Advanced Mooring System (AMS)

This publication constitutes a Broad Agency Announcement (BAA) as contemplated in Federal Acquisition Regulation (FAR) 6.102(d)(2). A formal Request for Proposals (RFP), solicitation, and/or additional information regarding this announcement will not be issued.

The Office of Naval Research (ONR) will not issue paper copies of this announcement.

The ONR reserves the right to select for award all, some or none of the proposals in response to this announcement. ONR provides no funding for direct reimbursement of proposal development costs. Technical and cost proposals (or any other material) submitted in response to this BAA will not be returned. It is the policy of ONR to treat all proposals as sensitive competitive information and to disclose their contents only for the purposes of evaluation.

I. GENERAL INFORMATION

1. Agency Name –

Office of Naval Research
One Liberty Center
875 N. Randolph Street
Arlington, VA 22203-1995

2. Research Opportunity Title –

Advanced Mooring System (AMS)

3. Research Opportunity Number –

BAA 10-016

4. Response Date –

Full Proposals Due Date: 09 September 2010 2PM Eastern Time
5. Research Opportunity Description –
The Office of Naval Research (ONR) is interested in receiving proposals for a technology concept designed to develop skin-to-skin mooring capabilities for the Navy. For simplicity, this technology need is referred to as the Advanced Mooring System or AMS. This product was selected because the Seabasing Joint Integrating Concept defines a need to quickly and safely moor lightweight hull connectors and high-flare container ships to the Mobile Landing Platform (MLP) in high sea states, and no system exists to do this today. In addition, the Chief of Naval Operations and the Commandant of the Marine Corps both expressed the need to interface Joint High Speed Vessel (JHSV) above Sea State 1 (the current capability).

The AMS will improve vehicle, personnel, and container transfer during skin-to-skin mooring within the sea base through Sea State 3 (threshold), Sea State 4 (objective). The technology must solve one or more of the problems seen with mooring in higher sea states that include, but are not limited to, the following:

- Increased line stresses
- Inadequate bandwidth of constant-tension winches
- Insufficient fender capacity
  - Insufficient energy absorption
  - Insufficient standoff for higher ship rolls
- Increased contact pressures on side-shells of ships
- Increased bitt stresses / required mooring configurations for multiple ships
- Reduced handling safety

Ultimately, solutions to these problems must be accomplished in a system that will be affordable for the Navy to procure and operate.

ONR seeks full proposals for Phase I - Concept Development Phase of the Science and Technology (S&T) effort to develop a core technology or suite of complementary technologies that will enable the mooring process. Proposals shall describe a complete system concept and provide a detailed scope of work for the development of the core technology(ies), not an approach on how to arrive at a recommended technology solution. In addition to the specific S&T capability, proposers need to also consider affordability of the system that would ultimately be procured. Any proposal that does not provide a specific technology concept, as well as discussion of system acquisition cost/affordability, will not be considered.

ONR seeks specific innovative solutions to the skin-to-skin mooring challenge. AMS scope is limited to the mooring of two ships, and a solution must be provided for this problem - any proposals which aim to improve an area outside of this scope (i.e., the approach and breakaway of two ships) will be considered only if the previous statement is met.
5.1 Background

This background is provided for informational purposes only. The purpose of this section is to provide an overview of the kinds of skin-to-skin mooring anticipated to be required to support a sea base and highlight important aspects of this effort to which proposers should pay particular attention. It is desired that AMS would increase the operating envelope to allow operations through Sea State 3 (threshold) to through Sea State 4 (objective). Performance specifications and requirements for this solicitation are provided in Section 5.2.1 of this BAA. Three general skin-to-skin mooring scenarios are envisioned for seabasing operations:

- Large vessel to connector operations
- Improved Navy Lighterage System (INLS) / Modular Causeway System (MCS) to connector operations
- Large vessel to large vessel operations

The three scenarios listed above involve platforms that will vary greatly in their size and purpose, and therefore make developing a single scalable, modular, and deployable technology solution particularly challenging. A significant and desired benefit of scalability of the technology would be greater applicability across all the scenarios. Another aspect of the challenge shared across platforms is ship impact. Concepts should minimize system area, volume, weight, and power requirements.

The primary “connectors” to be considered are the JHSV, the Landing Craft Utility (LCU) 1600 and the LCU 2000. The interfaces for the connectors will likely be the MLP and the INLS/MCS Roll-on/Roll-off Discharge Facility (RRDF).

The primary “large vessels” envisioned to operate skin-to-skin are the Large, Medium-Speed, Roll-on/Roll-off Ships (LMSR), the Maritime Prepositioning Force (MPF) ships, MLP variants, and commercial container ships. Secondary “large vessels” might include the Ready Reserve Force (RRF) crane ships and the RRF Roll-on/Roll-off (RORO) ships.

Large Vessel to Connector: In this operating scenario, either an MLP (or MLP-like vessel) or a Sealift variant moor alongside a connector vessel such as a JHSV. Figure 5-1, from the MLP Performance Specification, illustrates a representative notional scenario using traditional mooring equipment. It should be noted that actual vessel characteristics may vary from those illustrated. In addition, longitudinal alignment of the vessels may vary, and it is desirable that AMS solutions are adaptable to different vessel alignments. In addition, a unique limitation to mooring Government and commercial vessels (or even two Government vessels) at sea is the lack of suitable load carrying attachment points (i.e. winches, chocks, bitts, fairleads) and approved mooring arrangements. This is especially true in the case of containerships that are designed for mooring to piers. Therefore, when using traditional approaches, the types of vessels that might participate in seabasing operations may be limited and the environmental operating envelope may be restricted. It follows that a challenge for AMS is developing technologies that can interact with vessels that have not been purpose-designed for skin-to-skin mooring.
Figure 5-1: Large Vessel to Connector Operations

Improved Navy Lighterage System (INLS) to Connector: The INLS/MCS RRDF is a Sea State 3 capable causeway system. It is a floating pier that consists of non-powered floating platforms assembled from interchangeable modules. Figure 5-2 below illustrates recent testing of RRDF in conjunction with a connector surrogate. In these scenarios, it is assumed that operations occur at zero knots. In the figure, both a connector and a large sealift vessel are interacting with RRDF modules. The sealift vessel stern ramp has been lowered at one end of the causeway while the connector is moored at the far end on one side. Tugs are being used to assist in positioning of the causeway. There is a need for the RRDF to work in concert with seabasing connectors such as the JHSV; however, skin-to-skin mooring evolutions conducted between the JHSV and the RRDF have proven difficult above Sea State 1. Therefore, a challenge for AMS is developing technologies that will enable skin-to-skin mooring between connector vessels like the JHSV and RRDF through Sea State 3.

