



Large Displacement Unmanned Underwater Vehicle Innovative Naval Prototype Technology

INTRODUCTION:

This publication constitutes a Broad Agency Announcement (BAA) as contemplated in Federal Acquisition Regulation (FAR) 6.102(d)(2) and 35.016, the Department of Defense Grants and Agreements regulations (DoDGARS) 22.315(a) and DoD's Other Transaction Guide for Prototypes Projects, USD(AT&L), OT Guide, Jan 2001. 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:

Large Displacement Unmanned Underwater Vehicle Innovative Naval Prototype (LDUUV INP) Technology

3. Program Name: Large Displacement Unmanned Underwater Vehicle Innovative Naval Prototype (LDUUV INP)

4. Research Opportunity Number:

ONRBAA11-025

5. Response Date:

Full Proposals Due Date: 12 September 2011, 2:00 PM Eastern Daylight Time

6. Research Opportunity Description:

The Large Displacement Unmanned Underwater Vehicles Innovative Naval Prototype technology BAA will develop the critical technologies needed to enable UUVs to operate and survive in the littorals for 70+ days. The LDUUV is a pier-launched and recovered UUV (without the need for ship-launch or recovery) with the capability to transit in the open ocean and conduct over-the-horizon missions in littoral waters. This system will enable the extension of Navy platform sensing capability over the horizon and extend its influence. The creation of this UUV is intended to act as a significant force multiplier for the US Navy and will help close Warfighter gaps in a cost-effective manner. Two technology areas have been identified as critical to achieving this goal. These areas are Autonomy and Endurance Technologies.

This BAA research opportunity is divided into two separate sections, one for each of these technology areas. Proposers may submit to one or more of the technology area announcements. A separate standalone proposal is required for each technology area. A follow-on BAA may be issued for integration of the core components developed under this BAA

This background is provided for informational purposes only. Greater breadth of mission profiles for current and future Naval Unmanned Undersea Vehicles require longer propulsion systems that extend the current capability of these vehicles from tens of hours to operability of the system for weeks to months¹.

Briefs that describe the Navy need, current state-of-the-art, and program goals from ONR Industry Day for this BAA, held on 10 March 2011, are available on the ONR web site at: https://secure.onr.navy.mil/events/docs/734_LDUUV%20INP%20Industry%20Day_posted%20version.pdf. Appendix A provides additional links of interest.

Information in this BAA regarding desired capabilities, metrics, and any other technical or contracting information supersedes any previously published information (including that briefed at the industry day described above).

6.1 TECHNOLOGY AREA 1: LDUUV Autonomy Technology

¹ UUV Master Plan; www.navy.mil/navydata/technology/uuvmp.pdf

The Office of Naval Research (ONR) is interested in receiving proposals for autonomy software and associated hardware/sensors for incorporation onto the Large Displacement Unmanned Undersea Vehicle (LDUUV) Innovative Naval Prototype (INP) Program.

The Autonomy section of this BAA will be broken into two phases, denoted as Autonomy Phase I and Autonomy Phase II. The objectives for each phase are described below. A full technical and cost proposal for Phase I and a description of the technical approach for Phase II are being requested at this time. ONR will initially select for award only Phase I proposals.

The overall objectives of the Autonomy development of this LDUUV INP Science and Technology (S&T) program will be operated within this two-phased approach.

- Autonomy Phase I: Development of LDUUV autonomy hardware and software for mission durations of up to 30 days in benign littoral environments. It will be assumed that only vessels over 30 gross tons will be operating in the area. Operator assistance can be requested from the UUV when the scenario is too complicated over satellite communication (Iridium or similar).
- Autonomy Phase II: Development of LDUUV autonomy hardware and software for mission durations of 70+ days that can operate without human interaction in specified areas. The mission profile will include open ocean transits and littoral water navigation. Obstacle avoidance includes all vessels that operate in the littorals. Fishing can be moving and may operate anywhere in the UUV operating area. Operator assistance is not allowed from the UUV in specified areas. Once outside the specified areas, operator assistance can be requested from the UUV when the scenario is too complicated over satellite communication (Iridium or similar).

The LDUUV Program will conduct simulation and at sea testing of the developed autonomy algorithms and sensors. The proposal must define the language in which the algorithms will be coded, the simulation method for developing and testing the algorithms, definition of sensors to be used, definition of the hardware that the algorithms will run, performance of the proposed autonomy, and all interfaces to and from the algorithms and sensors. MATLAB code is adequate for the base effort. The option can be used to code the system into real time implementation.

Proposals can describe a complete system concept or specialized autonomy components that focus on one or more of the categories listed below. In all cases, proposals must provide a detailed scope of work for the development of the core technologies, including a description of the algorithm, development, laboratory implementation, embedded implementation using hardware in the loop, at-sea experimentation, and power, volume, and weight estimates.

6.1.1 Background

ONR seeks full technical proposals for the phased development of vehicle autonomy technologies capable of the performance characteristics described for the following autonomous navigational challenges:

- 1) Undersea Obstacle Avoidance – Automated detection of undersea stationary and moving obstacles and associated avoidance maneuvers conducted in an autonomous manner by the vehicle. Path planning algorithms to minimize energy consumption during maneuvers.
- 2) Surface Obstacle Avoidance – Automated surface vessel detection and classification. Autonomous processing that determines location planning (including depth) and scheduling for communications using pre-determined risk factors and prioritized communications path choices.
- 3) Surface Vessel Intent – Automated characterization of surface vessel behavior to determine probability distribution of vessel type and activity, including fishing, military, recreational, and commercial activity. Advanced autonomy algorithm development to determine optimal maneuvering in the presence of the activity while maintaining mission priorities.
- 4) Fishnet Detection, Avoidance, and Extraction – New sensors and processing for the detection of fishing nets, including mono-filament and twine nets which are difficult to detect with current sensing systems. Development of new autonomy algorithms for net avoidance and extrication. Vehicle hardware upgrades to minimize risk of fish net entanglement.

Unexpected challenges may arise during autonomous operations, so the autonomy should be flexible to account for unknowns.

The ASTM F41 standard may be used as a guide for the separation of tasks between the vehicle controller, payload controller, and mission controller. Commercial standards for all interfaces, hardware and software, are strongly encouraged.

6.1.2 Program Plan

Autonomy Phase I:

The contract Phase I period consists of an 18-month base period plus an additional six month option. During the Base Period, performers will work to develop the algorithms and hardware to meet the thresholds defined below in Tables A1 and A2 and perform the objectives in Autonomy Phase I. The option period will be exercised for those performers meeting the thresholds in the base period for the purpose of integrating the algorithms on a LDUUV Test bed (Section II refers). If private funds have been used to develop technologies or concepts related to the proposed design, the U.S. Government requires, at a minimum, Government Purpose Rights in the technical data and computer software developed under the contract.

A full scale government-operated UUV prototype may be provided as Government Furnished Property for autonomy testing during the Phase I option.

