

Naval Surface Warfare Center

METHOD AND SYSTEM FOR DETECTING LEAKAGE OF ENERGY STORAGE STRUCTURE LIQUID

***Patent Application # 12/023,218
Mini Market Study***

August 17, 2011

Prepared for:

NSWC-Crane Division

**John Dement, ORTA/Technology Transfer
Joe Gaines, Chief Technology Officer
Sue Waggoner, Inventor**

Prepared By:

Integrated Technology Transfer Network

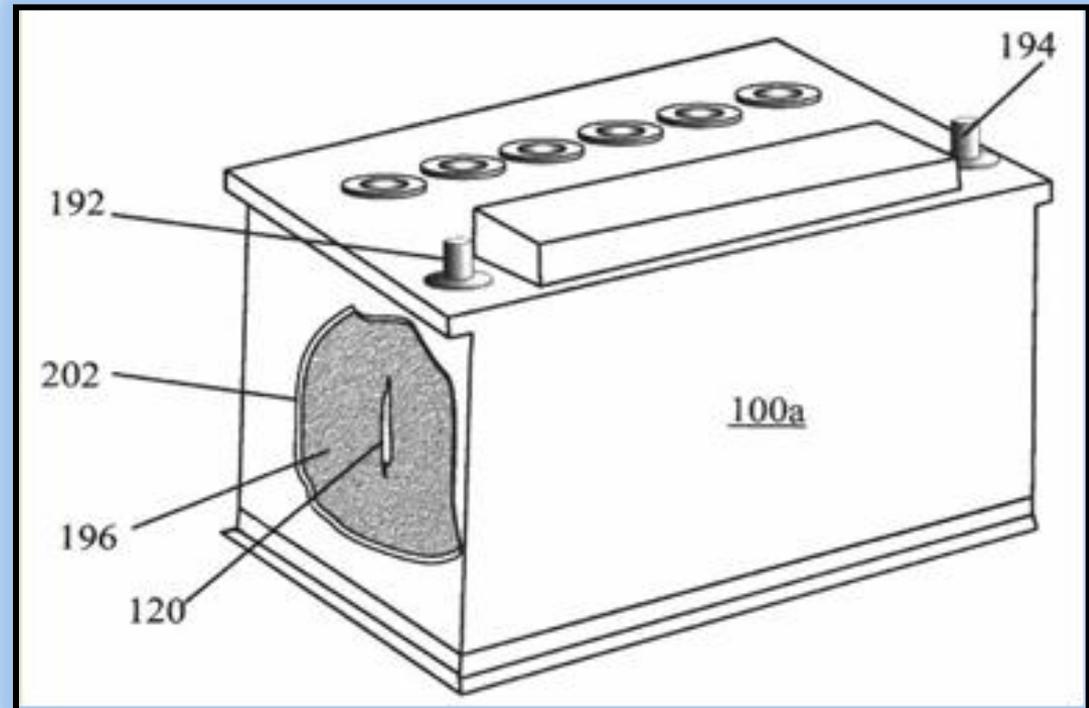
Nitrecus Simmons, Consultant, ITTN Fellow

Integrated Technology Transfer Network

Distribution Statement A: Approved for Public Release; Distribution is Unlimited

Technology Synopsis

- A fast, simple system that can be automated for detecting leakage of electrolyte from lead - acid batteries with nonconductive cases.
- **Problem Solved:**
 - Prevents
 - Pollution of the immediate environment
 - Corrosion to the battery and compartments
 - Usage of unacceptable battery
 - Reduces hazards to personnel
 - Decreases turnover of batteries





Key Competition & Competitive Advantage

Company Name/Inventor	Product Name	Location	Features
NTT Facilities Inc. 	VRLA battery remote management system	Tokyo, Japan	<ul style="list-style-type: none"> Automatically measures voltage and ambient temperature of each cell Reports time for battery replacement Electrolyte leakage detection externally
Lineage Power 	Acid Spill Management System	Plano, Texas	<ul style="list-style-type: none"> Eliminate corrosion damage Reduce the time required to effectively clean batteries Eliminate trickle self-discharge by making the case neutral and non-conductive. Detect leaks by color change when acids or acid salts are present.
Sue Waggoner 	Method and System for Detecting Leakage of Energy Structure Liquid	Crane, Indiana	<ul style="list-style-type: none"> Eliminate corrosion damage Able to detect internal leakage by using internal components Cost effective to manufacturers