Figure 5-2: RRDF Operations as viewed from Sealift Ship Stern with connector on the left and tugs on the right

Large Vessel to Large Vessel: In this operating scenario, a Government vessel is moored alongside a commercial vessel (such as a containership) or other Government vessel.
Figure 5-3 provides an illustration from the MLP performance specification for a representative notional scenario assuming traditional mooring absent any AMS advances. In this scenario, the vessel with more limited maneuvering capability would be expected to maintain heading during vessel approach. Skin-to-skin mooring using traditional mooring equipment would be expected to be similar to commercial tanker lightering operations. However, unlike tanker lightering operations where the vessels have both been designed for skin-to-skin lightering, a unique limitation to mooring Government and commercial vessels (or even two Government vessels) at sea is the lack of suitable load carrying attachment points and approved mooring arrangements. As mentioned previously, this is especially true in the case of containerships that are designed for mooring to piers. Therefore, when using traditional approaches, the types of vessels that might participate in seabasing operations may be limited and the environmental operating envelope may be restricted. Therefore, a challenge for AMS is developing technologies that can interact with vessels that have not been purpose-designed for skin-to-skin mooring.

![Figure 5-3: Large Vessel to Large Vessel Operations](image)

**Figure 5-3: Large Vessel to Large Vessel Operations**

Though the AMS technology is needed for all ship classes that support sea base logistics operations, the large sea base vessel-to-connector scenario poses the greatest challenge and is not currently practiced in the fleet. In addition, a demonstration of all three scenarios (including associated ship assets) is financially and logistically impractical. Therefore, though the technology development should aim to solve the challenges associated with all three scenarios, the large vessel to connector scenario is what will be demonstrated at the conclusion of the program. A key challenge for this scenario is the potential for damage to the connector vessel during skin-to-skin mooring with the larger sea-based vessel.

### 5.2 Program Plan

It is anticipated that award will be in the form of cost-type contract, specifically Indefinite Delivery Indefinite Quantity (IDIQ) contracts with cost-type Task Orders made off of those IDIQs. The three planned phases covered by this BAA and the objectives for each are described below. Only full proposals for Phase I are being requested at this time; other phases will be requested as the program progresses.
Objectives for Phase I: Concept Development

- Concept of Operations for the specific technology(ies) which address the AMS performance specifications and requirements as stated in Section 5.2.1 below.
- Concept design of a full-scale technology demonstrator that addresses the AMS performance specifications and requirements as stated in Section 5.2.1 below.
- Estimated production acquisition cost for an AMS based on the preliminary concept design.
- Demonstration of feasibility of the AMS concept through analysis, modeling and simulation.
- Identification of ship impacts and risks associated with the proposed AMS and a risk mitigation plan.
- Identification of applicable design standards, criteria, and procedures to provide equivalent margins of safety compared to traditional mooring equipment.
- Proposed follow-on statement of work, test plan(s), demonstration plan(s), schedule and cost proposal. Key technology(ies) shall be matured under follow-on S&T phases to ensure a Technology Readiness Level 6 for an AMS technology demonstrator.

Objectives for Phase II: S&T/Modeling

- Fabrication, testing, and evaluation of a sub-scale, proof-of-concept AMS technology demonstrator.
- Demonstration of the sub-scale, proof-of-concept AMS technology demonstrator with moderate sea conditions acting on the system.
- Detailed design of a full-scale, proof-of-concept AMS technology demonstrator.
- An updated estimated production acquisition cost for a production AMS, with appropriately increased fidelity, based on the detailed design of the demonstrator.
- Proposed follow-on statement of work, test plan(s), demonstration plan(s), schedule and cost proposal.

Objectives for Phase III: Sea Demonstration

- Fabrication, testing, and evaluation of a full-scale, proof-of-concept AMS technology demonstrator.
  - Individual Sub-systems
  - Full-system
- Demonstration of the full-scale, proof-of-concept AMS technology demonstrator in a relevant, dynamic motion environment.

5.2.1 AMS System Performance Specifications and Requirements

The AMS technical proposal shall address how the proposed concept will satisfy the following performance specifications and requirements. Threshold denotes that this specification is a minimum requirement. Objective denotes that this specification is a goal.
• **Performance Specifications**
  
  o **General**
    - The system shall provide for open architecture, where appropriate (e.g., control systems). – threshold
    - Operation and routine at-sea maintenance can be accomplished by ship’s force personnel with minimal additional training. – threshold
    - Mitigate risks inherent in traditional mooring systems. – threshold
      - Personnel safety (line handling).
      - Risk to vessels (approach, relative motions due to sea state and emergency break away).
    - Scalable – threshold
      - Accommodate range of ship motions as described below.
      - Scalable to alternative ship sizes and configurations.
    - Modular and Deployable – objective
      - System is transferrable from one vessel to another.
      - Technology is vessel independent.
      - Minimal ship interface/impact.
  
  o **Environmental**
    - Loads due to ship motion – presented in Vessel Data
      - Operational through sea state 3 – threshold
      - Operational through sea state 4 – objective
      - Survivable through sea state 8 in stowed configuration – threshold
    - Equipment exposed to the weather shall be capable of operating in air temperatures from -29°C (-20°F) and 49°C (120°F) with seawater temperatures from -2 C (28.4 F) to 35 C (95 F). – threshold
    - Relative humidity 0 to 95%. – threshold
    - The AMS must be designed to facilitate safe day and night operations. – threshold
    - Vessel Data: AMS will be required for a variety of vessels, with the following ranges of motions operating independently: - threshold
Operational