TABLE A1: Autonomy Phase I Threshold (Minimum Requirement) Criteria:

| Threshold Criteria | Metric |
|-------------------------------------|---|
| Stationary obstacles avoidance | All obstacles extending from the bottom into water column (greater than 6 “ diameter) for a 30 day mission |
| Surface vessel avoidance | Detect 99.9% of all surface vessels over 30 gross tons within 2 nautical miles (nm). Avoid (500+ ft separation) detected moving vessel 100% of time. Density of vessels will be no greater than 1 contact per square nm |
| Surfacing object avoidance | Detect objects greater than 3’ cross section above the vehicle within 20’ and avoid object |
| Fishing net detection and avoidance | Detect fishing activity within 1 nm with a probability of correct detection of 80% and a probability of false detection of 10%. Maneuver around the fishing activity |
| Operating time | 30 day of operation without sailor physically maintain software or hardware |
| Depth | Operate from 100’ to 400’ in depth |
| Bathymetry following | Provide control algorithms to control vehicle controller to maintain constant altitude of 100ft above bottom within + - 5 ft |
| Route success | Over a 30 day mission, reach 10 prescribed waypoints within 10 hours of the plan and 300 feet of the position |
| Efficiency | Autonomy hardware and software shall not exceed more than 400W average power consumption |

TABLE A2: AUTONOMY ENVIRONMENTAL METRICS. All hardware shall meet the following environmental metrics:

| Specification | Metric |
|-------------------------------|---|
| OPERATING CONDITIONS | |
| Neutrally buoyant in Salinity | 25 parts per thousand (ppt) |
| Water Temperature | -1.1°C – 35.0°C (30°F to 95°F) |
| Air Temperature | -28.9°C to 50°C (-20°F to 122°F) |
| Temperature Shock | -28.9°C to 50°C (-20°F to 122°F) |
| Shipboard Shock | MIL-S-901D (Grade B) while secured to transportation pallet |
| Shipboard Vibration | MIL-STD-167-1 |
| Humidity | 0-100 % relative humidity |
| Salt Fog | Marine Environment |
| Fungus | Avoid Materials that promote fungal growth |

| | |
|--------------------------------------|--|
| Icing/Freezing Rain | Operate where icing may occur from sea splash/spray |
| Electromagnetic Environment | MIL-STD-461F (RE101, RE102, RS101, RS103, CE101 and CE102) |
| Depth | Operate up to 400' |
| Non-Operating Conditions | |
| Transportation Altitude | 0 to 12,192 M(0-40,000 ft) (pressurized or non-pressurized) |
| Transportation & Storage Temperature | -40.0°C to 108.9°C (-40°F to 160°F) |
| Transportation Shock & Vibration | Withstand ground, air, rail, ship transport (MIL-STD-1366E guidance) |
| Storage | Operate where icing may occur from sea splash/spray |

Autonomy Phase I Deliverables:

- Monthly Progress and Financial Reports
- Open Architecture plan
- Interface control document (including space, power, and volume of any added hardware)
- Preliminary System Design Report
- Preliminary Design Review (PDR) Presentation and Slide Set
- Test Readiness report and Slide Set
- Technical Data Package, including (but not limited to) detailed block diagram of the autonomy approach, detailed algorithm descriptions, Technology Readiness Levels for each hardware component and software subsystems, 3D models of all hardware being proposed, and key findings from Phase I execution.
- Test and Simulation Software to validate autonomy algorithms.
- Phase II Overview and Execution Plan, including steps to enhance the technology to meet the objective metrics, interim testing periods, and a prioritized list of risks associated with the Phase II final system.
- Phase II technical and cost proposal delivered 30 days before the end of the base period of performance for Phase I.
- Initial cost analysis, including up front, life cycle, and total ownership costs.
- Demonstration of phase I criteria using test and simulation software for a 30+ day mission.

Autonomy Phase II:

The Phase II period is anticipated to be a 12-36-month performance period whereby the autonomy system is expected to meet or exceed the criteria listed in Tables A3 and A4 below. The period of performance will depend on the state of technology being proposed and estimated time required to bring the research to fruition.

TABLE A3: Autonomy Phase II Criteria:

| Criteria | Metric |
|--|---|
| Bottom stationary obstacles avoidance | All obstacles extending from the bottom into water column (greater than 6 “ diameter) for the 70+ day mission |
| Surface vessel avoidance | When on or near the surface, detect 99.9% of all surface vessels within 2 nmi. 90% Detection of all moving surface vessels within 3 nmi. Avoid (500+ ft separation) detected moving vessel 100% of time. Density of vessels will be no greater than 5 ships per square mile |
| Surface object avoidance | Detect objects greater than 3’ cross section above the vehicle within 20’ and avoid object |
| Fishing activity detection and avoidance | Detect fishing activity within 5 nmi with a probability of correct detection $\geq 95\%$ and a probability of false detection $\leq 5\%$. |
| Operating time | 70+ days of operation without sailor physically maintain software or hardware |
| Depth | Operate from 20’ to 800’ in depth |
| Bathymetry following | Provide control algorithms to control vehicle controller to maintain constant altitude of 100ft above bottom within + - 5 ft |
| Route success | Over a 70 day mission, reach 40 prescribed waypoints within 5 hours of the approved plan and 50m of each waypoint |
| Efficiency | Autonomy hardware and software shall not exceed more than 100w average power consumption |
| Surfacing | Conduct 5 minute surfacing maneuver where multiple surface vessels are within 10 nmi but none are with 1 nmi. |
| Low power station keeping | Conduct station keeping maneuvers in up to 3 knot current that conserves power. |
| Net detection | Detection of fishing net location within 100 ft with a probability $\geq 80\%$. Maneuver around the fishing net. |

TABLE A4: AUTONOMY PHASE II ENVIRONMENTAL METRICS. All hardware shall meet the following environmental metrics:

| Specification | Metric |
|-------------------------------|----------------------------------|
| OPERATING CONDITIONS | |
| Neutrally buoyant in Salinity | 25 parts per thousand (ppt) |
| Water Temperature | -1.1°C – 35.0°C (30°F to 95°F) |
| Air Temperature | -28.9°C to 50°C (-20°F to 122°F) |

| | |
|--------------------------------------|--|
| Temperature Shock | -28.9°C to 50°C (-20°F to 122°F) |
| Shipboard Shock | MIL-S-901D (Grade B) while secured to transportation pallet |
| Shipboard Vibration | MIL-STD-167-1 |
| Humidity | 0-100 % relative humidity |
| Salt Fog | Marine Environment |
| Fungus | Avoid Materials that promote fungal growth |
| Icing/Freezing Rain | Operate where icing may occur from sea splash/spray |
| Electromagnetic Environment | MIL-STD-461F (RE101, RE102, RS101, RS103, CE101 and CE102) |
| Depth | Operate up to 800' |
| Non-Operating Conditions | |
| Transportation Altitude | 0 to 12,192 M(0-40,000 ft) (pressurized or non-pressurized) |
| Transportation & Storage Temperature | -40.0°C to 108.9°C (-40°F to 160°F) |
| Transportation Shock & Vibration | Withstand ground, air, rail, ship transport (MIL-STD-1366E guidance) |
| Storage | Operate where icing may occur from sea splash/spray |

Phase II projects will be expected to conduct integrated full-scale testing at a Technology Readiness Level of 6 or greater within the Phase II Period of Performance. Offerors must demonstrate that their proposed autonomy technology has the potential to meet a full mission profile without operator assistance. The proposal must provide annual technology development spirals for both simulation testing and UUV integration. A full scale government-operated UUV prototype can be used for autonomy testing during Phase II, or the contractor can propose to develop and build its own vehicle for evaluation purposes. If the contractors request access to Government UUV, the proposal must include a schedule of time requested for their technology testing.

