DEPARTMENT OF THE NAVY (DoN)
25.1 Small Business Innovation Research (SBIR)
Direct to Phase II (DP2) Announcement and Proposal Submission Instructions

IMPORTANT

- **The following instructions apply to Direct to Phase II (DP2) SBIR topic only:**
  - **N251-D01 through N251-D07**
- Information on the 25.1 SBIR and 25.A STTR Topics Workshop can be found at https://navysbir.com/nw25_1.htm.
- Submitting small business concerns are encouraged to thoroughly review the DoD SBIR/STTR Program Broad Agency Announcement (BAA) and register for the DSIP Listserv to remain apprised of important programmatic changes.
  - The DoD Program BAA is located at: https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/#announcements. Select the tab for the appropriate BAA cycle.
  - Register for the DSIP Listserv at: https://www.dodsbirsttr.mil/submissions/login.
- The information provided in the DoN Proposal Submission Instructions takes precedence over the DoD Instructions posted for this BAA.
- A submitting small business concern **MUST** use the DP2 Phase I Feasibility proposal template for Volume 2. This template is specific to DoN DP2 topics and meets DP2 submission requirements. The DP2 Phase I Feasibility proposal template can be found at https://navysbir.com/links_forms.htm.
- Proposing small business concerns that are more than 50% owned by multiple venture capital operating companies (VCOC), hedge funds (HF), private equity firms (PEF) or any combination of these are eligible to submit proposals in response to DoN topics advertised in this BAA. Information on Majority Ownership in Part and certification requirements at time of submission for these proposing small business concerns are detailed in the section titled ADDITIONAL SUBMISSION CONSIDERATIONS.
- DoN provides notice that Basic Ordering Agreements (BOAs) or Other Transaction Agreements (OTAs) may be used for Phase II awards.
- This BAA is issued under regulations set forth in Federal Acquisition Regulation (FAR) 35.016 and awards will be made under "other competitive procedures". The policies and procedures of FAR Subpart 15.3 shall not apply to this BAA, except as specifically referenced in it. All procedures are at the sole discretion of the Government as set forth in this BAA. Submission of a proposal in response to this BAA constitutes the express acknowledgement to that effect by the proposing small business concern.

INTRODUCTION

The DoN SBIR/STTR Programs are mission-oriented programs that integrate the needs and requirements of the DoN's Fleet through research and development (R&D) topics that have dual-use potential, but

primarily address the needs of the DoN. More information on the programs can be found on the DoN SBIR/STTR website at www.navysbir.com. Additional information on DoN's mission can be found on the DoN website at www.navy.mil.

The Department of Defense (DoD), including the Department of the Navy (DoN), may issue an SBIR award to a small business concern under Phase II , without regard to whether the small business concern received a Phase I award for such project. Prior to such an award, the head of the agency, or their designee, must issue a written determination that the small business concern has demonstrated the scientific and technical merit and feasibility of the technology solution that appears to have commercial potential (for use by the government or in the public sector). The determination must be submitted to the Small Business Administration (SBA) prior to issuing the Phase II award. As such, DoN issues this portion of the BAA in accordance with the requirements of the Direct to Phase II (DP2) authority. Only those proposing small business concerns that are capable of meeting the DP2 proposal requirements may participate in this DP2 BAA. No Phase I awards will be issued to the designated DP2 topic.

For questions regarding this BAA, use the information in Table 1 to determine who to contact for what types of questions.

TABLE 1: POINTS OF CONTACT FOR QUESTIONS REGARDING THIS BAA

Type of Question	When	Contact Information
Program and administrative	Always	DoN SBIR/STTR Program Management Office usn.pentagon.cnr-arlington-va.mbx.navy-sbir-sttr@us.navy.mil or appropriate Program Manager listed in Table 2 (below)
Topic-specific technical questions	BAA Pre-release	Technical Point of Contact (TPOC) listed in each topic on the DoD SBIR/STTR Innovation Portal (DSIP). Refer to the Proposal Submission section of the DoD SBIR/STTR Program BAA for details.
	BAA Open	DoD SBIR/STTR Topic Q&A platform (https://www.dodsbirsttr.mil/submissions) Refer to the Proposal Submission section of the DoD SBIR/STTR Program BAA for details.
Electronic submission to the DoD SBIR/STTR Innovation Portal (DSIP)	Always	DSIP Support via email at dodsbirsupport@reisystems.com
Navy-specific BAA instructions and forms	Always	DoN SBIR/STTR Program Management Office usn.pentagon.cnr-arlington-va.mbx.navy-sbir-sttr@us.navy.mil

TABLE 2: DoN SYSTEMS COMMAND (SYSCOM) SBIR PROGRAM MANAGERS

Topic Numbers	Point of Contact	SYSCOM	Email

N251-D01 to N251-D03	Ms. Kristi DePriest	Naval Air Systems Command (NAVAIR)	navair-sbir@us.navy.mil
N251-D04 to N251-D05	Mr. Jason Schroepfer	Naval Sea Systems Command (NAVSEA)	NSSC_SBIR.fct@navy.mil
N251-D06 to N251-D07	Ms. Lore-Anne Ponirakis	Office of Naval Research (ONR)	usn.pentagon.cnr-arlington-va.mbx.onr-sbir-sttr@us.navy.mil

Each DoN SBIR DP2 topic requires documentation to determine that Phase I feasibility, described in the Phase I section of the topic, has been met.

The DoN SBIR DP2 is a two-step process:

> STEP ONE: Prepare and Submit a Phase I Feasibility Proposal (instructions and link to template provided below). The purpose of the Phase I Feasibility Proposal is for the proposing small business concern to provide documentation to substantiate that both Phase I feasibility and the scientific and technical merit described in the topic have been met. The Phase I Feasibility Proposal must: demonstrate that the proposing small business concern performed Phase I-type research and development (R&D) and provide a concise summary of Phase II objectives, work plan, related research, key personnel, transition/commercialization plan, and estimated costs. Feasibility documentation MUST NOT be solely based on work performed under prior or ongoing federally funded SBIR/STTR work. The government will evaluate Phase I Feasibility Proposals and select small business concerns to submit a Full DP2 Proposal. Demonstrating proof of feasibility is a requirement for a DP2 award. The small business concern must submit a Phase I Feasibility Proposal to be considered for selection to submit a Full DP2 Proposal.
>
> STEP TWO: If selected, the cognizant SYSCOM Program Office will contact the small business concern directly to provide instructions on how to submit a Full DP2 Proposal.

DoN SBIR reserves the right to make no awards under this DP2 BAA. All awards are subject to availability of funds and successful negotiations. Proposing small business concerns must read the topic requirements carefully. The Government is not responsible for expenditures by the proposing small business concern prior to award of a contract. For 25.1 topics designated as DP2, DoN will accept only Phase I Feasibility Proposals (described below).

DP2 PROPOSAL SUBMISSION REQUIREMENTS

The following section details requirements for submitting a compliant DoN SBIR DP2 Proposal to the DoD SBIR/STTR Programs.

(NOTE: Proposing small business concerns are advised that support contract personnel will be used to carry out administrative functions and may have access to proposals, contract award documents, contract deliverables, and reports. All support contract personnel are bound by appropriate non-disclosure agreements.)

DoD SBIR/STTR Innovation Portal (DSIP). Proposing small business concerns are required to submit proposals via the DoD SBIR/STTR Innovation Portal (DSIP); and follow proposal submission instructions

in the DoD SBIR/STTR Program BAA on the DSIP at https://www.dodsbirsttr.mil/submissions. Proposals submitted by any other means will be disregarded. Proposing small business concerns submitting through DSIP for the first time will be asked to register. It is recommended that proposing small business concerns register as soon as possible upon identification of a proposal opportunity to avoid delays in the proposal submission process. Proposals that are not successfully certified electronically in DSIP by the Corporate Official prior to BAA Close will NOT be considered submitted and will not be evaluated by DoN. Proposals that are encrypted, password protected, or otherwise locked in any portion of the submission will be REJECTED unless specifically directed within the text of the topic to which you are submitting. Please refer to the DoD SBIR/STTR Program BAA for further information.

Eligibility. Each proposing small business concern must:

- Have demonstrated feasibility of Phase I-type R&D work
- Have submitted a Phase I Feasibility Proposal for evaluation
- Meet Offeror Eligibility and Performance Requirements as defined in the Proposal Fundamentals section of the DoD SBIR/STTR Program BAA
- Comply with primary employment requirements of the principal investigator (PI) during the Phase II award including, employment with the small business concern at the time of award and during the conduct of the proposed project. Primary employment means that more than one-half of the PI's time is spent in the employ of the small business concern
- Register in the System for Award Management (SAM) as defined in the Certifications and Registrations section of the DoD SBIR/STTR Program BAA. To register, visit https://sam.gov/

Proposal Volumes. The following seven volumes are required.

- **Proposal Cover Sheet (Volume 1).** As specified in DoD SBIR/STTR Program BAA.

- **Technical Volume (Volume 2).**
  - Technical Proposal (Volume 2) must meet the following requirements or the proposal will be REJECTED:
    - A submitting small business concern MUST use the DP2 Phase I Feasibility proposal template for Volume 2. The DP2 Phase I Feasibility proposal template can be found at https://navysbir.com/links_forms.htm.

