

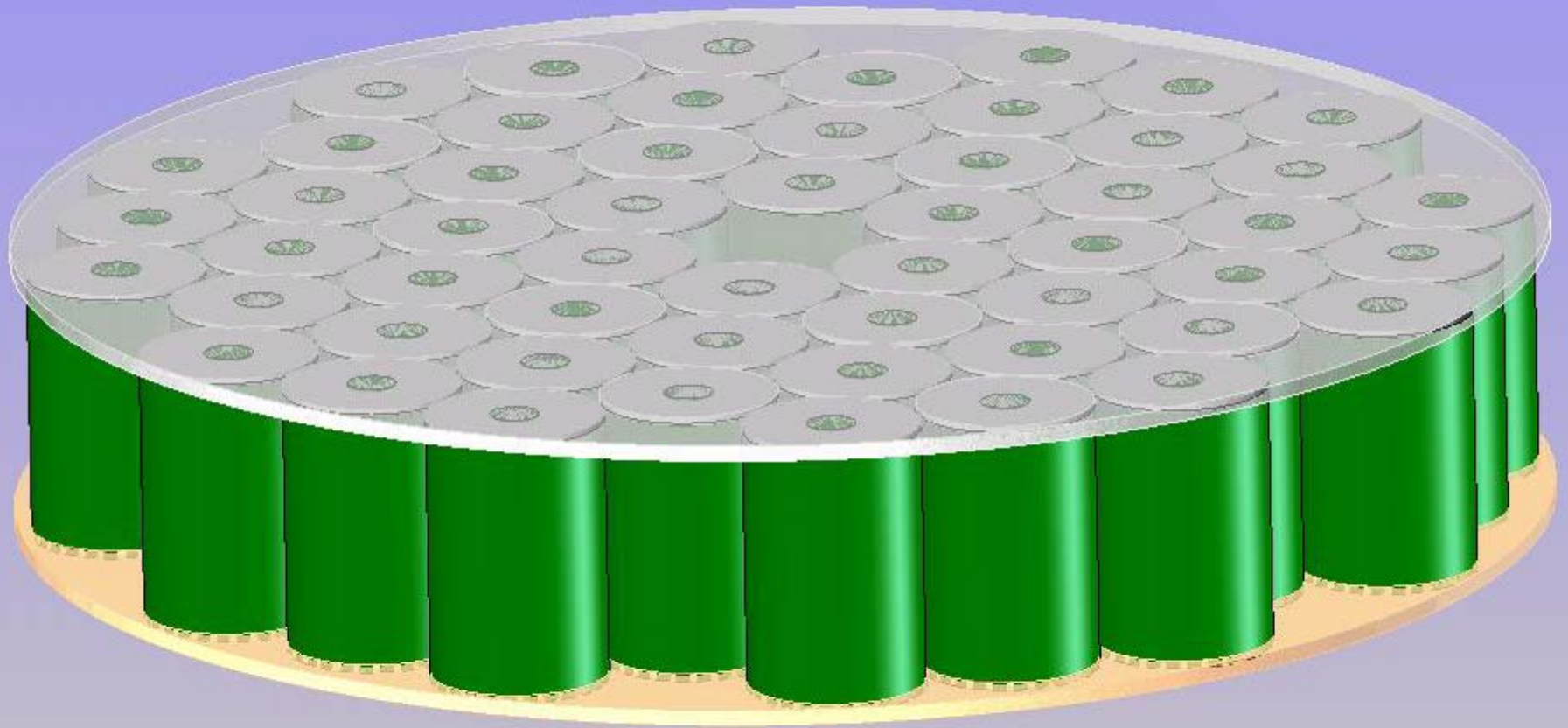
Eagle Picher Tech. Response

- 8 Series/27 parallel configuration of AGM Batteries
ICR36550HC 3.7V/6.0AH Li-Ion Cylindrical Cell
- Total Pack Capacity 4715 Whr
 - vendor conservatively derates cells to 5.9 AH
- Pack mass estimated at 36.5 kg
 - 31.5 kg of cells, 5 kg for electronics, packaging
- 100% Capacity for 200 Cycles (100% DOD)
- 80% Capacity for 1000 Cycles (100% DOD)
- 33.6 V open circuit/BOL (4.2V/cell)
- 29.6 V nominal/under load (3.7V/cell)
- 24.0V end of life (3.0V/cell)
- Each cell protected by discharge/charge control board
 - Protects from undervoltage during discharge, overvoltage during charge, overtemperature
 - Board automatically resets when out-of-range condition is eliminated
- Eagle-Picher can now incorporate pack management electronics with voltage/current/temperature monitoring & balancing