Autonomy Phase II Deliverables:

- Monthly Progress and Financial Reports
- Open Architecture plan and Interface control document (including weight, volume, power of any hardware)
- Preliminary System Design Report
- Preliminary Design Review (PDR) Presentation and Slide Set
- Test Readiness report and Slide Set
- Technical Data Package, including (but not limited to) detailed block diagram of the autonomy approach, detailed algorithm descriptions, Technology Readiness Levels for each hardware component and software subsystems, 3D models of all hardware being proposed, and key findings from Phase I & II execution.
- Test and Simulation Software developed to validate autonomy algorithms.
- Updated cost analysis, including up front, life cycle, and total ownership costs.

- Final Report, including (but not limited to) detailed block diagram of updated technology, test results from any and all endurance testing, relevant 2-D or 3-D models and drawings of the new technology, Technology Readiness Levels for each hardware component and software subsystems, and key findings from Phase II execution, recommendations necessary to further mature the technology, and component risks that need further development/testing of components that are not fully matured to TRL 6.
- Demonstration of phase II criteria on a UUV for a 70+ day mission.

6.2 TECHNOLOGY AREA 2: LDUUV Endurance Technologies

The Office of Naval Research (ONR) is interested in receiving proposals for technology that can extend the endurance of propelled (non-glider) Unmanned Undersea Vehicles (UUV's) which help extend the current capability of these vehicles from tens of hours to operability of the system to months of operation. The proposed technologies will be incorporated onto the Large Displacement Unmanned Undersea Vehicle (LDUUV) Innovative Naval Prototype (INP) Program. The addition of this capability is intended to act as a significant force multiplier for the US Navy and will help close Warfighter gaps in a cost-effective manner

The Endurance section of this BAA will be broken into two phases, denoted as Endurance Phase I and Endurance Phase II. The objectives for each phase are described below. A full technical and cost proposal for Phase I and a description of the technical approach for Phase II are being requested at this time. ONR will initially select for award only Phase I proposals.

Technology development for an increase in endurance and reliability is to focus on at-sea operations and not launch, recovery, or maintenance operations. Specifically, this section of the BAA is looking for three types of technologies.

- 1) Technology that reduces the neutrally buoyant volume of the core system while maintaining the current capability.
- 2) Power reduction technology that can reduce the power of core system while maintaining the current capability.
- 3) Reliability technology that can increase the reliability of the LDUUV significantly for missions of 70+ days in duration. Examples include reliable components, development of smart components that can predict failure before they occur, or new architectures with fault tolerant components, algorithms, or backup systems.

Submittals under this section may have technologies which overlap with energy technologies. It is strongly urged that submitters clearly discern between increases in power output and duration, and increases in efficiency, during the submittal process.

The overall S&T program will develop endurance technologies for the LDUUV in a two-phased approach to include:

- Endurance Phase I: Development of LDUUV endurance technologies for mission durations up to 30 days. The endurance increase is expected to be demonstrated in a land based test center starting around Month 14 of this phase. Technologies should reduce core system

power level by 33% and show reliability of 30+ days. The base period is 24 months, with an additional 6 month option for integration into a government test bed.

- Endurance Phase II: Development of LDUUV endurance technologies in a pier-launched mission expected to last no less than 70 days. The demonstration is expected to operate in open ocean transits and in littoral waters over two test periods; the first starting around Month 18 of the phase (assuming a 36-month project execution), and the second around Month 30. Technologies should strive to reduce core system power by 75% and have system reliability of no less than 70 days. Multiple task orders may be required to meet Phase II objectives.

6.2.1 Background

The Endurance Area will conduct laboratory and at-sea testing to demonstrate technology development throughout the program execution. Testing will be conducted using existing Test Ranges and facilities with autonomy testing conducted in accordance with a Navy-approved acceptance test plan for each set of equipment or sub-system. A test and evaluation plan will outline the details to include test schedules, test site requirements, testing criteria, portability and future maritime testing.

Time on a Government-Operated Large UUV prototype will be provided for at sea testing of the proposed effort. Specific details of the Prototype UUV and times will be provided after award of contracts. General description of the vehicle and its components are included in Appendix B. Proposals should include the time and dates needed to test on the Government UUV.

ONR seeks full technical proposals for the phased development of vehicle endurance technologies capable of the performance characteristics described for the following endurance challenges:

- 1) Reduction of neutrally buoyant volume
- 2) Reduction of power
- 3) Increased component/system reliability of 70+ days

Proposals can describe a complete system concept or specialized endurance components that focus on one or more of the categories listed above. In any case, proposals must provide a detailed scope of work for the development of the core technologies, including a description of system development, system laboratory implementation, embedded implementation using hardware in the loop, and at-sea experimentation. The government currently expects to provide the vehicle test bed which successful proposing awardees can use to test and evaluate endurance technology, using an annual test cycle similar to the Navy's Advanced Processing Build (APB) process.

6.2.2 Program Plan

Endurance Phase I:

The contract Phase I period consists of a 24 month base period plus an additional six month option whereby the system is expected to meet or exceed the Thresholds listed below. If private funds have been used to develop technologies or concepts related to the proposed design, the U.S. Government desires, at a minimum, Government Purpose Rights in the technical data and computer software developed under the contract. Final demonstration for Phase I will be at a land based test center, but a full scale government-operated UUV prototype can be used for autonomy testing during the Phase I option.

Endurance Phase I Thresholds:

- Develop technology that can reduce the neutrally buoyant volume of current equipment and systems in Appendix B by 33%.
- Develop technologies that can reduce the power draw of the current equipment and systems in Appendix B by 33%.
- Develop technologies that can assure 90% reliability for core vehicle mission critical components of the LDUUV for 30+ days.

Endurance Phase I Deliverables:

- Monthly Progress and Financial Reports
- Open Architecture Plan
- Interface Control Document (including weight, volume, power)
- Preliminary System Design
- Preliminary Design Review Presentation and Slide Set
- Test Plan and Presentation
- Technical Data Package, including (but not limited to) detailed block diagram of updated technology, test results from any and all endurance testing, relevant 2-D or 3-D models and drawings of the new technology, Technology Readiness Levels for each hardware component and software subsystems, and key findings from Phase I execution.
- Phase II Overview and Execution Plan, including steps to enhance the technology to meet the objective metrics, interim testing periods, and a prioritized list of risks associated with the Phase II final system.
- Phase II technical and cost proposal delivered 30 days before the end of the base period of performance for Phase I.
- Initial cost analysis, including up front, life cycle, and total ownership costs.
- Demonstration of endurance technology in a land based test center for 30 days.