      This template is specific to DoN DP2 topics and meets DP2 submission requirements:
      - Not to exceed 30 pages, regardless of page content; Phase I Proof of Feasibility portion not to exceed 20 pages, Snapshot of Proposed Phase II Effort portion not to exceed 10 pages
      - Single column format, single-spaced typed lines
      - Standard 8 ½" x 11" paper
      - Page margins one inch on all sides. A header and footer may be included in the one-inch margin.
      - No font size smaller than 10-point

  - Additional information:
    - A font size smaller than 10-point is allowable for headers, footers, imbedded tables, figures, images, or graphics that include text. However, proposing small business concerns are cautioned that if the text is too small to be legible it will not be evaluated.

- **Cost Volume (Volume 3).** The text fields related to costs for the proposed effort must be answered in the Cost Volume of the DoD Submission system (at https://www.dodsbirsttr.mil/submissions/), however, proposing small business concerns DO NOT need to download and complete the separate cost volume template when submitting the DoN SBIR Phase I Feasibility Proposal. Proposing small

business concerns are to include a cost estimate in the Order of Magnitude Cost Estimate Table (example below) within the Snapshot of Proposed Phase II Effort portion of the Technical Volume (Volume 2). Please refer to Table 3 below for guidance on cost and period of performance. Costs for the Base and Option are to be separate and identified on the Proposal Cover Sheet and in the Order of Magnitude Cost Estimate Table in the Technical Volume (Volume 2).

Order of Magnitude Cost Estimate Table			
Line Item – Details	**Estimated Base Amount**	**Estimated Option Amount**	**Total Estimated Amount Base + Option**
Direct Labor (fully burdened) – Prime			
Subcontractors/Consultants			
Material			
Travel & ODC			
G&A			
FCCM			
Fee/Profit			
TABA (NTE $25K, included in total amount)			
Total Estimated Costs			

TABLE 3: COST & PERIOD OF PERFORMANCE

Topic Number	**Base**		**Option**		**Total (NTE)**
	Cost (NTE)	**POP (NTE)**	**Cost (NTE)**	**POP (NTE)**	
N251-D01 to N251-D03	$1,000,000	30 mos.	$300,000	12 mos.	$1,300,000
N251-D04 to N251-D05	$700,000	12 mos.	$1,300,000*	24 mos.*	$2,000,000*
N251-D06 to N251-D07	$1,000,000	24 mos.	$1,000,000	24 mos.	$2,000,000

***** Step Two: for the Full Phase II submission, if selected, N251-D04 and N251-D04 will require the Phase II Option 1 and Phase II Option 2 to be detailed separately:

- Phase II Option 1: Cost $700,000, Period of Performance 12 months
- Phase II Option 2: Cost $600,000, Period of Performance 12 months

- Additional information:
  - For Phase II a minimum of 50% of the work is performed by the proposing small business concern. The percentage of work requirement must be met in the Base costs as well as in the Option costs. The percentage of work is measured by both direct and indirect costs. To calculate the minimum percentage of work for the proposing small business concern the sum of all direct and indirect costs attributable to the proposing small business concern represent the numerator and the total cost of the proposal (i.e., Total Cost before Profit Rate is applied) is the denominator. The subcontractor percentage is calculated by taking the sum of all costs attributable to the subcontractor as the numerator and the total cost of the proposal (i.e., Total Cost before Profit Rate is applied) as the denominator. **NOTE:** G&A, if proposed, will only be attributed to the proposing small business concern.

- Provide sufficient detail for subcontractor, material, and travel costs. Subcontractor costs must be detailed to the same level as the prime contractor. Material costs must include a listing of items and cost per item. Travel costs must include the purpose of the trip, number of trips, location, length of trip, and number of personnel.
- Inclusion of cost estimates for travel to the sponsoring SYSCOM's facility for one day of meetings is recommended for all proposals.
- The "Additional Cost Information" of Supporting Documents (Volume 5) may be used to provide supporting cost details for Volume 3.

- **Company Commercialization Report (Volume 4)**. DoD collects and uses Volume 4 and DSIP requires Volume 4 for proposal submission. Please refer to the Proposal Preparation Instructions and Requirements section of the DoD SBIR/STTR Program BAA for details to ensure compliance with DSIP Volume 4 requirements.

- **Supporting Documents (Volume 5).** Volume 5 is for the submission of administrative material that DoN may or will require to process a proposal, if selected, for contract award.

  All proposing small business concerns must review and submit the following items, as applicable:
  - **Majority Ownership in Part.** Proposing small business concerns which are more than 50% owned by multiple venture capital operating companies (VCOC), hedge funds (HF), private equity firms (PEF), or any combination of these as set forth in 13 C.F.R. § 121.702, are eligible to submit proposals in response to DoN topics advertised within this BAA. Complete the certification as detailed under ADDITIONAL SUBMISSION CONSIDERATIONS.

  - Additional information:
    - Proposing small business concerns may include the following administrative materials in Supporting Documents (Volume 5); a template is available at https://navysbir.com/links_forms.htm to provide guidance on optional material the proposing small business concern may want to include in Volume 5:
      - Additional Cost Information to support the Cost Volume (Volume 3)
      - SBIR/STTR Funding Agreement Certification
      - Data Rights Assertion
      - Allocation of Rights between Prime and Subcontractor
      - Disclosure of Information (DFARS 252.204-7000)
      - Prior, Current, or Pending Support of Similar Proposals or Awards
      - Foreign Citizens
    - Details of Request for Discretionary Technical and Business Assistance (TABA), if proposed, is to be included under the Additional Cost Information section if using the DoN Supporting Documents template.
    - Do not include documents or information to substantiate the Technical Volume (Volume 2) (e.g., resumes, test data, technical reports, or publications). Such documents or information will not be considered.
    - A font size smaller than 10-point is allowable for documents in Volume 5; however, proposing small business concerns are cautioned that the text may be unreadable.

- **Fraud, Waste and Abuse Training Certification (Volume 6)**. DoD requires Volume 6 for submission. Please refer to the Proposal Preparation Instructions and Requirements section of the DoD SBIR/STTR Program BAA for details.

- **Disclosures of Foreign Affiliations or Relationships to Foreign Countries (Volume 7)**. In accordance with Section 4 of the SBIR and STTR Extension Act of 2022 and the SBA SBIR/STTR

Policy Directive, the DoD will review all proposals submitted in response to this BAA to assess security risks presented by small business concerns seeking a Federally funded award. Small business concerns must complete the Disclosures of Foreign Affiliations or Relationships to Foreign Countries webform in Volume 7 of the DSIP proposal submission. Please refer to the Proposal Preparation Instructions and Requirements section of the DoD SBIR/STTR Program BAA for details.

DP2 EVALUATION AND SELECTION

The following section details how the DoN SBIR/STTR Programs will evaluate Phase I Feasibility proposals.

Proposals meeting DSIP submission requirements will be forwarded to the DoN SBIR/STTR Programs. Prior to evaluation, all proposals will undergo a compliance review to verify compliance with DoD and DoN SBIR/STTR proposal eligibility requirements. Proposals not meeting submission requirements will be REJECTED and not evaluated.

- **Proposal Cover Sheet (Volume 1).** The Proposal Cover Sheet (Volume 1) will undergo a compliance review to verify the proposing small business concern has met eligibility requirements and followed the instructions for Proposal Cover Sheet as specified in the DoD SBIR/STTR Program BAA.

- **Technical Volume (Volume 2).** The DoN will evaluate and select Phase I Feasibility proposals using the evaluation criteria specified in the Method of Selectin and Evaluation Criteria section of the DoD SBIR/STTR Program BAA, with technical merit being most important, followed by qualifications of key personnel and commercialization potential of equal importance. The information considered for this decision will come from Volume 2. This is not a FAR Part 15 evaluation and proposals will not be compared to one another. Cost is not an evaluation criterion and will not be considered during the evaluation process; the DoN will only do a compliance review of Volume 3. Due to limited funding, the DoN reserves the right to limit the number of awards under any topic.

  The Technical Volume (Volume 2) will undergo a compliance review (prior to evaluation) to verify the proposing small business concern has met the following requirements or the proposal will be REJECTED:
  - A submitting small business concern MUST use the DP2 Phase I Feasibility proposal template for Volume 2. The DP2 Phase I Feasibility proposal template can be found at https://navysbir.com/links_forms.htm.
    This template is specific to DoN DP2 topics and meets DP2 submission requirements:
    - Not to exceed 30 pages, regardless of page content; Phase I Proof of Feasibility portion not to exceed 20 pages, Snapshot of Proposed Phase II Effort portion not to exceed 10 pages
    - Single column format, single-spaced typed lines
    - Standard 8 ½" x 11" paper
    - Page margins one inch on all sides. A header and footer may be included in the one-inch margin.
    - No font size smaller than 10-point, except as permitted in the instructions above.

- **Cost Volume (Volume 3).** The Cost Volume (Volume 3) will not be considered in the selection process and will undergo a compliance review to verify the proposing small business concern has met the following requirements or the proposal will be REJECTED:
  - Must not exceed values for the Base and Option (refer to Table 3).

- Must meet minimum percentage of work; a minimum of 50% of the work is performed by the proposing small business concern. The percentage of work requirement must be met in the Base costs as well as in the Option costs.

- **Company Commercialization Report (Volume 4).** The CCR (Volume 4) will not be evaluated by the DoN nor will it be considered in the award decision. However, all proposing small business concerns must refer to the DoD SBIR/STTR Program BAA to ensure compliance with DSIP Volume 4 requirements.

