Sensor Enhanced and Model Validated Life Extension of Li-Ion Batteries for Energy Storage

Project Contacts

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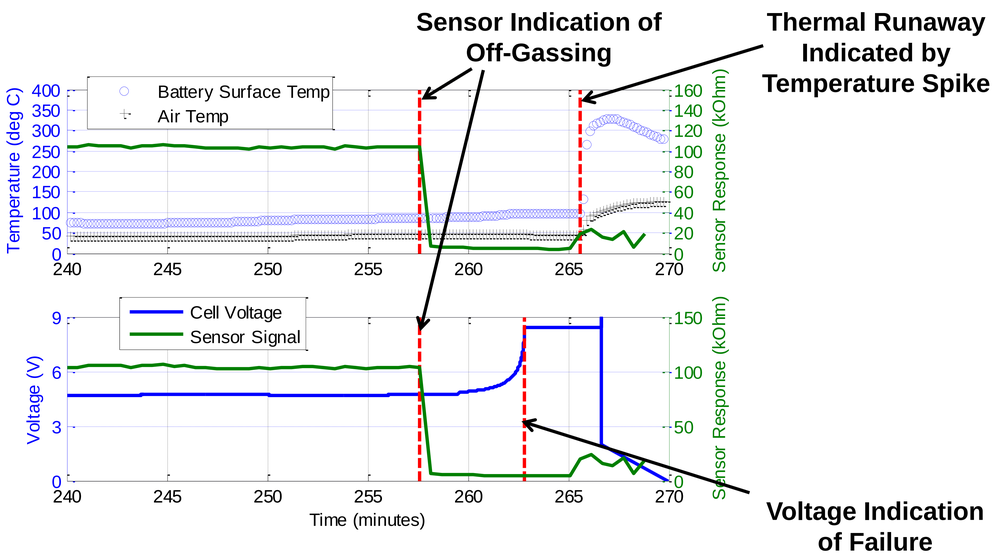
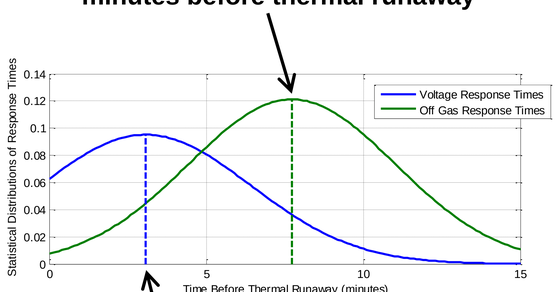


Technology Summary

- **Non-invasive:** system level sensing
- **Flexible:** independent or BMS-integrated battery safety monitoring
- **Consistent:** Sensor response in 100% of thermal runaway events
- **Early Warning**: Average 7 minute early warning before thermal runaway
- **Actionable**: thermal runaway can be prevented
- **Simple:** Ability to monitor full 25 kW system with 1-3 sensors

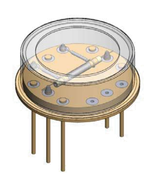
Early Warning

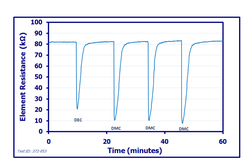
Average off-gas sensor indication 7.7 minutes before thermal runaway



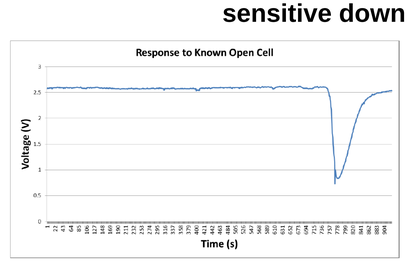
Voltage indication of failure only 3.1 minutes before thermal runaway

Detection Mechanism





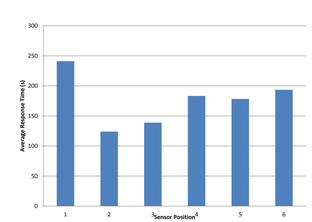
Chemi-resistive sensing element is responsive to carbonates, sensitive down to 50 ppb

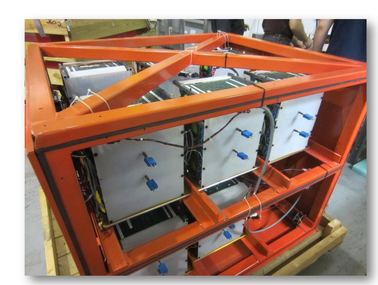


Inspecting damaged cell (courtesy of ATC New Technologies)

System Integration

DEC quantities injected for net concentration of 14.5 ppm - equivalent to 10 minute early warning





Off-gassing indicated with 100% detection rate and under 2 minute response time