TABLE E1: PHASE 1 ENDURANCE ENVIRONMENTAL METRICS. All hardware shall meet the following environmental metrics:

| Specification | Metric |
|--------------------------------------|--|
| OPERATING CONDITIONS | |
| Neutrally buoyant in Salinity | 25 parts per thousand (ppt) |
| Depth | Operate up to 400' |
| Water Temperature | -1.1°C – 35.0°C (30°F to 95°F) |
| Air Temperature | -28.9°C to 50°C (-20°F to 122°F) |
| Temperature Shock | -28.9°C to 50°C (-20°F to 122°F) |
| Shipboard Shock | MIL-S-901D (Grade B) while secured to transportation pallet |
| Shipboard Vibration | MIL-STD-167-1 |
| Humidity | 0-100 % relative humidity |
| Salt Fog | Marine Environment |
| Fungus | Avoid Materials that promote fungal growth |
| Icing/Freezing Rain | Operate where icing may occur from sea splash/spray |
| Electromagnetic Environment | MIL-STD-461F (RE101, RE102, RS101, RS103, CE101 and CE102) |
| Non-Operating Conditions | |
| Transportation Altitude | 0 to 12,192 M(0-40,000 ft) (pressurized or non-pressurized) |
| Transportation & Storage Temperature | -40.0°C to 108.9°C (-40°F to 160°F) |
| Transportation Shock & Vibration | Withstand ground, air, rail, ship transport (MIL-STD-1366E guidance) |
| Storage | Operate where icing may occur from sea splash/spray |

Endurance Phase II:

A competition among Phase I contractors performing under Option 1 will be conducted to select Phase II performers. Endurance Phase II is planned to have a period of performance of between 12 and 36 months, depending on the state of technology being performed, whereby the system is expected to meet or exceed the criteria below. The selected projects will be expected to conduct integrated full-scale testing at a Technology Readiness Level of 6 or greater within the Phase II Period of Performance. Offerers must demonstrate that their proposed endurance technology has the potential to meet a full mission profile without operator assistance in bench and at-sea tests. A full scale government-supplied UUV prototype can be supplied for endurance testing during Phase II, or the contractor can propose to develop and build its own vehicle for evaluation purposes.

Endurance Phase II Objectives:

- Develop technology that can reduce the neutrally buoyant volume of current equipment and systems in Appendix B by 75%
- Develop technologies that can reduce the power draw of the current equipment and systems in Appendix B by 75%
- Develop technologies that can assure 95% reliability for core vehicle mission critical components of the LDUUV for 70+ days

Deliverables:

- Monthly Progress and Financial Reports
- Critical Design Review (CDR) Data package including Detailed System Design Package, including Table of final system components with software application descriptions, software description documents, hardware specifications, sensor descriptions and associated cost
- TRR Presentation and Slide Set
- Full scale system integrated into an LDUUV and land-based tested prior to at-sea tests.
- At-sea test plans and reports.
- Final Report, including (but not limited to) detailed block diagram of updated technology, test results from any and all endurance testing, relevant 2-D or 3-D models and drawings of the new technology, weight, volume, and power requirements, Technology Readiness Levels for each hardware component and software subsystems, and key findings from Phase II execution, recommendations necessary to further mature the technology, and component risks that need further development/testing of components that are not fully matured to TRL6.
- Technical Data Package- This includes documented design including algorithms, source code, mechanical drawings, assembly drawings, and executable software, as applicable.
- Updated cost analysis, including up front, life cycle, and total ownership costs.
- Demonstration of endurance technology on a vehicle under relevant operating conditions for 70 days.

TABLE E2: PHASE 2 ENDURANCE ENVIROMENTAL METRICS. All hardware shall meet the following environmental metrics:

| Specification | Metric |
|-------------------------------|---|
| OPERATING CONDITIONS | |
| Neutrally buoyant in Salinity | 25 parts per thousand (ppt) |
| Depth | Operate up to 800' |
| Water Temperature | -1.1°C – 35.0°C (30°F to 95°F) |
| Air Temperature | -28.9°C to 50°C (-20°F to 122°F) |
| Temperature Shock | -28.9°C to 50°C (-20°F to 122°F) |
| Shipboard Shock | MIL-S-901D (Grade B) while secured to transportation pallet |
| Shipboard Vibration | MIL-STD-167-1 |
| Humidity | 0-100 % relative humidity |

| | |
|--------------------------------------|--|
| Salt Fog | Marine Environment |
| Fungus | Avoid Materials that promote fungal growth |
| Icing/Freezing Rain | Operate where icing may occur from sea splash/spray |
| Electromagnetic Environment | MIL-STD-461F (RE101, RE102, RS101, RS103, CE101 and CE102) |
| Non-Operating Conditions | |
| Transportation Altitude | 0 to 12,192 M(0-40,000 ft) (pressurized or non-pressurized) |
| Transportation & Storage Temperature | -40.0°C to 108.9°C (-40°F to 160°F) |
| Transportation Shock & Vibration | Withstand ground, air, rail, ship transport (MIL-STD-1366E guidance) |
| Storage | Operate where icing may occur from sea splash/spray |

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 24 May 2010. 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. The research shall not be considered fundamental in those rare and exceptional circumstances where the applied research effort presents a high likelihood of disclosing performance characteristics of military systems or manufacturing technologies that are unique and critical to defense, and where agreement on restrictions have been recorded in the contract or grant.

Pursuant to DoD policy, research performed under grants and contracts that are a) funded by Budget Category 6.2 (Applied Research) and NOT performed on-campus at a university or b) funded by Budget Category 6.3 (Advanced Research) does not meet the definition of "contracted fundamental research." In conformance with the USD(AT&L) guidance and National Security Decision Direction 189, ONR will place no restriction on the conduct or reporting of unclassified "contracted fundamental research," except as otherwise required by statute, regulation or Executive Order. For certain research projects, it may be possible that although the research being performed by the prime contractor is restricted research, a subcontractor may be conducting "contracted fundamental research." In those cases, it is the **prime contractor's responsibility** in the proposal to identify and describe the subcontracted unclassified research and include a statement confirming that the work has been scoped, negotiated, and determined to be fundamental research according to the prime contractor and research performer.

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.

As regards to the present BAA, the Research and Development efforts to be funded consist of Applied Research and Advanced Technology Development. Therefore, the funds available to support awards are Budget Activities 2 and 3.

7. Point(s) of Contact:

All UNCLASSIFIED communications shall be submitted via e-mail. All technical questions of an UNCLASSIFIED nature to the Technical Point of Contact (POC) shall be sent via e-mail with a copy to the designated Business POC.

