



ABMAS Battery Management System for USCG National Distress System Applications

Annual DOE Peer Review

September 2008

Benjamin L. Schenkman
(505) 284-5883
BLSCHEN@SANDIA.GOV



U.S. COAST GUARD





National Distress System (NDS) Problem

- ◆ Supplying Fuel to the propane generators is expensive especially when the fuel has to be chartered by helicopter.



U.S. COAST GUARD





NDS Background

- ◆ 365/7/24 distress communication coverage
- ◆ Remote Locations (Majority in Alaska)
- ◆ VHF-FM system powered by Battery, PV and USCG owned propane generators
- ◆ Fuel for the Generator is delivered by helicopter or car if possible

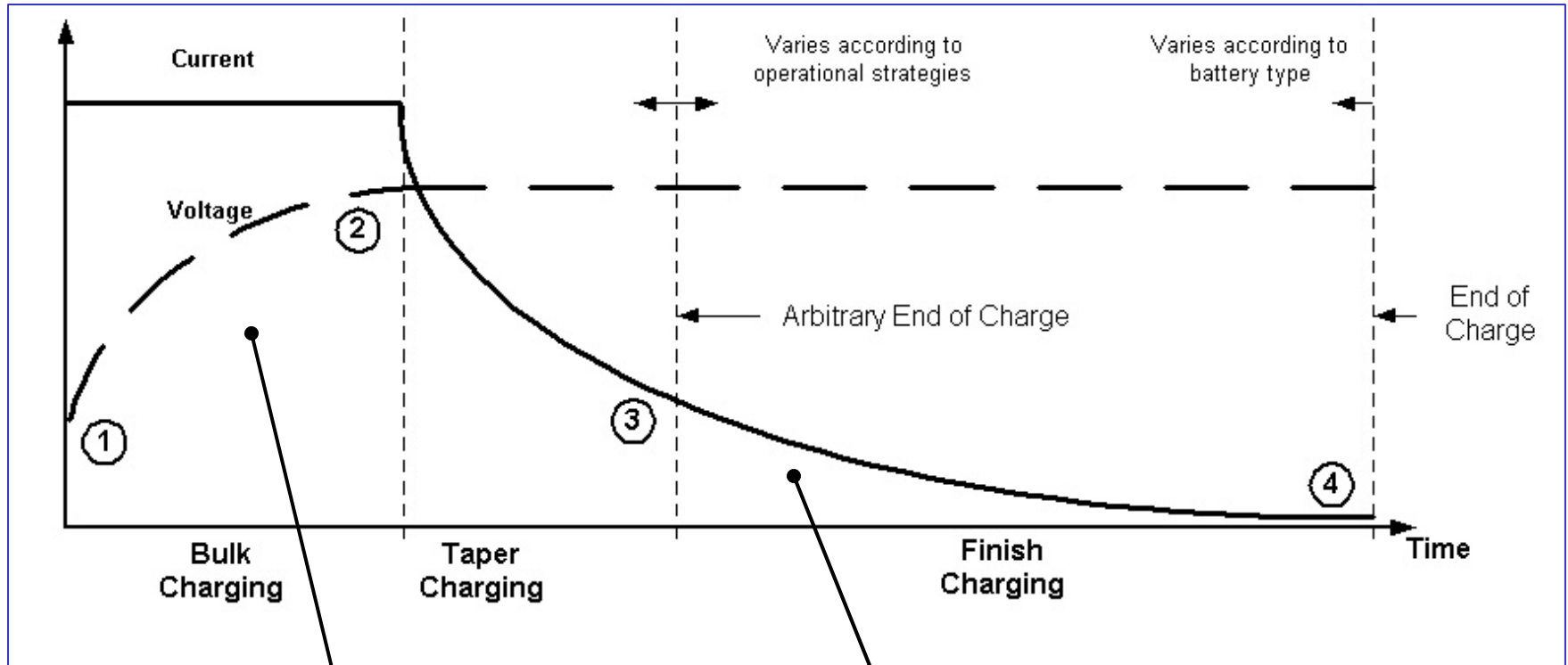


U.S. COAST GUARD



Conventional Battery Charging Scheme

Fuel/Battery Tradeoff



Good charge acceptance
Efficient generator operation

Necessary to fully recharge
Poor charge acceptance
Inefficient generator operation





