

Presentation for FPL/FESC



**Mark Kohler, PMP
Program Manager
G4 Synergetics**

A thick, dark blue arrow pointing to the right, with the word 'Charge' written in white, bold, sans-serif font in the center.

Charge

**G4 Manufactures Ultra
High Power, Bi-Directional
NiMH Batteries**

A thick, dark blue arrow pointing to the left, with the word 'Discharge' written in white, bold, sans-serif font in the center.

Discharge

Company Overview

- Snapshot
 - 7 years in existence
 - Based in United States (Alachua, FL)
 - Former General Electric/Energizer/Moltech/Gates facility
- Team consists of battery veterans with over 150 years experience



Land: 103 acres
Facility: 40,000 sq. ft.

Why NiMH? Most proven battery technology for high power applications



- The HV battery, battery control module are covered for **8 years/100,000 miles.**
- In states that have adopted the California Emission Control Warranty, the hybrid battery is covered for **10 years/150,000 miles.**

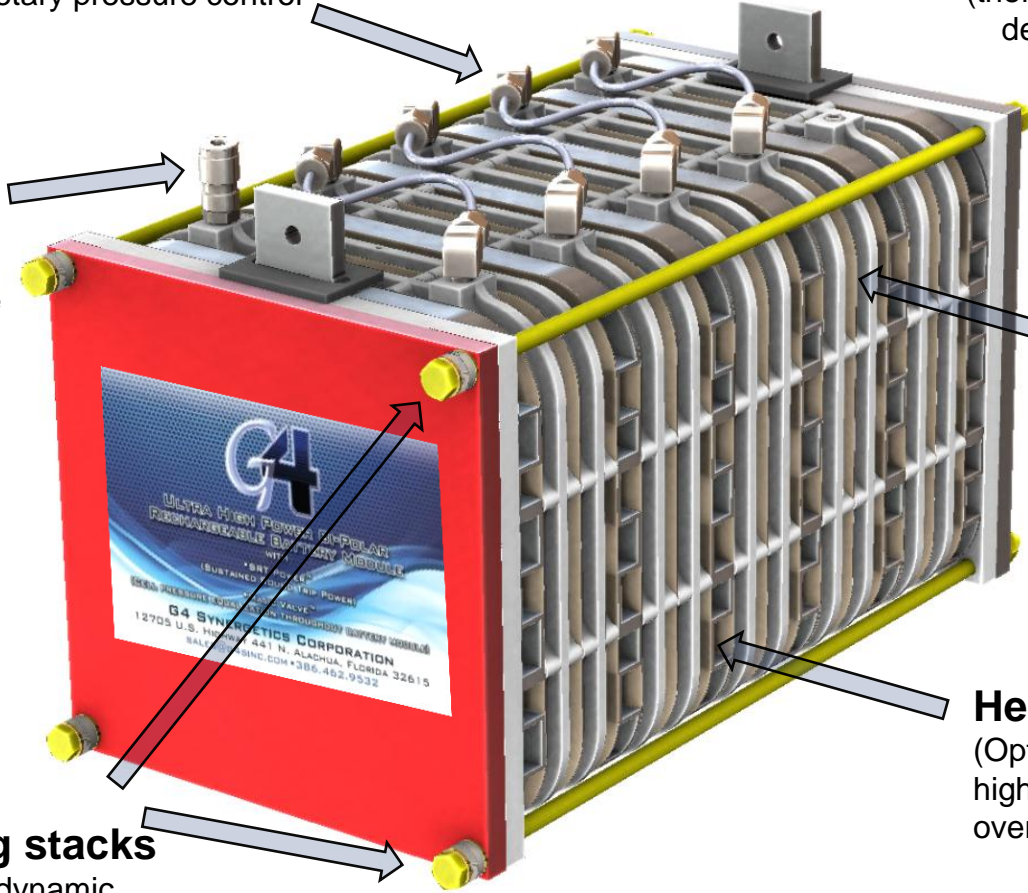
Source (April 2014): www.toyota.com

Commercially Proven Chemistry for Safe and Long Cycle Life Performance

G4 Unique Safety Features

Common pressure

(allows pressure equalization between cells and allows for proprietary pressure control operation)