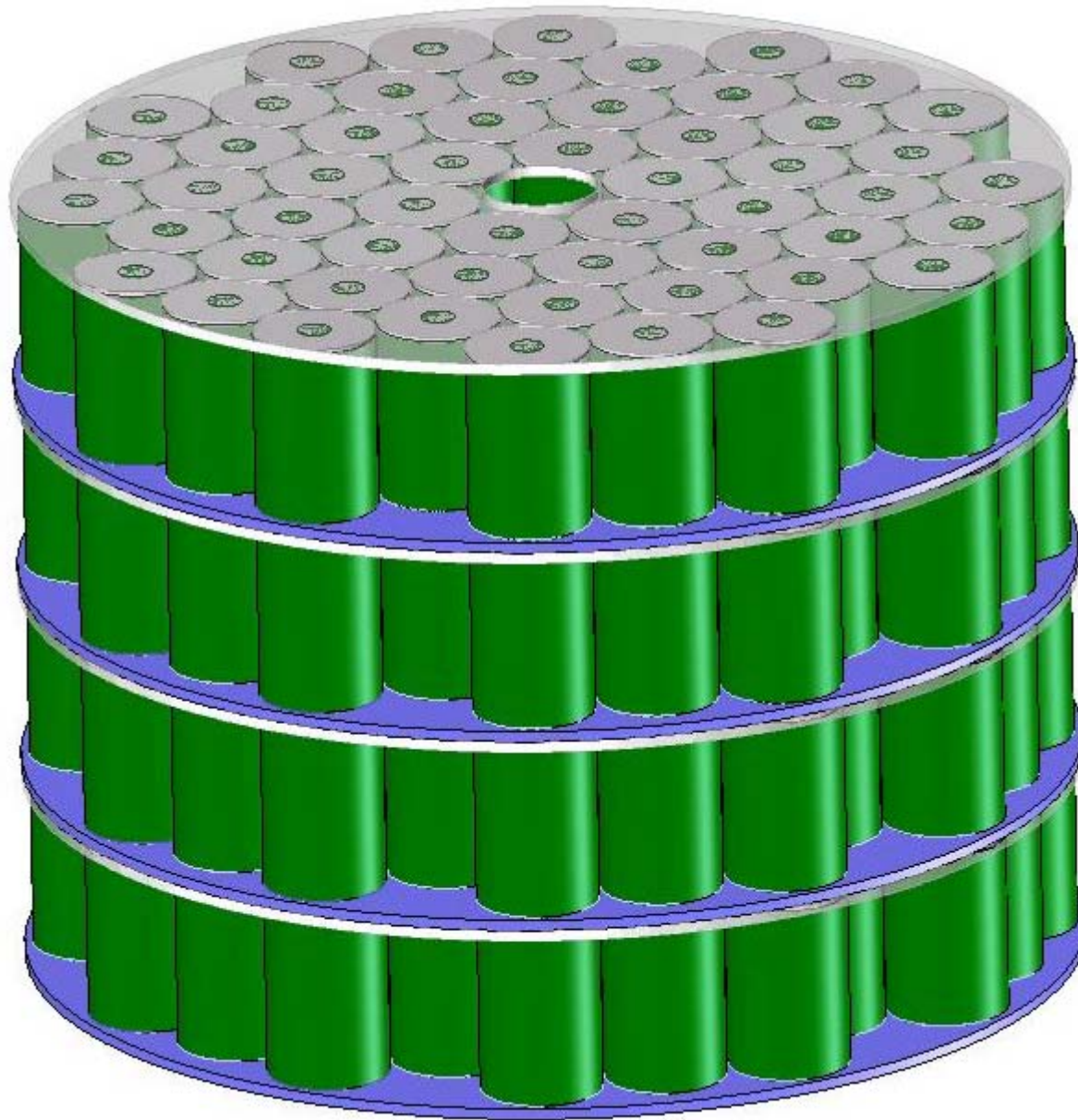
Eagle Picher Tech. Response

- Construction
 - Four circular trays, each holding 54 cells (27 strings of two cells each)
 - Trays small enough to allow air shipping
 - cells bonded into trays
 - wiring pathways built into trays, contacts resistance welded to cells
- Cost (based on 2002 proposal, still waiting for new numbers)
 - \$37,773.88 per battery (assumes 3 to 5 units)
 - \$17,643.86 NRE for documentation