- Proposers shall employ skin-to-skin mooring. Solutions relying on dynamic positioning will not be considered. – threshold
- Operation at zero knots or minimum maneuverable forward speed up to 8 knots to maintain favorable heading. – threshold
  - Not at anchor
- Enable vehicle, personnel, and container transfer during skin-to-skin mooring as discussed in previous section. – threshold
- Maintain safe separation distance. – threshold
  - 4.5 meter separation assumed for JHSV due to JHSV ramp configuration. For large to large vessels such as MLP to containership, 4.5 meter fenders would be utilized absent AMS. Proposers may recommend alternative separation distances.
- The time required shall be:
  - Less than 1 hour to moor. – threshold
  - Less than 15 minutes to unmoor during normal operations – threshold
- Accommodates:
  - Freeboard changes – threshold
  - Draft changes during the evolution – threshold
  - The proposed technology accommodates longitudinal changes in vessel alignment during the evolution - objective
- Facilitates emergency breakaways. – threshold
  - Rapid, safe breakaway.
  - Minimal time to recover the AMS to an operational state.
- Accommodates various hull forms and vessel characteristics – threshold
- Reliability, Maintainability and Availability – threshold
  - Operational availability of 98% ($A_0 = .98$) or better.
• Actuators and other machinery components shall not require replacement of component parts during a period of 5000 hours of operation. Exceptions to part replacement requirements are the planned replacement type components.

• Any control components shall not require replacement of component parts during a Mean Time Between Failure (MTBF) of 3750 hours. Exceptions to part replacement requirements are the planned replacement type components.

• The maximum mean-time-to-repair (MTTR) shall be eight hours for all sub-systems. The system shall be designed to minimize scheduled preventive maintenance man-hours. The system maintenance shall not require use of proprietary tools or tools not normally carried aboard ship.

• The system may be subjected to continuous periods of non-use of up to three years duration. During these lay-up periods of non-use, the system shall be in the stowed configuration and de-energized. The system shall operate without degraded performance following lay-up and start-up maintenance after being subjected to this stowed period.

• The system may be subjected to idle periods of non-use up to 6 months in duration. Following this idle period of non-use, the system shall be capable of operation without start-up maintenance.
  ▪ The amount of scheduled preventative maintenance shall be minimized. – threshold
  ▪ The amount of special test equipment and tools required for maintenance shall be minimized. – threshold

• **Design Requirements**
  o **Area, Volume and Weight**
  ▪ The platforms targeted for application of AMS are area, volume and weight critical. AMS area, volume and weight shall be kept to a minimum.

  o **Workload**
  ▪ Manning is a significant ship life cycle cost factor. Workload requirements for operation and maintenance of the AMS shall be kept to a minimum.

  o **Safety**
  ▪ Safety Features. The equipment design shall incorporate system safety practices to identify, classify, and manage mishap risk in accordance with MIL-STD-882. Safety design features, including fail-safe features, shall be incorporated into the design to prevent
damage to equipment and to ensure optimal personnel protection during operation, testing, maintenance, repair, or interchanging of any component or assembly. Safety feature controls and components shall not be exposed to damage under normal operating conditions. Safety feature components and controls shall be designed to discourage tampering by personnel where such tampering could defeat the safety feature.

- **Failsafe Design.** The equipment shall be designed and constructed for failsafe operation. Failure of the power source of a drive mechanism shall not result in damage to the vessels or jeopardize the safety of personnel, or result in uncontrolled movement of the vessels or equipment. In the event of power failure, all power operated equipment shall come to a controlled stop without damage. Restoration of power shall not result in automatic resumption of any equipment operation that may jeopardize the safety of the vessels, equipment, or personnel.

- **Control system safety.** The equipment shall be designed such that failure or fault of a single control system component shall not result in uncontrolled movement of the equipment or result in equipment operations that jeopardize the safety of the vessels, equipment or personnel.

- **System Controls**
  - If the technology contains a control system, the control system shall perform self diagnostics upon start-up to ensure operational status. The system shall continually monitor itself, halt operations if an off-normal condition is detected, and notify the operator of that condition. System diagnostics shall enable identification and isolation of faults to the lowest replaceable component or module.

- **The AMS shall have safe range indications (procedural, mechanical or electrical) for the following:**
  - Operating limits, including range of motions
  - Wear
  - Failure of components

- **Ship impact.** **Ship impact** (i.e., power, services, weight and arrangements) shall be kept to a minimum.
  - Ships’ service 125 PSIG LP Air is available.
  - For any subsystems equipped with wheels or rollers, wheel/roller contact pressure with ship’s deck shall not exceed 250 lbs/sq.in.

- **Electrical Equipment**
  - Power from a ship’s service 440VAC, 60 Hz, 3-Phase, high resistance ground, Type I power system having the steady state and transient characteristics in accordance with MIL-STD-1399-300 is available. The ground current is limited such that continued operation of the equipment with single ground fault is possible. If other types of power are needed
other than what has been described in this specification (e.g. vacuum, hydraulic, etc.), the generation of that power will be self contained within the system and meet all applicable standards for ship board use.

- Any proposed ship modification must be made in accordance with classification society rules.

6. Points of Contact –

Questions of a **technical** nature should be directed to:

Name:        Ms. Kate Mangum  
Occupation Title:  Program Officer  
Address:   Office of Naval Research  
            One Liberty Center  
            875 North Randolph Street  
            Arlington, VA. 22203-1995  
Code:    333  
Email Address:  katherine.mangum@navy.mil

Questions of a **business** nature should be directed to:

Name: Ms. Susan Parrott  
Occupation Title:  Contracting Officer  
Address:   Office of Naval Research  
            One Liberty Center  
            875 North Randolph Street  
            Arlington, VA. 22203-1995  
Code:    BD253  
Email Address:  susan.parrott@navy.mil

All questions shall be emailed to both the technical and business points of contact.

All questions are due no later than 2:00PM Eastern Time 10 days **prior to** the response date listed in Section I.4 above.

7. **Instrument Type** –

Award will be in the form of cost-type contract, specifically Indefinite Delivery Indefinite Quantity (IDIQ) contracts with cost-type Task Orders made off of those IDIQs.

