Call for Papers

Battery Reliability and Safety
Special Section in the IEEE Transactions on Reliability

IEEE Reliability Society is pleased to announce a call for papers to be published in a special section of IEEE Transactions on Reliability with expected publication period in spring 2013, pending sufficient acceptable papers by that time. This issue will focus specifically on the challenges and technologies surrounding battery reliability and safety.

The objective of this special issue is to highlight the pressing needs and potential solutions to challenges relating to battery safety and reliability. Further development of batteries for use as portable power sources and energy storage systems is regarded as a top priority for research and development. Technologies introduced over the past decade, from smaller and more powerful portable electronic devices to zero emission electric vehicles, are all indicative of the need for improved battery systems. However, the improvement of cell energy and power densities cannot come at the expense of safety, cost, and reliability. Penetration of new technologies such as electric vehicles into a traditionally fossil fuel dominated industry can be easily thwarted by claims of "lack of safety." Additionally, millions of dollars in financial losses can be incurred if a battery safety event results in a device recall. Therefore, it is important that advancements in reliability and performance run in parallel with advancements in safety.

Issues of battery safety stem from the inherent toxicities of the battery materials, and the fire or explosion hazard associated with thermal runaway. Safety risks are elevated when considering large battery-packs which combine multiple cells together to achieve high voltages and currents. Several challenges arise from uneven thermal and state of charge distributions across individual cells in a pack. Additionally, battery-pack architectures must be designed to minimize the risk of short circuits. This special issue will be concerned with, but is not limited to, issues of:

- Battery Pack Thermal Management
- Cell Thermal Modeling
- Prognostics and Catastrophic Failure Pre-curser Detection
- Design for Safety
- Non-toxic and Environmental Friendly Next Generation Electrodes
- Non-volatile Electrolytes
- Safe Separators (enhanced separator shut-down)
- Cell Balancing
- Abuse Tolerance
- Safe System Integration

Submissions should include a title page with the full-names and contact information of all the authors, and an abstract. All papers should follow the standard IEEE format guidelines found under information for authors at http://rs.ieee.org/transactions-on-reliability.

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