S²MARTS Project 20-01: Electromagnetic Spectrum Predictive Modeling Prototype

Request for Solutions (RFS) Questions & Answers | Posted March 6, 2020

1. **Question**: Which of the 8 identified objectives are the highest priority for Phase 1?

   Response: All of the objectives are of significant importance. To assist with scoping responses to the RFS, the objectives are listed in order of highest to lowest emphasis:

   - EW/EMS related technology trends, resulting in a Statement of Need that lays out the technology trends that impact current and future EW missions.

   - Methodology for NSWC Crane to vet advanced concepts for market viability and acceptability

   - Analytical model to produce Market Segment for EW and EMS related S&T across the Department of Defense, resulting in a visual representation of the EW/EMS S&T market, detailing budget trends and organizations in the market.

   - Identification of adjacent markets/DoD programs comparing emergent terms used in conjunction with or in lieu of EW (i.e. Information Warfare, Electromagnetic Spectrum Operations, Directed Energy, Cyber, etc…), and shall use this research to collaborate with NSWC Crane subject matter experts on publications that will contribute to the existing dialogue on the future of EW based on model outputs.

   - Visualization and communication methodology of effectiveness of Doctrine of the US Department of Defense related to the electronic warfare mission area and electromagnetic spectrum operational gaps and needs

   - Strategies, concepts, and doctrine that will enable the US to achieve electromagnetic superiority in future conflicts

   - Prototype of Force planning and order of battle for great power competition and Force composability, networks, power projection through a precision strike advantage, electromagnetic spectrum operations & warfare to assist in the development of the technical presentation, facilitated discussions, and operational vignettes used to explore opportunities and challenges associated with the EW Strategy and EW Strategic Implementation Plan.

   - Statement of need(s) to support escalation control and the expansion of the strategic competition

2. **Question**: Is there a preference between; (1) a high-level analytical process design for the entire Electronic Warfare domain, or (2) a detailed analytical predictive model for a particular subset of the problems, e.g. radar threat predictive model?

   Response: Preference is high-level process to look across the Electromagnetic Spectrum (EMS) domain holistically in order to identify doctrine, concepts of operations or technology gaps.

3. **Question**: Will the developed predictive models be used in conjunction with an existing wargaming simulation? If so, which one or ones? Does development of a new wargaming simulation fall into the scope of this RFS?

   Response: No, the models were not envisioned to be used in conjunction with existing wargaming simulation. The development of a new wargaming simulation is within scope of the RFS as long as the output(s) enable the objectives of the RFS to be met.

4. **Question**: Is the EW game space seen as a single large continuous engagement / simulation, or a discrete event / turn based series of engagements (i.e., is this a radar versus jammer / jammer versus countermeasure, or a predictive support tool to determine who has dominance within a broader engagement scope / large battle). a. If the later, what echelon and unit types are expected to be included in the game as potential combatants in order to give probability of outcomes (victory or loss)? b. What is seen as the payoff in the battle array scenario, and how are bets made? The entire battle space or per engagement (that is a play turn).

   Response: We are looking for models that will drive innovative concepts of operation (CONOPs) at the campaign level for the EW/EMS domain across the military services, not at the detailed tactical engagement level. We are looking for a predictive model that identifies effective EW/EMS CONOPS or concepts of employment that will give the US Military the competitive advantage. These concepts will drive technology trends and strategic priorities with respect to investments in science, technology, research and development.

5. **Question**: Are you asking to look at not only our budget trends, but also partner nations?

   Response: The primary focus for this effort is our (domestic) budget trends, however having the ability to also include partner nation's budgets would be a benefit as we will be fighting with coalition forces.

6. **Question**: From the aspect of the Non-Traditional Defense Contractor as part of your team vs internal cost share. Is it possible to count previous investments prior to this OTA release or are future investments only considered for cost share? i.e. Post Award investments.

   Response: Costs offered as a resource-share that were incurred for a project after the beginning of negotiations, but prior to the date the OT project is awarded, may be counted towards the cost share requirement if and to the extent that the Agreements Officer determines in writing that: (1) the party other than the Federal Government incurred the costs in anticipation of the OT agreement; and (2) it was appropriate for the entity to incur the costs before the OT agreement became effective in order to ensure the successful implementation of the OT agreement. [If pre-award expenditures are expected, we recommend informing the Agreements Officer during negotiations.]

7. **Question**: How would you define a gap in US capability in light of a new technology entering the market? Is a gap identified when US capability is compared to the realm of the possible or compared to specific near-peer threats?

   Response: It is envisioned that the gap would be identified when the US capability is compared to the realm of the possible and understanding the competitive advantage that a future technology would provide to the US. The goal is to target and identify game changing technologies and advanced concepts that will leap frog near peer capabilities and projected threats.

8. **Question**: Classification – from an overarching perspective for phase 2 and beyond how do you anticipate handling the classification? To get any level of detail on adversarial threats you can expect to reach TS/SCI level at some point. Will the OTA support SCI requirements?

   Response: The preference is for this predictive modeling capability to be unclassified. As the information is processed through the model it will become classified but that will be done outside the scope of the model development. Security classifications at the SECRET Level may be required for future phases and will be addressed on an as needed basis. At this time, we do not intend to have TS/SCI requirements through this OTA.

9. **Question**: For system model tools, should your tool be able to import SysML models including vulnerabilities, such as output by ASURANT?

   Response: Absolutely. The ability to import SySML models will be very useful in application of the tool.

10. **Question**: Would you favor AI/ML approaches over traditional analytics methods?

    Response: The preference is for traditional analytics methods. The concern would be that AI/ML approaches could be problematic without a means to validate the data sets used to train the machine/algorithm. If there is a solution to overcome the training concern for AI/ML, then we are open to AI/ML enabled solutions.

11. **Question**: If we use the "cost share" option for Phase 1, are we able to change to using a non-traditional partner for Phase 2 and beyond?

    Response: This approach is acceptable.