The **only** technology which:

- The system is internal to the battery**
- Can be automated or check with multi-meter.**



Potential Applications

Industry Segments	Applications	Uses	Size of market
A. *Military B. Commercial	1. Vehicular <ul style="list-style-type: none"> • Aircrafts • Automobiles • Marine • Tanks • Trucks 2. Fluid containment devices (tanks)	1. Detecting Electrolyte Leakage from Batteries with nonconductive cases 2. Eliminating poor performers out of critical applications 3. Preventing damage to battery compartments	\$33B Military Aircraft (2011) ¹

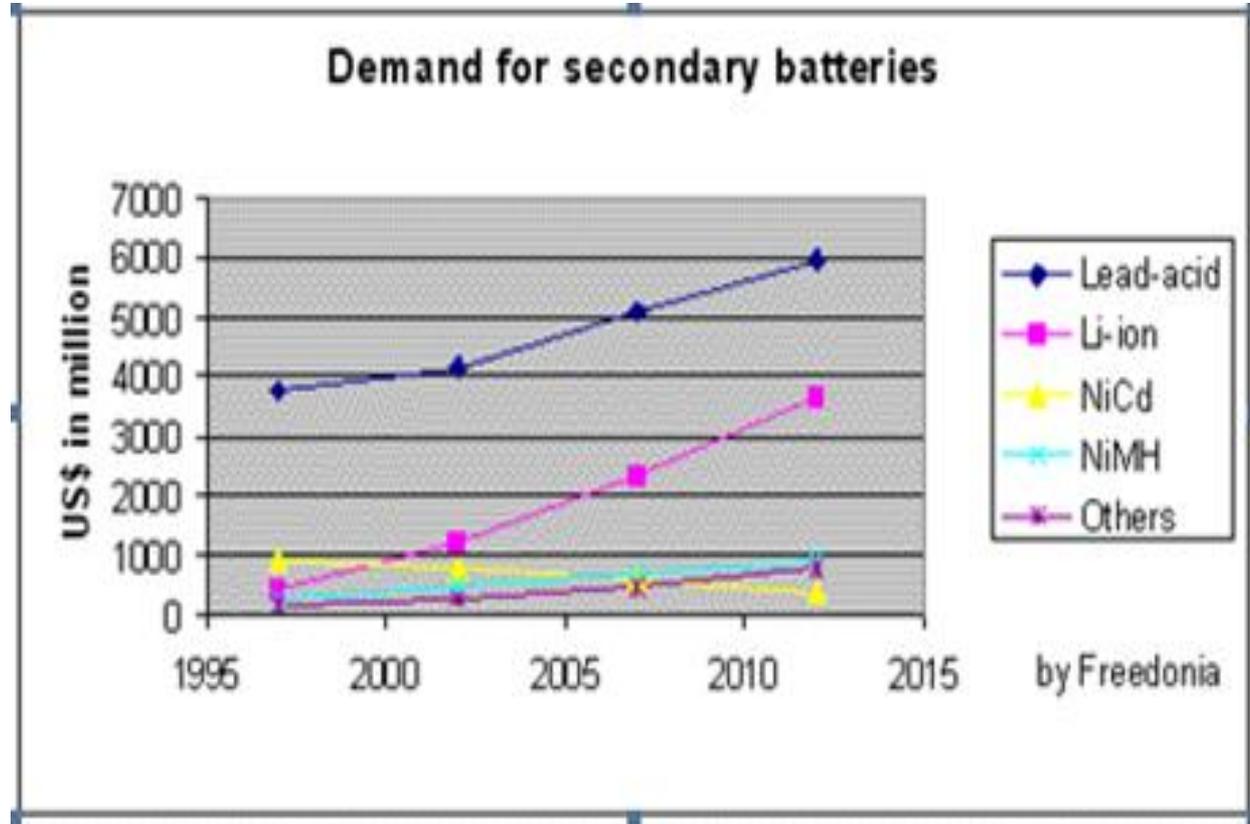
***Primary Market Focus**

Source:

1. http://annualreport2009.gkn.com/Business_Review/Review_of_Performance/Aerospace_Performance/Default.aspx?id=86

Market Opportunity

- The global market for lead-acid batteries is forecast to reach \$15.4 billion by the year 2015.