ONR reserves the right to award a different instrument type if deemed to be in the best interest of the Government.
8. Catalog of Federal Domestic Assistance (CFDA) Numbers –

12.300

9. Catalog of Federal Domestic Assistance (CFDA) Titles –

Basic and Applied Scientific Research

10. Other Information –

Work funded under a BAA may include basic research, applied research and some advanced technology development (ATD). With regard to any restrictions on the conduct or outcome of work funded under this BAA, ONR will follow the guidance on and definition of "contracted fundamental research" as provided in the Under Secretary of Defense (Acquisition, Technology and Logistics) Memorandum of 26 June 2008. As defined therein the definition of "contracted fundamental research", in a DoD contractual context, includes [research performed under] grants and contracts that are (a) funded by Research, Development, Test, and Evaluation Budget Activity 1 (Basic Research), whether performed by universities or industry or (b) funded by Budget Activity 2 (Applied Research) and performed on campus at a university. ATD is funded through Budget Activity 3. In conformance with the USD (AT&L) guidance and National Security Decision Directive 189, ONR will place no restriction on the conduct or reporting of unclassified fundamental research, except as otherwise required by statute, regulation or Executive Order. Normally, fundamental research is awarded under grants with universities and under contracts with industry. ATD is normally awarded under contracts and may require restrictions during the conduct of the research and DoD pre-publication review of research results due to subject matter sensitivity. The funds available to support awards are Budget Activity 2 and 3.

FAR Part 35 restricts the use of the Broad Agency Announcements (BAAs), such as this, to the acquisition of basic and applied research and that portion of advanced technology development not related to the development of a specific system or hardware procurement. Contracts and grants and other assistance agreements made under BAAs are for scientific study and experimentation directed towards advancing the state of the art and increasing knowledge or understanding.

This announcement is NOT for the acquisition of technical, engineering, and other types of support services.

In the case of funded proposals for the production and testing of prototypes, ONR may during the contract period add a contract line item or contract option for the provision of advanced component development or for the delivery of additional prototype units. However, such a contract addition shall be subject to the limitations contained in Section 819 of the National Defense Authorization Act for Fiscal Year 2010.
II. AWARD INFORMATION

ONR anticipates that up to two IDIQ awards will result from this BAA. Approximately $12.1 M is anticipated to be available over the 3-year span (FY11-13). Although the amount of funds and period of performance for each proposal will vary depending on the technical approach to be pursued by the offeror, it is expected each proposal will be structured similarly to the program structure below.

Total amount of funding available for each Task Order:
- Phase I: Up to $0.65 Million per award
- Phase II: Estimated to be up to $4.95 Million
- Phase III: Estimated to be up to $6.5 Million

Anticipated number of Task Orders:
- Phase I: Up to 2 Task Orders
- Phase II: 1 Task Order
- Phase III: 1 Task Order

Anticipated period of performance for each Task Order:
- Phase I: Up to 6 Months
- Phase II: Estimated to be up to 14 Months
- Phase III: Estimated to be up to 14 Months

The IDIQ minimum quantity will be $10,000. Subsequent Task Orders will be issued based on the success of the prior phase and will follow the criteria established in FAR 16.505. The IDIQ maximum quantity will be based on the total program estimate, which should be approximately $12.1 M.

Although ONR expects a program phasing plan similar to the above to be executed, ONR reserves the right to make changes.

III. ELIGIBILITY INFORMATION

All responsible sources from academia and industry may submit proposals under this BAA. Historically Black Colleges and Universities (HBCUs) and Minority Institutions (MIs) are encouraged to submit proposals and join others in submitting proposals. However, no portion of this BAA will be set aside for HBCU and MI participation.

Federally Funded Research & Development Centers (FFRDCs), including Department of Energy National Laboratories, are not eligible to receive awards under this BAA. However, teaming arrangements between FFRDCs and eligible principal bidders are allowed so long as they are permitted under the sponsoring agreement between the Government and the specific FFRDC.

Navy laboratories and warfare centers as well as other Department of Defense and civilian agency laboratories are also not eligible to receive awards under this BAA and
should not directly submit either white papers or full proposals in response to this BAA. If any such organization is interested in one or more of the programs described herein, the organization should contact an appropriate ONR POC to discuss its area of interest. The various scientific divisions of ONR are identified at http://www.onr.navy.mil/. As with FFRDCs, these types of federal organizations may team with other responsible sources from academia and industry that are submitting proposals under this BAA.

Teams are also encouraged and may submit proposals in any and all areas. However, Offerors must be willing to cooperate and exchange software, data and other information in an integrated program with other contractors, as well as with system integrators, selected by ONR.

Non-Government organizations previously contracted under a Government-funded program to support the development of the requirements for the Advanced Mooring System are not eligible to receive awards as a prime contractor or subcontractor under this BAA absent meeting the requirements of FAR Subpart 9.5 "Organizational and Consultant Conflicts of Interest", which may require Contractor submission and Government approval of an Organizational Conflict of Interest mitigation plan. (See Section VII, Other Information)

Research in areas that involve export controlled technologies is limited to “U.S. persons” as defined in the International Traffic in Arms Regulation (ITAR) – 22 CFR § 1201.1 et seq.

IV. APPLICATION AND SUBMISSION INFORMATION

1. Application and Submission Process -

This solicitation is for full proposals only. Full proposals are due before the date and time listed in Section I.4. Full Proposal shall be mailed to the technical point of contact listed in Section I.6.

2. Content and Format of Full Proposals -

Proposal submissions will be protected from unauthorized disclosure in accordance with FAR Subpart 15.207, applicable law, and DoD/DoN regulations. Offerors are expected to appropriately mark each page of their submission that contains proprietary information. The proposals submitted under this BAA are expected to be unclassified.

A. Full Proposal Format – Volume 1 - Technical and Volume 2 - Cost Proposal

- Paper Size – 8.5 x 11 inch paper
- Margins – 1 inch
- Spacing – single-spaced
- Font – Times New Roman, 12 point
- Number of Pages –
Volume 1: Technical Proposal

- Sub-Volume 1: IDIQ proposal (Address All Program Phases) – The following sections are limited to a total of no more than 25 pages: Technical Approach and Justification, Project Schedule and Milestones, Technology Transition, Software Development Plan, Technical/Design Reviews, Management Approach, and Current and Pending Project and Proposal Submissions.

- Sub-Volume 2: Task Order 0001 proposal (Address Program Phase I) – The following sections are limited to a total of no more than 25 pages: Statement of Work, Technical Approach and Justification, Project Schedule and Milestones, Technology Transition, Software Development Plan, and Technical/Design Reviews.

Within the page limit for each sub-volume, the Technical Approach and Justification section is limited to no more than 15 pages of the 25 page limit for that sub-volume.


