

DEPARTMENT OF THE NAVY (DON)
Small Business Innovation Research (SBIR)
DoW 2026 SBIR BAA Release 2
Phase I Proposal Submission Instructions

IMPORTANT

- **The following instructions apply to topics:**
 - **DON26BZ02-NV045 through DON26BZ02-NV050**
- Submitting small business concerns (SBCs) are encouraged to thoroughly review the DoW SBIR/STTR Program Broad Agency Announcement (BAA) and register for the DSIP Listserv to remain apprised of important programmatic changes.
 - The DoW Program BAA is located at: <https://www.dodsbirsttr.mil/submissions/login>. 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 DoW Instructions posted for this BAA.
- **DON Phase I Technical Volume (Volume 2) page limit is not to exceed 10 pages.**
- Proposing SBCs 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 SBCs are detailed in the section titled ADDITIONAL SUBMISSION CONSIDERATIONS.
- Phase I Technical Volume (Volume 2) and Supporting Documents (Volume 5) templates, specific to DON topics, are available at https://www.navysbir.com/links_forms.htm.
- The DON may consider the following FAR and Non-FAR contract strategies when issuing Phase I awards: Firm Fixed Price (FFP), Basic Ordering Agreement (BOA), or Prototype Other Transaction (OT). The DON may consider the following FAR and Non-FAR contracting strategies when issuing Phase II awards: Cost Plus Fixed Fee (CPFF), FFP, BOA, or Prototype OT.
- 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 SBC.

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.navy.sbir.com. Additional information on DON’s mission can be found on the DON website at www.navy.mil.

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	Navy 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 DoW SBIR/STTR Innovation Portal (DSIP). Refer to the Proposal Submission section of the DoW SBIR/STTR Program BAA for details.
	BAA Open	DoW SBIR/STTR Topic Q&A platform (https://www.dodsbirsttr.mil/submissions) Refer to the Proposal Submission section of the DoW SBIR/STTR Program BAA for details.
Electronic submission to the DoW 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 COMMANDS (SYSCOM) SBIR PROGRAM MANAGERS

Topic Numbers	Point of Contact	SYSCOM	Email
DON26BZ02-NV045 to DON26BZ02-NV050	Mr. Jason Schroeffer	Naval Sea Systems Command (NAVSEA)	NSSC_SBIR.fct@navy.mil

PHASE I SUBMISSION INSTRUCTIONS

The following section details requirements for submitting a compliant Phase I proposal to the DoW SBIR/STTR Programs.

(NOTE: Proposing SBCs 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.)

DoW SBIR/STTR Innovation Portal (DSIP). Proposing SBCs are required to submit proposals via the DoW SBIR/STTR Innovation Portal (DSIP); and follow proposal submission instructions in the DoW SBIR/STTR Program BAA on the DSIP at <https://www.dodsbirsttr.mil/submissions>. Proposals submitted by any other means will be disregarded. Proposing SBCs submitting through DSIP for the first time will be asked to register. It is recommended that SBCs 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 DoW SBIR/STTR Program BAA for further information.

Proposal Volumes. The following seven volumes are required.

- **Proposal Cover Sheet (Volume 1).** As specified in DoW SBIR/STTR Program BAA.
- **Technical Proposal (Volume 2)**
 - Technical Proposal (Volume 2) must meet the following requirements or the proposal will be REJECTED:
 - Not to exceed ten (10) pages, regardless of page content
 - 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
 - Include, within the ten-page limit of Volume 2, an Option that furthers the effort in preparation for Phase II and will bridge the funding gap between the end of Phase I and the start of Phase II. Tasks for both the Phase I Base and the Phase I Option must be clearly identified. Phase I Options are exercised upon selection for Phase II.
 - Work proposed for the Phase I Base must be exactly six (6) months.
 - Work proposed for the Phase I Option must be exactly six (6) months.
 - Additional information:
 - A Phase I proposal template specific to DON to meet Phase I requirements is available at https://navysbir.com/links_forms.htm
 - A font size smaller than 10-point is allowable for headers, footers, imbedded tables, figures, images, or graphics that include text. However, proposing SBCs are cautioned that if the text is too small to be legible it will not be evaluated.
- **Cost Volume (Volume 3).**
 - Cost Volume (Volume 3) must meet the following requirements or the proposal will be REJECTED:
 - The Phase I Base amount must not exceed \$140,000.
 - Phase I Option amount must not exceed \$100,000.
 - Costs for the Base and Option must be separated and clearly identified in Volume 3.

- For Phase I, a minimum of two-thirds of the work is performed by the proposing SBC. The two-thirds percentage of work requirement must be met in the Base costs as well as in the Option costs. DON will not accept deviations from the minimum percentage of work requirements for Phase I. The percentage of work is measured by both direct and indirect costs. To calculate the minimum percentage of work for the proposing SBC the sum of all direct and indirect costs attributable to the proposing SBC 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 (Total Subcontractor Costs (TSC)) as the numerator and the total cost of the proposal (i.e., Total Cost before Profit Rate is applied) as the denominator.
 - Proposing SBC Costs (included in numerator for calculation of the SBC):
 - Total Direct Labor (TDL)
 - Total Direct Material Costs (TDM)
 - Total Direct Supplies Costs (TDS)
 - Total Direct Equipment Costs (TDE)
 - Total Direct Travel Costs (TDT)
 - Total Other Direct Costs (TODC)
 - General & Administrative Cost (G&A)
 - NOTE:** G&A, if proposed, will only be attributed to the proposing SBC.
 - Subcontractor Costs (numerator for subcontractor calculation):
 - Total Subcontractor Costs (TSC)
 - Total Cost (i.e., Total Cost before Profit Rate is applied, denominator for either calculation)
- **Cost Sharing: Cost sharing is not accepted on DON Phase I proposals. A value above or below \$0.00 entered in the Cost Sharing field will not be considered in the Phase I contract award.**
- Additional information:
 - 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. When a proposal is selected for award, be prepared to submit further documentation to the SYSCOM Contracting Officer to substantiate costs (e.g., an explanation of cost estimates for equipment, materials, and consultants or subcontractors).
- **Company Commercialization Report (Volume 4).** DoW 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 DoW 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.
 - Proposing SBCs must review and submit the following items, as applicable:

- **Majority Ownership in Part.** Proposing SBCs 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. Complete the certification as detailed under ADDITIONAL SUBMISSION CONSIDERATIONS.
- Additional information:
 - Proposing SBCs 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 SBC 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
 - 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 (TABAs), 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) in Volume 5 (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 SBCs are cautioned that the text may be unreadable.
- **Fraud, Waste and Abuse Training Certification (Volume 6).** DoW requires Volume 6 for submission. Please refer to the Proposal Preparation Instructions and Requirements section of the DoW 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 DoW will review all proposals submitted in response to this BAA to assess security risks presented by SBCs seeking a Federally funded award. SBCs 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 DoW SBIR/STTR Program BAA for details.