ABMAS Control Scheme Features

- ◆ Operate Generator for BULK CHARGE ONLY
- ◆ FINISH CHARGE one string from other string(s)
- ◆ FULLY RECHARGE based on Ampere-hours

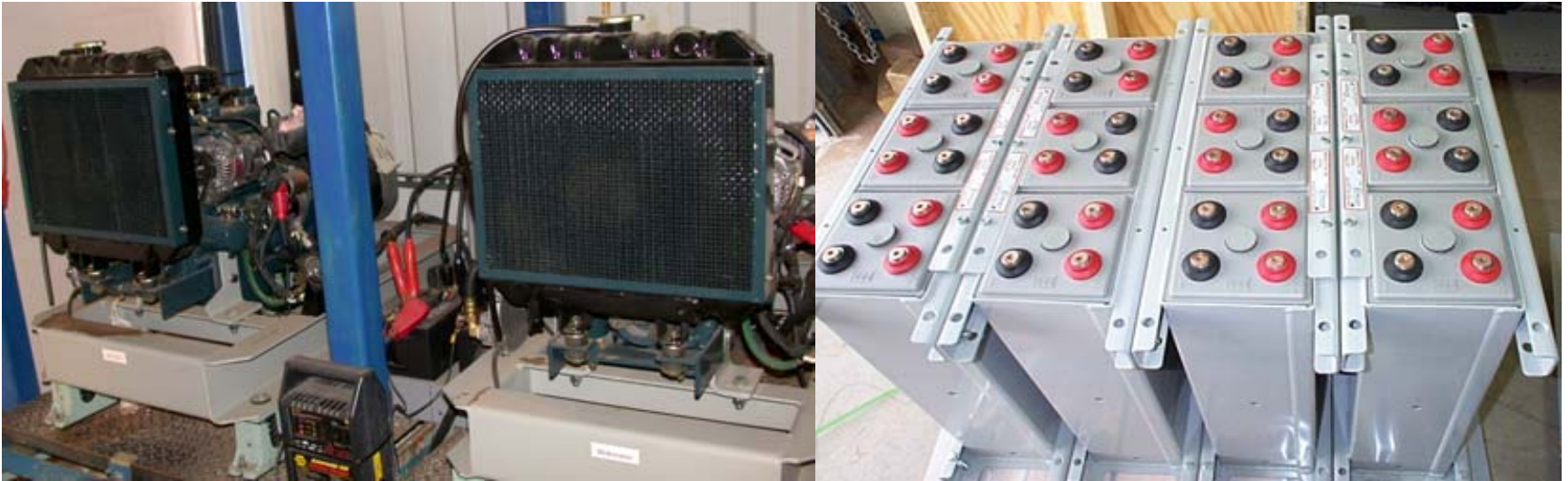


U.S. COAST GUARD



Advanced Battery Management System

ABMAS



U.S. COAST GUARD





Milestones

- ◆ 2004 – Successful test at Sandia National Labs of a reference system versus the reference system with an ABMAS controller establishing a fuel savings of 16.5% - 30%
- ◆ 2005 – Initiated one year field test at the NDS site on Duke Island, Alaska
- ◆ 2006 – Completed Field test on Duke Island
- ◆ 2007 – Upgrades and Burn-in Tests to ABMAS begins



U.S. COAST GUARD





ABMAS Upgrades

- ◆ Multiple program running environment
- ◆ Q basic to C++ source code; Linux operating system
- ◆ User name and password protected dial-in capability
- ◆ Laptop with ethernet port on-site connectivity (HMI)
- ◆ Updated PC104 hardware set
- ◆ Built-in optoisolation for serial communications
- ◆ Internally protected power and PC104 on/off switches
- ◆ Upverter mounting & cooling fan bracket beefed up
- ◆ Significant internal wiring reduction



U.S. COAST GUARD





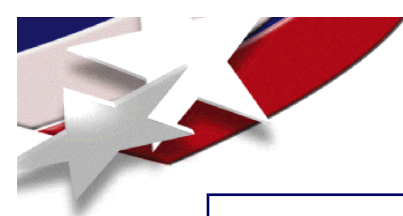
Future of ABMAS

- ◆ Complete one year test at Bay Point, California
- ◆ Install 4+ more ABMAS units at NDS sites locations to be determined by USCG
- ◆ Other applications are being considered



U.S. COAST GUARD





QUESTIONS