Copies – one (1) unbound signed original, 6 unbound copies, and one electronic copy on a CD-ROM or DVD, (in Microsoft® Word or Excel 97 compatible or .PDF format).

B. Full Proposal Content

Technical Proposals shall consist of two sub-volumes:
- Sub-Volume 1: IDIQ proposal (Address All Program Phases)
- Sub-Volume 2: Task Order 0001 proposal (Address Only Program Phase I)

i. Volume 1: Technical Proposal

- **Cover Page:** This should include the words “Technical Proposal” and the following:
  1) BAA number
  2) Title of Proposal
  3) Identity of prime offeror and complete list of subcontractors, if applicable
  4) Technical contact (name, address, phone/fax, electronic mail address)
  5) Administrative/business contact (name, address, phone/fax, electronic mail address)
  6) Proposed period of performance (identify both the base period and any options, if included)
  7) Start and end dates for offeror’s fiscal year
  8) Signature of official authorized to obligate the institution contractually
  9) Proposal validity of at least 180 days and the date offer is submitted
• **Proposal Checklist:** (include in both sub-volumes) To assist offerors in the development and submission of their proposals in response to this BAA, a Proposal Checklist for Contracts, Grants, Cooperative Agreements and Other Transactions has been uploaded as an attachment. Offerors should print and complete the checklist to ensure that all required actions have been taken and information included prior to proposal submission. Inclusion of the completed checklist as the first page of your Volume I, Technical Proposal will assist in proposal evaluation and may shorten the time it takes to make an award.

• **Table of Contents:** (include in both sub-volumes) An alphabetical/numerical listing of the sections within the proposal, including corresponding page numbers.

• **Executive Summary:** (include in both sub-volumes) The Executive Summary allows offerors to present briefly and concisely the important aspects of their proposals to evaluators. The summary should include a brief description of the technology concept proposed and an organized progression of the work to be accomplished, without the technical details, such that the reader can grasp the core concepts of the proposed project design, construction, and testing. The Executive Summary is limited to no more than two pages.

• **Statement of Work:** (include only in Task Order 0001 sub-volume; the Statement of Work for the IDIQ contract will be the General Information section of this solicitation) A Statement of Work (SOW) clearly detailing the scope and objectives of the effort and the technical approach. It is anticipated that the proposed SOW will be incorporated as an attachment to the resultant award instrument. To this end, such proposals must include a severable, self-standing, task-oriented SOW without any proprietary restrictions, which can be attached to the contract or agreement award. Include a detailed listing of the technical tasks/subtasks organized by year and a section which lists all proposed deliverables.

Submission of the SOW without restrictive markings is your company’s affirmation that the SOW is non-proprietary and releasable in response to Freedom of Information Act (FOIA) requests.

• **Technical Approach and Justification** (include in both sub-volumes) The major portion of the proposal should consist of a clear description of the technical approach being proposed. This discussion should provide the technical foundation/justification for pursuing this particular approach/direction and why one could expect it to enable the objectives of the proposal to be met.
• **Operational Naval Concept:** (include in both sub-volumes) A description of the project objectives, the concept of operation for the new capabilities to be delivered, and the expected operational performance improvements.

• **Operational Utility Assessment Plan:** (include in both sub-volumes) A plan for demonstrating and evaluating the operational effectiveness of the Offeror’s proposed products or processes in field experiments and/or tests in a simulated environment.

• **Project Schedule and Milestones:** (include in both sub-volumes) A summary of the schedule of events and milestones for all the phases in sub-volume 1 and for task order 1 in sub-volume 2.

• **Assertion of Data Rights:** (include as appropriate in either sub-volume) For a contract award an Offeror may provide with its proposal, assertions to restrict use, release or disclosure of data and/or computer software that will be provided in the course of contract performance. The rules governing these assertions are prescribed in Defense Federal Acquisition Regulation Supplement (DFARS) clauses 252.227-7013, .7014, and -7017. These clauses may be accessed at the following web address: [http://farsite.hill.af.mil;VFDFARA.HTM](http://farsite.hill.af.mil;VFDFARA.HTM)

  The Government may challenge assertions that are provided in improper format or that do not properly acknowledge earlier federal funding of related research by the Offeror.

  If it is determined that data rights are not applicable, indicate no assertions are being made in the proposal submission.

• **Deliverables/Reports:** (include only in Task Order 0001 sub-volume) A detailed list of reports and any proposed hardware, software or prototypes, inclusive of the timeframe in which they will be delivered.

  Some examples of deliverables are test data, technical reports, and technology transfer media such as a video of the process. At a minimum, deliverables will include the following:

  • Monthly Financial Progress Summary: Brief report detailing current expenditures, percent of work complete, and estimate to complete.
  • Monthly Technical Summary: Brief report detailing program’s technical status and progress.
  • Quarterly Report: Concise report addressing accomplishments, status and issues, actions, and plans for the next quarter.
  • Presentation Materials.
  • Full proposals (Technical Proposal and Cost Proposal) for subsequent phases.
• Final Report.

In the later phase task orders, it is anticipated that a model scale system and full scale proof of principle demonstrator deliverables will be required.

• **Technology Transition:** (include in both sub-volumes) Discuss the suitability for implementation on current or new Navy platforms. Key points to include in this section are:
  - A Technology Transition Plan detailing the strategy to be used for the transition to R&D for current or new Navy platforms. The plan shall cover multiple platforms, if applicable.
  - Indicate testing and specification and standards changes required to implement the results of the project. Each possible platform should be addressed.
  - Indicate routes that might be taken to achieve a broader diffusion of the technology.

• **Software Development Plan:** (include in both sub-volumes) Any proposal that includes software development must provide a brief (typically, one page or less) outline of the development plan explaining the proposed functionality, approach, interoperability, and methodology. Plans should address all the phases in sub-volume 1 and address task order 1 in sub-volume 2.

• **Technical/Design Reviews:** (include in both sub-volumes) The contractor shall perform quarterly reviews. This section will describe the intended reviews and identify when and where they will be conducted.

• **Management Approach:** (include only in IDIQ sub-volume) A discussion of the overall approach to the management of this effort, including brief discussions of the total organization; use of personnel; project/function/subcontractor relationships; government research interfaces; and planning, scheduling and control practice. Identify which personnel and subcontractors (if any) will be involved. Include a description of the facilities that are required for the proposed effort with a description of any Government Furnished Equipment/Hardware/Software/Information required, by version and/or configuration.

