

PEO-M-U: Battery Bottle Assessment Event (AE)

Assessment Criteria

Overview

The Government Stakeholder team is seeking cost and schedule estimates, as well as a technical review focused primarily on manufacturability, of several designs to be provided as part of this effort. The objective is to accumulate input from industry and select one or more vendors to manufacture and deliver one or more of the government-provided designs. The vendor(s) will be responsible for reviewing the design(s) for manufacturability, assuming the Government will maintain Design Authority and perform applicable testing of the delivered pods.

Problem Context & Operational Use Case

PEO-M-U is pursuing a multi-path approach to obtain Battery Bottles for the Large Format Propagation and Pressure-Resistant (PPR) battery system for the DCS and the Vehicle. These Bottles will hold the battery half strings in a watertight state through all applicable environments. The current development path is: PEO-M-U requested Applied Research Laboratories at Penn State University (PSU) to develop the following Battery Bottle Designs:

1. **A low cost and rapid delivery version of the SwRI R9M3 design is currently defined as the baseline for the program.** This design will be made of Aluminum to similar design dimensions as the potential SwRI delivered production units. The goal is for rapid delivery at a lower cost than the baseline Titanium design. It is intended that these units, although designed to support the operating pressures, will not meet the CS&S/UNDEX loads and therefore will be used first as fit check items, support equipment test units and for transport and short-term storage of battery half strings. These units will be tested at PSU for their ability to withstand pressure.
2. **A lightweight design (designated ALI02) in Aluminum that is internally stiffened.** This design will be like the SwRI baseline but has a modified internal rib configuration and is made in Aluminum v. the Titanium of the baseline. These units will be tested at PSU for their ability to withstand pressure. If the Program Office directs, these units may be subjected to the CS&S/UNDEX loads. We are requesting a cost and schedule for the delivery of 4 units with appropriate single endcaps.
3. **A lightweight design (designated K3+) in Aluminum that is externally stiffened.** This design will be significantly different from the SwRI with a smooth internal bore configuration and is made in Aluminum v. the Titanium of the baseline. These units will be tested at PSU for their ability to withstand pressure. If the Program Office directs, these units may be subjected to the CS&S/UNDEX loads. We are requesting a cost and schedule for the delivery of 4 units with appropriate single endcaps.
4. **A Lightweight DCS Bottle.** As part of the DCS program upgrade and performance improvement effort, the LiFT batteries are being replaced with the same battery system as the Vehicle with a different half string length. The legacy battery bottles were Steel and were very heavy and suffering degradation due to environment. ARL-PSU has designed a battery bottle design that has the same ID and alignment design as the Vehicle configuration, made of Aluminum with lighter weight endcaps. These units will

be tested at PSU for their ability to withstand pressure. We are requesting a cost and schedule for the delivery of 14 units with appropriate endcaps.

5. **Bottle End Caps.** To support all combinations and possible CONOPS we have endcap designs for:
 - a. Dual End Cap design for The Vehicle
 - b. Single End Cap Design for The Vehicle
 - c. Single End Cap design for DCS

Target Focus Area(s)

Target focus area is assessment of industry capability, interest, possible manufacturing technologies, and development of supply base. This is primarily a Manufacturing Readiness Level (MRL)/ Industrial Readiness Level (IRL) risk reduction; however, we are open to Technology Readiness Level (TRL) suggestions from industry.

Readiness Level (TRL/IRL/MRL)

Assuming that the ARL-PSU designs are complete and acceptable, TRL will not be significantly increased by this assessment, but we expect significant risk reduction in MRL and IRL.

Performance Characteristics (SWaP & Technical Attributes)

Define practical constraints without over-prescribing solutions.

Size, Weight, and Power (SWaP) and Delivery

Minimum Performance:

- Does the solution provided answer the items in the White Paper?
- Is the scheduled delivery consistent with program needs?
- Does the vendor demonstrate the ability to meet the program's needs?
- Is government-furnished equipment (GFE) or data involved?

Desired Performance:

- Schedule
- Cost
- Manufacturing Capacity