

**STRATEGIC & SPECTRUM MISSIONS ADVANCED RESILIENT TRUSTED SYSTEMS
(S²MARTS)
REQUEST FOR SOLUTIONS (RFS)**

in support of the
Electro-Optic Detector Characterization

Project No. 20-10a

All prospective respondents must be members of the NSTXL consortium.

- 1. Project Title:** Electro-Optic Detector Characterization
- 2. Prototype Project Sponsor/Requiring Activity:** Naval Surface Warfare Center (NSWC) Crane, Code WXRQ
- 3. Contracting Activity:** Naval Surface Warfare Center (NSWC) Crane, Code 024
- 4. Project Background & Current Capability:**

The Naval Surface Warfare Center Crane Division, Infrared (IR) /Radar Frequency (RF) Systems Technologies Division is seeking prototype support to address Modeling & Simulation issues in the area of countermeasures and countermeasure techniques to protect U.S. aircraft from threat missile systems. The threat environment is changing at an ever-increasing rate. This reality requires the capability to respond rapidly to new threat missile systems. This cannot be done without an efficient means of developing prototype models, simulators, countermeasures, and countermeasure techniques. The advent of each new threat missile system triggers the requirement for the development of multiple new prototype systems. These requirements cannot be met without efficient, flexible acquisition strategy.

Modeling and Simulation (M&S) is an essential component of all current Department of Defense (DoD) efforts to protect our platforms from threat weapon systems as well as ensure the effectiveness of our own weapon systems. M&S tools used for these types of applications are quite varied and take many forms such as live-fire engagements, captive seeker field tests, hardware-in-the-loop (HITL) simulations, software-in-the-loop simulations, and all-digital simulations. Model development is primarily driven by the availability of resources and information on the system to be modeled. If the actual hardware of the system is available, given the necessary time, resources and expertise, a highly accurate model of the system can be developed. Otherwise, information gaps will have to be filled with engineering and intelligence estimates resulting in a tool that may be of significant value, but which must be viewed with appropriate caution due to the inherent uncertainty. In some cases, surrogate simulations are developed to explore the realm of the possible rather than emulate a known system.

A critical aspect of these M&S prototyping efforts is to be able to characterize infrared detector performance. Existing detector characterization methodologies provide the required data to support current M&S tools. However, current capabilities are insufficient to address some emerging requirements. Currently, two types of characterization are required:

1. Characterization required to develop higher fidelity detector models capable of accurately responding to high frequency/high energy inputs, which includes collaboration on development of the high-fidelity detector model.
2. Characterization required to identify replacement detectors that are equivalent to a specific detector that is not readily available.

5. Desired End-State Objective(s) & Success Criteria:

The Government requires a suite of Test and Evaluation (T&E) ready simulators for threat exploitation and countermeasure development that have been fully documented, verified, validated, and accredited. The deliverables from this RFS will be a critical component of these new T&E ready simulators. Prototype simulators will be sufficiently documented to allow routine replication of the prototypes in response to run capacity requirements. An essential component of the development of these prototype simulators is a capability to perform high-fidelity infrared detector characterization. The process must be fully documented and validated, which includes but is not limited to documentation of all tests, required test equipment, and test procedures. The Government reserves the right to observe any aspect of performance and testing during the project duration. The end goal is sufficient data and data rights to support the specification of requirements for production and acquisition of new infrared detectors and support the development of high-fidelity detector models. The Performer will also be required to collaborate with the Government on the development of the high-fidelity detector model which is tied to the characterization process.

The project is expected to have a duration of 9-12 months. Upon successful completion of the Modeling and Simulation Capability Prototype the Performer will deliver a fully documented infrared detector characterization process sufficient to support the following two objectives:

1. Implementation of a high-fidelity detector model
2. The specification and procurement of equivalent replacement detectors.

The Performer will demonstrate both of these types of characterization processes for at least one relevant detector and provide fully documented results which includes but is not limited to documentation of all tests, required test equipment, and test procedures.

