

Dry Combat Submersible (DCS) Fault-Tolerant Battery Technology Design Goals

DCS Fault Tolerant Battery Technologies - our target capability – density, voltage, size, weight, charge/discharge rates are provided in this list of desired capabilities. It is the goal develop a solution that is certified in accordance with the NAVSEA SG270 and 9010 technical requirements. The solution must include provisions for a Battery Management System that also meets the Govt safety critical software requirements to reliably and safely, charge, discharge and monitor the proposed solution.

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System must be propagation resistant, minimum single fault tolerant, and contain no single points of failure

Energy density: Threshold 69kWh per battery pod; Objective 90 kWh per battery pod

Bus voltage: Minimum 252VDC, Maximum 353VDC

Battery Pod: 18” DIA x 67” length (add up to 3.65” for each of two end caps)

* Other battery container shapes or pressure compensated systems will be considered

Weight: Maximum of 1160 pounds for everything inside battery pod

Maximum/Average Discharge rates: C5/C10

Maximum turnaround time for charge: 12 hours

Cycle Life: 500 cycles minimum

Cell Production Availability: Threshold 5 years, Objective 10 years

Battery Management System (BMS) required to maintain battery system in safe operating envelope, provide Operator/Maintainer situational awareness regarding battery performance and health via telemetry display (GUI) and recording, and use of warning and alarm flags. Safety critical software shall be safety critical software certified via NAVSEA.

Use of a Lithium based chemistry for this application shall require NAVSEA S9310-AQ-SAF-010 (TECHNICAL MANUAL FOR BATTERIES, NAVY LITHIUM SAFETY PROGRAM RESPONSIBILITIES AND PROCEDURES)/SG270-BV-SAF-010 (LITHIUM BATTERY NAVY PLATFORM INTEGRATION. SAFETY MANUAL. APPROVAL AUTHORITY) lithium battery safety certification.

Hazard Assessments, independent of chemistry, will be conducted IAW MIL-STD-882 and the Joint System Software Safety Handbook.