

Basic Battery Safety

Lead Acid Storage Batteries



Hazards of Lead Acid Batteries

- Chemical burns (sulfuric acid)
- Arc flash / burns
- Shock
- Explosive gas (hydrogen)
- Fire
- Weight



Sulfuric Acid Safety

PPE requirements

- Safety glasses
- Rubber gloves
- Face shield
- Rubber apron

(Provide an eyewash within
10 seconds of battery
charging/cleaning areas)

Hazards

- Ph <7
- Corrosive material
- Burns to skin
- Burns to eyes
- Never open the battery caps with your face directly over the battery.

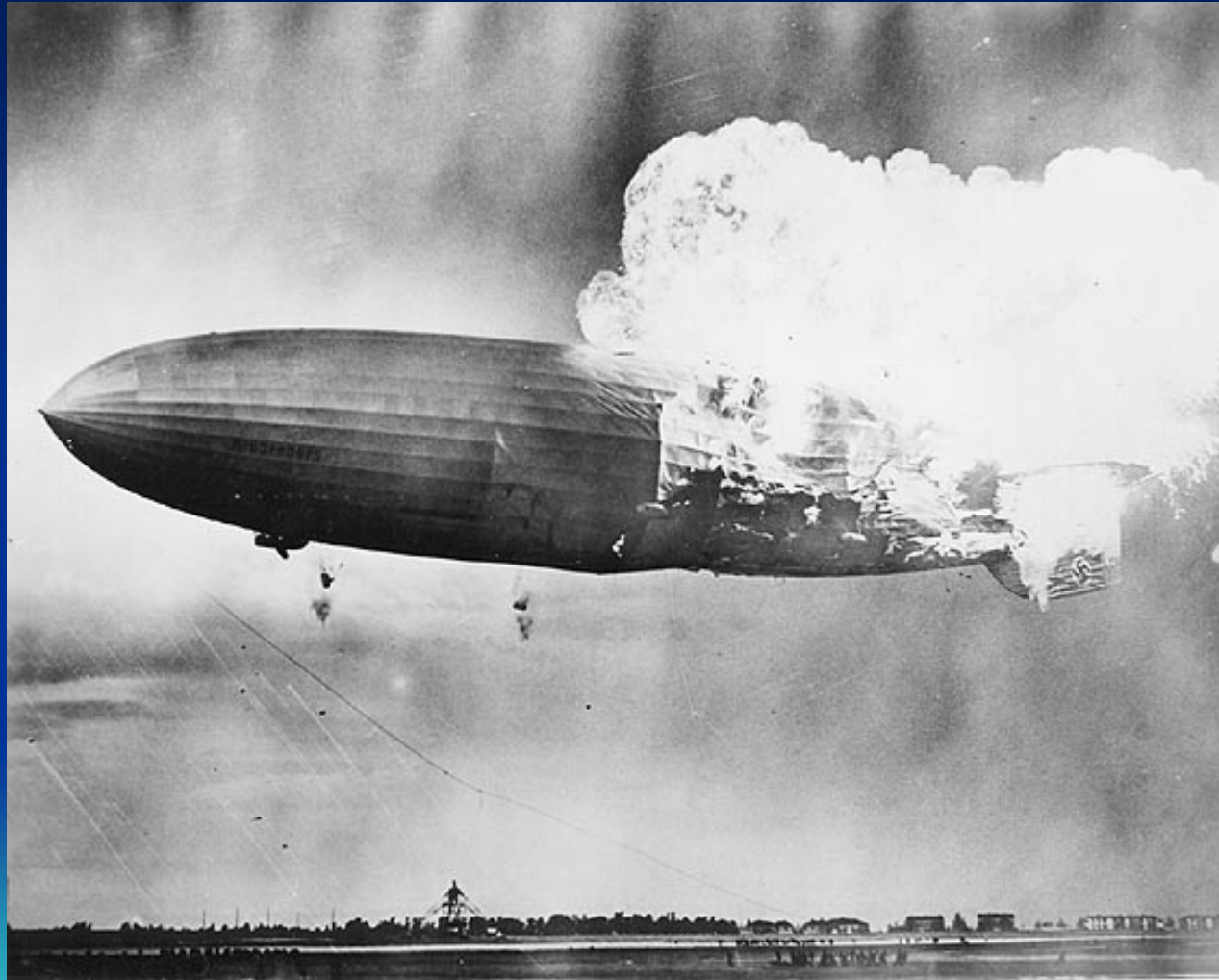


Shock / Arc Flash / Burn Safety

- Never touch both battery terminals with your bare hands at the same time!
- Remove rings, watches, and dangling jewelry when working with batteries. The metal in the jewelry can cause shock and/or burn if they contact the battery terminals.
- Only use insulated, non-conducting tools to remove cell caps or when connecting or disconnecting jumpers. Never lay tools or other metal parts on top of a battery.



Hydrogen Safety



Hydrogen Safety

- A by-product of the battery's charging process.
- Lighter than air.
- Flammable in nature.
- Explosive mixture at 4 – 74% by volume of air.
- Can not taste or see the gas vapors. You can smell the acid in the battery if it heats up.



Fire Safety

- Do not smoke in battery charging areas.
- Prevent open flames, sparks, or electric arcs in battery charging areas.
- Charge batteries in a well ventilated area.
- Do not strike the sides of the battery with any spark producing item.
- Keep tools and other metallic objects away from uncovered batteries.
- Have an ABC dry chemical fire extinguisher in charging areas or readily available when servicing a battery.



Weight / Handling Safety

- Industrial batteries used on board passenger cars are heavy. Example: A locomotive sized 4-cell unit weighs 400 lbs+.
- Use appropriate equipment to load/unload batteries.
- Ensure you are trained in using the loading equipment.
- Ensure the battery is securely blocked in place and battery box covers secure prior to movement.
- Do not attempt to stop a battery if it slides out of the equipment.



Cleaning Batteries

- Wear safety glasses, face shield, rubber gloves & apron.
- Ensure an eyewash station is readily available.
- Dampen the top of the battery with water first.
- Place dry baking soda on battery.
- Let sit for a few minutes for acid to be neutralized.
- Rinse off with cold water.
- When adding water, use watering cans to avoid contact with acid and battery terminals.



Charging Batteries

- Don't overcharge. Leads to boiling of electrolyte, creating excessive heat and hydrogen gas. Shortens battery life.
- Follow manufacturer's recommended charging voltages, varies by battery type and chemistry.
- Beware the possibility of unregulated charging of batteries when powering a car from DC shore power.
- NEVER trainline different voltage cars together!
- Assure proper polarity when connecting battery chargers. Severe damage to equipment or explosion is possible. Giving the battery a reverse charge is also possible!



Safe Maintenance Practices

- Protect eyes from acid splash when removing cell caps.
- Keep tools and other metallic objects away from uncovered batteries.
- Ensure the battery's water cell levels are maintained.
- Only add water to ***charged batteries.***
- Use baking soda to neutralize spilled acid.



Maintenance Tips

- Disconnecting leads: Do not leave leads loose on battery. Can short to other terminals or carbody, causing arcing and possible explosion.
- Connecting leads: Assure connections are clean and TIGHT. Damage to battery lugs and leads can result when drawing large currents through a loose terminal!
- Do not allow discharged batteries to freeze. Case may crack and cause battery to leak.



Quick Recap

- Know the hazards.
- Use the required PPE.
- No open flame.
- Follow manufacturer's instructions.
- Keep them clean.
- Keep them charged.
- Keep them watered.

