NREL
NATIONAL RENEWABLE ENERGY LABORATORY

Platform Li-Ion Battery Risk Assessment Tool

Cooperative Research and Development Final Report

CRADA Number: CRD-10-407

NREL Technical Contact: Kandler Smith

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Cooperative Research and Development Final Report

In accordance with Requirements set forth in Article XI.A(3) of the CRADA document, this document is the final CRADA report, including a list of Subject Inventions, to be forwarded to the Office of Science and Technical Information as part of the commitment to the public to demonstrate results of federally funded research.

CRADA number: CRD-10-407

CRADA Title: Platform Li-Ion Battery Risk Assessment Tool

Parties to the Agreement: Creare Incorporated

Joint Work Statement Funding Table showing DOE commitment:

Estimated Costs	**NREL** Shared Resources
Year 1	$ 00.00
Year 2	$ 00.00
Year 3	$ 00.00
TOTALS	$ 00.00

Abstract of CRADA work:

Creare was awarded a Phase 1 STTR contract from the US Office of Naval Research, with a seven month period of performance from 6/28/2010 to 1/28/2011. The objectives of the STTR were to determine the feasibility of developing a software package for estimating reliability of battery packs, and develop a user interface to allow the designer to assess the overall impact on battery packs and host platforms for cell-level faults. NREL served as sub-tier partner to Creare, providing battery modeling and battery thermal safety expertise.

Summary of Research Results:

Under the CRADA, Creare developed a user-friendly graphical interface to drive NREL battery thermal analysis software. The resulting software toolset is capable of simulating a multi-cell Li-ion battery pack's electrical and thermal response to abuse conditions. Through simulation, the software toolset establishes proximity to thermal runaway and thus hazard risk for various abuse scenarios including cell and module electrical shorts. An example battery platform was demonstrated, namely an 80-cell battery pack built using 18650-standard Li-ion cells. The software toolset has application for safety and design analysis of Li-ion batteries.

Subject Inventions listing:

None.

Report Date: 1/28/2011 Responsible Technical Contact at Alliance/NREL: Kandler Smith

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