

Boeing problems put spotlight on battery technology (lithium-ion)

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An electrical fire on Boeing's new 787 Dreamliner is drawing renewed scrutiny for lithium-ion batteries, an increasingly important component in planes and hybrid cars.

A Japan Airlines 787 experienced a battery fire while parked on the ground in Boston on Monday, causing substantial damage in an equipment bay. While the plane is designed to contain the smoke from such a fire in-flight, because it was on the ground the smoke entered the cabin.

The use of the new battery technology is among the cost-saving features of the 787, which Boeing says burns 20 percent less fuel than rival jets using older technology.

Boeing used electrical systems extensively on the 787 instead of traditional hydraulic equipment - a change that reduced the 787's weight but added to its complexity.

Lithium-ion batteries can catch fire if they are overcharged, and once alight, they are difficult to extinguish because the chemicals produce oxygen, Boeing's chief engineer for the 787, Mike Sinnott, said on a conference call with reporters Wednesday.

Engineers designed multiple onboard systems to prevent overcharging, contain a battery fire and siphon smoke away before it reaches the cabin, Sinnott said.

He said a lithium-ion battery was not the only choice of battery, but "it was the right choice" and "knowing what I know now, I'd make the same choice now."

Sinnott wouldn't discuss specifics of the Japan Airlines fire, which is being investigated by the National Transportation Safety Board, and it wasn't known whether there was a fault with the battery, which was made by GS Yuasa Corp, which has said it is investigating. [ID:nL4N0AE0LH] Sinnott said Boeing is not considering using different battery technology.

The battery that caught fire was part of an auxiliary power unit designed to provide electricity when the plane is on the ground. The battery is about twice as large as a car battery and it has been extensively tested, both in the lab and in operation. "We've got 1.3 million operating hours on these battery cells in flight with no issues," Sinnott said.

TEST AND RE-TEST

A similar challenge confronts automakers and other users over lithium ion batteries, which are used in laptops and other electronics.

"It is always difficult to predict the level of safety precaution needed for new technology," said Menahem Anderman, a battery consultant who worked on the Boeing 777 battery systems when he was at Acme Electric Corp, in an email.

"One of the challenging design criteria that automakers are struggling with is whether it is necessary to ensure that if a single cell catches fire, the fire does not propagate to other cells," he said.

While Dreamliner passengers may not realize there is a lithium-ion battery inside the plane, drivers of electric cars do. The auto industry has been increasingly veering toward using lithium-ion batteries rather than the cheaper, but heavier nickel-metal hydride battery used by Toyota Motor Corp in its top-selling Prius.

General Motors Co, the largest U.S. automaker, uses a lithium-ion battery in its Chevrolet Volt plug-in hybrid, while its smaller U.S. rival Ford Motor Co uses the technology in its green cars, including the recently launched C-Max hybrid.

The technology is favored in the latest generation of such cars for the same reason plane makers are keen to use it -- the batteries can be made lighter, smaller and in a way that retains capacity longer. Lithium-ion batteries are about half the weight of nickel-metal hydride batteries.

In 2011, a lithium-ion battery pack in a Volt caught fire three weeks after a U.S. safety regulators conducted a crash test. But after a two-month investigation, the National Highway Traffic Safety Administration determined that the Volt and other electric vehicles posed no greater risk for a fire than gasoline-powered vehicles.

Lithium-ion battery maker A123 Systems was forced to recall battery packs made for Fisker Automotive's plug-in hybrid sports car, the Karma, last year. A123, which ultimately went bankrupt, citing a manufacturing defect for the problems in the batteries.

"Because they're new and different, a fire in an electric car gets a lot more attention than in a gas car," said Tom Gage, a battery expert whose company EV Grid works on ways to manage the charging of electric cars. "The standard is, are they as safe as the gas tank? That's certainly the target they have to strive for."

He said there probably wasn't enough data to determine their comparable safety record.

GM is exploiting the technology aggressively in the Volt, having done 100 million miles of drive testing by the CEO's account. Chief Executive Dan Akerson said Wednesday that GM tests the batteries "like you wouldn't believe" and was confident in its safety procedures. He declined to comment on Boeing's battery use.

SOURCE Reuters