PHASE I EVALUATION AND SELECTION

The following section details how the DON SBIR/STTR Programs will evaluate Phase I 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 DoW 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 SBC has met eligibility requirements and followed the instructions for the Proposal Cover Sheet as specified in the DoW SBIR/STTR Program BAA.

- **Technical Volume (Volume 2).** The DON will evaluate and select Phase I proposals using the evaluation criteria specified in the Method of Selection and Evaluation Criteria section of the DoW 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 SBC has met the following requirements or the proposal will be REJECTED:

- Not to exceed ten (10) pages, regardless of page content
 - 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.
 - Include, within the 10-page limit of Volume 2, an Option that furthers the effort in preparation for Phase II and will bridge the funding gap between the end of Phase I and the start of Phase II. Tasks for both the Phase I Base and the Phase I Option must be clearly identified.
 - Work proposed for the Phase I Base must be exactly six (6) months.
 - Work proposed for the Phase I Option must be exactly six (6) months.
- **Cost Volume (Volume 3).** The Cost Volume (Volume 3) will not be considered in the selection process and will only undergo a compliance review to verify the proposing SBC has met the following requirements or the proposal will be REJECTED:
 - Must not exceed values for the Base (\$140,000) and Option (\$100,000).
 - Must meet minimum percentage of work; a minimum of two-thirds of the work is performed by the proposing SBC. The two-thirds percentage of work requirement must be met in the Base costs as well as in the Option costs. DON will not accept deviations from the minimum percentage of work requirements for Phase I.
 - **Cost Sharing: Cost sharing is not accepted on DON Phase I proposals. A value above or below \$0.00 entered in the Cost Sharing field will not be considered in the Phase I contract award.**
 - **Company Commercialization Report (CCR) (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 SBCs must refer to the DoW 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 SBC has included items in accordance with the PHASE I 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 DoW SBIR/STTR Program BAA to ensure compliance with Volume 7 requirements.

ADDITIONAL SUBMISSION CONSIDERATIONS

This section details additional items for proposing SBCs 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 War, in coordination with the Small Business Administration, to establish and implement a due diligence program to assess security risks presented by SBCs seeking a Federally-funded award. Please review the Certifications and Registrations section of the DoW SBIR/STTR Program BAA for details on how DoW will assess security risks presented by SBCs. 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 SBCs may request, in their Phase I Cost Volume (Volume 3) and Phase II Cost Volume, to contract these services themselves through one or more TABA providers in an amount not to exceed the values specified below. The Phase I TABA amount is up to \$6,500 and is in addition to the award amount. 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). As with Phase I, the amount proposed for TABA cannot include any profit/fee by the proposing SBC 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 SBC. 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. An SBC receiving TABA will be required to submit a report detailing the results and benefits of the service received. This TABA report will be due at the time of submission of the final report.

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 SBC
- propose a TABA provider that is the SBIR proposing SBC
- propose a TABA provider that is an affiliate of the SBIR proposing SBC
- propose a TABA provider that is an investor of the SBIR proposing SBC
- propose a TABA provider that is a subcontractor or consultant of the requesting SBC 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 I:
 - Online DoW Cost Volume (Volume 3) – 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.
- 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 I: A total of \$6,500
- Phase II: A total of \$25,000 per award, not to exceed \$50,000 per Phase II project

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 SBC 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). An SBC 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 SBCs 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 SBCs 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, SBCs must register with the SBA Company Registry Database.
- b. The proposing SBC 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 SBC become a member of this ownership class after submitting its proposal and prior to any receipt of a funding agreement, the proposing SBC 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 SBCs 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 SBCs should confirm that they are registered to receive contracts (not just grants) and the address in SAM matches the address on the proposal. An SBC selected for an award MUST have an active SAM registration at the time of award or they will be considered ineligible.

Cybersecurity Maturity Model Certification (CMMC) Program. DoW has established the CMMC Program to verify that awardees have implemented required security measures necessary to safeguard Federal Contract Information (FCI) and Controlled Unclassified Information (CUI). CMMC Level requirements are identified within each topic and must be met prior to award. Proposing SBCs should anticipate that a Projected CMMC Level for Phase II award may be higher than the Projected CMMC Level advertised in the Phase I topic. Proposing SBCs should carefully review and consider the CMMC requirements as compliance may impact proposed costs and technical approach. Please review the DoW SBIR/STTR Program BAA for additional information on the CMMC Program.

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 252.240-7997, in order to be considered for award, an SBC 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. Due to the short timeframe associated with Phase I of the SBIR/STTR process, the DON does **not** recommend the submission of Phase I proposals that require the use of Human Subjects, Animal Testing, or Recombinant DNA. For example, the ability to obtain Institutional Review Board (IRB) approval for proposals that involve human subjects can take 6-12 months, and that lengthy process can be at odds with the Phase I goal for time-to-award. Before the DON makes any award that involves an IRB or similar approval requirement, the proposing SBC must demonstrate compliance with relevant regulatory approval requirements that pertain to proposals involving human, animal, or recombinant DNA protocols. It will not impact the DON's evaluation, but requiring IRB approval may delay the start time of the Phase I award and if approvals are not obtained within two months of notification of selection, the decision to award may be terminated. If the use of human, animal, and recombinant DNA is included under a Phase I or Phase II 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.

Government Furnished Equipment (GFE). Due to the typical lengthy time for approval to obtain GFE, it is recommended that GFE is not proposed as part of the Phase I proposal. If GFE is proposed, and it is determined during the proposal evaluation process to be unavailable, proposed GFE may be considered a weakness in the technical merit of the proposal.

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 SBC 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 compliance review of Volume 3 to confirm eligibility of the proposing SBC, and to take other relevant steps necessary prior to making an award.