Questions of a **technical** nature should be submitted to the Technical Point of Contact, as specified below, with a copy to the Business Point of Contact:

Name: Mr. Daniel Deitz
Occupation Title: Program Officer
Code: Ocean Battlespace Sensing, Code 321
Address: Office of Naval Research
One Liberty Center
875 North Randolph Street
Arlington, VA 22203-1995
Email Address: Daniel.Deitz@navy.mil

Questions of a **business** nature should be submitted to the Contract Specialist specified below:

Name: Mr. Michael Boyle
Occupation Title: Contract Specialist
Code: Contracts & Grants, BD 252
Address: Office of Naval Research
One Liberty Center
875 North Randolph Street
Arlington, VA 22203-1995
Email Address: michael.s.boyle@navy.mil

Questions of a **security** nature should be submitted to:

Name: Ms. Diana Pacheco
Occupation Title: Industrial Security Specialist
Code: Security Department, Code 43
Address: Office of Naval Research
One Liberty Center
875 North Randolph St.
Arlington, VA 22203-1995

Email Address: diana.pacheco@navy.mil

Note: All UNCLASSIFIED communications shall be submitted via e-mail. All questions of an UNCLASSIFIED nature to the Technical Point of Contract (POC) shall be sent via e-mail with a copy to the designated Business POC.

CLASSIFIED questions shall be handled through the ONR Security POC. Specifically, any entity wanting to ask a CLASSIFIED question shall send an email to the ONR Security POC with a copy to both the Technical POC and the Business POC stating that the entity would like to ask a CLASSIFIED question. DO NOT EMAIL ANY CLASSIFIED QUESTIONS. The Security POC will contact the entity and arrange for the CLASSIFIED question to be asked through a secure method of communication.

All questions are due no later than 2:00 PM Eastern Daylight Time 29 August 2011.

Questions submitted after this deadline may not be answered, and the due date for submission of the full proposal will not be extended.

Amendments will be posted to one or more of the following web pages:

- Federal Business Opportunities (FEDBIZOPPS) Webpage – <https://www.fbo.gov/>
- ONR Broad Agency Announcement (BAA) Webpage – <http://www.onr.navy.mil/en/Contracts-Grants/Funding-Opportunities/Broad-Agency-Announcements.aspx>

8. Instrument Type(s):

It is anticipated that awards will be in the form of Indefinite Delivery Indefinite Quantity (IDIQ) contracts with cost-type Task Orders executed under the IDIQs. ONR reserves the right to award a different instrument type if deemed to be in the best interest of the Government.

9. Catalog of Federal Domestic Assistance (CFDA) Numbers:

12.300

10. Catalog of Federal Domestic Assistance (CFDA) Titles:

DOD Basic and Applied Scientific Research

11. Other Information:

FAR Part 35 restricts the use of 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.

II. AWARD INFORMATION

The IDIQ minimum quantity will be \$25,000. Subsequent Task Orders will be issued based on the success (exercise of the Phase I option) of the prior phase and will follow the criteria established in FAR 16.505. The IDIQ maximum quantity will be based on the total annual program estimate, which is approximately \$15M.

This is a multiple award solicitation. ONR anticipates that up to ten (10) IDIQ contracts and Task Order 0001 awards will result from this BAA. A total of approximately \$70M is anticipated to be available over the 6 year span (FY12-17). Although the amount of funds and period of performance for each proposal will vary depending on the technical approach to be pursued by the proposer, it is expected each proposal will be structured according to the Research Opportunity Description above.

This competitive process will be simplified in order to facilitate the order process and prevent undue administrative burden upon the Contractor and the Government. This section includes the procedures that will be used in issuing orders and the procedures and selection criteria that will be used to provide all awardees a fair opportunity to be considered for each order.

A cost-type task order consisting of the Phase I base period and option(s) will be awarded concurrently with the initial contract award to those contractors submitting successful proposals. Those contractors meeting threshold requirements and performing under Option 1 will be requested to submit proposals for evaluation and award of an initial and potential subsequent Task Order(s) for Phase II work.

According to FAR 16.505, the Contracting Officer shall ensure that individual orders clearly describe all services to be performed or supplies to be delivered. The Contracting Officer shall ensure that orders are within the scope, period, and maximum value of the contract as stated in the Contract.

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.

Although ONR expects a program phasing plan similar to that described in this Section, ONR reserves the right to make changes.

Phase I Base and Option

The Phase I effort (Task Order 0001) will be awarded based on the BAA award criteria (see section V below). It is expected that each Phase I (base plus option) contract will total no more than \$2.5M. For Phase I, each Offeror selected for a basic award will receive a Task Order 0001 contract including a Base and Option period. The Government anticipates award of the Phase I option based on the Contractor's performance during the base period, including successfully meeting Phase I thresholds and metrics.

Phase II

The Phase II effort (Task Order 0002 and subsequent orders) will be competed among those awardees of the Phase I Option. Although the Government may issue Task Order 0002 to all awardees of the Phase I option, the Government reserves its right to provide a further down selection that provides fair opportunity in accordance with FAR 16.505 by making awards to the Phase I performer or performers that, having met the Phase I thresholds, have best met or exceeded the metrics and have the best likelihood to meet the overall objectives described in the BAA.

Subsequent Task Orders, if issued, will be accomplished through a further down selection that provides fair opportunity in accordance with FAR 16.505 by making awards to the Phase II performer or performers have best met or exceeded the metrics and have the best likelihood to meet the overall objectives described in the BAA.

Periods of Performance

TASK ORDER 1

| | Phase I Base | Phase I Option |
|------------------|---------------------|-----------------------|
| Autonomy | 18 Months | 6 Months |
| Endurance | 24 Months | 6 Months |

TASK ORDER 2 (AND SUBSEQUENT TASK ORDERS)

| | Phase II |
|------------------|-----------------|
| Autonomy | 12-36 Months |
| Endurance | 12-36 Months |

III. ELIGIBILITY INFORMATION

All responsible sources from industry and academia 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 full proposals in response to this BAA. If any such organization is interested in the program described herein, the organization should contact the technical POC to discuss their interest. As with FFRDCs, these types of federal organizations may team with other responsible sources from industry and academia that are submitting proposals under this BAA.

University Affiliated Research Centers are eligible to submit proposals under this BAA unless precluded from doing so by their Department of Defense UARC contracts.

Teams are also encouraged and may submit proposals. However, proposers 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.

This BAA topic covers export controlled technologies. Research in these areas is limited to “U.S. persons” as defined in the International Traffic in Arms Regulation (ITAR) – 22 CFR § 1201.1 et seq. Additionally, since access to US Navy and other access controlled research facilities will be required, **All Key Personnel** for each proposer must be United States citizens.

Proposers must possess an active PKI certificate (External Certificate Authority) from 30 days after contract award through the duration of the performance period. This is required for access to a government run sharepoint site for report and briefing materials submission.