- **Supporting Documents (Volume 5).** Supporting Documents (Volume 5) will not be considered in the selection process and will only undergo a compliance review to ensure the proposing small business concern has included items in accordance with the DP2 SUBMISSION INSTRUCTIONS section above.

- **Fraud, Waste, and Abuse Training Certificate (Volume 6).** Not evaluated.

- **Disclosures of Foreign Affiliations or Relationships to Foreign Countries (Volume 7)**. Disclosures of Foreign Affiliations or Relationships to Foreign Countries (Volume 7) will be assessed as part of the Due Diligence Program to Assess Security Risks. Refer to the DoD SBIR/STTR Program BAA to ensure compliance with Volume 7 requirements.

ADDITIONAL SUBMISSION CONSIDERATIONS

This section details additional items for proposing small business concerns to consider during proposal preparation and submission process.

Due Diligence Program to Assess Security Risks. The SBIR and STTR Extension Act of 2022 (Pub. L. 117-183) requires the Department of Defense, in coordination with the Small Business Administration, to establish and implement a due diligence program to assess security risks presented by small business concerns seeking a Federally funded award. Please review the Certifications and Registrations section of the DoD SBIR/STTR Program BAA for details on how DoD will assess security risks presented by small business concerns. The Due Diligence Program to Assess Security Risks will be implemented for all Phases.

Discretionary Technical and Business Assistance (TABA). The SBIR and STTR Policy Directive section 9(b) allows the DoN to provide TABA (formerly referred to as DTA) to its awardees. The purpose of TABA is to assist awardees in making better technical decisions on SBIR/STTR projects; solving technical problems that arise during SBIR/STTR projects; minimizing technical risks associated with SBIR/STTR projects; and commercializing the SBIR/STTR product or process, including intellectual property protections. Proposing small business concerns may request, in their Cost Volume (Volume 3), to contract these services themselves through one or more TABA providers in an amount not to exceed the values specified below. The Phase II TABA amount is up to $25,000 per award, is to be included as part of the award amount and is limited by the established award values for Phase II by the SYSCOM (i.e., within the $2,000,000 or lower limit specified by the SYSCOM). The amount proposed for TABA cannot include any profit/fee by the proposing small business concern and must be inclusive of all applicable indirect costs. TABA cannot be used in the calculation of general and administrative expenses (G&A) for the SBIR proposing small business concern. A Phase II project may receive up to an additional $25,000 for TABA as part of one additional (sequential) Phase II award under the project for a total TABA award of up to $50,000 per project. A TABA Report, detailing the results and benefits of the service received, will be required annually by October 30.

Request for TABA funding will be reviewed by the DoN SBIR/STTR Program Management Office.

If the TABA request does not include the following items the TABA request will be denied.

- TABA provider(s) (firm name)
- TABA provider(s) point of contact, email address, and phone number
- An explanation of why the TABA provider(s) is uniquely qualified to provide the service
- Tasks the TABA provider(s) will perform (to include the purpose and objective of the assistance)
- Total TABA provider(s) cost, number of hours, and labor rates (average/blended rate is acceptable)

TABA must NOT:

- Be subject to any indirect costs, profit, or fee by the SBIR proposing small business concern
- Propose a TABA provider that is the SBIR proposing small business concern
- Propose a TABA provider that is an affiliate of the SBIR proposing small business concern
- Propose a TABA provider that is an investor of the SBIR proposing small business concern
- Propose a TABA provider that is a subcontractor or consultant of the requesting small business concern otherwise required as part of the paid portion of the research effort (e.g., research partner, consultant, tester, or administrative service provider)

TABA requests must be included in the proposal as follows:

- Phase II:
    - — DoN Phase II Cost Volume (provided by the DoN SYSCOM) - the value of the TABA request.
    - — Supporting Documents (Volume 5) – a detailed request for TABA (as specified above) specifically identified as "TABA" in the section titled Additional Cost Information when using the DoN Supporting Documents template.

Proposed values for TABA must NOT exceed:

- Phase II: A total of $25,000 per award, not to exceed $50,000 per Phase II project

If a proposing small business concern requests and is awarded TABA in a Phase II contract, the proposing small business concern will be eliminated from participating in the Navy SBIR Transition Program (STP), the DoN Forum for SBIR/STTR Transition (FST), and any other Phase II assistance the DoN provides directly to awardees.

All Phase II awardees not receiving funds for TABA in their awards must participate in the virtual Navy STP Kickoff during the first or second year of the Phase II contract. While there are no travel costs associated with this virtual event, Phase II awardees should budget time of up to a full day to participate. STP information can be obtained at: https://navystp.com. Phase II awardees will be contacted separately regarding this program.

Disclosure of Information (DFARS 252.204-7000). In order to eliminate the requirements for prior approval of public disclosure of information (in accordance with DFARS 252.204-7000) under this award, the proposing small business concern shall identify and describe all fundamental research to be performed under its proposal, including subcontracted work, with sufficient specificity to demonstrate that the work qualifies as fundamental research. Fundamental research means basic and applied research in science and engineering, the results of which ordinarily are published and shared broadly within the scientific community, as distinguished from proprietary research and from industrial development, design, production, and product utilization, the results of which ordinarily are restricted for proprietary or national security reasons (defined by National Security Decision Directive 189). A small business concern whose proposed work will include fundamental research and requests to eliminate the requirement for prior approval of public disclosure of information must complete the DoN Fundamental Research Disclosure and upload as a separate PDF file to the Supporting Documents (Volume 5) in DSIP as part of their proposal

submission. The DoN Fundamental Research Disclosure is available on https://navysbir.com/links_forms.htm and includes instructions on how to complete and upload the completed Disclosure. Simply identifying fundamental research in the Disclosure does **NOT** constitute acceptance of the exclusion. All exclusions will be reviewed and, if approved by the Government Contracting Officer, noted in the contract.

Majority Ownership in Part. Proposing small business concerns that are more than 50% owned by multiple venture capital operating companies (VCOC), hedge funds (HF), private equity firms (PEF), or any combination of these as set forth in 13 C.F.R. § 121.702, **are eligible** to submit proposals in response to DoN topics advertised within this BAA.

For proposing small business concerns that are a member of this ownership class the following must be satisfied for proposals to be accepted and evaluated:

a. Prior to submitting a proposal, proposing small business concerns must register with the SBA Company Registry Database.
b. The proposing small business concern within its submission must submit the Majority-Owned VCOC, HF, and PEF Certification. A copy of the SBIR VC Certification can be found on https://navysbir.com/links_forms.htm. Include the SBIR VC Certification in the Supporting Documents (Volume 5).
c. Should a proposing small business concern become a member of this ownership class after submitting its proposal and prior to any receipt of a funding agreement, the proposing small business concern must immediately notify the Contracting Officer, register in the appropriate SBA database, and submit the required certification, which can be found on https://navysbir.com/links_forms.htm.

System for Award Management (SAM). It is strongly encouraged that proposing small business concerns register in SAM, https:// sam.gov, by the Close date of this BAA, or verify their registrations are still active and will not expire within 60 days of BAA Close. Additionally, proposing small business concerns should confirm that they are registered to receive contracts (not just grants) and the address in SAM matches the address on the proposal. A small business concern selected for an award MUST have an active SAM registration at the time of award or they will be considered ineligible.

Notice of NIST SP 800-171 Assessment Database Requirement. The purpose of the National Institute of Standards and Technology (NIST) Special Publication (SP) 800-171 is to protect Controlled Unclassified Information (CUI) in Nonfederal Systems and Organizations. As prescribed by DFARS 252.204-7019, in order to be considered for award, a small business concern is required to implement NIST SP 800-171 and shall have a current assessment uploaded to the Supplier Performance Risk System (SPRS) which provides storage and retrieval capabilities for this assessment. The platform Procurement Integrated Enterprise Environment (PIEE) will be used for secure login and verification to access SPRS. For brief instructions on NIST SP 800-171 assessment, SPRS, and PIEE, please visit https://www.sprs.csd.disa.mil/nistsp.htm. For in-depth tutorials on these items please visit https://www.sprs.csd.disa.mil/webtrain.htm.

Human Subjects, Animal Testing, and Recombinant DNA. If the use of human, animal, and recombinant DNA is included under a DP2 proposal, please carefully review the requirements at: https://www.nre.navy.mil/work-with-us/how-to-apply/compliance-and-protections/research-protections. This webpage provides guidance and lists approvals that may be required before contract/work can begin.

International Traffic in Arms Regulation (ITAR). For topics indicating ITAR restrictions or the potential for classified work, limitations are generally placed on disclosure of information involving topics of a classified nature or those involving export control restrictions, which may curtail or preclude the involvement of universities and certain non-profit institutions beyond the basic research level. Small

businesses must structure their proposals to clearly identify the work that will be performed that is of a basic research nature and how it can be segregated from work that falls under the classification and export control restrictions. As a result, information must also be provided on how efforts can be performed in later phases if the university/research institution is the source of critical knowledge, effort, or infrastructure (facilities and equipment).

SELECTION, AWARD, AND POST-AWARD INFORMATION

Notifications. Email notifications for proposal receipt (approximately one week after the Phase I BAA Close) and selection are sent based on the information received on the proposal Cover Sheet (Volume 1). Consequently, the e-mail address on the proposal Cover Sheet must be correct.