Contract Types. A Firm Fixed Price (FFP), Basic Ordering Agreement (BOA), or Prototype Other Transaction (OT) may be used for Phase I awards.

Funding Limitations. In accordance with the SBIR and STTR Policy Directive section 4(b)(5), there is a limit of one sequential Phase II award per SBC per topic. The maximum Phase I proposal/award amount including all options is \$240,000. The Phase I Base amount must not exceed \$140,000 and the Phase I Option amount must not exceed \$100,000. The maximum Phase II proposal/award amount including all options (including TABA) is \$2,000,000 (unless non-SBIR/STTR funding is being added). Individual SYSCOMs may award amounts, including Base and all Options, of less than \$2,000,000 based on available funding. The structure of the Phase II proposal/award, including maximum amounts as well as breakdown between Base and Option amounts will be provided to all Phase I awardees either in their

Phase I award or a minimum of 30 days prior to the due date for submission of their Initial Phase II proposal.

Contract Deliverables. Contract deliverables for Phase I are typically a kick-off brief, progress reports, and a final report. Required contract deliverables (as stated in the contract) must be uploaded to <https://www.navysbirprogram.com/navydeliverables/>.

Payments. The DON makes three payments from the start of the Phase I Base period, and from the start of the Phase I Option period, if exercised. Payment amounts represent a set percentage of the Base or Option value as follows:

Days from Start of Base Award or Option	Payment Amount
15 Days	50% of Total Base or Option
90 Days	35% of Total Base or Option
180 Days	15% of Total Base or Option

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 II GUIDELINES

Evaluation and Selection. All Phase I awardees may submit an **Initial** Phase II proposal for evaluation and selection. The evaluation criteria for Phase II is the same as Phase I (as stated in this BAA). The Phase I Final Report and Initial Phase II Proposal will be used to evaluate the SBC's potential to progress to a workable prototype in Phase II and transition the technology to Phase III. Details on the due date, content, and submission requirements of the Initial Phase II Proposal will be provided by the awarding SYSCOM either in the Phase I contract or by subsequent notification.

Awards. The DON will consider the following for Phase II award: Cost Plus Fixed Fee (CPFF), Firm Fixed Price (FFP), Basic Ordering Agreement (BOA), or Prototype Other Transaction (OT). Phase II awards can be structured in a way that allows for increased funding levels based on the project's transition potential. To accelerate the transition of SBIR/STTR-funded technologies to Phase III, especially those that lead to Programs of Record and fielded systems, the Commercialization Readiness Program was authorized and created as part of section 5122 of the National Defense Authorization Act of Fiscal Year 2012. The statute set-aside is 1% of the available SBIR/STTR funding to be used for administrative support to accelerate transition of SBIR/STTR-developed technologies and provide non-financial resources for the SBCs (e.g., the Navy SBIR Transition Program, STP).

Navy SBIR Transition Program (STP). Phase II awardees have the opportunity to 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.

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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DON26BZ02-NV045 TITLE: Active Detection of Low-Observable Surface Targets through Electro-Optical Means

OUSW (R&E) CRITICAL TECHNOLOGY AREA(S): Quantum and Battlefield Information Dominance (Q-BID)

COMPONENT TECHNOLOGY PRIORITY AREA(S): Integrated Sensing and Cyber;Microelectronics

PROJECTED CMMC LEVEL REQUIREMENT: Level 2 (Self)

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 a means to detect, determine the range of, and track low-observable surface targets utilizing active electro-optical sensors.

DESCRIPTION: The Navy continues to field multiple systems incorporating imaging sensors (cameras). Taken collectively, the Navy has cameras covering both wide and narrow fields of view, with varying resolution (pixel count), and operating across essentially the entire span of visible to infrared (IR) wavelength bands. For surface ships, camera sensors are used for general situational awareness, to aid in navigation for target detection and tracking, and for targeting. Camera sensors, even those operating in the IR, provide information (video imagery) to the ship's crew that is fundamentally familiar, intuitive, and contextual. However, that does not mean that the information is complete and unambiguous. A particularly challenging problem is the detection of low-observable surface objects (targets). These targets are small enough that their motion is subject to wave conditions as low as sea state 3. These objects rise and fall with the waves such that, for oblique observation angles, they are obscured from observation when at other than the crest of the wave. These objects are also typically submerged to a large degree, with only a fraction of their size breaking above the surface of the water. Low-observable targets include relatively benign objects such as drifting debris, buoys, and navigation markers. They also include lethal objects such as floating mines and semi-submersible crafts such as sea attack drones. In between these two extremes are a host of mine-like objects (MLOs), floating hazards (for example, shipping containers), personnel in the water, and marine mammals that are of high importance for general safety and safe navigation. While small commercial and civilian pleasure craft would typically not be considered low-observable objects (because they purposely make themselves observable with running lights), the Navy does occasionally assist in searching for small vessels in distress or downed aircraft that, under the circumstances, are considered low-observable objects. One final class of low-observable targets is periscopes and elements of submarine masts that have a small cross-section and are intermittent by nature. For strictly passive imaging sensors, low-observable targets are obscured by wave clutter and sun glint, even when in the direct line of sight. They are often only intermittently visible due to wave action. White caps, foam, and spray caused by breaking waves further obscure targets, present false targets, and significantly add clutter, especially in the visible band. Active sensors – essentially the incorporation of a laser, or multiple lasers, can improve the probability of accurate detection. In addition, incorporation of a

laser provides the possibility of obtaining critical range information on the target, something that is quite difficult to do with strictly passive imaging sensors.

However, active sensing presents its own challenges. Lasers are highly focused and must be directly incident on the target. Fast scanning or scanning in discrete steps with a focused beam runs a significant risk that small targets will be missed. Laser beams can be expanded into a fan pattern through incorporation of suitably chosen lens elements, but the incident laser power on the target is then correspondingly decreased, reducing the detection range. Increasing the laser power to compensate for this runs the risk of producing a hazard to friendly personnel, bystanders, marine life, and equipment. Hybrid detection schemes that incorporate multiple lasers or switch the beam(s) from broad to narrowly focused through opto-mechanical means add cost and system complexity. Semi-active means, whereby the laser acts as an illumination source with the returned light received by an imaging sensor, are possible, but this increases the complexity of determining range.