IV. APPLICATION AND SUBMISSION INFORMATION

1. Application and Submission Process: Full Proposals

Full Proposals – Only proposals for the Phase I Base and Phase I Option and a description of the technical approach for Phase II are being solicited at this time. The due date for receipt of Full Proposals is 2:00 PM (Eastern Daylight Time) on 12 September 2011. It is anticipated that initial selections will be made by 12 December 2011. As soon as the final proposal evaluation process is completed, the proposers will be notified via email of their selection or non-selection for an award. Full Proposals shall be mailed to the technical point of contact listed in Section I.7.

2. Content and Format of Full Proposals:

Proposals submitted under this BAA are expected to be unclassified.

Unclassified Proposal Instructions:

Unclassified proposals shall be submitted in accordance with paragraphs 5 and 6 of Section IV.

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

IMPORTANT NOTE: Titles given to Full Proposals should be descriptive of the work they cover and not be merely a copy of the title of this solicitation.

***NOTE:** Submission instructions for BAAs issued after FY2010 have changed significantly from previous requirements. Potential proposers are advised to carefully read and follow the instructions below. The new format and requirements have been developed to streamline and ease both the submission and the review of proposals. Both the Template and the Spreadsheet have instructions imbedded into them that will assist in completing the documents. Also, both the Template and the Spreadsheet require completion of cost-related information – both documents must be fully completed to constitute a valid proposal.*

All proposals must use ONR's Technical and Cost Proposal Template and Cost Proposal Spreadsheet. The Template can be found by following this link: <http://www.onr.navy.mil/Contract-Grants/submit-proposal/contracts-proposal/cost-proposal.aspx>. Please note that all the attachments listed in Section III.8 of the Template can be incorporated into the Template file for submission.

The Cost Proposal Spreadsheet can be found by following this link: <http://www.onr.navy.mil/Contracts-Grants/submit-proposal/contracts-proposal/cost-proposal.aspx>. Click on the “proposal spreadsheet” link and save a copy of the spreadsheet. Instructions for completion have been embedded into the spreadsheet. Any proposed options that are identified in the Technical and Cost Proposal Template, but are not fully priced out in the Cost Proposal Spreadsheet, will not be included in any resulting contract or other transaction. If proposing options, they **must** be separately priced and separate spreadsheets should be provided for the base period and each option period.

For proposed subcontracts or interorganizational transfers over \$150,000, Offerors must provide a separate fully completed Cost Proposal Spreadsheet in support of the proposed costs. This spreadsheet, 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. Offerors should also familiarize themselves with the new subcontract reporting requirements set forth in Federal Acquisition Regulation (FAR) clause 52.204-10, Reporting Executive Compensation and First-Tier Subcontract Awards. From October 1, 2010 through February 28, 2011, any newly awarded subcontract must be reported if the prime contract award amount is \$550,000 or more. Starting

March 1, 2011, any newly awarded subcontract must be reported if the prime contract award amount was \$25,000 or more. The pertinent requirements can be found in Section VII, Other Information, of this document.

Offerors should submit one (1) original plus one hard copy of their Technical and Cost Proposal package, and one (1) electronic copy on CD-ROM. Offerors shall follow the Technical and Cost Proposal Template. The electronic Technical and Cost Proposal should be submitted in a secure, pdf compatible format, save for the electronic file for the Cost Proposal Spreadsheet which should be submitted in a Microsoft Excel 2007 compatible format. All attachments should be submitted in a secure, pdf compatible format.

The secure pdf compatible format is intended to prevent unauthorized editing of the proposal prior to any award. A password should not be required for opening the proposal document, but the Government must have the ability to print and copy text, images, and other content. Offerors may also submit their Technical and Cost Proposal in an electronic file that allows for revision (preferably in Microsoft Word) to facilitate the communication of potential revisions. Should an Offeror amend its Technical and Cost Proposal package, the amended proposal should be submitted following the same hard and electronic copy guidance applicable to the original proposal.

The electronic submission of the Excel spreadsheet should be in a “useable condition” to aid the Government with its evaluation. The term “useable condition” indicates that the spreadsheet should visibly include and separately identify within each appropriate cell any and all inputs, formulas, calculations, etc. The Offeror should not provide “value only spreadsheets” similar to a hard copy.

In addition to completing the ONR Technical and Cost Proposal Template for the IDIQ contract, the offeror must also submit a Task Order 0001 proposal that will address Program Phase I only. The following sections in Section III, Technical Content, of the ONR Technical and Cost Proposal Template shall be addressed: Phase I Statement of Work, Phase I Technical Approach and Justification, Phase I Schedule and Milestones, and Phase I Deliverables/Reports.

In addition to following the requirements in the *Technical and Cost Proposal Template*, the following additional guidance is provided when completing the sections for “Technical Approach and Justification”, “Future Naval Relevance”, “Operational Naval Concept”, “Operational Utility Assessment Plan”, and “Statement of Work”.

(a) Technical Content Section III.1 entitled “Technical Approach and Justification” in the *Technical and Cost Proposal Template* is limited to a total of 20 pages rather than the 15 pages specified in the Template, including supplementary attachments to further explain scientific approach.

(b) Sections entitled, “Future Naval Relevance”, “Operational Naval Concept”, and “Operational Utility Assessment Plan” stated in Section III.1 of the *Technical and Cost Proposal Template* **are not required** for this solicitation.

(c) SOW Section III.2 (3.0) entitled, “Requirements” in the *Technical and Cost Proposal Template* has numbering requirements for tasks, which **must** map directly to the Work Breakdown Structure (WBS) developed for pricing the proposal. Additionally, all subcontractors and internal organizations must use the same SOW and WBS numbering/definitions in their proposal to the prime contractor.

(d) Supplementary Attachments listed in Section III.8 entitled “List of Attachments” shall conform to the following format requirements and address the areas in (i) through (iv) below where applicable:

- Paper Size – 8.5 x 11 inch paper
- Margins – 1 inch
- Spacing – single or double spaced
- Font – Times New Roman, 12 point

(i) Intellectual Property: (Provide separate attachment; does not count towards page limit)

Noncommercial Items (Technical Data and Computer Software):

Proposers responding to this BAA shall identify all noncommercial technical data and noncommercial computer software that it plans to generate, develop, and/or deliver under any proposed award instrument in which the Government will acquire less than unlimited rights, and to assert specific restrictions on those deliverables. Proposers shall follow the format under DFARS 252.227-7017 for this stated purpose. In the event that proposers do not submit the list, the Government will assume that it automatically has “unlimited rights” to all noncommercial technical data and noncommercial computer software generated, developed, and/or delivered under any award instrument, unless it is substantiated that development of the noncommercial technical data and noncommercial computer software occurred with mixed funding. If mixed funding is anticipated in the development of noncommercial technical data and noncommercial computer software generated, developed, and/or delivered under any award instrument, then proposers should identify the data and software in question, as subject to Government Purpose Rights (GPR). In accordance with DFARS 252.227-7013 Rights in Technical Data - Noncommercial Items, and DFARS 252.227-7014 Rights in Noncommercial Computer Software and Noncommercial Computer Software Documentation, the Government will automatically assume that any such GPR restriction is limited to a period of five (5) years in accordance with the applicable DFARS clauses, at which time the Government will acquire “unlimited rights” unless the parties agree otherwise. Proposers are advised that the Government will use the list during the source selection evaluation process to evaluate the impact of any identified restrictions and may request additional information from the proposer, as may be necessary, to evaluate the proposer’s assertions. If no restrictions are intended, then the proposer should state “NONE”