According to **PulseTech Products Corporation**, "thousands" of damaged lead acid batteries are needlessly disposed, adding to an already unhealthy situation.



Potential Targets for Licensing



- Largest industrial battery manufacturer in the world, operating manufacturing and assembly facilities worldwide for customers in over 100 countries.



- Global diversified technology and industrial leader that create quality products, services and solutions to optimize energy and operational efficiencies of buildings and lead-acid automotive batteries.



- One of the world's largest producers and recyclers of lead-acid batteries.



- The world's largest and most modern independent battery manufacturer.



Industry Insights



- **Scott Lichte, Technical Product Manager**
 - *“Deemed commercially feasible and applicable to their products.”*
 - *“Address a design/performance issue and must be considered reliable.”*
 - *“Technology’s cost must be feasible and it has to pass a valid performance test.”*
 - *Not familiar with MSDLESSL technology*
-



- **Lou Vondenbosch**
 - *“Do not understand the need for the technology within the company, but I am willing to pass information to engineers.”*
-



Recommendation and Next Steps

- The key to commercializing this innovation is to contact **leading lead-acid battery manufacturers to determine interest in electrolyte leakage detection system for military applications, specifically military aircrafts.**
- **Contact EnerSys' Scott Lichte (Technical Product Manager)** to familiarize him with the MSDLESSL technology, its capabilities, and the problem that it solves for the customers. Afterwards, determine if there is a need in the company, how the technology can be potentially integrated, and a list of other possible companies that would be interested in the technology.
 - Phone: 660-429-7556
 - Email: scott.lichte@enersys.com
- **Follow-up with Lou Vondenbosch** from East Penn Manufacturing company to determine whether the company's engineers have reviewed the patent information and to determine if integration of the electrolyte leakage detection system is feasible. Ask for a list of companies who would be interested in integrating this technology.
 - Email: louv@dekabatteries.com



Recommendation and Next Steps

- Explore market opportunity within the commercial industry. (Focus: Commercial vehicles and aircrafts that use lead acid batteries)
 - **Attend the Advance Automotive Battery Conference**
 - This conference exhibits dynamic networking events, symposiums, tutorials that address the key issues affecting the technology and market of advanced vehicles and the batteries that will power them.
 - **February 6-10, 2012 in Orlando, Florida.**
 - **Attend the National Alliance for Advanced Technology Batteries Second Annual Meeting Summit and Conference**
 - This year's theme, "New Markets, New Innovation, will discuss crucial topics facing the U.S. advanced battery industry.
 - **September 7-8, 2011 in Louisville, Kentucky at the Seelbach Hilton**
 - Registration is open now! www.naatbatt.org
 - **Sponsorship and exhibit opportunities contact:**
 - Jim Greenberger at 312.588.0477 or jgreenberger@naatbatt.org
 - Marty Tullio, McCloud Communications, at 949.632.1900 or marty@mccloudcommunications.com



Naval Surface Warfare Center

METHOD AND SYSTEM FOR DETECTING LEAKAGE OF ENERGY STORAGE STRUCTURE LIQUID Patent Application # 12/023,218

**For further discussions, contact:
NSWC-Crane Division**

**Director of Technology Transfer:
John Dement
John.dement@navy.mil
812-854-4164**

**Chief Technology Officer: Joe Gates
Inventor: Sue Waggoner**



Status to Date

Status	Required Tasks
Completed	Draft interview agenda/questions. Obtain mentor approval prior to interviews.
Completed	Perform in person interview with inventor(s) and/or subject matter experts (SME) in accordance with a provided checklist
Completed	Develop a short succinct (1-2 paragraphs) common language description
Completed	Perform a web search for similar / competing products.
Completed	Identify potential markets for the technology including an abbreviated horizontal and vertical analysis and potential company lists.
Completed	For the top 2-3 markets, contact potential companies to determine interest, issues, etc.