The Navy seeks an active electro-optic/IR (EO/IR) sensing technology that compliments shipboard passive imaging sensors (cameras). This technology is needed to detect low-observable targets, as defined above, with no known commercially available solution. Detection is defined as determination of relative azimuth and range. Tracking will be accomplished by post-processing (software) of the detection data returned by the sensor over time and is not part of this effort. However, the detection update (re-visit) rate must be fast enough to support tracking, accounting for wave action, the resulting intermittent visibility of the targets, and the maximum expected speed of sea drones, periscopes, and other non-drifting targets. High probability of detection is prioritized over low false alarm rate as the system implementation anticipates cueing of narrow field of view cameras to confirm and identify targets with the help of target recognition algorithms and the human operator. Therefore, some false alarms can be tolerated but the goal is to reduce the false alarm rate to that which is manageable by a single human operator. Automatic target recognition software and the operator display are outside the scope of this effort.

Acceptable solutions may employ lasers in lidar configurations or as laser illuminators in range-gated detection architectures (or any such combination). Solutions that utilize existing wide field of view cameras operating in the visible and mid-wave IR (MWIR) bands as receivers of the laser return are acceptable, provided no modification of those cameras (framerate, resolution, etc.) is required. Solutions that incorporate more than one laser are allowed. However, solutions that rely on hyperspectral imaging sensors are not permitted as the Navy does not intend to replace its existing suite of sensors to realize this capability. Because of blockages from the ship superstructure, the maximum field of regard is 190° (180° coverage plus 5° margin at either end). However, for purposes of the prototype delivered under this effort, design for and demonstration of 45° coverage is acceptable, provided that the solution can be readily extended to the full field of regard without loss of performance.

As a performance metric, a probability of detection of 98% with an associated false alarm rate of no more than two per minute for conditions up to and including sea state 5 is the starting benchmark. Detection range is assumed to scale with laser power. However, an effective sensor range of 100 to 500 meters should be taken as the nominal requirement for demonstration of the solution. Longer range is highly desirable. Optical platforms for the Navy's existing systems are already stabilized, therefore ship motion does not factor into the solution. A sensor location of 60 feet above water line should be assumed. The size and nature of the target also contributes significantly to the detection problem. For purposes of evaluating feasibility through modelling and simulation, analysis, or scaled or partial prototype testing, a steel or iron metal sphere with diameter of one-meter, matte surface finish (but wet), and 90% (by volume) submerged, with sea state 3 conditions is the preferred baseline for comparison. In demonstration of the full solution, at or near the end of Phase II, the awardee shall propose and select surrogate targets that are representative of the most stressful targets of interest described above. Full at-sea testing is

understood to be beyond the scope of this effort. Therefore, innovative test procedures that demonstrate and measure the performance and utility of the solution are expected.

Considering the requirements and objectives described above, system complexity and cost are the next most relevant factors. Systems that incorporate more than one laser or sensor element should strive to use a single aperture. If a dedicated focal plane array is included, it should be of the smallest possible size and cost and increase system complexity as little as possible. Mechanical components such as gimbals, steering mirrors, and scanning mechanisms should be minimized and made as simple as possible to reduce acquisition cost, ease repair, and maximize reliability. A solution that is eye-safe at the water surface is mandatory. An eye-safe solution at the aperture is highly desirable. Finally, solutions that utilize hard to detect laser wavelengths or covert (low probability of intercept) operating modes to deter detection by adversaries and mitigate interference with other Navy ships are also highly desirable.

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 NAVSEA 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: Develop a concept for an active EO/IR sensor for detection and range determination of low-observable surface targets meeting the requirements in the Description. Assess feasibility and estimate initial performance using the 90% submerged metal sphere as a surrogate target, also as described above. Define a systems architecture with sufficient detail that the system complexity is readily apparent and estimate the system size and weight. Feasibility may be demonstrated by analysis, modelling and simulation, the fabrication and testing of initial or partial prototypes (or prototype subsystems and components), or some combination of all three. The Phase I Option, if exercised, will include initial design and interface specifications necessary to build and demonstrate the prototype in Phase II.

PHASE II: Develop and deliver a prototype active EO/IR sensor for the detection and range measurement of low-observable surface targets based on the concept, analysis, preliminary design, process steps, and specifications resulting from Phase I. Demonstrate functionality and performance against surrogate targets and show that the functionality and performance can be extended to full 190° coverage. Show the range performance dependence on laser power and estimate the full range over which the solution could be effectively applied, assuming laser power was increased. Extrapolate the measured performance to estimate performance in sea states as high as sea state 5. Upon completion of the effort, deliver the prototype to Naval Surface Warfare Center, Crane Division.

It is probable that the work under this effort will be classified under Phase II (see Description section for details).

PHASE III DUAL USE APPLICATIONS: Support the Navy in transitioning the technology for Navy use. Scale the power for range and safety requirements determined by program needs. Demonstrate functionality and performance across a field of regard (not to exceed 190°), also determined by program needs. Develop product specifications, performance specifications, and process control drawings for

specific sensor designs. Assist the Navy in integration of these sensors with existing and future surface ship camera systems and then into Navy combat systems. Establish, either in-house, or through partnering or licensing, production facilities necessary to support Navy and other Government production demand. In addition to defense applications, the demand for active EO/IR sensing is expected to expand in the areas of security, navigation, search and rescue, and the fields of scientific study that utilize advanced earth sensing and surface mapping.

REFERENCES:

1. Driggers, Ronald G., et al. "Introduction to Infrared and Electro-Optical Systems, Second Edition." Boston: Artech House, 2012. <https://ieeexplore.ieee.org/document/9100032>
2. Koretsky, G. M., et al. "A Tutorial on Electro-Optical/Infrared (EO/IR) Theory and Systems." Institute for Defense Analysis, Document D-4642, January 2013 (Updated April 2021). https://www.ida.org/idamedia/Corporate/Files/Publications/IDA_Documents/SED/ida-document-d-4642.pdf
3. "National Industrial Security Program Executive Agent and Operating Manual (NISP), 32 U.S.C. § 2004.20 et seq. (1993)." <https://www.ecfr.gov/current/title-32/subtitle-B/chapter-XX/part-2004>

KEYWORDS: Low-Observable Surface Objects; Lidar; Active Sensing; Laser Illuminators; Imaging Sensors; Range-Gated Detection

DON26BZ02-NV046 TITLE: High Frequency Omni-Directional Acoustic Sensor with Open Architecture Telemetry

COMPONENT TECHNOLOGY PRIORITY AREA(S): Advanced Materials;Microelectronics

PROJECTED CMMC LEVEL REQUIREMENT: Level 2 (Self)

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 acoustic sensor with omnidirectional high-frequency detection of low source levels, accurate bearing determination, and native integration with an Open Architecture Telemetry (OAT) towed array.