A sample list for complying with this request is as follows:

| NONCOMMERCIAL | | | |
|---|------------------------|-----------------------------|--|
| Technical Data Computer Software To be Furnished With Restrictions | Basis for Assertion | Asserted Rights Category | Name of Person Asserting Restrictions |
| (LIST) | (LIST) | (LIST) | (LIST) |

Commercial Items (Technical Data and Computer Software):

Proposers responding to this BAA shall identify all commercial technical data and commercial computer software that may be embedded in any noncommercial deliverables contemplated under the research effort, along with any applicable restrictions on the Government’s use of such commercial technical data and/or commercial computer software. In the event that proposers do not submit the list, the Government will assume that there are no restrictions on the Government’s use of such commercial items. The Government may use the list during the source selection evaluation process to evaluate the impact of any identified restrictions and may request additional information from the proposer, as may be necessary, to evaluate the proposer’s assertions. If no restrictions are intended, then the proposer should state “NONE.”

A sample list for complying with this request is as follows:

| COMMERCIAL | | | |
|---|------------------------|-----------------------------|--|
| Technical Data Computer Software To be Furnished With Restrictions | Basis for Assertion | Asserted Rights Category | Name of Person Asserting Restrictions |
| (LIST) | (LIST) | (LIST) | (LIST) |

- (ii) Patents: (Provide separate attachment; does not count towards page limit)

Proposers shall include documentation proving their ownership of, or possession of, appropriate licensing rights to all patented inventions (or inventions for which a patent application has been filed) that will be utilized under their proposal for the ONR program. If a patent application has been filed for an invention that the proposal utilizes, but the application has not yet been made publicly available and contains proprietary information, the proposer may provide only the patent number, inventor name(s), assignee names (if any), filing date, filing date of any related provisional application, and a summary of the patent title, together with either: 1) a representation that they own the invention, or 2) proof of possession of appropriate licensing rights in the invention.

- (iii) Intellectual Property Representations: (Provide separate attachment; does not count towards page limit)

Proposers shall provide a good faith representation that they either own or possess appropriate licensing rights to all other intellectual property that will be utilized under their proposal for the ONR program. Additionally, proposers shall provide a short summary for each item asserted with less than unlimited rights that describes the nature of the restriction and the intended use of the intellectual property in the conduct of the proposed research.

- (iv) Letters of Commitment: (Does not count towards page limit)

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.

3. Significant Dates and Times

| Anticipated Schedule of Events | | |
|---------------------------------------|-------------------|------------------------------|
| Event | Date (MM/DD/YEAR) | Time (Eastern Daylight Time) |
| Pre-Proposal Conference/Industry Day | 03/10/2011 | |
| Questions Due | 08/29/2011 | 1400 |
| Full Proposals Due Date | 09/12/2011 | 1400 |
| Notification of Selection for Award * | 12/12/2011 | |
| Contract Awards* | 04/12/2012 | |
| Kickoff Meeting* | 04/27/2012 | |

*These dates are estimates as of the date of this announcement.

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. 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 extended 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 proposer if its proposal, modifications, or revision was received late and must inform the proposer whether its proposal will be considered.

5. Address for Submission of Full Proposals

All hard copies of full proposal shall be **mailed or hand delivered** to the Technical Point of Contact located in Section I.7 above.

NOTE: PROPOSALS SENT BY FAX OR E-MAIL WILL NOT BE CONSIDERED

V. EVALUATION INFORMATION

1. Evaluation Criteria

Award decisions will be based on competitive selection of proposals resulting from a scientific/technical and cost review. Evaluations will be conducted using the following evaluation criteria:

1. Ability to Meet Program Technical Objectives and Metrics & Overall Scientific and Technical merit:

Ability to Meet Program Technical Objectives and Merits. The feasibility and likelihood of the proposed approach to meet the program technical objectives/metrics. The extent to which the proposal reflects a mature, substantiated, and quantitative understanding of the program technical objectives/metrics, the statistical confidence with which they may be

measured, and their relationship to the concept of operations that will result from successful performance in the program. A proposal that fails to adequately address how it will meet Program Technical Objectives/Metrics shall not be reviewed further. If the proposal is rated unacceptable in this category, it shall not be reviewed any further.

Technical Merit. The extent to which the proposed technical approach is feasible, achievable, and complete. Task descriptions and associated technical elements provided are complete and in a logical sequence with all proposed deliverables clearly defined such that a final product that achieves the goal can be expected as a result of award. The proposal identifies major technical risks, and planned mitigation efforts are clearly defined and feasible.

Scientific Merit. Proposer must demonstrate that its proposal is innovative, that the technical approach is comprehensive, systematic and sound, that it has an understanding of critical technical issues and risks, that it has a plan for mitigation of those risks, and that the technical elements are well integrated into a cohesive program. Task descriptions and associated technical elements provided are complete and in a logical sequence with all proposed deliverables clearly defined such that the final product can be expected to achieve the program goals.

2. Potential for the Technology to Transition:

This factor assesses a technology's potential and likelihood of implementation on Navy platforms.

A concern for the government is the ability to transition the LDUUV INP program to production once the technology is proven. Key to a successful transition is upfront planning, acknowledging and resolving all aspects of IP rights. The following criteria will be considered to evaluate best value and best fit to any future transition: The IP assertions are realistic and clearly delineated.

- IP assertions are well substantiated.
- Licensing terms are clear and enforceable.
- Mitigating Technology Risk
- Open Architecture

In addition, the least restrictive IP rights provided to the Government in the resulting technology will be considered as favorable. Also, if applicable, providing the government the opportunity to purchase Government Purpose Rights in any critical, relevant technical data and computer software will be considered as favorable.

3. Proposer's Capabilities and/or Qualification:

The Offeror's capabilities, facilities, techniques, management plan, or unique combinations of these which are integral factors for achieving the proposal objectives and bringing product under development to mature technology. The proposed team has the expertise to manage the cost and schedule. The qualifications, capabilities and experience of the proposed principal investigator, team leader and other key personnel who are critical in achieving the proposal objectives.

4. Past Performance

This factor assesses the experience of the organization in performing similar contracts in the past successfully. The proposer's prior experience in similar efforts must clearly demonstrate an ability to deliver products that meet the proposed technical performance within the proposed budget and schedule. Similar efforts completed/ongoing by the proposer in this area are fully described including identification of other Government sponsors.