Debriefs. Requests for a debrief must be made within 15 calendar days of select/non-select notification via email as specified in the select/non-select notification. Please note debriefs are typically provided in writing via email to the Corporate Official identified in the proposal of the proposing small business concerns within 60 days of receipt of the request. Requests for oral debriefs may not be accommodated. If contact information for the Corporate Official has changed since proposal submission, a notice of the change on company letterhead signed by the Corporate Official must accompany the debrief request.

Protests. Interested parties have the right to protest in accordance with the procedures in FAR Subpart 33.1.

Pre-award agency protests related to the terms of the BAA must be served to: osd.ncr.ousd-r-e.mbx.SBIR-STTR-Protest@mail.mil. A copy of a pre-award Government Accountability Office (GAO) protest must also be filed with the aforementioned email address within one day of filing with the GAO.

Protests related to a selection or award decision should be filed with the appropriate Contracting Officer for an Agency Level Protest or with the GAO. Contracting Officer contact information for specific DoN Topics may be obtained from the DoN SYSCOM Program Managers listed in Table 2 above. For protests filed with the GAO, a copy of the protest must be submitted to the appropriate DoN SYSCOM Program Manager and the appropriate Contracting Officer within one day of filing with the GAO.

Awards. Due to limited funding, the DoN reserves the right to limit the number of awards under any topic. Any notification received from the DoN that indicates the proposal has been selected does not ultimately guarantee an award will be made. This notification indicates that the proposal has been selected in accordance with the evaluation criteria and has been sent to the Contracting Officer to conduct cost analysis, confirm eligibility of the proposing small business concern, and to take other relevant steps necessary prior to making an award.

Contract Types. In addition to the negotiated contract award types listed in the section of the DoD SBIR/STTR Program BAA titled Additional Considerations, for Phase II awards the DoN may (under appropriate circumstances) propose the use of an Other Transaction Agreement (OTA) as specified in 10 U.S.C. 4021/10 U.S.C. 4022 and related implementing policies and regulations. The DoN may choose to use a Basic Ordering Agreement (BOA) for Phase I and Phase II awards.

Contract Deliverables. Contract deliverables are typically progress reports and final reports. Required contract deliverables must be uploaded to https://www.navysbirprogram.com/navydeliverables/.

Transfer Between SBIR and STTR Programs. Section 4(b)(1)(i) of the SBIR and STTR Policy Directive provides that, at the agency's discretion, projects awarded a Phase I under a BAA for SBIR may transition in Phase II to STTR and vice versa.

PHASE III GUIDELINES

A Phase III SBIR/STTR award is any work that derives from, extends, or completes effort(s) performed under prior SBIR/STTR funding agreements, but is funded by sources other than the SBIR/STTR programs. This covers any contract, grant, or agreement issued as a follow-on Phase III award or any contract, grant, or agreement award issued as a result of a competitive process where the awardee was an SBIR/STTR firm that developed the technology as a result of a Phase I or Phase II award. The DoN will give Phase III status to any award that falls within the above-mentioned description. Consequently, DoN will assign SBIR/STTR Data Rights to any noncommercial technical data and noncommercial computer software delivered in Phase III that were developed under SBIR/STTR Phase I/II effort(s). Government prime contractors and their subcontractors must follow the same guidelines as above and ensure that companies operating on behalf of the DoN protect the rights of the SBIR/STTR firm.

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Direct to Phase II Topic Index

*** N251-D07 NOTE: SEA AIR SPACE EXPOSITION SMALL BUSINESS SHOWCASE:** Small business concerns that are selected to submit a Full DP2 Proposal to topic N251-D07 will be invited to present their capabilities with leadership and attendees during the Navy Sea Air Space Exposition Small Business Showcase (SBS). Sea Air Space will be held April 6-9, 2025 in the Washington, DC area. Please review the Description section of topic N251-D07 for further information.

N251-D01 TITLE: DIRECT TO PHASE II: Passive Acoustics Sonobuoys Intelligence and Machine Learning

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Human-Machine Interfaces;Trusted AI and Autonomy

The technology within this topic is restricted under the International Traffic in Arms Regulation (ITAR), 22 CFR Parts 120-130, which controls the export and import of defense-related material and services, including export of sensitive technical data, or the Export Administration Regulation (EAR), 15 CFR Parts 730-774, which controls dual use items. Offerors must disclose any proposed use of foreign nationals (FNs), their country(ies) of origin, the type of visa or work permit possessed, and the statement of work (SOW) tasks intended for accomplishment by the FN(s) in accordance with the Announcement. Offerors are advised foreign nationals proposed to perform on this topic may be restricted due to the technical data under US Export Control Laws.

OBJECTIVE: Develop an efficient, robust, and automated system that can process passive acoustic signals, effectively reducing human intervention, reducing operator workload, and improving data analysis accuracy. Develop and demonstrate innovative technologies, including new techniques from other signal processing domains, to enable the Directional Frequency Analysis and Recording (DIFAR) sonobuoy and Airborne Anti-Submarine Warfare (ASW) systems to automatically and accurately detect, classify, track, and localize threats.

DESCRIPTION: The Air Anti-Submarine Warfare (ASW) Systems Program Office (PMA-264), in response to the evolving challenges posed by nation states with significant investment in undersea capability and capacity, wants to develop innovative technologies that advance air ASW systems to reliably detect, classify, track, and localize submarines and unmanned underwater vehicles (UUVs) via passive sensors. This SBIR effort is to be confined to the acoustic processor on an aircraft (manned or unmanned). This SBIR effort should not require any changes to the sonobuoy. The focus is to incorporate advanced technology solutions with integrated sensor data to speed up reaction times that support the acoustic operator and improve passive acoustic target detection, classification, tracking, and localization. Advanced technologies have demonstrated promise in other signal processing domains such as target discrimination, the development of matched filters or templates for never-before-seen targets, and incoherent aggregation of signatures. Techniques may include generating unique identifiable signatures by combining data from multiple receivers or receptions in highly dynamic, real-time environments—even on computationally limited assets—to aid in automated detection, classification, tracking, and localization. These techniques produce additional metadata surrounding a signature to aid or refine classification. Recognition accuracy, reliability, and speed of processing are all important performance goals. The automated and accurate detection, classification, tracking, and localization of targets will go a long way in maintaining ASW superiority in the theater.

Recent advances in artificial intelligence (AI) sensing of passive acoustic data have paved the way for further improvements that rely more on automated processing of data with human operator oversight. The goal is to increase automation in passive acoustic processing with sensor information on the platform and ensure that other relevant data is being leveraged to better inform decision-making (e.g., environmental data, historical data, and sensor fusion data). Solutions will need to show significant accuracy in the detection, classification, tracking, and localization of undersea contacts.

Although the topic chiefly requires a technical solution, it also is focused on developing and maturing the continuum of human-machine interaction. The envisioned solution would allow operators to be part of the process sometimes, with the capability providing them decision-support. While at other times allowing operators to be supervisors of the analysis, providing oversight and expertise. This topic requires a level

of automation transparency with the operators to enable a human to quickly understand why the system is presenting the information including the basis of automated detection, classification, and localization. The importance of the human operator's ability to adapt to new information, answer questions about information, and truly analyze an ASW target's characteristics and behavior cannot be overstated. The proposed capability needs to support the warfighter in his or her job and be a power multiplier, while reducing operator workload.

Multiple passive sonobuoys can enable the rapid identification, classification, and localization of threats. In order to extend the current capabilities, efficient innovative techniques are needed. The proposed solution should be designed to significantly enhance the efficiency of detecting, classifying, tracking, and localizing underwater threats, outperforming current capabilities managed by human operators. The system aims to speed up the detection and classification processes, ensuring a high degree of accuracy and reliability. Throughout the development effort, the proposer will be required to provide clear and provable metrics that demonstrate performance improvements when compared to the average acoustic operator capability.

The proposed solution must meet ethics principles outlined by the Department of Defense (Responsible, Equitable, Traceable, Reliable, and Governable) and present a plan that will be accounted for and tracked throughout the effort. Additionally, the final solution will meet Risk Management Framework and Cyber Security.

Work produced in Phase II may become classified. Note: The prospective contractor(s) must be U.S. owned and operated with no foreign influence as defined by 32 U.S.C. § 2004.20 et seq., National Industrial Security Program Executive Agent and Operating Manual, unless acceptable mitigating procedures can and have been implemented and approved by the Defense Counterintelligence and Security Agency (DCSA) formerly Defense Security Service (DSS). The selected contractor must be able to acquire and maintain a secret level facility and Personnel Security Clearances. This will allow contractor personnel to perform on advanced phases of this project as set forth by DCSA and NAVAIR in order to gain access to classified information pertaining to the national defense of the United States and its allies; this will be an inherent requirement. The selected company will be required to safeguard classified material during the advanced phases of this contract IAW the National Industrial Security Program Operating Manual (NISPOM), which can be found at Title 32, Part 2004.20 of the Code of Federal Regulations.

PHASE I: For a Direct to Phase II topic, the Government expects that the small business would have accomplished the following in a Phase I-type effort and developed a concept for a workable prototype or design to address, at a minimum, the basic requirements of the stated objective above. The below actions would be required to satisfy the requirements of Phase I:

Demonstrate the proof-of-concept techniques for advanced identification, data fusion, signal aggregation, and classification of targets in dynamic ASW scenarios. Demonstrate advanced passive sonar techniques that significantly improve target discrimination in tactical scenarios.