Characterization parameters will include (but are not limited to) the following:

High-Fidelity Detector Model Characterization:

1. Rise/Fall Times
2. Spectral Responsivity, (commonly referred to as $R(\lambda)$, with units of Amperes/Watt)

3. Dark Current
4. Noise Equivalent Power (NEP)
5. Noise Equivalent Irradiance (NEI)
6. Junction Capacitance (Zero bias)
7. Shunt Resistance
8. Series Resistance
9. Other parameters as needed for high-fidelity detector model development

Characterization for Replacement Detector Specification:

1. All characterization parameters included above under High-Fidelity Detector Model Characterization
2. Sensor Material
3. Sensor Package
4. Sensor Active Area
5. Other parameters as needed for replacement detector specification

6. Project Deliverables

#	Deliverable(s)	Description	Frequency	Delivery Method
1	Monthly Status Report	Provide summary of events/actions completed during the previous month.	1/Month	Electronic submission
2	Infrared Detector Characterization Process	Fully documented infrared detector characterization process sufficient for high-fidelity detector modeling and procurement of replacement detectors. This includes collaboration on the development of a high-fidelity detector model.	Upon Completion	Crane, IN
3	Results of Process Application to a Relevant Detector	Fully documented results of the application of the detector characterization process to a relevant infrared detector. This includes a characterization suitable for a high-fidelity digital model of the detector response characteristics, and a characterization suitable for specifying and procuring replacement detectors.	Upon Completion	Crane, IN

7. Current Project Budget: \$250,000

This value represents what is currently available for the subject project at the time of the RFS release. This value is subject to change but is being provided for planning purposes. Respondents should propose a cost that reflects the respondent's approach and not use the budgetary estimate only. Respondents are encouraged to clearly explain how much of their solution can be developed for the advertised or lesser amount. Capabilities or project phases that will require additional funding beyond the project budget must be identified as such.

8. Security Classification, Respondent Restrictions, and other required compliances:

This RFS has been released under Distribution Statement A: Approved for public release

This project encompasses the following restrictions:

- a. Security Classification: All contractors who support the M&S Capability Development will be required to have cleared personnel and facilities clearance at the SECRET (Personnel and Safeguarding) level at the time of proposal submission.
- b. ITAR Compliance is required.
- c. Respondent Restrictions: Respondents are limited to domestic companies based in the United States only; Subcontractors/teaming partners may not include foreign entities. Only U.S. Citizens or Foreign Nationals cleared to SECRET Clearance (at a minimum) may perform the work. If respondents do not hold a current clearance, they must lay out a plan to obtaining that clearance. Respondent Restrictions (e.g., domestic companies only): US Citizens or Foreign Nationals Cleared to Secret.
- d. Any additional restrictions applicable to this project: Simulator and subcomponent designs must be compatible with NSWC Crane Reconfigurable Signal Injection Missile Simulator (RSIMS) real-time simulation architecture. RSIMS compatibility will be determined through collaboration with the Government. The test detectors being characterized will be Government Furnished Property (GFP). The GFP will be supplied to awardees and shall be returned to NSWC Crane after completion of the effort.
- e. Respondents must be compliant with DODI 8582.01. "Security of Unclassified DoD Information and Non-DoD Information Systems" and DoDM 5200.01 Volume 4, "DoD Information Security Program; Controlled Unclassified Information". Respondents must implement the security requirements in NIST SP 800-171, "Protecting Controlled Unclassified Information in Non-Federal Information Systems and Organizations"
- f. Respondents shall complete the Section 889(a)(1)(B) Prohibition on Contracting with Entities Using Certain Telecommunications and Video Surveillance Services or Equipment

representation attached to this RFS (Attachment B), and return the signed representation with the submitted proposal (Attachment A).

9. Level of Data Rights Requested by the Government:

Unlimited rights: The right to use, modify, reproduce, perform, display, release, or disclose technical data in whole or in part, in any manner, and for any purpose whatsoever, and to have or authorize others to do so.

Data Rights and Intellectual Property may be negotiated based on the offeror’s proposed solution.

