

Dangers of battery charging

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A Member has reported the following incident which occurred on one of its vessels during normal operations.

What happened?

One cell of a battery used on the engine popped out, causing a small amount of acid to spill out. Nobody was in the vicinity when this incident occurred, nobody was injured and no other damage took place.

On investigation, it was noticed that the electrolyte level in the battery was much lower than the minimum level indicated on the body of the battery, leading to a higher concentration of acid inside the battery cell. Due to the automatic continuous charging of this battery, the acid was electrolysed, forming hydrogen gas, which tried to escape and popped the battery cap.

The Member pointed out the following dangers:

- Sulphuric acid is highly corrosive. It can cause severe injury to any person who is handling it unless adequate precautions are taken. Acid fumes, if inhaled, can cause severe health problems;
- Hydrogen gas is highly flammable. When escaping out of the battery, if the gas had come into contact with a spark, it would have ignited and caused tremendous damage, particularly in a space with other flammables close by.

Our member took the following action:

The company involved has reminded its employees of its in-house guidelines on storing and charging batteries and has arranged for the following notice to be posted near battery usage/charging areas.

“Charging of batteries causes the emission of flammable hydrogen gas. Incorrect connecting and disconnecting of battery leads may cause sparking which could explosively ignite any accumulated hydrogen. Thus battery charging, connecting and disconnecting should be considered as hazardous and adequate protective measures taken.

All battery charging shall be performed in a dedicated area, and all sources of ignition (i.e. smoking, naked flames and the use of any electrical or hand tools which might cause sparking) shall be prohibited within a radius of 3m from the battery charging facility.

All battery chargers shall be fitted with a 3-core power cable, three prong plug, and be properly earthed with a property attached ground.

Adequate ventilation shall be provided to ensure the rapid dispersion of any flammable hydrogen gas.

Eye protection (impact resistant chemical goggles) shall be worn at all times in the battery charging facility.

The charger power supply shall be disconnected prior to connecting or disconnecting batteries.

All battery cell covers or plugs shall be removed during charging, and not replaced until all 'bubbling' has stopped.

Electrolyte level shall be checked and if required topped up both before and after charging batteries.

Separate racks or shelving shall be provided for charged batteries and batteries waiting recharging. These shelves shall be a minimum of 1 meter from the charging bench. All shelves shall be open wooden shelving or purpose manufactured plastic racks, to prevent the accumulation of hydrogen gas.

The following equipment shall be available in the charging/storage area:

- *Dry powder fire extinguisher*
- *Water source for washing away spilled electrolyte*
- *Neutraliser for spilled acid (i.e. baking soda)*
- *Eyewash station*
- *Drainage facilities."*

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