Pressure Relief Valve

(additional safety feature that can exhaust excessive manifold pressure)

Flat Plate Design

(thermally optimized flat plate designs allows for latter thermal transfer using metallic current collectors)

Finned substrates

(increases cell heat removal, allows easy access for voltage/temperature monitoring)

Heat Sinks

(Optional: allows for extreme high power operation/extended overcharge)

Washer spring stacks

(accommodates dynamic movements during cycling)

G4
ULTRA HIGH POWER BIPOLAR
RECHARGEABLE BATTERY MODULE
WITH
SUSTAINED HIGH POWER
* 800 AMPERES
* 100 WATT VALVE
G4 SYNERGETICS CORPORATION
12705 U.S. HIGHWAY 441 N. ALACHUA, FLORIDA 32615
SALES: G4SYNERGETICS.COM * 386.452.9532



Customized Energy Storage Solutions

- **Turnkey Solution Provider:**
 - Custom battery module manufacturer tailored to meet specialty requirements
 - Fully integrated customizable battery management system (BMS)

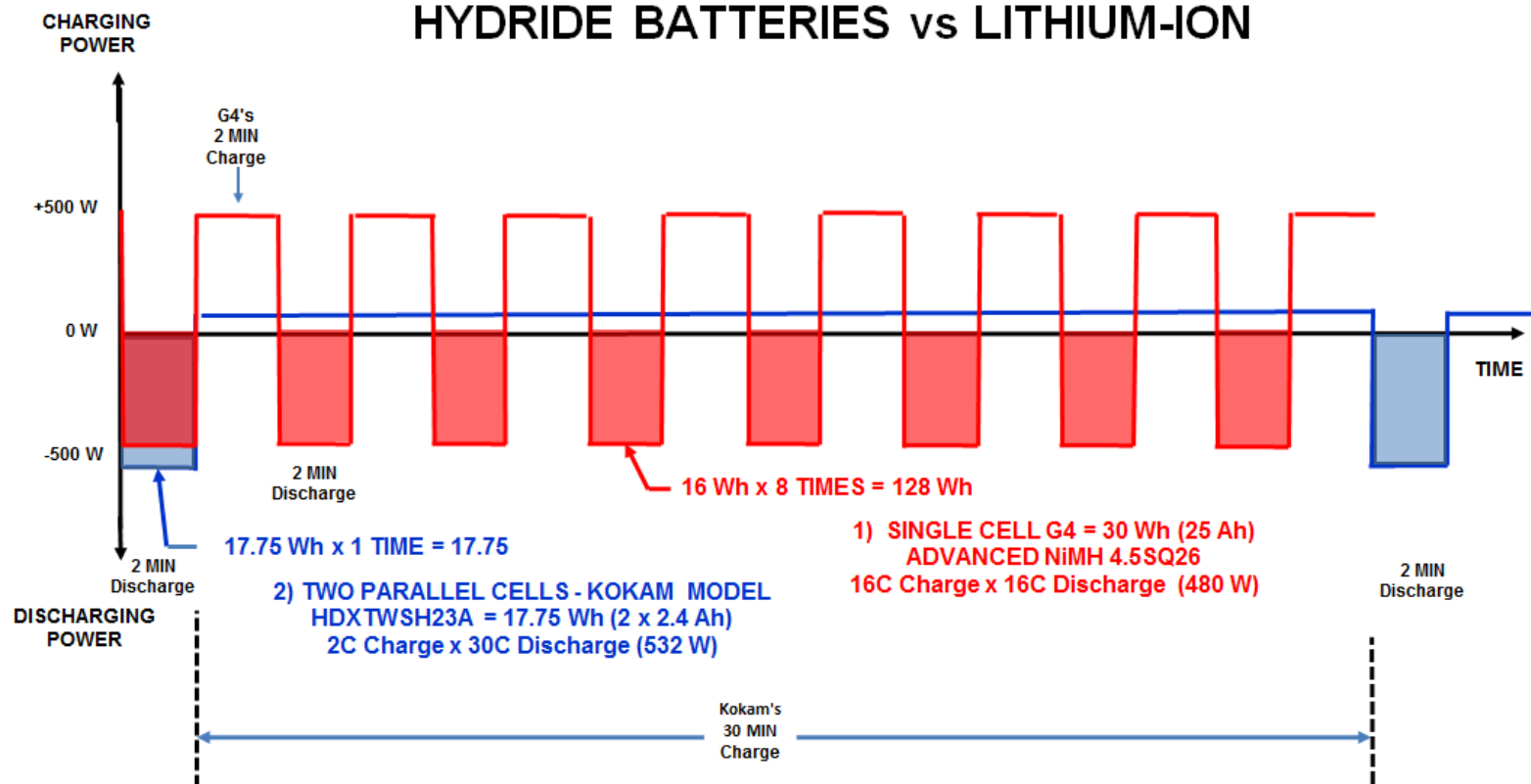


Target Markets and Applications

Current markets include, but are not limited to:

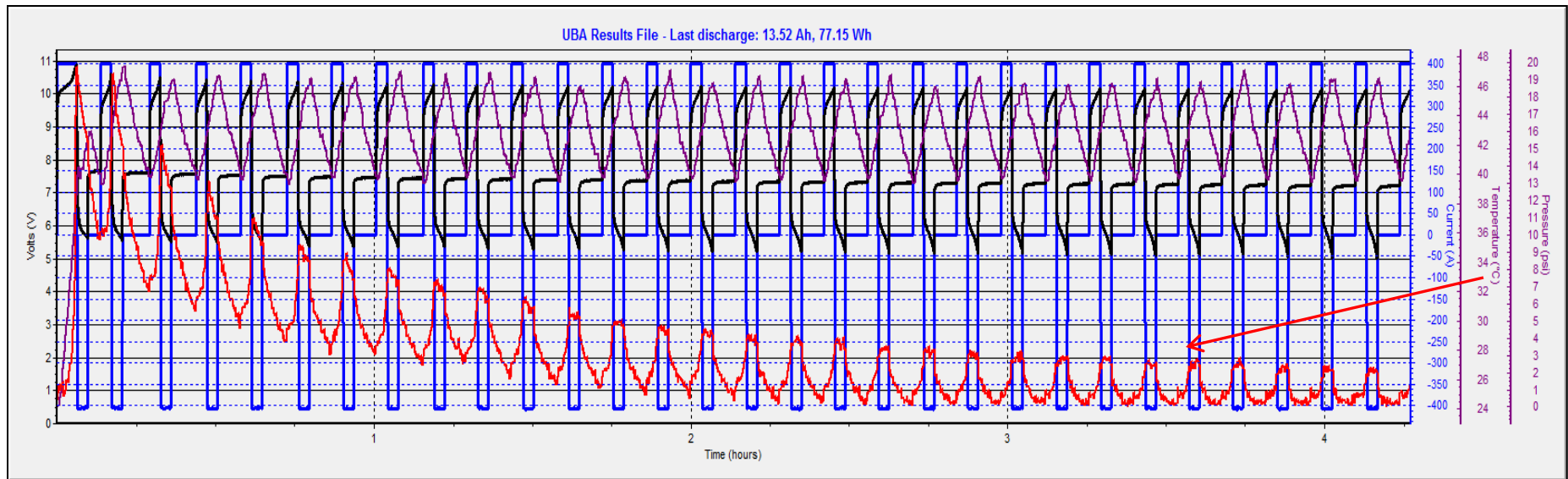
- Military
- Transportation
 - Hybrid Vehicles – presently integrated
 - Vehicle Start/Stop – latest data on [G4 website](#)
- Utility and Electrical Grid Services
 - Frequency Regulation
 - Renewables Firming
- Any application(s) requiring high rate charge/discharge acceptance in a safe, NiMH chemistry