10. RFS and Response Process:

a. The following is requested from all respondents:

Proposal Volumes	Page Limitation
Technical Response	20 pages (max)
Price Response	5 pages (max)

For written submissions, the following formatting guidelines shall be followed by respondents:

- 10-point font (or larger) for all response narratives; smaller type may be used in figures and tables but must be clearly legible.
- Single-spaced, single-sided (8.5 by 11 inches).
- Margins on all sides (top, bottom, left, and right) should be at least 1 inch.
- Page limitations shall not be circumvented by including inserted text boxes/pop-ups or internet links to additional information. Such inclusions are not acceptable and will not be considered as part of the response
- Files must be submitted in PDF and/or Microsoft Word formats only. Price volumes may be submitted in an editable, unlocked Excel file

b. Each submittal **must include** (i) a Cover Page, (ii) a Technical Response, and (iii) a Price Response that each align to the instructions below:

i. Cover Page: (Not included within page count) The cover page shall include the company’s name, Commercial and Government Entity (CAGE) Code (if available), level of facility clearance (if available), address, primary point of contact, business size, and status of U.S. ownership.

Respondents shall also identify the applicable 10 U.S.C. § 2371b eligibility criteria related to the response (*please identify only one*):

- There is at least one nontraditional defense contractor (*defined below*) or nonprofit research institution participating to a significant extent in the project; **OR**
- All significant participants in the transaction other than the Federal Government are small businesses (including small businesses participating in a program described under section 9 of the Small Business Act (15 U.S.C. § 638)) or nontraditional defense contractors; **OR**
- At least one third of the total cost of the project is to be provided by sources other than the Federal Government.

Note: A *Nontraditional Defense Contractor* is defined as an entity that is not currently performing and has not performed, for at least the one-year period preceding the solicitation of sources by the Department of Defense (DOD) for the procurement of transaction, any contract or subcontract for the DOD that is subject to full coverage under the cost accounting standards prescribed pursuant to 41 U.S.Code § 1502 and the regulations implementing such section.

ii. Technical Response:

Responses should be constructed to align with the order of the instructions below (1 - 8).

1. Solution Narrative: Respondents shall describe the approach used to design/deliver a unique prototype solution for the prototype technology objectives defined in RFS Section 5, Desired End-State Objective(s), to include any attachments. While these focus areas are of significant importance, responses will be considered as a whole. No pricing shall be included in the technical response.

The Solution Narrative must also include a discussion on schedule and the timing of all deliverable(s) to include those outlined within RFS Section 6, Project Deliverables.

2. Explanation Supporting Eligibility for Award of a Prototype OTA:

Respondents shall provide rationale to support the specific condition that permits award of an OTA to the proposed prime contractor/performer. The onus of proof to support *nontraditional participation to a significant extent; small business or nontraditional defense contractor status; or any cost sharing arrangement* lies with the respondent and has a direct correlation to award eligibility.

3. Foreign Owned, Controlled, or Influenced (FOCI) Documentation (if applicable): Documentation may include, but is not limited to: Standard Form 328 (Certificate Pertaining to Foreign Interest); Listing of Key Management Personnel; an Organizational Chart; Security Control Agreements: Special Security Agreements;

and Proxy Agreements or Voting Trust Agreements. It is recommended companies who fall within the FOCI category visit <https://www.dss.mil> for additional guidance and instruction.

4. Government Furnished Property or Information: Respondents must clearly identify if its proposed solution depends on Government Furnished Information (GFI) / Government Furnished Property (GFP) or other forms of Government support (i.e. laboratory or facility access), etc.

If so, the response must specify the GFI/GFP required, respondents must clearly identify if its proposed solution depends on GFI/GFP or other forms of Government support be provided, the impact to the solution if the requested information/property/asset is not available, and will confirm the details with the respondent prior to any proposal revisions or selection, if applicable.