• **Organizational Conflict of Interest:** (include only in IDIQ sub-volume) The contractor shall disclose the existence or potential existence of organizational conflicts of interest, as defined in FAR 9.501. All proposers and proposed subcontractors must affirmatively state whether they are providing scientific, engineering, and technical assistance (SETA) or similar support to any ONR or NAVSEA technical office(s) through an active contract or subcontract. All affirmations must state which office(s) the offeror supports and the prime contract number. This disclosure shall include a description of any action the proposer has taken or proposes to take to avoid, neutralize, or mitigate such
conflict. All facts relevant to the existence or potential existence of organizational conflicts of interest (FAR 9.5) must be disclosed. If the proposer believes that no such conflict exists, the proposer shall make that statement. See Section VII, paragraph 3 for additional information.

- **Current and Pending Project and Proposal Submissions:** (include only in IDIQ sub-volume) Offerors are required to provide information on all current and pending support for ongoing projects and proposal that are related or complementary to this effort from other possible sponsors, (e.g., ONR, Federal, State, local or foreign government agencies, public or private foundations, industrial or other commercial organizations). Concurrent submission of a proposal to other organizations will not prejudice its review by ONR. The following information is required:

  1) Title of Proposal and Summary;
  2) Source and amount of funding (annual direct costs; provide contract and/or grant numbers for current contracts/grants);
  3) Percentage effort devoted to each project;
  4) Identity of prime Offeror and complete list of subcontractors, if applicable;
  5) Technical contact (name, address, phone/fax, electronic mail address);
  6) Administrative/business contact (name, address, phone/fax, electronic mail address);
  7) Duration of effort (differentiate basic effort);
  8) The proposed project and all other projects or activities requiring a portion of time of the Principal Investigator and other senior personnel must be included, even if they receive no salary support from the project(s);
  9) The total award amount for the entire award period covered (including indirect costs) must be shown as well as the number of person-months or labor hours per year to be devoted to the project, regardless of source of support; and
  10) State how projects are related to the proposed effort and indicate degree of overlap.

- **Qualifications:** (include only in IDIQ sub-volume) A discussion of the qualifications of the proposed Principal Investigator and any other key personnel. Include resumes for the Principal Investigator and other key personnel and resumes or full curricula vitae for consultants. The resumes and/or curricula vitae shall be attached to the proposal and will not count toward the page limitations.

- **Letters of Commitment:** (include only in IDIQ sub-volume) Include Letters of Commitment from key member companies/organizations. These letters shall not exceed one page in length and must reflect commitment (e.g., cost
share, other donated services, etc.) to the project and not discuss technical information.

ii. **Volume 2: Cost Proposal**

The following information is provided to assist contractors in preparing and submitting an adequate and compliant cost proposal. The purpose of the submission of cost or pricing data is to enable Government personnel to perform cost or price analysis and ultimately negotiate a fair and reasonable cost. Offerors are reminded that the responsibility for providing adequate supporting data and attachments lies solely with the offeror. Further, the offeror must also bear the burden of proof in establishing reasonableness of proposed costs; therefore, it is in the contractor’s best interest to submit a fully supportable and well-prepared cost proposal. The basis and rationale for all proposed costs should be provided as part of the proposal so that Government personnel can place reliance on the information as current, complete and accurate. Further, FAR 15.403-4 sets forth those circumstances in which Offerors are required to submit certified cost or pricing data.

All Offerors shall use the cost proposal format spreadsheet (cost proposal spreadsheet.xls) that is an attachment to this document as the basis of the cost proposal. This cost proposal format spreadsheet must also be submitted for subcontractors over $100K.

For pricing purposes, assume that performance will start **no earlier than** six (6) months after submission of the proposal.

**Only submit a cost proposal for Task Order 0001; the minimum IDIQ amount will be $10,000.**

The cost proposal should include a statement that the company has (or has not) done business with the Government before. If the company has done business with the Government before and has an approved accounting system, the statement should include the date that the accounting system was determined to be adequate. If this will be the company’s first Government contract, please download the Defense Contract Audit Agency’s (DCAA) “Information for Contractors” pamphlet, which can be found at [www.dcaa.mil](http://www.dcaa.mil) and become familiar with the Federal Acquisition Regulation (FAR) Part 31.205 to ensure that a successful accounting system review can be completed prior to contract award.

The cost proposal shall consist of a cover page and two parts: Part 1 will provide a detailed cost breakdown of all costs by cost category by offeror’s fiscal year and Part 2 will provide a cost breakdown by task/sub-task corresponding to the task numbers in the proposed Statement of Work.
**Cover Page:** The use of the SF 1411 is optional. The words “Cost Proposal” should appear on the cover page in addition to the following information:

- BAA number
- Title of Proposal
- Identity of prime Offeror and complete list of subcontractors, if applicable
- Technical contact (name, address, phone/fax, electronic mail address)
- Administrative/business contact (name, address, phone/fax, electronic mail address)
- Proposed period of performance (identify both the base period and any proposed options)

**a. Part 1:** Detailed breakdown of all costs by cost category by calendar or Contractor fiscal year:

- **Direct Labor** – Individual labor categories or persons, with associated labor hours and unburdened direct labor rates. Provide escalation rates for out years.

- **Indirect Costs** – Fringe Benefits, Overhead, G&A, COM, etc. and their applicable allocation bases. If composite rates are used, provide the calculations used in deriving the composite rates.

- **Travel** – The proposed travel cost should include the following for each trip: the purpose of the trip, origin and destination if known, approximate duration, the number of travelers, and the estimated cost per trip must be justified based on the organization’s historical average cost per trip or other reasonable basis for estimation. Such estimates and the resultant costs claimed must conform to the applicable Federal cost principles.