54 Cell Platter



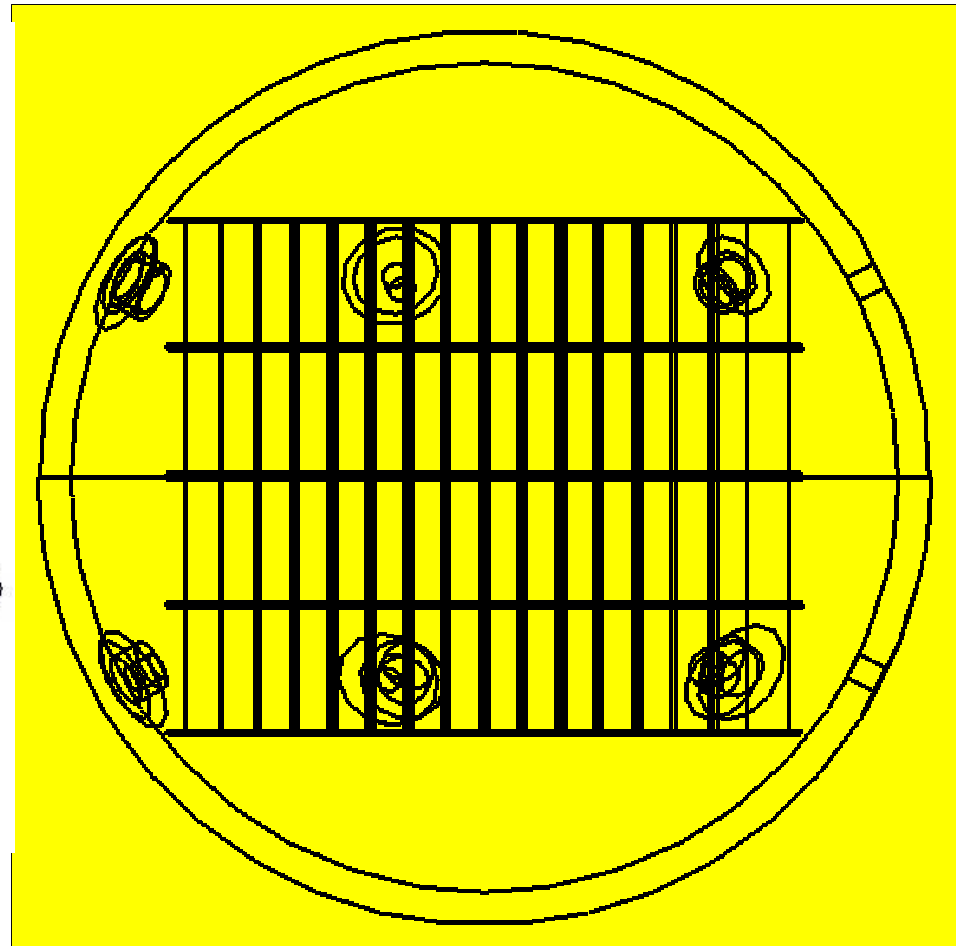
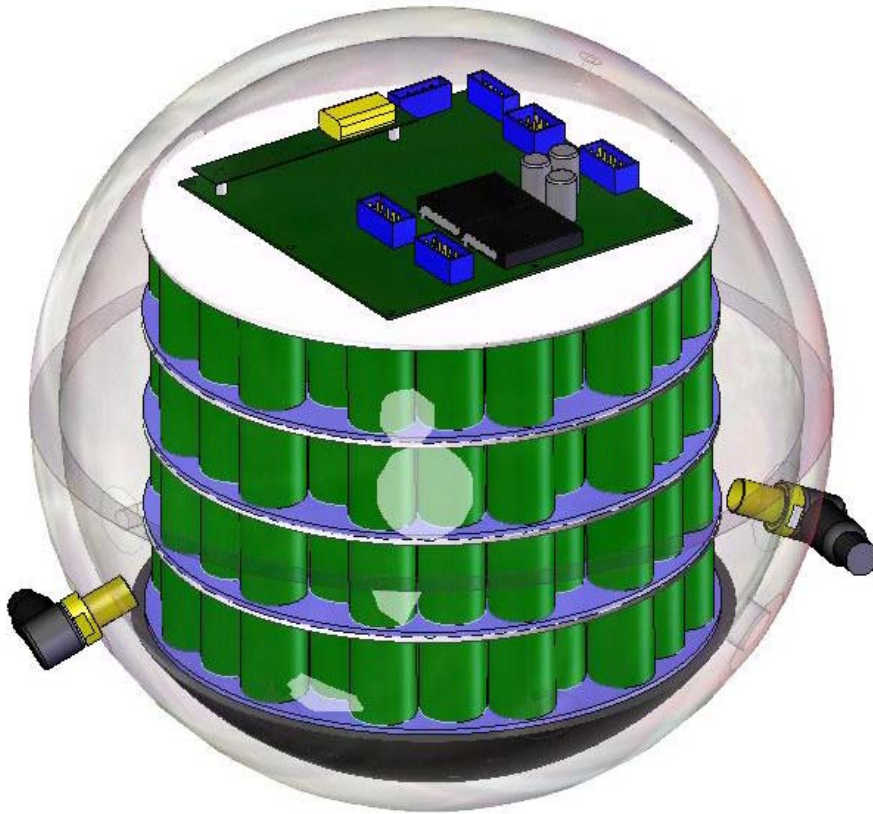
216 Cell Battery



