

Lithium-Ion Batteries

Advanced Technology but Needing Careful Management.

Advice to owners of liveaboards and facilities where fire risks are significant, in terms of rechargeable lithium-ion batteries. (These are now more correctly referred to as lithium-ion polymer or LiPo batteries.)

1. Chargers to be OEM only; only OEM batteries to be used in the devices.
2. Consider providing LiPo-safe bags for both charging and for storing LiPo batteries when not in use.
3. Batteries should be inspected before being allowed to be charged – for any sign of heat or physical damage (e.g. swollen batteries or damaged outer coverings).
4. Batteries should not be left to charge overnight or for long periods of time. This can be regulated through observation of charge indicators, time limits or surface heat. Good practice would be for the fire watch or duty staff, or even a timer to switch off power to all chargers after a certain time and certainly overnight.
5. Once charged, batteries must be disconnected from the charger.
6. Placement of heat and flame sensors at charging station. The sensor alarms should be clearly audible under all conditions (weather, sea-state, engines and other machinery) and sound throughout the vessel.
7. Charging only allowed at a central charging station.
8. Consider limiting number of chargers in use at any one time.
9. Proper power outlets (individually protected) to be provided (not a standard power strip).
10. Ensure that charge station is away from where any flammable fluids are stored (note some cleaning fluids and solvents are flammable); gas for cooking; engine fuels or lubricants; compressed air and especially oxygen filling and storage locations.
11. Charging stations to be a strict part of the fire watch – perhaps even a CCTV if someone is on the bridge or monitoring station at night. Visual as well as heat inspections are needed.
12. Charge station should have a solid base with heat/fire resistant covering.
13. Develop an emergency action plan specific to a fire involving a LiPo battery. These can be exceedingly hot, fast, explosive and toxic.
14. Provide specific fire extinguishers for LiPo battery fires (AFFF, CO₂, ABC or dry powder only: these fires are not the same as lithium metal fires which need a Class D extinguisher). Never use water on a LiPo fire.
15. Reduce power available in cabins – only cell phones, not even laptops or tablets may be charged there (low current circuit breakers would suffice).
16. Warning signs should be placed especially in cabins detailing behaviors to avoid, such as not leaving phones charging when not in cabin, and certainly not under clothing, towels, pillows or bedding.
17. Briefing clients about the safe handling of all rechargeable batteries.