DESCRIPTION: Towed acoustic receive arrays provide powerful insight into the undersea environment and the natural and man-made entities that exist under the surface of the ocean, including adversaries. Towed arrays are populated with hydrophones. Accurate bearing determination is crucial for effective evasion or attack. To determine bearing using existing sensors, either maneuvers or arrays of omnidirectional sensors must be used. These maneuvers and arrays introduce delay and complexity to acting. Providing a high frequency omnidirectional hydrophone with bearing capability will substantially reduce the time required to achieve effective evasion or attack. Currently there is no commercially available technology to fill this need.

Given new telemetry paradigms that increase the number of sonar elements that can be included in a towed array, the Navy seeks a small omnidirectional acoustic sensor that can improve array capability. This omnidirectional sensor, paired with vector sensors to enable bearing determination, would be compatible with OAT. This will enhance towed arrays performance in detecting and localizing acoustic entities across a wide frequency range. With increased hydrophone density in the towed array, higher resolution mapping of the acoustic field can be achieved. However, the number of data channels available in the array is limited by the available bandwidth and amount of power that can be utilized throughout the array.

The Navy has developed OAT to reduce Navy reliance on proprietary hardware vendors. This open architecture approach allows other vendors to participate in the refinement of key Navy towed acoustic receive array design elements.

The high-frequency omnidirectional acoustic sensor must be robust enough for towed array deployment, survive a range of environmental conditions, withstand speeds up to 30 knots, and depths to one mile. To minimize flow disruption over the towed array, the dimensions of the High Frequency Omni-Directional acoustic sensor should be smaller than approximately 2 inches in diameter. 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 NAVSEA 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: Develop a concept for an OAT High Frequency Omni-directional acoustic sensor meeting the parameters of the Description. Demonstrate the concept is feasible and can meet the parameters through analysis and modeling. The Phase I Option, if exercised, will include the initial design specifications and capabilities description to build a prototype solution in Phase II.

PHASE II: Develop and deliver the prototype sensor designed in Phase I. Demonstrate the sensor through testing in a controlled body of water, such as the deep waters of Lake Pend Oreille near Bayview, Idaho, by conducting prototype testing to verify the survivability of the acoustic sensor in the ocean environment. This testing will provide data to support the Navy's decision regarding the potential adoption of the sensor into future towed receive array designs.

It is probable that the work under this effort will be classified under Phase II (see Description section for details).

PHASE III DUAL USE APPLICATIONS: Support the Navy in transitioning the technology for Navy use. Work with Navy subject matter experts to develop designs that will perform as desired when integrated with the other open architecture telemetry elements, towed array hydrophones, and towed array physical form factor. Should the Navy determine that the designs are appropriate for incorporation into the OAT system, the Navy will provide refined system requirements. Prototypes will either be purchased by the government or by prime contractors producing towed arrays.)

Potential dual use would be for arrays used in oil and gas exploration and other environmental sensing applications.

REFERENCES:

1. "MFTA: The US Navy's New Towed Array for Naval Detection." Defense Industry Daily, 23 September 2019. <https://www.defenseindustrydaily.com/mfta-the-us-navys-new-towed-array-for-naval-detection-04956>
2. "Navy asks L-3 Chesapeake Sciences to build additional TB-34X submarine towed array sonar systems." Military and Aerospace Electronics, 17 August 2019. <https://www.dote.osd.mil/Portals/97/pub/reports/FY2010/navy/2010tb34.pdf?ver=2019-08-22-112821-240>
3. National Industrial Security Program Executive Agent and Operating Manual (NISP), 32 U.S.C. § 2004.20 et seq. (1993). <https://www.ecfr.gov/current/title-32/subtitle-B/chapter-XX/part-2004>

KEYWORDS: Open Architecture Telemetry; Omni-directional hydrophone; Vector Sensors; towed acoustic receive array; increased hydrophone density; low source levels

DON26BZ02-NV047 TITLE: Rapid Range Determination of Airborne Targets in Complex Raid Scenarios

OUSW (R&E) CRITICAL TECHNOLOGY AREA(S): Quantum and Battlefield Information Dominance (Q-BID)

COMPONENT TECHNOLOGY PRIORITY AREA(S): Directed Energy (DE);Integrated Sensing and Cyber;Microelectronics

PROJECTED CMMC LEVEL REQUIREMENT: Level 2 (Self)

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 a technology to determine the range of multiple, simultaneous, widely spaced, and independently moving small airborne targets using electro-optical/infrared (EO/IR) means.

DESCRIPTION: The Navy fields, and continuously updates, multiple systems incorporating imaging sensors (cameras). Across all systems, the Navy will have cameras covering both wide and narrow fields of view, operating over essentially the entire span of visible to infrared (IR) wavelength bands. While there is no strict operational division, wide field of view (WFOV) cameras typically provide general situational awareness over a broad sector. When an object of interest is observed, the WFOV camera system then provides coordinates (azimuth and elevation angles) to cue narrow field of view (NFOV) cameras for high magnification imaging of the object. If the target can then be positively identified and is of a known type (for example, a cargo ship or commercial airliner), its range might then be inferred. Otherwise, or when precise range information is required, a laser rangefinder may be employed. Laser rangefinders and NFOV cameras are typically deployed in stabilized gimballed mounts, providing full degrees of freedom and precise aiming. They are valuable and expensive resources.

A challenging problem arises when multiple targets are simultaneously present in the sector covered by a WFOV camera. While the WFOV camera images the targets and calculates their relative coordinates instantly, the NFOV cameras and rangefinders must mechanically slew to each target and hold on that target for some finite moment in order to effectively focus the image and capture the range data. This is a significant problem if the targets are small, widely dispersed throughout the field of view, and maneuvering independently, especially at high speed. As the number of targets grows, the point is reached where the NFOV camera and the range finder (often mounted on the same gimbal) simply cannot move fast enough to follow every target.