5. Mandatory Compliance with Restrictions: Respondents must address the restrictions identified within RFS Section 8, Security Classification, Respondent Restrictions, and other Required Compliance, and explain how each regulation or standard is currently, or will be met.
6. Task Description Document (Not Included Within Page Count): Respondents must provide a Task Description Document (TDD) outlining the project tasks to be performed along with schedule milestones and delivery dates required for successful completion. It is anticipated that, if selected, the proposed TDD will be incorporated into the resultant OT agreement. Respondents are encouraged to be concise but thorough when outlining their TDD. The TDD may be submitted as an appendix or a separate file as part of the proposal.
7. Summary of Subcontractor Participation (if applicable): Respondents must identify all subcontractors involved and their role within the performance of the proposed concept. The information must include the following:
 - a. Subcontractor company name, Commercial and Government Entity (CAGE) Code (if available), level of facility clearance (if available), address, primary point of contact, business size, and status of U.S. ownership and U.S. employee citizenship.
 - b. If the subcontracted company's involvement is considered significant, rationale supporting the significance must be present within the narrative. The onus of proof to support participation to a significant extent or any cost sharing arrangement lies with the respondent and has a direct correlation to award eligibility.
 - c. If applicable, Foreign Owned, Controlled, or Influenced (FOCI) Mitigation Documentation shall be provided for subcontractors and will not count towards the page count.

8. Data Rights Assertions and Level of Rights Proposed:

- a. The rights offered should be displayed in a manner that allows for ease of discussion in determining trade-offs and potential options for long-term sustainability of the deliverables of this effort.
- b. If rights are being asserted at a level less than the Government's desired level of allocation (see RFS Section 9, Level of Data Rights Requested by the Government), respondents must provide detail explaining the specific rationale for the assertion. Please also review 10(b)(iii)(5) below for additional requirements related to data rights pricing.
- c. Any items previously developed with federal funding (and used for the proposed solution) should clearly identify all individual components funded by the Government and the recipient of the deliverables.
- d. If commercial software is proposed as part of the prototype solution, all applicable software licenses must be identified and included with the response. Note that any software license term or condition inconsistent with federal law will be negotiated out of the license.

iii. Price Response:

The price response shall be submitted as a separate file from the technical response. No pricing details shall be included in the technical response. This project will employ the Fixed Price with Payable Milestones following pricing structure:

1. The overall total price should be divided among severable increments that align to a proposed milestone payment schedule. Milestones are not required to match actual expenditures but should realistically align to the effort expended or products delivered.
 - a. The proposed milestone payment schedule shall be provided in a columnar/table format with the following column headers: Task/Milestone; Timeline/date; and Payment Value. Milestones payments shall align with a meaningful project event.
2. In order to support the Government's evaluation of fair and reasonable pricing, the respondent shall delineate the key pricing components, and show clear traceability to the phases and/or milestones of the Technical Response. At a minimum, key pricing components include Labor Total(s), Other Direct Costs/Material Total(s), License prices and Subcontractor price(s). Data should be segregated by each key objective, milestone, and/or phase proposed.
3. Include a brief narrative that explains your pricing structure and maps the proposed prices to the solution's technical approach.

4. Including a Basis of Estimate to support your pricing may substantially expedite evaluation of your response.
5. If limited or restricted rights are being asserted within the response, a table that includes prices for both Government Purpose Rights and Unlimited Rights for any limited or restricted item must be included.
6. Any additional features or capabilities that extend beyond the currently requested core technical objectives shall be separately priced for the Government's consideration. Pending funding availability and need, the Government may fund these advanced features at a later date.

11. Evaluation Process and Methodology:

- a. Individual responses will be evaluated with consideration given to:
 - i. Demonstrated expertise and overall technical merit of the response;
 - ii. Feasibility of implementation; and
 - iii. Total project risk as it relates to the technical focus areas, price and schedule
- b. The Government will evaluate the degree to which the proposed solution provides a thorough, flexible, and sound approach in response to the prototype technical objectives as stated in RFS Section 5, Desired End-State Objectives, as well as the ability to fulfill the objectives in this RFS.
- c. The Government will award this project, via S²MARTS (Agreement No. N00164-19-9-0001), to the respondent(s) whose solution is assessed to be the most advantageous to the Government, when price, schedule, technical risks, the level of data rights, and other factors are considered. The Government reserves the right to award to a respondent that does not meet all the requirements of the RFS.
- d. The proposed project price, schedule, and intellectual property/data rights assertions will be considered as aspects of the entire response when weighing risk and reward. The assessment of risks is subjective and will consider all aspects of the proposed solution. Respondents are responsible for identifying risks within their submissions, as well as providing specific mitigating solutions.
- e. The Government reserves the right to reject a submission and deem it ineligible for consideration if the response is incomplete and/or does not clearly provide the requested information. Debriefings will not be provided.

