

A254-034: Small Innovative Mission Power Sources

ADDITIONAL INFORMATION

N/A

TECHNOLOGY AREAS:

Materials

MODERNIZATION PRIORITIES:

Advanced Materials

KEYWORDS:

Ammunition; Medium Caliber; Fuze; Power Source

OBJECTIVE:

There is a need to increase the supplier base and production capacity for power sources currently implemented in advanced ammunition fuzing applications.

Joint Program Executive Office Armaments and Ammunition (JPEO A&A) Project Manager Maneuver Ammunition Systems (PM MAS) desires alternate power sources to increase the supplier base and production capacity to meet the increasing demand of cartridges employing these advanced fuzing technologies. The proposed power source solutions should meet or exceed the performance and reliability of the current solution. The proposed solutions need to be capable of maintaining an extended shelf-life, fitting within a 400 mm³ cylindrical volume, and functioning under high g-load and spin rate conditions and within cold and hot temperature extremes IAW MIL-STD-810 while supplying 50 to 200 mW for the duration of the mission. Acceptable proposed solutions can implement energy harvesting or stored energy.

DESCRIPTION:

PM MAS is currently producing ammunition with advanced fuzing technologies which require small form-factor power sources. Additional ammunition solutions are currently in development to support numerous services and platforms, with demand for such capabilities steadily increasing. Additional power source solutions are being sought to either replace the current solution or be used as an alternate source.

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PHASE I:

This topic is only accepting Phase I proposals for a cost up to \$250,000 for a 6-month period of performance.

During the Phase 1 SBIR project, a feasibility study will be conducted on power source options. The Phase 1 study should include a review of the available technologies and their suitability in Medium Caliber fuzing applications and a recommended down select of the proposed solution. The study should also include costs and timelines for implementation of a prototype/production power source as well as production capacity projections. If feasible, a small sample of prototypes will be fabricated and evaluated to assess performance at the component level in a laboratory test environment.

PHASE II:

The Phase 2 SBIR project is expected to result in an improved prototype power source which will be delivered to U.S. Army Combat Capabilities Development Command (DEVCOM) Armaments Center (AC) for follow-on integration and testing. The improved prototype will be based on the results of the Phase 1 study. A first iteration of prototypes in this phase will be integrated into fuze assemblies and will undergo laboratory testing and testing in a simulated launch environment. For this iteration, it is desired but not required to achieve full scale-down to the 400 mm³ cylindrical volume form factor. A second iteration of prototypes in this phase will be required to achieve the necessary target volume, and will be integrated into prototype fuzes and cartridges for a Technology

Readiness Level (TRL) 6 assessment, which will include full prototype cartridges fired from a relevant weapon system.

PHASE III DUAL USE APPLICATIONS:

This technology could be used to power commercial or residential Internet of Things (IoT) devices, remote sensors, medical devices, and Micro-Electromechanical Systems (MEMS) in various fields and applications.

REFERENCES:

1. https://ndia.dtic.mil/wp-content/uploads/2019/fuze/21767_Schisselbauer.pdf

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