FEASIBILITY DOCUMENTATION: Offerors interested in participating in Direct to Phase II must include in their response to this topic Phase I feasibility documentation that substantiates the scientific and technical merit and Phase I feasibility described in Phase I above has been met (i.e., the small business must have performed Phase I-type research and development related to the topic NOT solely based on work performed under prior or ongoing federally funded SBIR/STTR work) and describe the potential commercialization applications. The documentation provided must validate that the proposer has completed development of technology as stated in Phase I above.

PHASE II: Develop a working prototype that can incorporate the developed advanced passive sonar processing techniques. The prototype capability should be able to ingest synthetic data, as well as real-world training data. Demonstration of the prototype capability should include its capability to perform autonomously and independently, as well as with an operator working with the system.
Work in Phase II may become classified. Please see note in Description paragraph.

PHASE III DUAL USE APPLICATIONS: Refine the capability from the Phase II final demonstration and show consistent reliability in a known performance envelope. A Phase III capability must include and demonstrate a function to self-tune its own algorithm based on new data inputs. The Phase III system must integrate engineering and pass operationally representative testing on an air deployed system and support Navy-supported test scenarios within current acoustic warfare operator training and go through verification and validation testing, as well as effectiveness and usability testing. Transition completed technology to fleet or appropriate Navy platform.

Technology developed in this SBIR topic could be leveraged for other marine monitoring applications. This technology could include air-deployable search and rescue hardware; resource exploration sensor technology; and oceanographic survey instrumentation.

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2. Holler, R. A.; Horbach, A. W. and McEachern, J. F. “The ears of air ASW: a history of US Navy sonobuoys.” Navmar Applied Sciences Corporation, 2008. https://www.worldcat.org/title/720627294
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5. Wang, P. and Peng, Y. “Research on feature extraction and recognition method of underwater acoustic target based on deep convolutional network.” 2020 IEEE International Conference on Advances in Electrical Engineering and Computer Applications (AEECA), August 2020, pp. 863-868. https://ieeexplore.ieee.org/document/9213504
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KEYWORDS: Automation; Autonomy; Anti-Submarine Warfare; Machine Learning; Artificial Intelligence; Explainability

N251-D02 TITLE: DIRECT TO PHASE II: Heat Treatment and Microstructural Modeling & Simulation of High-Performance Gear and Bearing Steel Alloys

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Advanced Computing and Software;Advanced Materials

OBJECTIVE: Develop and validate advanced modeling and simulation tools for predicting the microstructural and material property response to raw material melt and heat treatment processing variables of aerospace gear and rolling element bearing steels.

DESCRIPTION: High-performance gear and bearing steel alloys such as X-53, Pyrowear53 (P53), and Pyrowear675 (P675) can be susceptible to several types of material defects such as inclusions, sub-optimal microstructures and undesirable carbide morphologies and chemistries due to the raw material melt and/or heat treatment processes (i.e., carburization). There have been multiple instances where such defects have escaped non-destructive inspection (NDI) quality assurance processes currently in place to preclude these from service, resulting in poor component reliability and catastrophic failure leading to multiple safety mishaps. Traditional methods to address the issue often involve large scale empirical testing to determine root cause and corrective action, which consumes large amounts of resources and time, prohibitive in the current state of warfighter operational tempo and supply chain challenges. Computer modeling and simulation (M&S) is a powerful method that can be applied to explore critical material process variables in a digital space, potentially allowing rapid iteration and ability to reduce the amount of empirical testing required to deliver a robust material solution. Although such M&S tools already exist, there has not been a dedicated effort to apply these to the subject steel alloys of interest and identified above. This SBIR topic is aimed at leveraging existing M&S tools available from small business entities to help address the forgoing material processing issues described above. The end-goal is to enable original equipment manufacturers (OEMs), suppliers, and end users to perform processing simulations, microstructure modeling, and material property predictions to computationally investigate material issues and optimize gear and bearing material performance for critical aerospace applications. There is also potential to leverage across to other alloys once the benefit is realized. Emphasis is on case carburized gear and bearing steel alloys such as Pyrowear675 (P675), X-53, and Pyrowear53 (P53). These alloys are currently used in safety critical components and sub-assemblies including aircraft gearboxes, transmissions and propulsion systems on multiple naval aviation platforms including the F-35, V-22, CH-53K, and H-1.

PHASE I: For a Direct to Phase II topic, the Government expects that the small business would have accomplished the following in a Phase I-type effort and developed a concept for a workable prototype or design to address, at a minimum, the basic requirements of the stated objective above. The below actions would be required to satisfy the requirements of Phase I:
Developed a physics-based computational model and simulation tool capable of performing heat treatment processing simulations, microstructural modeling, and resulting material property predictions.
Demonstrated the feasibility of the existing M&S tool by validating simulated predictions with microstructural evaluation of applicable material coupons and specimen/component testing (if available). Examples of validation include, but are not limited to, residual stress measurement and case depth, dimensional/strain measurement through heat treat process, microstructural phase composition determination.

FEASIBILITY DOCUMENTATION: Offerors interested in participating in Direct to Phase II must include in their response to this topic Phase I feasibility documentation that substantiates the scientific and technical merit and Phase I feasibility described in Phase I above has been met (i.e., the small business must have performed Phase I-type research and development related to the topic NOT solely based on work performed under prior or ongoing federally funded SBIR/STTR work) and describe the

potential commercialization applications. The documentation provided must validate that the proposer has completed development of technology as stated in Phase I above.

PHASE II: Develop a computational model of one of the materials of interest above as a baseline, with potential expansion to other materials of interest. Explore variables in the digital space that can affect material microstructure, performance, hardenability, and overall fatigue properties. The software tool must be capable of modeling material microstructure in raw material form, account for variations in alloy element compositions including inclusion content and phase transformation, computationally investigate material response to post processing operations (i.e., forging, heat treat, and carburization operations). Anticipated tasks include the following:

1. Coordinate with a supply chain in a representative bearing or gear application to determine detailed material properties and refine modeling and simulation changes in properties that occur through raw material ingot formation, forging, and subsequent heat treatment operations prior to final machining of a component.
2. Investigate carburization response of selected material to heat treat variable processing inputs such as coarsening effects of carbides molybdenum carbide (MoC), chromium carbide (CrC), and other relevant carbides; grain growth, diffusion, and precipitation during carburization equilibrium microstructure and homogenization processes; evaluation of variable processing history to evaluate whether MoC dispersion or alternate microstructural features more significantly impact carburization response and determine methods of elimination.
3. Develop and/or upgrade of an existing modeling tool capable of predicting carbide formation including carbide size, distribution, and location within the microstructure. The modeling tool should be able to establish mitigation strategies for precipitation in areas other than prior austenite grain boundaries as an output.
4. Validate software predictions thru subscale coupon and component testing.

PHASE III DUAL USE APPLICATIONS: Integrate the Phase II developed M&S tool to OEM and suppliers of steel alloy gears and bearings manufacturing process, to optimize alloy melt and heat treatment processes to ultimately provide the Navy with microstructurally robust steel alloy components. Potential dual use applications include any aerospace/automotive/marine/industrial applications that require high performance alloys (e.g., powertrain transmissions systems, turbine engine subcomponents, and gas pipelines).

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2. Simsir, C. “Modeling and simulation of steel heat treatment—prediction of microstructure, distortion, residual stresses, and cracking.” ASM Handbook 4B, Chapter: Modeling and Simulation of Steel Heat, September 2014, pp.409-466. https://www.researchgate.net/publication/269984971_Modeling_and_Simulation_of_Steel_Heat_Treatment_Prediction_of_Microstructure_Distortion_Residual_Stresses_and_Cracking

KEYWORDS: Inclusions; Carbide Networks; Steel Alloys; Modeling and Simulation; Heat Treatment Modeling; Gears and Bearings

N251-D03 TITLE: DIRECT TO PHASE II: Accelerator-Based Launcher for Shipboard Systems

PLEASE NOTE TOPIC TITLE CHANGE

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Hypersonics;Space Technology

OBJECTIVE: Develop a shipboard Accelerator-Based Launch System to launch group 1-2 unmanned aerial vehicles (UAVs) distances of more than 70 km without using UAV fuel or energy. UAV payload could support intelligence, surveillance, and reconnaissance (ISR) or anti-submarine warfare (ASW) mission threads.

DESCRIPTION: Currently, the United States Navy utilizes traditional launching systems for unmanned aerial vehicles (UAVs) or Vertical Takeoff and Landing (VTOL) UAVs. These systems require a UAV to expense fuel immediately upon launch. The Naval Aviation Community is interested in an innovative air vehicle launching system having significantly higher end speeds to achieve a greater distance before a UAV begins to expense onboard fuel reserves. The Navy seeks to address the limitations of existing launching systems, which suffer from several drawbacks such as onboard fuel dependent launches and large footprints, limiting mission flexibility and ship capacity. With a system such as this, the UAV will have the ability to stay on aloft longer or increase payloads due to the increased fuel reserves. This could provide greater intelligence, surveillance, and reconnaissance (ISR) capabilities and force projection.
Deliverables:

- System Design: Design a shipboard accelerator-based launching system capable of releasing UAVs at speeds exceeding Mach 1. Achieve deployment distances greater than 70 km over ground and altitudes surpassing 40 km.
- Scaled Prototype: Construct a working scaled prototype that accurately models scaled exit velocities, distance over ground and altitude of the full-scale design.
- Air Vehicle Considerations: While the air vehicle doesn't have to currently exist, it can be derived from the launching system's launch forces. Aim for a UAV weight within the group 1-2 category (small to medium-sized), which can be scaled down for the prototype. If possible, a group 3 category weight is optional. Remember that the vehicle's weight directly affects the distance it can travel based on stored fuel capacity as well as duration on station.
- Size: This accelerator is expected to be adapted to work off of a sea-based platform. The ship or platform does not need to currently exist, but it would be preferred. The upper limit size restraint is no more than 294 m in length, 32 m beam and a draft of 12 m so that the vessel can traverse through the world's canals. If the vessel chosen is towed, the design must also incorporate the lead vessel into the mentioned dimensions to adequately be towed through canals.
- Support documentation: Provide documentation that demonstrates the scaled prototype will meet the full-scaled design if a full-scaled prototype was constructed.