- **Subcontracts/Interorganizational Transfers** – A cost proposal as detailed as the Offeror’s cost proposal will be required to be submitted by all proposed subcontractors and for all interorganizational transfers. For subcontracts or interorganizational transfers over $100,000, the subcontract proposal along with supporting documentation, must be provided either in a sealed envelope with the prime’s proposal or via e-mail directly to both the Program Officer and the Business Point of Contact at the same time the prime proposal is submitted. The e-mail should identify the proposal title, the prime Offeror and that the attached proposal is a subcontract, and should include a description of the effort to be performed by the subcontractor. A proposal and supporting documentation must be received and reviewed before the Government can complete its cost analysis of the proposal and enter negotiations. The prime contractor should perform and provide a cost/price analysis of each subcontractor’s cost proposal. *Offerors
are required to obtain competition to the maximum extent practicable when selecting subcontractors or interorganizational transfers. If the offeror has obtained competitive quotes, copies should be provided. If the Offeror has selected other than the low bid for inclusion in its proposal or intends to award the subcontract/interorganizational transfer on a sole-source basis, the offeror should provide rationale for its decision. Certified cost or pricing data may be required for subcontractor proposals over $650,000. The cost proposal format spreadsheet (spreadsheet.xls) that is an attachment to this document must be used for subcontractors over $100K.

*Note: Federal Acquisition Regulation provision 52.215-22 is incorporated into this solicitation by reference. The offeror is to exclude excessive pass-through charges from subcontractors. The offeror must identify in its proposal the percentage of effort it intends to perform and the percentage to be performed by each of its proposed subcontractors. If more than 70 percent of the total effort will be performed through subcontractors, the offeror must include the additional information required by the above-cited clause.

- **Consultant** – Provide a breakdown of the consultant’s hours, the hourly rate proposed, any other proposed consultant costs, a copy of the signed Consulting Agreement or other documentation supporting the proposed consultant rate/cost, and a copy of the consultant’s proposed statement of work if it is not already separately identified in the prime contractor’s proposal.

- **Materials & Supplies** - Provide an itemized list of all proposed materials and supplies for each year including quantities, unit prices, proposed vendors (if known), and the basis for the estimate (e.g., quotes, prior purchases, catalog price lists). If the total cost for materials and supplies exceeds $100,000 per year, then select a sample of the items proposed and provide catalog price lists/quotes/prior purchase orders to support the price for the items in the sample. All items with a unit price over $10,000, regardless of the total cost for materials and supplies, must be supported with a copy of catalog price lists/quotes/prior purchase orders.

- **Contractor Acquired Equipment or Facilities** – Equipment and/or facilities are normally furnished by the Contractor. If acquisition of equipment and/or facilities is proposed, a justification for the purchase of the items must be provided including: 1) a very specific description of any equipment/hardware that it needs to acquire to perform the work, 2) whether or not each particular piece of equipment/hardware will be included as part of a deliverable item under the resulting award, and 3) the basis for the estimate (e.g., quotes, prior purchases,
catalog price lists). The description should identify the component, nomenclature, and configuration of the equipment/hardware that it proposes to purchase for this effort. The purchase on a direct reimbursement basis of equipment that is not included in a deliverable item will be evaluated for allowability on a case-by-case basis. Maximum use of Government integration, test, and experiment facilities is encouraged in each of the Offeror’s proposals.

- **Other Direct Costs** – Provide an itemized list of all other proposed other direct costs and the basis for the estimate (e.g., quotes, prior purchases, catalog price lists).

- **Fee/Profit** – NOTE: Profit or fee will not be allowed on direct costs for plant equipment or general purpose equipment or in cost-sharing contracts.

Note: Indicate if you have an approved Purchasing/Estimating System and/or describe the process used to determine the basis of reasonableness (e.g., competition, market research, best value analysis) for subcontractors, consultants, materials, supplies, equipment/facilities, and other direct costs.

3. **Submission of Late Proposals**

Any proposal, modification, or revision, that is received at the designated Government office after the exact time specified for receipt of proposals is “late” and will not be considered unless it is received before award is made, the contracting officer determines that accepting the late proposal would not unduly delay the acquisition and

(a) If it was transmitted through an electronic commerce method authorized by the announcement, it was received at the initial point of entry to the Government infrastructure not later than 5:00 p.m. one working day prior to the date specified for receipt of proposals; or

(b) There is acceptable evidence to establish that it was received at the Government installation designated for receipt of proposals and was under the Government’s control prior to the time set for receipt of proposals; or

(c) It was the only proposal received.
However, a late modification of an otherwise timely and successful proposal that makes its terms more favorable to the Government will be considered at any time it is received and may be accepted.

Acceptable evidence to establish the time or receipt at the Government installation includes the time/date stamp of that installation on the proposal wrapper, other documentary evidence of receipt maintained by the installation, or oral testimony or statements of Government personnel.

If an emergency or unanticipated event interrupts normal Government processes so that proposals cannot be received at the Government office designated for receipt of proposals by the exact time specified in the announcement, and urgent Government requirements preclude amendment of the announcement closing date, the time specified for receipt of proposals will be deemed to be extend to the same time of day specified in the announcement on the first work day on which normal Government processes resume.

The contracting officer must promptly notify any offeror if its proposal, modifications, or revision was received late and must inform the offeror whether its proposal will be considered.

4. Significant Dates and Times –

<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposal Due Date</td>
<td>See Section 1.5</td>
</tr>
<tr>
<td>Notification of Selection for Award</td>
<td>Approximately October 2010</td>
</tr>
<tr>
<td>Issuance of Award</td>
<td>Approximately March 2010</td>
</tr>
</tbody>
</table>

**NOTE:** Due to changes in security procedures since September 11, 2001, the time required for hard-copy written materials to be received at the Office of Naval Research has increased. Materials submitted through the U.S. Postal Service, for example, may take seven days or more to be received, even when sent by Express Mail. Thus it is strongly recommended that any hard-copy proposal should be submitted long enough before the deadline established in the solicitation so that it will not be received late and thus be ineligible for award consideration.

4. Address for the Submission of Full Proposals –

All hard copies of full proposals shall be mailed or hand delivered to the Technical Point of Contact located in Section 1.6 above. If hand delivered, building security will contact the Technical Point of Contact or Lisa Carey (Code 333) if the Technical Point of Contact is not available to receive the proposal in person.