DUTY CYCLE OF G4 ADVANCED NICKEL METAL HYDRIDE BATTERIES vs LITHIUM-ION



ADVANCED NICKEL METAL HYDRIDE WILL DELIVER 721% MORE ENERGY (128 Wh) IN 32 MINUTES THAN THE DOW-KOKAM LITHIUM ION (17.75 Wh) IN THE SAME TIME

D1301: High Rate, 6 Cell, 25Ah rated Battery at 400A, 30 Cycles Test (fans on)

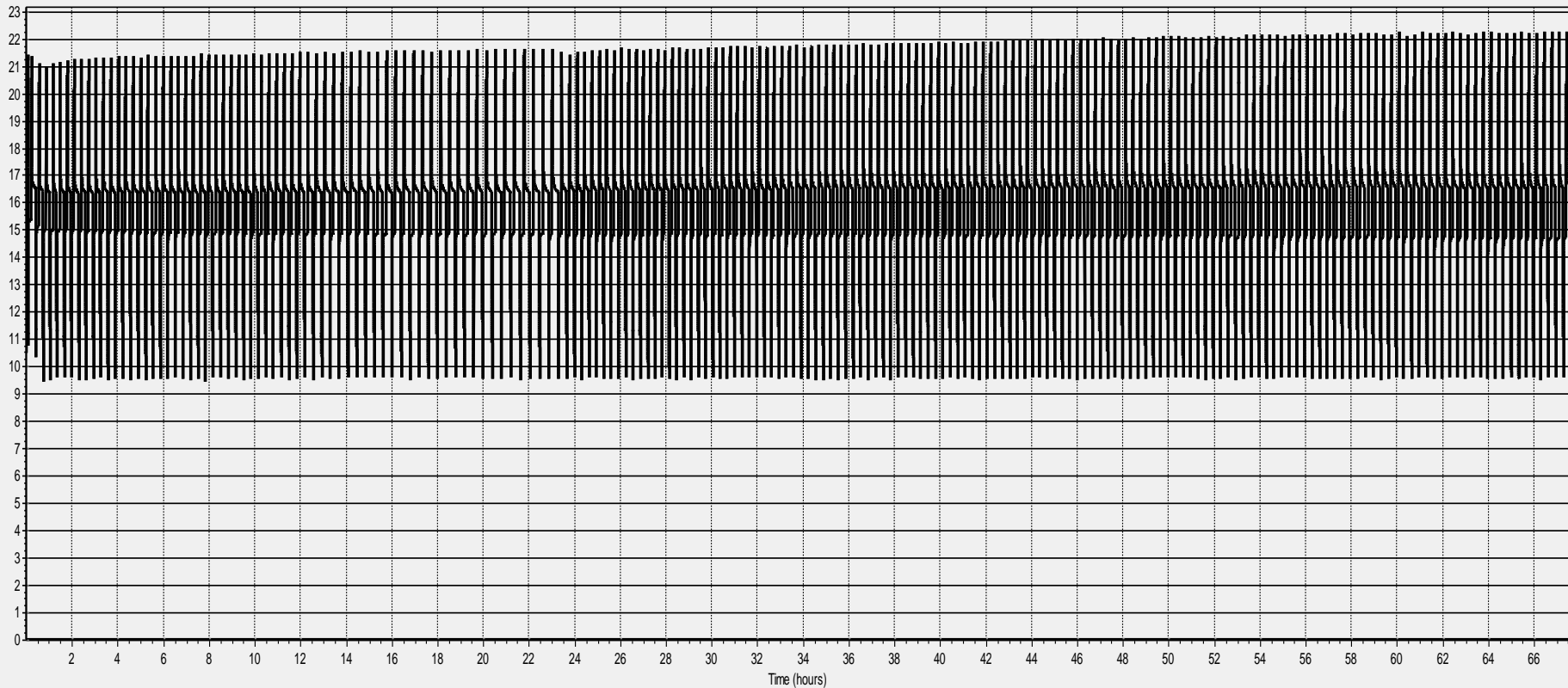


2 min pulses at 400 Amps, 5 minute dwell period between pulses