Airborne targets can be exceptionally challenging to cover because they are free to move in three dimensions and because they can typically maneuver at much higher velocities than surface targets. Alternately, small surface targets are often obscured by more severe clutter conditions due to wave action but move slower and are confined to the ocean surface. Consequently, swarms of surface and airborne targets present entirely different problems in detection and range determination. There is currently no commercial technology known that solves this problem.

The Navy needs an EO/IR sensing technology that can rapidly determine the ranges of large numbers of small, independent, rapidly maneuvering airborne targets in complex raid scenarios. Solutions may employ active means, semi-active means, or passive means. In this regard, “active means” refers to a laser-based solution, such as a lidar or conventional laser rangefinder where the solution incorporates a laser (or multiple lasers), a dedicated receiver for detecting the laser return(s), and an appropriate steering or scanning mechanism, all mounted together. A “semi-active” solution would incorporate a laser (or multiple lasers) but would make use of the separate and already available WFOV imaging sensors to detect the laser return. For this purpose, WFOV cameras can be assumed to be available in the visible and mid-wave IR (MWIR) bands. A strictly passive solution would determine range solely by the (optional) utilization of existing WFOV cameras and any passive imaging sensor necessary to augment the WFOV cameras.

Cost is always a factor and WFOV cameras are expensive and typically require a dedicated aperture, which further increases system cost and complexity. Therefore, solutions that require the modification of existing WFOV cameras or the incorporation of additional WFOV cameras are excluded from consideration. Utilization of the ship’s existing NFOV cameras is also not permitted. Solutions that require a library of target images or signatures are also not allowed.

Because of blockages from the ship superstructure, the maximum azimuthal field of regard is 190 degrees (180-degree coverage plus 5-degree margin at either end) and 45-degree elevation. However, for purposes of the prototype delivered under this effort, design for and demonstration of 45-degree azimuthal coverage is acceptable, provided that the solution can be readily extended to the full field of regard without loss of performance. As an initial performance baseline, consider ten airborne targets randomly scattered over the field of regard, both in azimuth and elevation. Range measurements for these ten targets should be refreshed at a minimum rate of once per second (for the full 190-degree field of regard). It is understood that the measurement refresh rate may slow proportionately as the number of simultaneous targets increases. A nominal range resolution of ± 1.0 m at 1000 m range is desired. For active and semi-active solutions, maximum usable range is assumed to scale with laser power. For the prototype demonstrated under this effort, an eye-safe condition at the emission aperture is desired with the understanding that (future) tactical units may require higher power. Consequently, for solutions that incorporate lasers, system architectures that permit scaling of the laser power are most attractive. Conversely, indiscriminate beaming of laser energy can interfere with nearby Navy and civilian aircraft so, for the case of active and semi-active solutions, a low probability of intercept technology is also desired.

The technology developed under this SBIR topic is not expected to detect new or otherwise previously unobserved targets. This topic assumes that targets are visible to and have been detected by the WFOV cameras. Consequently, target coordinates in azimuth and elevation may be assumed to be available to the range measurement system. Likewise, for active and semi-active solutions, sector blanking (that is “do not lase”) coordinates should also be accommodated. In short, the desired ranging technology is expected to interface, work, and compliment the ship’s existing WFOV camera(s). However, the Navy cannot provide tactical hardware, and it is incumbent on proposers to include surrogate hardware (or emulation software) that replicates the function of a WFOV staring (fixed) camera. A test plan that includes representative targets should also be included as part of the proposed solution.

Considering the requirements and objectives described above, system complexity and cost is the next most relevant factor. Systems that incorporate more than one laser or sensor element should strive to use a single aperture. If a dedicated focal plane array is included, it should be of the smallest possible size and cost and increase system complexity as little as possible. Mechanical components such as gimbals, steering mirrors, and scanning mechanisms should be minimized and made as simple as possible to reduce acquisition cost, ease repair, and maximize reliability.

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 NAVSEA 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: Develop a concept for an EO/IR range measurement sensor for use in determination of target ranges in complex raid scenarios meeting the requirements in the Description. Assess feasibility and estimate initial performance using ten dispersed and independent airborne targets as the baseline, also as described in the Description. Define a systems architecture with sufficient detail that the system complexity is readily apparent and estimate the final prototype system size and weight. Feasibility may be demonstrated by analysis, modelling and simulation, the fabrication and testing of initial or partial prototypes (or prototype subsystems and components), or some combination of all three. The Phase I Option, if exercised, will include initial design and interface specifications necessary to build and demonstrate the prototype in Phase II.

PHASE II: Develop and deliver a prototype EO/IR range measurement sensor based on the results of Phase I. Demonstrate functionality and performance against surrogate targets and show that the functionality and performance can be extended to full 190-degree coverage. Show the range performance dependence on laser power and estimate the full range over which the solution could be effectively applied, assuming laser power was increased. Extrapolate the measured performance to estimate performance against more than ten targets. Upon completion of the effort, deliver the prototype to Naval Surface Warfare Center, Crane Division.

It is probable that the work under this effort will be classified under Phase II (see Description section for details).

PHASE III DUAL USE APPLICATIONS: Support the Navy in transitioning technology for Navy use. Scale the power for range and safety requirements determined by program needs. Demonstrate functionality and performance across a field of regard (not to exceed 190 degrees), also determined by program needs. Develop product specifications, performance specifications, and process control drawings for specific sensor designs. Assist the Navy in integration of these sensors with existing and future surface ship camera systems and then into Navy combat systems. Establish, either in-house, or through partnering or licensing, production facilities necessary to support Navy and other Government production demand. In addition to defense applications, the demand for active EO/IR sensing is expected to expand in the areas of security, navigation, and perhaps air traffic control.

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1. Driggers, Ronald G., et al. "Introduction to Infrared and Electro-Optical Systems, Second Edition." Boston: Artech House, 2012. <https://ieeexplore.ieee.org/document/9100032>
2. Koretsky, G. M., et al. "A Tutorial on Electro-Optical/Infrared (EO/IR) Theory and Systems." Institute for Defense Analysis, Document D-4642, January 2013 (Updated April 2021). https://www.ida.org/idamedia/Corporate/Files/Publications/IDA_Documents/SED/ida-document-d-4642.pdf

3. National Industrial Security Program Executive Agent and Operating Manual (NISP), 32 U.S.C. § 2004.20 et seq. (1993). <https://www.ecfr.gov/current/title-32/subtitle-B/chapter-XX/part-2004>

KEYWORDS: Range Measurement; Raid Scenarios; Airborne Targets; Laser Rangefinders; Imaging Sensors; Low Probability of Detection

DON26BZ02-NV048 TITLE: Advanced Techniques for Enhanced Deep-Sea Object Detection and Localization for Towed Mine Countermeasures (MCM) Sonar

OUSW (R&E) CRITICAL TECHNOLOGY AREA(S): Applied Artificial Intelligence (AAI)

COMPONENT TECHNOLOGY PRIORITY AREA(S): Advanced Computing and Software; Integrated Sensing and Cyber; Microelectronics

PROJECTED CMMC LEVEL REQUIREMENT: Level 2 (Self)

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 innovative enhancements and techniques for towed Mine Countermeasures (MCM) sonars to enable object detection and localization at increased ocean depths.