Market Study Goals

- Conduct an abbreviated market study assessment to:
 - a. Define the technology in common language as a priority in commercial and military application.
 - b. Create collateral material for industry outreach.
 - c. Validate collateral material communication through primary and secondary research.

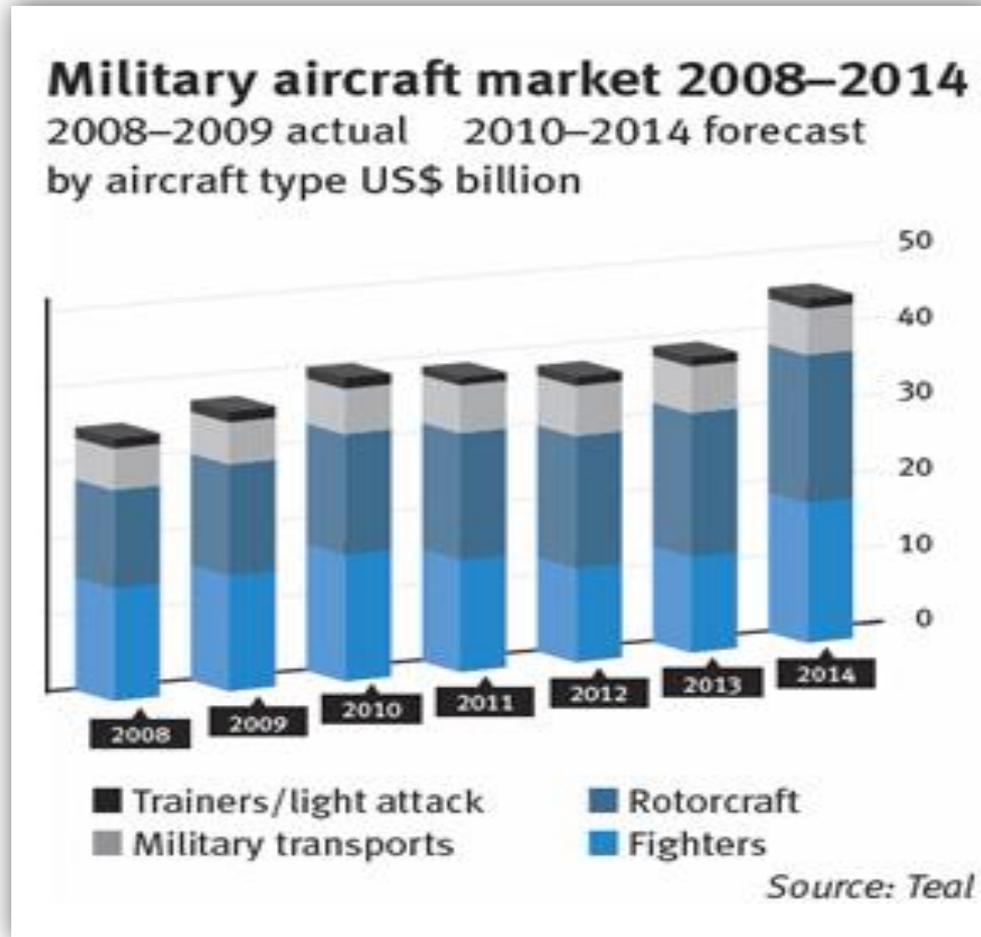


Situational Summary

Inventor Susan Waggoner of the NAVSEA Crane Lab Invented a Method And System For Detecting Leakage of Energy Storage Structure Liquid to detect electrolyte leakage in lead-acid batteries.

- The technology is not currently used. Technology is in the patenting process. Prototype is unavailable.
- Applications for the technology are in the military and commercial industries.
- Both primary and secondary research indicate market potential.

Market



****Note: Military aircrafts use lead acid batteries.**