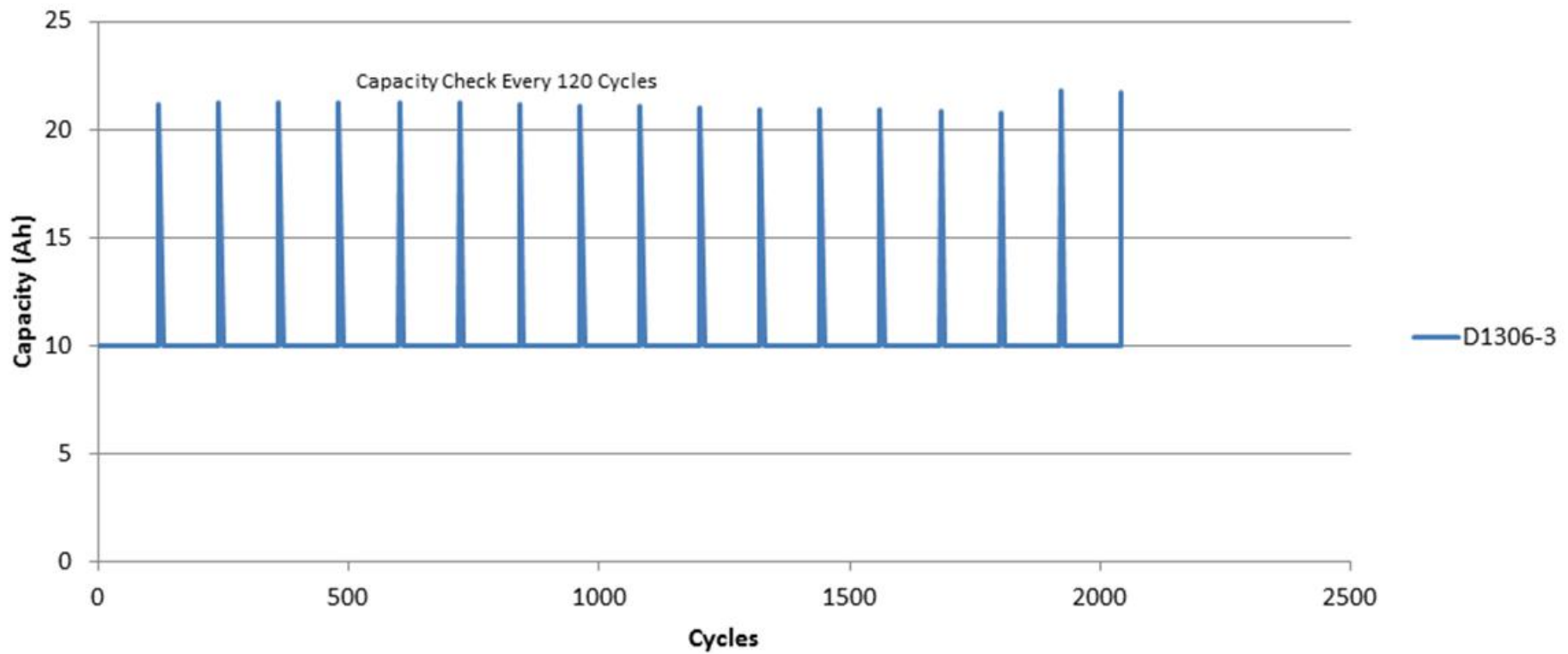


D1251:12 Cell G4 25Ah rated Battery:400A/ 2 Minute Test (Fans on) for 200 Cycles

UBA Results File - Last discharge: 10.54 Ah, 114.7 Wh



G4 25Ah Cell - Capacity vs. Cycles
RT Cycle Life - 40% Depth of Discharge (DoD)



G4 25Ah Cell - Capacity vs. Cycles RT Cycle Life - 60% Depth of Discharge (DoD)

