

# Battling Battery-Uncertainty Syndrome

by Jonathan Klopman

**L**ithium-ion batteries start fires. There you go, I said it. None of the manufacturers or tech acolytes want to discuss that f-word, but it is there, and it shouldn't be left up to Joe Public to address the problem. Certainly, transparency concerning the unavoidable critical elements in lithium-ion technology must be led by the manufacturers and designers. Trying to fluff this off by claiming that lithium batteries have not burned down many boats is hardly a ringing endorsement for the technology. To my knowledge, there is no lithium-ion-barbecue actuarial database.

To put this in perspective, my firm specializes in accident reconstruction and failure analysis. Most of this work involves insurance underwriters and claims departments. One thing I can absolutely assure everyone, when faced with a smoldering shell of charred fiberglass, we don't see parties eager to step forward and accept liability for the accident. When we are sifting through the mess to discover the magic widget that failed first, we are on our own. No one from the manufacturer calls in to mention how Bill in the engineering department fought with marketing to keep the units off the shelves until they had the bugs worked out. Rather, all the named parties tend to step back with their hands in their pockets.

This lack of honest cooperation means that virtually every event is an Agatha Christie whodunit. The inexorable result is that the evidence from the wreckage is tossed to a legal mosh pit of attorneys, who tend to climb out bruised and battered with a split decision. The often-imperfect results cannot help but leave all parties equally disgusted with the needlessly expensive outcome.

So, what part does insurance have in all of this? There's a common

misconception among the public that insurance represents a giant reservoir of cash and that whenever someone needs money, they just toss a bucket in the well and haul out what they need. The reality is that insurance companies each have their own reserves of capital, and they stay in business by *not* doling it out to people they do not insure. To be clear, yacht underwriters do not exist to underwrite the periodic oopsies of experimental industries that manufacture boxes filled with highly reactive metals that have a nasty tendency to ignite.

This leads us to the American Boat & Yacht Council, which should be able to lead its legions of PTCs (project technical committees) to navigate us to the land of Safe. We currently have a technical information report TE-13 for lithium-ion batteries. I was able to glean the following from that publication:

- Lithium-ion batteries need an electronic BMS (battery management system), which means another computer system on a boat. *Nothing could go wrong there.*

- Lithium-ion batteries must be well ventilated, and simple holes in berths aren't adequate. *So, does this mean we need a dedicated BVS (battery ventilation system)?*

- Lithium-ion batteries can't be allowed to get too hot or too cold. *Maybe this means we need to install heaters in Maine boats and air-conditioning in Florida boats. Super.*

- Lithium-ion batteries don't like shock or vibration. *Shock or vibration in a boat? Nah.*

- The secret electrolyte sauce in most lithium batteries is flammable, *so a metal enclosure would be a good idea.*

- The fire from lithium batteries cannot be extinguished by conventional

suppression agents, so you'll need to figure out your own system. *Vast quantities of water seem to work. So, you could install a dedicated sensor, through-hull, water pump, and flooding software. I'm sure that someone will figure out a Bluetooth-connected app so you can remotely sink your boat to prevent it from burning.*

Which prompts me to consider the likely end users. Certainly, no one with a Sea Ray or a big Viking cares much about lithium batteries, or Greta Thunberg for that matter. What about the prototypical retired-engineer sailor who has read just enough online to want to design and install his own Victor von Frankenstein perpetual-power system? Or the recreational powerboaters who, between joystick controls, bow thrusters, autopilot, and gyros, seem most concerned that they may be forced to learn how to actually handle a boat. Does anyone honestly believe that the average boater has the capability or dedication to take meaningful responsibility for these complex systems?

At this point, I try to remind myself that these are pleasure boats, not floating monuments to battery systems. The builders, boaters, dealerships, and hapless service shops are not there to fulfill the dreams of some electrical engineers and visionaries. I'm not a Luddite. Just as I do with my iPhone and laptop, I will greedily enjoy the fruits of someone else's research and labor when we reach the promised land of safe, efficient batteries. In the meantime, let's all remember that Toyota and Tesla did not ask the insurance industry to underwrite their R&D failures. **PBB**

**About the Author:** Jonathan Klopman is a NAMS Certified Marine Surveyor with an office in Marblehead, Massachusetts. [www.jklopman.com](http://www.jklopman.com).