

DOCKETED

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safety of battery packs

There have been a number of failures of a battery-pack, whether in a vehicle or as stand-by utility-power in a shipping container. In each case the results have been catastrophic.

While the reliability of individual lithium-ion cells is high, it is not perfect, and when assembled into large arrays such as in vehicles, trucks, energy-storage for solar-powered homes or utility stand-by power, the failure-rate becomes unacceptable. If one home in a million per year would be incinerated by the failure of its battery-pack, this would be unacceptable. A comparable battery-pack in a truck would be subjected to vibration and its failure rate would be higher.

I am an electronics engineer, chemist and physicist and work in the field of component and systems reliability. I recognize and commend to your attention that what is needed is a battery-pack that is FAULT-TOLERANT, meaning capable of graceful degradation in performance if one or more individual cells fault, without immolation of the entire assembly.

The science to do this kind of thing exists; what is needed is engineering work to develop technology by application of known science to achieve the desired result.

This technology is a necessary part of the overall zero-emission vehicle goal. It has been overlooked until now.

None of the manufacturers of lithium-ion battery packs or modules of same appear to have given any consideration to achieving reliability by fault-tolerance; evidently they do not have this kind of expertise in-house.

I have such expertise. My website www.consultingscientist.us discusses some of my work.

I propose your award to me of a grant to develop fault-tolerant technology for lithium-ion battery arrays. What I propose to develop would be applicable to arrays of any size vehicle, to battery-cell-arrays for houses, for utility-standby power, arrays of any size or energy storage level.