**NOTE:** PROPOSALS SENT BY FAX OR E-MAIL WILL NOT BE CONSIDERED.
V. EVALUATION INFORMATION

1. Evaluation Factors –

Award decisions will be based on a competitive selection of proposals resulting from a scientific and cost review. All proposals must meet the minimum or threshold requirements as described in Section 5.2.1 of this BAA. Assuming proposals meet minimum requirements, individual task order proposals will be evaluated during all three phases using the criteria described below.

a. Technical Merit. This factor is divided into the following sub-factors that are listed in priority order.
   i. Performance. This sub-factor determines the extent to which the performance specifications and design requirements listed in Section 5.2 are met or exceeded in the areas of operating envelope expansion; modularity, scalability and ease of deployment; breadth of applicability to all scenarios in Section 5.1; ability to accommodate changes in draft and vessel alignment; and mitigation of risks associated with skin-to-skin mooring.
   ii. Ship Impact. Minimize system area, volume, weight, and power.
   iii. Affordability. The degree to which acquisition and total ownership costs are minimized.

b. Scientific Merit. This factor assesses the degree of innovation involved and whether the proposed technology presses the state of the art while still having credibility with regard to technical approach.

c. Technology Transition. This factor assesses a technology’s potential Naval relevance and likelihood of implementation on Navy platforms.

d. Offeror’s Capabilities and Technical Plan. This factor assesses other related project experience, facilities, techniques, or unique combinations of these that are integral factors for achieving the proposal objectives. Qualifications, capabilities, and experience of the proposed management team and technical personnel will be assessed, as well as the degree to which the proposal describes a complete system and provides a detailed scope of work for the development of the core technology(ies).

e. Cost Realism. Realism of the proposed costs and availability of funds.

Overall, the Technical and Scientific merit factors (a. and b. above) are weighted equally with one another and higher than factors c. and d., which held equal to each other. Technical factors a. through d. are individually significantly more important than cost e.

Within the Technical Merit evaluation factor, sub-factor i. is weighted the highest, ii. the second highest, and iii. the third highest.

The degree of importance of cost will increase with the degree of equality of the proposals in relation to the other factors on which selection is to be based, or when the
cost is so significantly high as to diminish the value of the proposal’s technical superiority to the Government.

For proposed awards to be made as contracts to other than small businesses, the socio-economic merits of each proposal will be evaluated based on the extent of the Offeror’s commitment in providing meaningful subcontracting opportunities for small businesses, small disadvantaged businesses, woman-owned small businesses, HUBZone small businesses, veteran-owned small businesses, service disabled veteran-owned small businesses, historically black colleges and universities, and minority institutions.

2. Evaluation Panel –

Technical and cost proposals submitted under this BAA will be protected from unauthorized disclosure in accordance with FAR 3.104-4 and 15.207. The cognizant Program Officer and other Government scientific experts will perform the evaluation of technical proposals. Restrictive notices notwithstanding, one or more support contractors may be utilized as subject-matter-expert technical consultants. Similarly, support contractors may be utilized to evaluate cost proposals. However, proposal selection and award decisions are solely the responsibility of Government personnel. Each support contractor’s employee having access to technical and cost proposals submitted in response to this BAA will be required to sign a non-disclosure statement prior to receipt of any proposal submissions.

VI. AWARD ADMINISTRATION INFORMATION

Administrative Requirements –

- The North American Industry Classification System (NAICS) code – The North American Industry Classification System (NAICS) code for this announcement is “541712” with a small business size standard of “500 employees”.

- CCR - Successful Offerors not already registered in the Central Contractor Registry (CCR) will be required to register in CCR prior to award of any grant, contract, cooperative agreement, or other transaction agreement. Information on CCR registration is available at https://www.bpn.gov/ccr/default.aspx.

- Certifications – Proposals should be accompanied by a completed certification package, which shall include the following two items:
  - Online Representations and Certifications Application (ORCA) – In accordance with FAR 4.1201, prospective contractors shall complete and submit electronic annual representations and certifications available at https://orca.bpn.gov.
  - ONR Contract Specific Representations and Certifications – Completed ONR contract specific representations and certifications, i.e., Section K,

- Subcontracting Plans – Successful contract proposals that exceed $550,000, submitted by all but small business concerns will be required to submit a Small Business Subcontracting Plan in accordance with FAR 52.219-9 prior to award.

VII. OTHER INFORMATION

1. Government Property/Government Furnished Equipment (GFE) and Facilities

Government research facilities and operational military units are available and should be considered as potential government-furnished equipment/facilities. These facilities and resources are of high value and some are in constant demand by multiple programs. It is unlikely that all facilities would be used for any one specific program. The use of these facilities and resources will be negotiated as the program unfolds. Offerors should explain as part of their proposals which of these facilities are critical for the project’s success.

2. Department of Defense High Performance Computing Program

The DoD High Performance Computing Program (HPCMP) furnishes the DoD S & T and DT & E communities with use-access to very powerful high performance computing systems. Awardees of ONR contracts, grants, and assistance instruments may be eligible to use HPCMP assets in support of their funded activities if ONR Program Officer approval is obtained and if security/screening requirements are favorably completed. Additional information and an application may be found at http://www.hpcmo.hpc.mil/.

3. Organizational Conflicts of Interest

In accordance with FAR 9.503 and without prior approval, a contractor cannot simultaneously be a SETA and a research and development performer. Proposals that fail to fully disclose potential conflicts of interests or do not have acceptable plans to mitigate identified conflicts will be rejected without technical evaluation and withdrawn from further consideration for award. If a prospective offeror believes that any conflict of interest exists or may exist (whether organizational or otherwise), the offeror should promptly raise the issue with ONR by sending his/her contact information and a summary of the potential conflict by e-mail to the Business Point of Contact in Section I, item 7 above, before time and effort are expended in preparing a proposal and mitigation plan. If, in the sole opinion of the Government after full consideration of the circumstances, any conflict situation cannot be effectively avoided or mitigated, the proposal may be rejected without technical evaluation and withdrawn from further consideration for award under this BAA.
4. Project Meetings and Reviews

Individual program reviews between the ONR sponsor and the performer may be held as necessary. Program status reviews may also be held to provide a forum for reviews of the latest results from experiments and any other incremental progress towards the major demonstrations. These meetings will be held at various sites throughout the country. For costing purposes, offerors should assume that 40% of these meetings will be at or near ONR, Arlington, VA and 60% at other contractor or government facilities. Interim meetings are likely, but these will be accomplished via video telephone conferences, telephone conferences, or via web-based collaboration tools.