

Developing Energy Informed Outcomes

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With Guest Lecturer Col Paul Roege, USAR

Program Manager, Department of Energy's Idaho National Laboratory

Abstract:

More sensors are needed for enhanced safety in lithium ion battery systems, and without the proliferation of wires. Elimination of such wiring harnesses promise to increase reliability, decrease weight, and increase mass-specific power and energy. Wireless sensors and controllers provide a means of eliminating the massive wiring harnesses, and are capable of increasing safety, reliability, specific power, and specific energy. Specific performance parameters of individual Li-ion cells that can be monitored and transmitted wirelessly to the BMS or operator during charge-discharge cycling include: (1) terminal voltages during charge-discharge cycling; (2) electrode voltages measured against an internal reference electrode; (3) cell current; (4) surface temperature; (5) internal core temperature with an embedded sensor; (6) package strain; and (7) internal cell pressure. These sensors are ideally suited for monitoring a broad range of energy conversion and storage devices, including but not limited to primary and secondary electrochemical batteries, photovoltaic cells, thermoelectric generators, capacitors, flywheels, and various types of generators.



Col Paul Roege, USAR

Biography:

Paul Roege is a program manager at the Department of Energy's Idaho National Laboratory (INL), where he recently returned after spending four years on active military duty to establish the Army's concepts and strategies. His current priority is to advance energy resilience through research, communication, and development of key enabling technologies, such as small nuclear reactors and hybrid energy technologies. Mr. Roege has over 34 years of international engineering experience in both civilian and military capacities, including nuclear operations and safety, energy system engineering, and construction. He managed military construction for the US Army Corps of Engineers in Africa, Southwest, and Southeast Asia; designed petrochemical plants with the M. W. Kellogg Company; and managed engineering in support of nuclear facility operations and disposition at the US Department of Energy's Hanford site, and at the Idaho National Laboratory. He is a registered professional engineer, a West Point graduate and alumnus of Boston University (MBA) and MIT (Nuclear Engineer).