PHASE I: For a Direct to Phase II topic, the Government expects that the small business would have accomplished the following in a Phase I-type effort and developed a concept for a workable prototype or design to address, at a minimum, the basic requirements of the stated objective above. The below actions would be required to satisfy the requirements of Phase I:
Proposers interested in submitting a Direct to Phase II proposal must provide documentation to substantiate that the scientific and technical merit and feasibility equivalent to a Phase I project has been met. Documentation can include data, reports, specific measurements, success criteria of a prototype, and so forth.

FEASIBILITY DOCUMENTATION: Offerors interested in participating in Direct to Phase II must include in their response to this topic Phase I feasibility documentation that substantiates the scientific and technical merit and Phase I feasibility described in Phase I above has been met (i.e., the small business must have performed Phase I-type research and development related to the topic NOT solely based on work performed under prior or ongoing federally funded SBIR/STTR work) and describe the potential commercialization applications. The documentation provided must validate that the proposer has completed development of technology as stated in Phase I above.

PHASE II: Provide a detailed design and engineering analyses consistent with a Critical Design Review. Include a demonstration of the full-scale system operating in simulation. If a subscale prototype can be built, utilize that to validate model performance. Provide detailed cost estimate, and a plan for manufacturing the full-scale prototype.

PHASE III DUAL USE APPLICATIONS: Build and test a full-scale prototype at sea.
This SBIR topic may benefit the private sector by providing a ship-based launching platform for satellites and UAVs. Having a mobile platform will better alleviate air and sea traffic from the area based on time of day, sea conditions, orbit or launch angle is required.

REFERENCES:

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2. Guertin, N. H. “Director Operational Test & Evaluation Report FY22.” Department of Defense, January 2023, p. 18. https://www.dote.osd.mil/portals/97/pub/reports/fy2022/fy22doteannualreport.pdf

KEYWORDS: Rotational Accelerator; Rotational Launcher; Launcher; Unmanned Aerial Vehicles; UAVs; Group 1, Group 2; Accelerator

N251-D04 TITLE: DIRECT TO PHASE II: Mission Center Large Screen Display Modernization

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Advanced Materials;FutureG

OBJECTIVE: Develop and demonstrate innovative technologies that upgrade the large screen display system in Ship's Mission Center (SMC) to improve mission viewing, introduce advanced mounting methodologies, and enhance viewing specifications to meet Navigation Electronic Chart Display and Information System – Navy (ECDIS-N) requirements.

DESCRIPTION: Improvement to the operational picture within the SMC is needed to modernize key capabilities by replacing the currently obsolete system. The Navy seeks an innovative large screen display with improved access for maintenance, improved operational availability (Ao) and minimal Mean-Time-To-Repair. The proposer should develop and demonstrate innovative technologies that upgrade the display system in the SMC to improve mission viewing, introduce advanced mounting methodologies, and enhance viewing specifications to meet Navigation Electronic Chart Display and Information System – Navy (ECDIS-N) requirements.

The Ship's display system requires an upgrade that will promote and support an efficient and rapidly responsive combat environment. The current configuration consists of four (4) projectors displaying an image on one (1) large display. Any proposed modular display should not exceed the dimensions of 280"x50" and must meet all environmental qualification requirements. Proposed technology must be capable of displaying high resolution content using computer inputs as well as a Jumbotron fine pixel pitch. Solutions must provide an acceptable viewing distance/range from 6ft to 30ft. The upgraded display system must be modular, facilitate ease of repair, and have a display and mounting structure no thicker than 6" from the bulkhead. Technology must fit within the existing interior of the SMC. Solution should utilize advanced mounting methodologies that incorporate shock and vibration mitigation. Any repairs should be quickly implemented to allow for continued operations and testing. Minimal training should be required for this process. The improved display should reduce maintenance and improve safety with a secured system by allowing for accessible maintenance. Ship integration of selected panel technology must incorporate Navy specific data inputs as determined by a review of existing system discrepancies and limitations. Develop display upgrades to bring available wall display technologies up to Navy standards for current Navy Combatant ships, starting with the DDG 1000 class. Supporting documents to be developed will include updates of drawing packages and Ship Change Documents submission. Leveraging existing commercial wall display technologies, potential solutions should advance system capabilities to meet or exceed all Navy ship specific requirements.

PHASE I: For a Direct to Phase II topic, the Government expects that the small business would have accomplished the following in a Phase I-type effort and developed a concept for a workable prototype or design to address, at a minimum, the basic requirements of the stated objective above. The below actions would be required in order to satisfy the requirements of Phase I:
Display viewing area as large as feasible to fit within the SMC not to exceed 280" wide x 50" high.
Provide resolution appropriate for viewing distance/range from 6ft to 30ft.
Display must meet color, brightness, and resolution requirements of ECDIS-N and other conventional ship console displayed systems.
Display system must be modular, easy to repair, and hatchable at the lowest replaceable unit level.

FEASIBILITY DOCUMENTATION: Offerors interested in participating in Direct to Phase II must include in their response to this topic Phase I feasibility documentation that substantiates the scientific and technical merit and Phase I feasibility described in Phase I above has been met (i.e., the small business must have performed Phase I-type research and development related to the topic NOT solely based on work performed under prior or ongoing federally funded SBIR/STTR work) and describe the

potential commercialization applications. The documentation provided must validate that the proposer has completed development of technology as stated in Phase I above. Documentation should include all relevant information including, but not limited to technical reports, test data, prototype designs/models, and performance goals/results. Work submitted within the feasibility documentation must have been substantially performed by the offeror and/or the principal investigator (PI). Read and follow all of the DoN SBIR 25.1 Direct to Phase II Broad Agency Announcement (BAA) Instructions. Phase I proposals will NOT be accepted for this topic.

PHASE II: Develop and demonstrate innovative technologies that upgrade the large screen display system in the SMC to improve mission viewing, introduce advanced mounting methodologies, and enhance viewing specifications to meet ECDIS-N requirements. Continue to develop the large screen display prototype through specified analysis and qualification testing to Navy requirements. Utilize mock-ups and customized application testing to validate the prototype hardware performance and that the above requirements are met and propose necessary modifications.

Provide specific design and hardware plan for a DDG 1000 SMC large screen display to meet or exceed the threshold performance objectives. Manufacture a prototype display to scale appropriate for evaluation. Develop a qualification test plan to include environmental requirements. Ensure the system design accommodates all shipboard input formats and meets Navy cyber protection standards. Execute test plan to fully qualify display and mounting system for a DDG 1000 SMC. Work with a Program Office to develop a final packaging design that meets the platform's Size, Weight, and Power (SWaP). Produce qualified first article at full scale suitable for installation in a DDG 1000 class ship. Demonstrate system performance in a military-relevant environment and ensure production readiness.

PHASE III DUAL USE APPLICATIONS: Support the DoD in transitioning large format displays to other operational environments. Commercial applications for such technology could include outdoor venues, cruise ships, fishing boats, golf courses, and sporting events.

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KEYWORDS: Screen Display; Navigation Electronic Chart Display and Information System – Navy (ECDIS-N); High Resolution; Modular; Mounting Technology; Secured System

N251-D05 TITLE: DIRECT TO PHASE II: Guided Wave Technology for Tank Leak Detection

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Microelectronics;Sustainment;Trusted AI and Autonomy

OBJECTIVE: Develop a portable, user-friendly Non-Destructive Testing and Evaluation (NDT&E) technology that will provide objective and easy to interpret data to detect and locate leaks in shipboard tanks without opening the tank.

DESCRIPTION: The Navy is interested in the application of methods or tools that may be combined with tank air testing to locate leaks. The Navy requires development of an advanced and novel solution that will allow for initial assessment to be performed more efficiently than the current process of targeting areas of concern that may require more detailed x-ray (NDT&E) to be performed. Examples of these new technologies for consideration should include the field of ultrasonics (guided waves) for test and analysis and provide a solution that is cost effective in purchase, operation, repair, and training.

