collection tank, need to be lined and fused with the acid resistant floor. The collection tank can be emptied periodically and the acidic water can be neutralized before a proper disposal, in line with the regulatory norms.

The battery room must not have any hanging wires and all electrical wires must be properly secured and bunched together in case they cannot be laid through cable trays due to some reason. Such bunched cables must not be in pathways and must be restricted to the space between the charger and battery with clear demarcation. Necessary fire extinguishers must be available at various locations for emergency use. Buckets filled with sand must also be kept at various locations for emergency use in case of a fire. Fire alarms and necessary outlets for water to put off the fires must be available since lead

acid battery fires can be put off using water after switching OFF all electrical equipment and switchgear. The chargers and electrical connections must have proper tripping facilities to disconnect and switch OFF in case of a fire.

All battery charging rooms must be designed with emergency exits since a single entry and exit is a very dangerous situation. The exits must be on opposite sides and must preferably lead to the open and not to another room which may be housing the charger or load connected to the battery room. Multiple emergency exits shall be better since a fire can also lead to explosions with lead shrapnel causing grievous injury to people trapped inside in case of a fire.

At times a simple operation like checking of specific gravity if not done carefully can result in acid splash into the eyes. In such cases, it is important to urgently splash eyes with water to prevent damage to the eyes. Hence, it is recommended that an arrangement be made available to rinse the eyes with water. Such safety equipment for rinsing eyes is available and need to be preferably fitted near the battery rooms. A first aid kit to take care of burns due to fire with gauze cloth and other medicines must also be available near the battery room. These must not be in the battery room if there is a possibility of them being corroded.

The battery room designed, taking the above points into consideration, shall solve a lot of issues for the battery user. A service engineer or maintenance department personnel taking care of batteries must be aware of the above requirements as regards to battery rooms.

About the author

With over 42 years of active role in the lead acid battery, starting at the age of 20 as a graduate trainee and rising to a managerial role to taking the lead in setting up a successful greenfield export-oriented battery plant and finally being part of a business startup in the last 22 years of his career - Ramesh Natarajan has donned many hats.

Of late a lot of industry personnel in India & abroad have been consulting him on technical matters connected to batteries & chargers too.

He has been a speaker at various seminars & conducted technical training sessions in India & abroad.

His career roles encompassed designing batteries for various applications including specialized needs, to project planning & execution, to overall manufacturing, to training personnel for quality systems, vendor development, marketing, & customer service.

His first book Batteries Demystified is a No. 1 Bestseller on Amazon.

You can listen to his Podcasts and see the Videos on topics related to batteries by visiting his website www.RameshNatarajan.in.

Energy Takers



- Sugar
- People Pleasing
- Fear and doubt
- Sitting all day
- Overthinking
- Worrying
- Dehydration
- Living on autopilot
- Junk food
- The News
- Resentment
- Gossip
- Clutter
- Hate

Energy Givers



- Sunlight
- Being authentic
- Positive Self-talk
- Movement
- Living in the moment
- Deep breathing
- Filtered water
- Living mindfully
- Nutritious food
- Music
- Acceptance
- Friends
- Minimalism
- Love



Save **PLANET** the



B-Proactive ASK
EHS

RNI Reference No.: 1290385 Title Code: GUJENG16148

EHS Magazine

ASK Institute of Environment, Health & Safety Pvt. Ltd.
+91 63558 23091 | magazine@askehspmc.com

ASK EHS Engineering & Consultants Pvt. Ltd.
+91 92276 95228 | info@askehspmc.com