12. Follow-On Activity:

- f. Upon successful completion of this prototype effort, the Government anticipates that a follow-on production effort may be awarded via either contract or transaction, without the use of competitive procedures if the participants in this transaction successfully complete the prototype project as competitively awarded from this document. The prototype effort will be considered successfully complete upon demonstration of the aforementioned technology objectives.
- g. Successful completion for a specific capability may occur prior to the conclusion of the project to allow the Government to transition that aspect of the prototype project into production while other aspects of the prototype project have yet to be completed.
- h. Requirements of other potential follow-on activities could involve, though not limited to, continued development and baseline management, fielding, sustainment, training, further scaling of the solution, integration of future capabilities, or integration of the solution with other capabilities.

13. RFS Attachments

- 1. Attachment A - Section 889 (a)(1)(B) Section 889 Clause
- 2. Attachment B - Section 889 (a)(1)(B) Section 889 Verification - Representation

14. Important Dates

- a. Questions related to this RFS shall be submitted no later than 12:00 PM EDT on Tuesday, November 10, 2020.

To submit any questions, visit the opportunities page at www.nstxl.org/opportunities, select the “Current” tab, locate the respective project, and select “Submit a Question”.

- b. Proposals submitted in response to this RFS are due no later than 12:00 PM EDT on Monday, November 30, 2020.
- c. To submit your proposal, visit the opportunities page at www.nstxl.org/opportunities, select the “Current” tab, locate the respective project, and select the “Submit Proposal” link. You must have an active account and be logged-in to submit your response.
- d. RFS Respondents must be active members of the consortium at the time of proposal submission.

15. Additional Project Information

- e. The Government intends to award one Other Transaction Agreement as a result of this RFS; however, more than one award may be made if determined to be in the

Government's best interest. The Government also reserves the right to not select any of the solutions proposed.

- f. Acceptable responses not selected for the immediate award will be retained by NSTXL & the Government for possible future execution and funding. The non-selected proposals will be considered as viable alternatives for up to 36 months. If a proposal (that was not previously selected) is determined to be a suitable alternative, the company will be contacted to discuss any proposal updates and details of a subsequent project award.

Respondents whose proposals are not selected for the initial award shall not contact the Government or NSTXL to inquire about the status of any ongoing effort as it relates to the likelihood of their company being selected as a future alternative.

- g. The United States Navy, specifically Naval Surface Warfare Center, Crane Division, has release authority on any publications related to this prototype project.
- h. Unsuccessful respondents will be notified, however, debriefings for this project are not required nor planned at this time.
- i. If resource-sharing is proposed in accordance with 10 U.S. Code § 2371b(d)(1)(C), then the non-Federal amounts counted as provided, or to be provided, by parties other than the Federal Government may not include costs that were incurred before the date on which the OT agreement becomes effective. Costs offered as a resource-share that were incurred for a project after the beginning of negotiations, but prior to the date the OT agreement becomes effective, may be counted as non-Federal amounts 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.
- j. Certain types of information submitted to the Department during the RFS and award process of an OT are exempt from disclosure requirements of 5 U.S.C. §552 (the Freedom of Information Act or FOIA) for a period of five years from the date the Department receives the information. It is recommended that respondents mark business plans and technical information that are to be protected for five years from FOIA disclosure with a legend identifying the documents as being submitted on a business confidential basis.
- k. No classified data shall be submitted within the proposal. To the extent that the project involves DoD controlled unclassified information, respondents must comply with DoDI 8582.01 and DoDM 5200.01 Volume 4. Respondents must implement the security requirements in NIST SP 800-171 for safeguarding the unclassified internal information system; and must report any cyber incidents that affect the controlled unclassified information directly to DoD at <https://dibnet.dod.mil>.

1. Export controls (if applicable): Research findings and technology developments arising from the resulting proposed solution may constitute a significant enhancement to the national defense and to the economic vitality of the United States. As such, in the conduct of all work related to this effort, the selected performer must comply strictly with the International Traffic in Arms Regulation (22 C.F.R. §§ 120-130), the National Industrial Security Program Operating Manual (DoD 5220.22-M) and the Department of Commerce Export Regulation (15 C.F.R. §§ 730-774).