SON Number: WPSON-23-C5 **28 October 2021**

Strategic Environmental Research and Development Program (SERDP)

FY 2023 STATEMENT OF NEED

Weapons Systems and Platforms (WP) Program Area

IMPROVED FIRE TESTING AND TRAINING METHODOLOGIES FOR FIREFIGHTING FORMULATIONS

1. Objective of Proposed Work

The objective of this Statement of Need (SON) is to develop novel test methodologies for evaluating the effectiveness of firefighting formulations against realistic threats presented by Class B liquid pool fires. Proposed test methods can address control, containment, edge effects and burnback, as well as other relevant performance characteristics that can be correlated with extinguishment performance on liquid pool fires using a variety of fuel threats, including jet fuel, gasoline and other flammable liquids.

Proposals may focus on characterization of current tests in MIL-PRF-24385 to determine minimum performance requirements that are needed to mitigate fires in operational environments thereby streamlining testing or develop new test methods and/or instrumentation. In addition, proposals are sought to develop new training techniques to reduce the environmental impact of live fire training with foam agents, while maintaining or improving firefighter readiness.

Proposals may conduct bench scale (comparable to 1 ft^2 fires) or larger studies.

2. Expected Benefits of Proposed Work

The outcome of this SON will enable researchers to evaluate firefighting formulation efficacy rapidly and enable development of safe, high performance formulations. Technologies could streamline qualification of formulations and reduce variability between test agencies. In addition, novel training methodologies will increase the likelihood of success for effectively fielding PFAS-free firefighting formulations to threats posed across the spectrum of DoD applications. The deployment off these new products provides the opportunity to revisit firefighter training that has been restricted due to environmental risks associated with AFFF.

3. Background

The 2020 National Defense Authorization Act (NDAA) prohibits the utilization of currently approved, PFAS-containing aqueous film-forming foam (AFFF) beginning October 1, 2024; development of new firefighting formulations has also led to a re-examination of current testing and training methodologies for firefighting. The Naval Sea Systems Command (NAVSEA) in conjunction with the Navy Research Laboratory (NRL) initiated a process to develop a revised specification for shore-based applications. Additional test methodologies or performance requirements may be incorporated into future specification revisions for both shore- and sea-based applications.

Qualification to MIL-PRF-24385 relies primarily on a standard 28 ft^2 liquid pool fire suppression test with active firefighting to quantify foam capabilities. These tests are subject to environmental conditions and firefighter performance, which provides variability between tests. Subjective test data, including knockdown, 90% containment, edge effects and 25% burnback times are typically recorded and are currently based on visual observations (i.e., a calibrated eye). Test requirements have been developed and refined over the past 30-40 years based on significant test history that correlates large scale, realistic fire scenarios to performance in the 28 ft^2 test. Firefighting foams can also be qualified to multiple industry specifications, including UL-162, ICAO and LASTFIRE. Each organization uses different performance testing and requirements to qualify foams. Each test and qualification provide a specific/different level of performance against hazards associated with active threats.

DoD limits live fire training with foam agents to reduce release of foam and fuels to the environment. Any foam discharge must be contained and treated as hazardous waste. Typical firefighting training relies on simulated fire scenarios (typically propane burners) that are manually secured once the instructor believes that an adequate amount of water (not foam) has been applied to the fire. Realistic live-fire training with fielded firefighting agents is vital to maintaining readiness across DoD.

4. Cost and Duration of Proposed Work

The cost and time to meet the requirements of this SON are at the discretion of the proposer. Two options are available:

Standard Proposals: These proposals describe a complete research effort. The proposer should incorporate the appropriate time, schedule, and cost requirements to accomplish the scope of work proposed. SERDP projects normally run from two to five years in length and vary considerably in cost consistent with the scope of the effort. It is expected that most proposals will fall into this category.

Limited Scope Proposals: Proposers with innovative approaches to the SON that entail high technical risk or have minimal supporting data may submit a Limited Scope Proposal for funding up to $250,000 and approximately one year in duration. Such proposals may be eligible for follow-on funding if they result in a successful initial project. The objective of these proposals should be to acquire the data necessary to demonstrate proof-of-concept or reduction of risk that will lead to development of a future Standard Proposal. Proposers should submit Limited Scope Proposals in accordance with the SERDP Core Solicitation instructions and deadlines.

5. Point of Contact

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For Core proposal submission due dates, instructions, and additional solicitation information, visit the Funding & Opportunities page on the SERDP website.