



Safety Alert

Aircraft Battery Hazards

- Battery chargers may cause fires to start. The most common scenario is a fire started by a short circuit. The first materials to catch fire are the components of the charger itself, followed by combustible materials located nearby, including those used in construction, such as sandwich panels with combustible cores. Commonly, battery chargers are left in operation during off-hours and thus no employees are present.
- Know the size in amp hours of your battery bank. If you under-estimate the required charging capacity of your battery bank, the charger will take longer to charge your batteries. If you over-estimate the required charging capacity, the charger may deliver too much current. Excessive charging current can cause battery overheating, accelerated water loss in flooded type batteries, damaged batteries and fires.
- Battery charging should be done in a location designated for the charging and storing of the batteries. The designated location would require adequate ventilation to avoid the buildup of hydrogen gas during the charging process.
- Never smoke or allow sparks or flames near the batteries. Some gas bubble residue generated during charging may stick to the electrode plates of the battery and may be released slowly from the battery for some time subsequent to the charging operation. As such, it should be assumed that combustible gases are always present in the space surrounding the battery top.
- The battery charger should be suitably rated and protected against electrical faults. The cable connection terminals should be properly shrouded to prevent an accidental short-circuit of the conductor parts and to prevent electric shock.
- Battery leakage - overfilling while servicing a wet cell battery can cause leakage which could result in corrosion, component damage or a consequential fire.
- Battery overcharging - batteries can be overcharged due to faulty charging equipment or inappropriate maintenance procedures. It is imperative that you follow the maintenance procedures received with the charger.

- If lead acid batteries are overcharged, they can vent hydrogen gas which can result in an explosion or fire.
- If Nickel Cadmium batteries are overcharged, they are more susceptible to thermal runaway, which can result in an explosion or fire.

OSHA Regulation 29 CFR 1910.178(g), addresses the procedures and equipment required to minimize hazards and prevent accidents during battery maintenance operations. The link for reference:

https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_id=9828&p_table=standards.

FAA [Advisory Circular No: 00-33A](#) provides guidance on the operation, maintenance and overhaul of Nickel-Cadmium batteries. The link for reference:

https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC_00-33A.pdf

Recommendations

- Conduct a [Job Safety Analysis \(JSA\)](#) for battery maintenance including battery charging.
- Build safety features in the charging room, to include a fire extinguisher, barriers and adequate ventilation.
- Only charge batteries in a charging room where no maintenance is performed and where batteries are not removed from the aircraft and no electrolyte is present in the area. Remove all possible ignition sources from the charging area. Personal protective equipment should be used when and where required. The link for reference:
[https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9828#1910.178\(g\)\(2\)](https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9828#1910.178(g)(2))
- Provide employees with appropriate safety equipment. Face shields, aprons and rubber gloves should be provided for workers handling battery acid.
- Facilities for quick drenching of the eyes and body should be provided within 25 feet (7.62 m) of battery handling areas.

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