Structurally sound and leak free tanks are mandatory to support a fully operational Naval asset. Tank repairs and satisfactory tank tightness testing are prerequisites for timely completion of ship repair availabilities. Locating leaks in built-in tanks is challenging, costly, and consumes valuable availability of man-hours. Commercial ships are required to conduct tank tightness checks on tanks that are opened in a shipyard availability and following repairs in accordance with ABS rules. Similarly, Navy repair activities follow similar requirements in accordance with NAVSEA technical requirements. Tanks are verified tight through hydro-pneumatic or pneumatic pressure drop testing. Difficult to locate leaks in U.S. Navy surface ships are identified by entering a tank, visually inspecting it for suspect areas, cleaning the suspect areas, and performing magnetic particle testing to confirm the extent of the defect. Preparations in larger tanks may involve expensive staging to obtain safe access to suspect areas. The Navy requires a technology that can locate leaks prior to opening a tank to help direct visual and conventional NDT&E follow-up to a leak location to expediting repairs, save man-day costs, and contribute to on-time availability completion.

Built-in tanks on surface combatants, amphibious ships, carriers, and auxiliary ships are most susceptible to leaks due to weld cracks, corrosion thinning, and tank penetration stress concentrations. The Navy requires an NDT&E method or tool that will direct an NDT&E technician to a specific area in a tank where a leak is present without entering the tank. The ability to accurately determine a leak location will result in a significant decrease in inspection and repair man-hours and ultimately, expedite satisfactory tank close out leading to on-time availability completions. The method or tool must be portable, capable of operation with or without the availability of a power source, and provide automated results easily interpreted by shipyard trades that routinely test tanks for tightness. It is highly desirable that the tank leak locating method or tool provide leak locating utility during pre-availability and early availability periods. The developed solution can be used in statically and dynamically assessing the integrity of naval vessel storage tanks.

PHASE I: For a Direct to Phase II topic, the Government expects that the small business would have accomplished the following in a Phase I-type feasibility effort and developed a concept for a workable prototype or design to address, at a minimum, the basic requirements for identifying leaks in built-in tanks using a novel NDT&E solution.

FEASIBILITY DOCUMENTATION: Offerors interested in participating in Direct to Phase II must include in their response to this topic Phase I feasibility documentation that substantiates the scientific and technical merit and describe the potential commercialization applications. The documentation provided must validate that the proposer has completed development of technology as stated in Phase I

above. Documentation should include all relevant information including, but not limited to technical reports, test data, prototype designs/models, and performance goals/results. Work submitted within the feasibility documentation must have been substantially performed by the offeror and/or the principal investigator (PI). Read and follow all of the DoN SBIR 25.1 Direct to Phase II Broad Agency Announcement (BAA) Instructions. Phase I proposals will NOT be accepted for this topic.

PHASE II: Develop and deliver an advanced, portable, NDT&E solution (hardware/software/firmware) using guided wave technology (ultrasonics) for use by shipyard or regional maintenance center personnel in assessing liquid stage tanks (fuel, water, lube oil, etc.). Produce a prototype to be used to determine and locate leaks and material defects in tanks without opening the tank plus applicable technical data and training.

PHASE III DUAL USE APPLICATIONS: Assist the Navy in transitioning the technology for Navy use. Provide and field an NDT&E system based on unique, cutting-edge technology that will be used for non-invasively and accurately locating leaks in tanks on naval vessels. Provide Navy personnel with training on how to utilize the system for the collection of data. Work with Navy personnel in conducting analysis until such time as they intend to assume that role.

In a manner like shipboard tank assessments, this same novel NDT&E system can be employed on large, above ground storage tanks (AST), common to both military and civilian petrochemical storage, to identify and locate AST bottom plate leaks and assess AST bottom plate integrity.
This technology would apply to commercial ship inspections.

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KEYWORDS: Guided Wave Analysis; Leak Detection; Non-Destructive Testing & Evaluation; Ultrasonic Sensors; Tanks; Microelectronics

N251-D06 TITLE: DIRECT TO PHASE II: Tiling Approach to Large Format Focal Plane Arrays

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Integrated Sensing and Cyber;Microelectronics

The technology within this topic is restricted under the International Traffic in Arms Regulation (ITAR), 22 CFR Parts 120-130, which controls the export and import of defense-related material and services, including export of sensitive technical data, or the Export Administration Regulation (EAR), 15 CFR Parts 730-774, which controls dual use items. Offerors must disclose any proposed use of foreign nationals (FNs), their country(ies) of origin, the type of visa or work permit possessed, and the statement of work (SOW) tasks intended for accomplishment by the FN(s) in accordance with the Announcement. Offerors are advised foreign nationals proposed to perform on this topic may be restricted due to the technical data under US Export Control Laws.

OBJECTIVE: Develop and demonstrate a focal plane array (FPA) tiling technique that permits small, high-yield FPA and/or read-out integrated circuits (ROIC) chiplets to be assembled into a high-performing, large format FPA having appropriate flatness (or curvature) and uniformity to produce high-quality, wide field-of-view (FOV) imagery with improved manufacturing cost and yield.

DESCRIPTION: FPAs are routinely used in military imaging systems operating in the infrared (IR) spectral bands. Achieving high resolution and wide FOV simultaneously results in competing objectives as high resolution requires many pixels on target, while widening FOV inherently leads to increasing pixel sparsity. FPA technology development is therefore driven to two extremes: smaller pixels to increase resolution and larger array sizes to increase FOV. However, due to the lack of lattice compatibility between crystalline Si-based ROIC and epitaxially grown IR detector materials, the sensing layer and ROIC are currently assembled using indium-based bump-bonding techniques, which become more difficult as pixel size is decreased and array size increased. FPA advancement is further challenged by decreasing ROIC yield with increasing ROIC size due to the exponential increase in fabrication defects with ROIC area. While alternatives to bump-bonding may be found, the ROIC yield challenge continues to impede large FPA development because a multitude of Silicon (Si) wafers must be sacrificed to achieve a few ROICs that meet performance requirements.

To improve ROIC yield, tiling approaches in which high yielding small format ROICs or FPAs are assembled into larger arrays have been suggested for over a decade, but tiling remains largely a concept. The active area of existing ROIC designs is surrounded by peripheral electronics that provide address logic and detector bias voltages. To enable tiling, the peripheral electronics must be relocated to permit high fill-factor assembly, thereby avoiding image artifacts arising from inter-tile gaps. The tiled array must also be highly planar to remain within the depth of focus of the image collection optic. These requirements can potentially be met by 3D electronics integration, which should in principle be easy as the connection involves only Si-based analog and digital layers. The purpose of this Direct-to-Phase-II topic is to develop and demonstrate a prototype process for low-cost, large MWIR FPA and ROIC fabrication with tiling.

PHASE I: For a Direct-to-Phase II topic, the Government expects that the small business has accomplished the following:

- Demonstrated experience in FPA fabrication.
- Developed ROIC designs that enable 2- and/or 4-sided tiling of ROICs or FPAs, such that peripheral electronics have been relocated.
- Developed a tiling technique that enables 2- and/or 4-sided tiling of ROICs or FPAs with sufficient precision to permit inter-tile gaps of < 1 pixel to be routinely achieved.
- Developed techniques to synchronize tile-based images to form full-frame images.

FEASIBILITY DOCUMENTATION: Offerors interested in participating in Direct to Phase II must include in their response to this topic Phase I feasibility documentation that substantiates the scientific and technical merit and Phase I feasibility described in Phase I above has been met (i.e., the small business must have performed Phase I-type research and development related to the topic NOT solely based on work performed under prior or ongoing federally funded SBIR/STTR work) and describe the potential commercialization applications. The documentation provided must validate that the proposer has completed development of technology as stated in Phase I above. Documentation should include all relevant information including, but not limited to: technical reports, test data, prototype designs/models, and performance goals/results. Work submitted within the feasibility documentation must have been substantially performed by the offeror and/or the principal investigator (PI). Read and follow all of the DoN SBIR 25.1 Direct to Phase II Broad Agency Announcement (BAA) Instructions. Phase I proposals will NOT be accepted for this topic.

PHASE II: The Phase II effort, including the Base and Option periods, should fabricate a fully functional tiled FPA consisting of at least 4 tiles, either in a 2x2 2D tile array or a 1x4 1D tile array mounted on a precision interposer. The preferred detector type is the high operating temperature (HOT) mid-wave infrared (MWIR) strained-layer superlattice (SLS) detector. Individual tiles should consist of NKxMK (for example 2048 x 2048) arrays of 5 micrometer (um) pixels, where N and M are selected to produce maximum tiled FPA yield. It is anticipated that peripheral electronics will be direct-bonded to form a multi-layer 3D integrated stack consisting of the detector layer, analog electronics layer, mixed signal layer, and precision interposer layer, although other designs, such as 1D tile arrays where all peripheral electronics are located on 2 sides, are also of interest. The tiling process can involve assembly of complete FPA tiles on an interposer or the assembly of ROIC tiles followed by bonding of a single, full-size, detector array. The tiled FPA will be fabricated from selected, defect-free individual tiles, as some defective tile yield is expected even for these smaller ROIC units. Importantly, the sensor chip assembly should be thoroughly and quantitatively characterized at ambient and operating temperature for operability, noise, gap widths, planarity, and be ready for camera integration in separate, subsequent testing.) Phase II deliverable will be a prototype camera core (tiled sensor chip assembly) packaged in a test dewar with appropriate optics and control electronics. A final report will include relative design and data package, Manufacturing Readiness Level (MRL) assessment for large format focal plane array producibility, and user's manual for the prototype camera. The Seminal Transition Event will include an imaging demonstration and will occur at the conclusion of Phase II.