DESCRIPTION: The Navy's existing minehunting systems primarily use side-scan sensors to detect, classify, and localize mines resting on the sea floor. Volume search sonars are used to detect and localize mines, tethers, and anchors for moored mines tethered to the sea floor. However, the performance of these sonars is limited by the distance and depth that the sonars can sense objects. The Navy seeks to enhance the effectiveness of existing Navy Minehunting high-frequency sonar systems by increasing sensor range for depth and distance.

The Navy seeks to develop an innovative solution to increase the range of minehunting sonar by enabling the sensors to detect and localize objects at increased distances and depths. The solution can be a combination of hardware, software, algorithms or techniques necessary to optimize sensor range. Solutions that lower the tow body to increased depths will not be considered due to the necessary increased Size, Weight, and Power (SWaP) required. There is currently nothing available commercially to meet these requirements.

A required range and depth are not provided. Proposals should articulate the expected increased range and depths that their proposed solution will achieve. Proposed software and algorithms will reside either in the tow body sensor processors or in the back-end Post Mission Analysis (PMA) processors. Hardware solutions shall fit within existing SWaP parameters that follow: 30in length x 10.5inch width x 3.5inch height, 44.5lbs, and be powered by an 80V constant current amplifier. Hardware solutions should consider the shape of the tow body. If proposing a new sensor, the Gap Filler Sonar would be the preferred sensor for replacement. Any solution shall be compatible with current software and hardware architecture and available resources. The resulting technology should provide a significant improvement in the performance and detection by reducing the Probability of False Alarm (Pfa).

Improvements are considered significant when sensor performance at increased ranges approaches the current baseline requirements for sensor performance. This includes achieving a minimum probability of detection of 90% while maintaining a false alarm rate of 0.1 false alarms per hour. Candidate minehunting sonar systems include AN/AQS-20 and AN/AQS-24.

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 NAVSEA 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: Develop a concept for a deep detection system that meets the requirements described above. Demonstrate the feasibility of the concept in meeting Navy needs and establish that the concept can be feasibly developed into a useful product for the Navy. Feasibility will be established by either testing and analytical modeling or both.

The Phase I Option, if exercised, will include the initial design specifications and capabilities description to build a prototype solution in Phase II.

PHASE II: Develop and deliver a prototype for evaluation as appropriate. The prototype will be evaluated to determine its capability in meeting the performance goals defined in the Phase I and the Navy requirements for the Enhanced Deep-Sea Object Detection and Localization capability. Demonstrate performance with a detailed analysis, and live demonstration in a test environment as part of the evaluation. Provide detailed technical documentation of the design, including an interface control drawing and interface specification, to allow successful transition of the product. Prepare a Phase III development plan to transition technology to Navy use.

It is probable that the work under this effort will be classified under Phase II (see Description section for details).

PHASE III DUAL USE APPLICATIONS: Provide technical support for transitioning and incorporating the solution into Navy program(s). Depending on the program, support for additional testing may be needed. Explore the potential to transfer the system or technology to other military and commercial systems, including the underwater archeologic community, offshore oil and gas exploration, and oceanographic scientific research.

Technology developed under this effort is applicable to any domain that requires deep SONAR sensing. This includes bathymetric mapping and research, diving expeditions, and commercial fishing.

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KEYWORDS: Detection of Ocean Mines; Deep Sea Mine Hunting; Towed Mine Countermeasures; Sound Navigation and Ranging; SONAR; Deep Waters mine detection; Acoustic Sensor, Optic Sensor, Electro-Optic Sensor

DON26BZ02-NV049 TITLE: Universal Submersible Logistics Deployment and Stowage Package

OUSW (R&E) CRITICAL TECHNOLOGY AREA(S): Contested Logistics Technologies (LOG)

COMPONENT TECHNOLOGY PRIORITY AREA(S): Integrated Network Systems-of-Systems;Sustainment;Trusted AI and Autonomy

PROJECTED CMMC LEVEL REQUIREMENT: Level 2 (Self)

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 a submergible low-cost, long-duration, tamper-resistant logistics delivery and stowage system, which stores and facilitates retrieval of logistics payloads from the seabed.

DESCRIPTION: The Navy is seeking a secure, low-cost capability for a passive seabed logistics delivery and stowage system. The system will be capable of delivering and storing supplies, equipment, and materials on the seabed for extended periods (24 months). The system should minimize reliance on expensive surface vessel support and specialized underwater vehicles for deployment and retrieval, thereby significantly reducing operational costs. There is nothing commercially available that does this. The system must provide secure, environmentally protected stowage for a variety of payload sizes and types and safeguarding against corrosion, biofouling, and other environmental factors.

The entire system must have a cylindrical form factor of 19 inches in diameter and 51 inches in length, with a maximum dry weight is 1,000 lbs and able to withstand maritime deployment while maintaining and controlling descent to the seabed. The system will be optimized for the maximum amount of payload/minimized amount of command electronics contained within the system. The system must function regardless of its orientation on the seafloor and must be operational on the seabed for a minimum of 12 months (Threshold), 24 months (Objective). The payload must be pressure tolerant between 300 meters and 600 meters, and able to withstand differing bottom types, currents, sea growth, and corrosion without performance degradation, as well as currents up to 2 knots.

The system must incorporate a low-power, acoustic communication system for remote monitoring of critical parameters (e.g., location, environmental conditions, payload status) and control of specific functions (e.g., retrieval/release mechanisms, scuttling). Consideration should be given to minimizing power consumption and maximizing communication range and reliability in challenging underwater acoustic environments. Horizontal acoustic communications ranges should approach 5 to 10 km. The system shall be capable of being retrieved from the seabed depth by surfacing or deploying a float to enable retrieval.

