GRID-SCALE ENERGY STORAGE DEMONSTRATION FOR ANCILLARY SERVICES USING THE ULTRABATTERY™ TECHNOLOGY

Jeff Seasholtz
East Penn Manufacturing

John Wood
Ecoult
UltraBattery™

Lead-Acid Cell

PbO₂

Separator

Pb

Asymmetric Supercapacitor

PbO₂

Carbon Electrode

i

i₁

i₂
REGULATION
USE IN PARTIAL STATE OF CHARGE

Regulation Signal

Resulting Battery State of Charge

PARTIAL STATE
OF CHARGE
OPERATION
LONG LIFE & HIGH EFFICIENCY IN PARTIAL STATE OF CHARGE

Comparison of Efficiency vs State of Charge

UltraBattery is more efficient across range of SOC

Capacity over time with PSoC use

UltraBattery can turn over much more energy during its life
EPM'S FREQUENCY REGULATION PROJECT

BESS (BATTERY ENERGY STORAGE) SYSTEM

- UltraBattery Strings (3 x CUBS)
- 900 kW Inverter
- 3.6 MW BES System for 3MW of Frequency Regulation

3 MW Frequency Regulation Installed at EPM

EAST PENN manufacturing co., inc.
LOGIC STRUCTURE
OF ENERGY STORAGE SYSTEM

- Application System Control Processor
- Storage System Control Processor
  - SCADA interface, DNP3 or modbus over TCP/IP
- String Master Controller X N strings

Ecoutl Remote System
- Monitoring and database
- Cell performance trending
- Cell replacement
- Scheduling & customer Reporting

East Penn UltraBattery Cells

Battery Monitoring Modules (BMM)
1 per 32 cells.
ACCELERATED CHARACTERIZATION
PROJECT STATUS

UltraBattery
Management System
Power Control System
Buildings & Containers
System Integration
Interconnect
Commissioning and Operation
BUILDING AND CONTAINERS

Status: 80% complete
START OF OPERATIONS: EARLY 2nd QTR 2012
THANK YOU

EAST PENN manufacturing co., inc.

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