PHASE III DUAL USE APPLICATIONS: Large format FPA arrays are in demand across the Services. Within the Navy, the Shipboard Passive Electro-Optic and Infrared (SPEIR) Program of Record (PoR) has a requirement for wide FOV, high-resolution MWIR sensors for surface ships to which this technology is expected to transition. Successful completion of Phase II is expected to result in Phase III funding to scale up the tiled FPA size, improve manufacturability, and pursue other optimizations. Extensive field testing will be performed in Phase III in relevant environments to demonstrate capability. Successful demonstration of tile-based large array format sensors would benefit and improve camera technologies for the commercial digital photography and computer vision, astrophotography/astronomy, and autonomous navigation markets.

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KEYWORDS: Focal Plane Array (FPA); Tiling; Chiplet; Readout Integrated Circuit (ROIC), Optical Detector Array; Mid-Wave Infrared (MWIR); Infrared; IR

N251-D07 TITLE: DIRECT TO PHASE II: Next-generation Design Tools for Accelerated Navy Shipbuilding

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Advanced Computing and Software

OBJECTIVE: Develop next-generation software design tools for Navy vessels, with a focus on medium or large autonomous surface vessels, that will enable dramatically faster design, construction, and outfitting times.

DESCRIPTION: The U.S. commercial shipbuilding industry is not competitive in the world market and has become a key vulnerability in the U.S. defense industrial base [Ref 1]. U.S. shipbuilding capacity has contracted drastically over the past decades; however, the Navy's shipbuilding budget has increased over the past several years, creating significant challenges in the U.S.'s capacity to meet that demand [Ref 2]. Increasing output quickly and efficiently involves addressing several areas such as shipyard modernization, rebuilding the workforce, and strategic economic development [Ref 2]. In addition, and the focus of this SBIR topic, is the development of new design tools for Navy ships or combatant craft (defined for the purposes of this topic as smaller vessels up to 200 ft long).

The intent of this topic is a substantial increase in the capability of design tools over today's state-of-the-art, directed toward dramatically faster design and construction (including fabrication, outfitting, and testing) times, with a focus on medium or large autonomous surface vessels. It is anticipated that the starting TRL of this effort will be TRL 2-3. The Navy today uses several tools, such as CREATE-SHIPS, which is a set of physics-based engineering tools developed by DoD [Refs 3,4,5] and includes, for example, Rapid Ship Design Environment (RSDE) for concept design, Integrated Hydrodynamics Design Environment (IHDE), and Integrated Structural Design Environment (ISDE). The Navy also uses Leading Edge Architecture for Prototyping Systems (LEAPS) [Ref 6] for a common database, Smart Ship Systems Design (S3D) [Ref 7], etc. Great progress has been made over the past few years in the development of new design tools, such as tools for simulation and virtual testing, digital twins, tools that help understand the cost and schedule impacts of requirements, visualization tools such as virtual reality, etc. Today, we are seeing tremendous advances in artificial intelligence/machine learning (AI/ML) approaches and increasing availability of large datasets. Ship requirements evolve rapidly and increasing complexity requires greater design space exploration. AI/ML approaches have potential to enable this design space exploration. Further, multi-domain optimization techniques continue to be developed, providing additional ability to explore design space [Ref 8].

Questions to consider include (1) Can a ship design be optimized for producibility, using a much larger number of parameters than possible today? And (2) Furthermore, might the entire construction be optimized, early in the design phase, including fabrication, outfitting, and testing, rather than just optimizing the structure? Moreover, quantum computing is maturing rapidly, which might allow huge numbers of possible alternatives to be examined quickly and efficiently. Computational fluid dynamic (CFD) capability has also progressed substantially [Ref 9] so can CFD and other methods be used to enable simulation capability for virtual testing of the hydrodynamic performance of early-stage designs? Virtual testing may also be beneficial for structure, control systems, topside signatures, shock damage, underwater explosion, and chemical/biological/radiation/nuclear (CBRN) defense. Digital twins of shipboard systems or subsystems might be used to optimize producibility so could a digital twin of the entire manufacturing process (construction, outfitting, testing) be used to optimize the process and foresee bottlenecks or rate-limiting steps?

Capabilities for design space exploration, design optimization, understanding cost and schedule earlier in the design process and understanding cost and schedule impact of changed requirements will all play a role in increasing the U.S. shipbuilding capacity.

SEA AIR SPACE EXPOSITION SMALL BUSINESS SHOWCASE: Small business concerns that are selected to submit a Full DP2 Proposal to topic N251-D07 will be invited to present their capabilities with leadership and attendees during the Navy Sea Air Space Exposition Small Business Showcase (SBS). As Sea Air Space occurs after the selections for consideration of award for Full DP2 Proposals, no information presented by the small business concerns at Sea Air Space will be considered evaluative. Small business concerns that submit a proposal to topic N251-D07 will be invited to attend the Small Business Showcase. Information on registration for the Small Business Showcase will be sent via email to the contacts listed on the proposal coversheet after the close of this BAA. Sea Air Space will be held April 6-9, 2025 in the Washington, DC area. Though there is no registration fee to participate in the Small Business Showcase activity at Sea Air Space, all travel, lodging, and other related costs for Sea Air Space are the responsibility of the small business concern.

PHASE I: For a Direct to Phase II topic, the Government expects that the small business will have accomplished the following in a Phase I-type effort and developed a concept for a workable prototype or design to address, at a minimum, the basic requirements of the stated objective above. The below actions would be required in order to satisfy the requirements of Phase I:

- Proposals must show that the Offeror understands the current state of the art in ship design tools including the ones mentioned above, explain how the proposed approach will advance the state of the art and explain the return on investment.
- Proposals must describe in detail the Offeror's concept for next-generation ship/craft design tools. The proposal should clearly explain the rationale for the selection of the proposed concept for next-generation ship or craft design tools and how it will enable faster design and construction times. This rationale must be clearly supported by, for example, analysis, testing in simulation, and/or small scale-model testing. The rationale must include a discussion of how the proposed approach addresses and significantly accelerates a rate-limiting step in the design process.
- Proposal must clearly define the scope of the proposed effort, which is anticipated to be a subset of that discussed in the Description section, and show that the proposed scope is commensurate with the available resources and project duration.
- Approaches to next-generation ship/craft design tools that are adapted from non-maritime systems are of interest. In this case, the proposal would need to demonstrate understanding of the differences between design of the non-maritime system and a ship and how these differences will be addressed in the SBIR Phase II.
- Approaches that leverage previous lower-TRL research in this area are of interest and partnering with a university engaged in this research will be beneficial.
- The proposal must describe the approach to testing and validation of the next-generation design tool(s). The proposal must provide a clear explanation of the feasibility of the proposed testing methodology.

FEASIBILITY DOCUMENTATION: Offerors interested in participating in Direct to Phase II must include in their response to this topic Phase I feasibility documentation that substantiates the scientific and technical merit and Phase I feasibility described in Phase I above has been met (i.e., the small business must have performed Phase I-type research and development related to the topic NOT solely based on work performed under prior or ongoing federally funded SBIR/STTR work) and describe the potential commercialization applications. The documentation provided must validate that the proposer has completed development of technology as stated in Phase I above. Documentation should include all relevant information including, but not limited to technical reports, test data, prototype designs/models, and performance goals/results. Work submitted within the feasibility documentation must have been substantially performed by the offeror and/or the principal investigator (PI). Read and follow all of the DON SBIR 25.1 Direct to Phase II Broad Agency Announcement (BAA) Instructions. Phase I proposals will NOT be accepted for this topic.

PHASE II: Using results from the Phase I-type effort, develop, demonstrate, and validate prototype next-generation ship design tool(s) that develop next-generation design tools for Navy ships that will enable faster ship design and construction (including fabrication, outfitting, and testing) times.
Address, at a minimum:

1) Development of the algorithm, process, etc. that the next-generation design tool will be based on.
2) Testing to support development of the next-generation design tools(s).
3) Testing to confirm and validate the function of the next-generation design tools(s). This testing will confirm the ability of the design tool(s) to reduce ship design and construction time. The validation phase will elucidate the exit TRL of the next-generation design tool(s) resulting from this project.
4) Clearly define the scope of the proposed effort, which is anticipated to be a subset of that described in the Description above and show that the proposed scope is commensurate with the available resources and project duration.
5) Description of how the software is architected to address cyber security issues and the approach for doing so.

Provide deliverables that include the next-generation design tool software, a report containing robust documentation of the software data acquired during this project (including algorithms, architecture, interfaces, build instructions, necessary software components and environment to build the next-generation design tool software, and a software user manual); and test methodology, metrics, and results.

Note: Teams that are structured to facilitate knowledge transfer of previous research results to this project, for example a small business-university team, are strongly encouraged.

The Phase II period of performance is anticipated to be four years; 24 month Base, 24 month Option, if exercised.

PHASE III DUAL USE APPLICATIONS: Given successful completion of the Phase II project and subject to availability of funding, the expected transition of next-generation ship design tools resulting from this Phase II SBIR is expected to be into the acquisition program. To enable successful commercialization, Phase III is expected to address integration, via interfaces defined by the Navy, of the next-generation ship design tool(s) product resulting from this Phase II SBIR into a larger architecture, cyber security compliant next-generation ship design tool, as well as additional rigorous testing in higher fidelity environments. Such a set of design tools might also be used to design commercial or civilian ships.

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KEYWORDS: ship design tools; shipbuilding; multi-objective optimization; digital twin; computational fluid dynamics; autonomous surface vessels