- 12.20" Diameter
- 9.21" Tall
- ~31.5kg
- 4.715 kWhr total energy
- Individual cell-level protection
- Requires ~11kg additional buoyancy when packaged in 17" sphere

Contains Proprietary & Vendor Sensitive Data/Do Not Circulate Outside MBARI

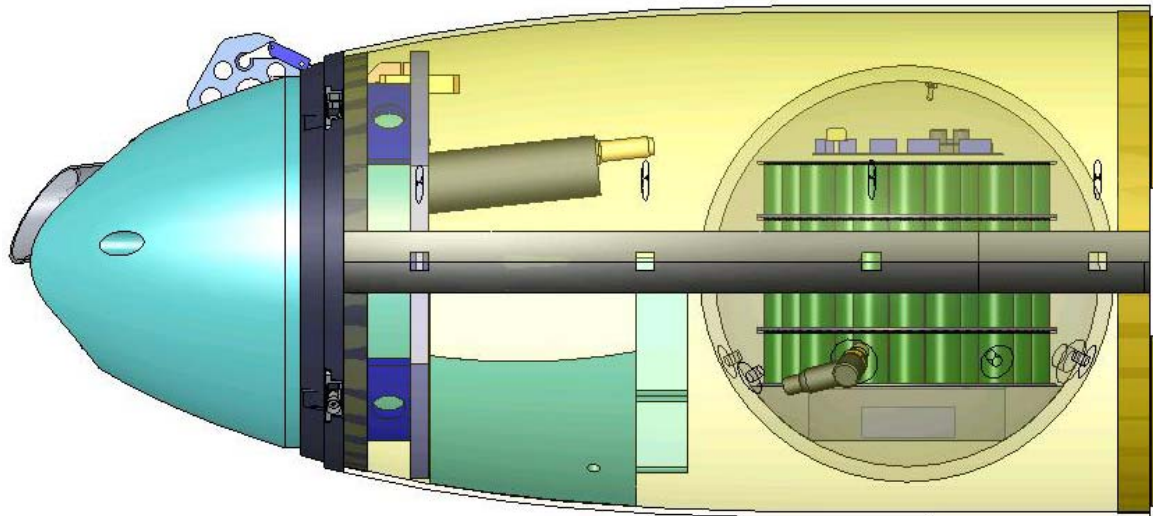
EPI Sphere Packaging



Contains Proprietary & Vendor Sensitive Data/Do Not Circulate Outside MBARI

Nose Packaging (Single Sphere)

- Utilize existing nose fairing & buoyancy modules
- Includes CTD, obstacle sonar, networking electronics (these are in sphere now)
- Mass = 101.3 kg
- Displacement = 107.7 kg
- Margin = 6.4kg



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Nose Packaging (Double Sphere)

- Provides 9.4 kW*hr of energy
- Replace existing CTD with more compact inductive cell unit (suggested model Valeport)
- Still working on drawing