Additionally, the system must be capable of scuttle/neutralization after a set time duration or after the payload is retrieved.

A detailed Interface Control Document (ICD) will be provided as Controlled Unclassified Information (CUI). This ICD will specify the physical attachment points, as well as describe the umbilical and electronic communications to be received from the vehicle.

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 NAVSEA 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: Develop a concept for a prototype that meets the requirements described above. Demonstrate through modeling and simulation, benchtop tests or other supporting documentation the efficacy of the proposed system design for satisfying prototype system requirements. The Phase I Option, if exercised, will include the initial design specifications and capabilities description to build a prototype solution in Phase II, and plans to assist the Navy in refining system level requirements for transition.

PHASE II: Develop and deliver a prototype as a fully functional payload delivery system. Perform laboratory testing, modeling, or analytical methods as appropriate depending on the company's proposed approach. Conduct rigorous testing and validation in a relevant environment and demonstrate integration with a designated Unmanned Undersea Vehicle (UUV) platform.

PHASE III DUAL USE APPLICATIONS: Support the Navy in transitioning the technology to Navy use. Support further refinement and testing of the functionality following successful prototype development and demonstration.

If successful, potential applications include repositioning various payloads, enabling new underwater operational concepts.

In addition to such DOW applications, these payloads could be used in commercial oil, gas, and oceanographic applications, long-term storage, and on-demand retrieval of subsea equipment, tools, and materials.

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KEYWORDS: Clandestine Undersea Logistics Delivery; Undersea Bottom Nodes; Subsea Seabed Warfare Logistics; Unmanned Undersea Vehicle (UUV) Payloads; Extra Large Unmanned Undersea Vehicle (UUV); Unmanned Maritime Autonomy Architecture (UMAA)

DON26BZ02-NV050 TITLE: Low-Cost Bottoming Seabed Nodes for Unmanned Underwater Vehicle (UUV) Support

OUSW (R&E) CRITICAL TECHNOLOGY AREA(S): Contested Logistics Technologies (LOG)

COMPONENT TECHNOLOGY PRIORITY AREA(S): Integrated Network Systems-of-Systems;Sustainment;Trusted AI and Autonomy

PROJECTED CMMC LEVEL REQUIREMENT: Level 2 (Self)

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 modular, low-cost, high endurance seabed nodes to support integration of diverse subsea payloads.

DESCRIPTION: The Navy is seeking low-cost, modular seabed nodes with standardized mechanical, electrical, and data interfaces to accommodate diverse payload options, including acoustic communications modems, undersea sensors, navigation, and data transfer and storage. The commercial market lacks seabed nodes appropriate for Navy use. The nodes should be capable of operating independently or operating as part of a larger node network and support interoperability with other underwater acoustic platforms, networks, and a wide range of underwater vehicles. The nodes must have a cylindrical form factor of 19 inches in diameter and 51 inches in length, with a maximum dry weight is 1,000 lbs and able to withstand maritime deployment while maintaining and controlling descent to the seabed.

The nodes must function regardless of their orientation on the seafloor and must be operational on the seabed for a minimum of 12 months (Threshold), 24 months (Objective). The nodes must be pressure tolerant up to a depth of 300 meters and able to anchor in differing bottom types, currents, sea growth, and corrosion without performance degradation, as well as in currents up to 2 knots. Each node must manage its power usage to maximize operational lifespan and utilize power management strategies when possible.

While the focus of the effort is the design and development of payload agnostic subsea nodes, the desired initial payload of this effort will be acoustic communications nodes with the ability to expand development. Acoustic communication nodes should support two interfaces. The first acoustic communications interface shall enable long range, low data rate horizontal communications in the frequency band of 1kHz to 5kHz. The second communications interface shall enable short range, high data rate communications with Unmanned Underwater Vehicle (UUVs). The acoustic communications modem used must leverage Commercial off-the-shelf products, to include software-defined acoustic modems, to allow flexibility in the definition waveforms, modulation schemes, transmission power levels, and the use of Low Probability of Detection and Low Probability of Intercept (LPD/LPI) acoustic waveforms. The mesh network must support persistent data storage and distribution services for small data payloads (less than 1KB in size), and data storage only for larger payloads (less than 100KB in size).

To maximize range on the sea floor and enable connectivity with other nodes, the node can deploy an undersea beacon or other methods to adjust the altitude of its acoustic transducer.

A detailed Interface Control Document (ICD) will be provided as Controlled Unclassified Information (CUI) upon entering Phase II. This ICD will specify the physical attachment points, as well as describe the umbilical and electronic communications to be received from the vehicle.

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 NAVSEA 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: Develop a concept design for low-cost, modular seabed nodes with standardized mechanical, electrical, and data interfaces that meet the form factor and operational requirements described above. The concept design feasibility should include any modeling and simulation and studies in support of concept risk reduction. Establish feasibility by developing system diagrams that show the design concept and provide estimated weight, dimensions, cost estimate, and manufacturability of the concept. Phase I Option, if exercised, will include the initial design specifications and capabilities description to build a prototype solution in Phase II.

PHASE II: Develop and deliver a minimum of two prototype nodes for evaluation. The prototype will be evaluated to determine its capability in meeting the performance goals defined in the Phase I and the Navy requirements. Demonstrate performance with a detailed analysis and live demonstration in a test environment as part of the evaluation. Provide detailed technical documentation of the design, including an interface control drawing and interface specification, to allow successful transition of the product. Prepare a Phase III development plan to transition this technology for Navy use.

It is probable that the work under this effort will be classified under Phase II (see Description section for details).

PHASE III DUAL USE APPLICATIONS: Support the Navy in transitioning the technology for Navy use. Support further refinement and testing of the functionality following successful prototype development and demonstration.

If successful, potential applications include integration with other government agencies depending on the capability provided that supports subsea warfare, increasing the Navy's capability to perform a variety of Subsea Seabed Warfare and Undersea Warfare missions.

In addition to such DOW applications, these payloads could be used in commercial oil, gas, and oceanographic applications to improve communication between undersea vehicles.

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KEYWORDS: Seafloor and Bottom Nodes; Seafloor Logistics; Undersea Communications Networks; Undersea Constellation; Unmanned Undersea Vehicle Communications; Clandestine Delivered Mine (CDM)