5. Cost:

The objective of this criterion is to establish that the proposed costs are realistic and reasonable for the technical and management approach offered, as well as to determine the proposer's practical understanding of the effort. This will be principally measured by cost per labor hour and number of labor hours proposed. Undue emphasis on cost may motivate proposers to offer low-risk ideas with minimum uncertainty and to staff the effort with junior personnel in order to be in a more competitive posture. ONR discourages such cost strategies. Cost reduction approaches that will be received favorably include innovative management concepts that maximize direct funding for technology and limit diversion of funds into overhead. Proposers may add a second option to the base period to allow the Government to buy government purpose rights in any proprietary technology that has been proposed.

Overall, the Technical Factors (Factors 1- 4 above) are significantly more important than the Cost Factor (Factor 5 above), with the Technical Factors weighted in descending order of importance, from Factor 1 through Factor 4. The degree of importance of the Cost Factor 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.

Award(s) will be made to the proposers whose proposals are determined to be the most advantageous and of best value to the Government, all factors considered, including the potential contributions of the proposed work to the overall research program and the availability of funding for the effort.

2. Commitment to Small Business

The Office of Naval Research is strongly committed to providing meaningful subcontracting opportunities for small businesses, small disadvantaged businesses, woman-owned small businesses, historically underutilized business zone (HUBZone) small businesses, veteran-owned small businesses, service disabled veteran-owned small businesses, historically black colleges and universities, and minority institutions, and other concerns subject to socioeconomic considerations through its awards.

For proposed awards to be made as contracts that exceed \$650K to other than small businesses, the offeror is required to submit a Small Business Subcontracting Plan in accordance with FAR 52.219-9.

For proposed awards made as contracts to small businesses at any value or to other than small businesses that are less than \$650K, the offeror shall provide a statement which demonstrates how it intends to provide meaningful subcontracting to support this policy.

3. Options

The Government will evaluate options for award purposes by adding the total cost for all options to the total cost for the basic requirement. Evaluation of options will not obligate the Government to exercise the options during contract performance.

4. 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 NAICS code for this announcement is 541712 with a small business size standard of 500 employees.
- Central Contractor Registration - All proposers submitting proposals or applications **must**:
 - (a) Be registered in the Central Contractor Registration (CCR) prior to submission;
 - (b) Maintain an active CCR registration with current information at all times during which it has an active Federal award or an application under consideration by any agency; and
 - (c) Provide its DUNS number in each application or proposal it submits to the agency.
- Subcontracting Plans: All successful contract proposals, with the exception of small business concerns, that exceed \$650,000 shall be submitted to submit Subcontracting Plans. Subcontracting Plans will be required prior to award in accordance with FAR 52.219-9.
- Certifications – Proposal 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, may be accessed under the Contracts and Grants Section of the ONR Home Page at <http://www.onr.navy.mil/Contract-Grants/submit-proposal/contract-proposal.aspx>.

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. Proposers should indicate in the Technical and Cost Proposal Template, Section II, Blocks 8 and 9, which of these facilities are critical for the project's success.

For BAA research section 6.1, a full scale UUV Energy Section hull and interface documentation will be provided as GFE/GFI. *NOTE: these energy section hulls will not be customized beyond the need for fueling/penetrator ports.*

2. Security Classification

In order to facilitate intra-program collaboration and technology transfer, the Government will attempt to enable technology developers to work at the unclassified level to the maximum extent possible. If access to classified material will be required at any point during performance, the proposer must clearly identify such need in Section II, Block 11 of the Technical and Cost Proposal Template.

3. 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/>.

4. Organizational Conflicts of Interest

All proposers and proposed subcontractors must affirm whether they are providing scientific, engineering, and technical assistance (SETA) or similar support to any ONR technical office(s) through an active contract or subcontract. All affirmations must state which office(s) the proposer supports and identify the prime contract numbers. Affirmations shall be furnished at the time of proposal submission. All facts relevant to the existence or potential existence of organizational conflicts of interest (FAR 9.5) must be disclosed. The disclosure shall include a description of the action the proposer has taken or proposes to take to avoid, neutralize, or mitigate such conflict. 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 proposer believes that any conflict of interest exists or may exist (whether organizational or otherwise), the proposer 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.

5. 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, proposers should assume one kick-off meeting in the Washington D.C. area, one review meeting per year at the proposer's location, and one annual review in the Washington D.C. area.

6. Executive Compensation and First-Tier Subcontract Reporting (Applies only to Contracts)

Section 2(d) of the Federal Funding Accountability and Transparency Act of 2006 (Pub. L. No. 109-282), as amended by section 6202 of the Government Funding Transparency Act of 2008 (Pub. L. 110-252), requires the Contractor to report information on subcontract awards. The law requires all reported information be made public, therefore, the Contractor is responsible for notifying its subcontractors that the required information will be made public.

Unless otherwise directed by the Contracting Officer, by the end of the month following the month of award of a first-tier subcontract with a value of \$25,000 or more, (and any modifications to these subcontracts that change previously reported data), the Contractor shall report the following information at <http://www.fsrc.gov> for each first-tier subcontract:

(a) Unique identifier (DUNS Number) for the subcontractor receiving the award and for the subcontractor's parent company, if the subcontractor has one.

(b) Name of the subcontractor.

- (c) Amount of the subcontract award.
- (d) Date of the subcontract award.
- (e) A description of the products or services (including construction) being provided under the subcontract, including the overall purpose and expected outcomes or results of the subcontract.
- (f) Subcontract number (the subcontract number assigned by the Contractor).
- (g) Subcontractor's physical address including street address, city, state, and country. Also include the nine-digit zip code and congressional district.
- (h) Subcontractor's primary performance location including street address, city, state, and country. Also include the nine-digit zip code and congressional district.
- (i) The prime contract number, and order number if applicable.
- (j) Awarding agency name and code.
- (k) Funding agency name and code.
- (l) Government contracting office code.
- (m) Treasury account symbol (TAS) as reported in FPDS.
- (n) The applicable North American Industry Classification System (NAICS) code.

By the end of the month following the month of a contract award, and annually thereafter, the Contractor shall report the names and total compensation of each of the five most highly compensated executives for the Contractor's preceding completed fiscal year at <http://www.ccr.gov>, if –

- (a) In the Contractor's preceding fiscal year, the Contractor received –
 - (i) 80 percent or more of its annual gross revenues from Federal contracts (and subcontracts), loans, grants (and subgrants) and cooperative agreements; and
 - (ii) \$25,000,000 or more in annual gross revenues from Federal contracts (and subcontracts), loans, grants (and subgrants) and cooperative agreements; and
- (b) The public does not have access to information about the compensation of the executives through periodic reports filed under section 13(a) or 15(d) of the Securities Exchange Act of 1934 (15 U.S.C. 78m(a), 78o(d)) or section 6104 of the Internal Revenue Code of 1986. (To determine if the public has access to the compensation

information, see the U.S. Security and Exchange Commission total compensation filings at <http://www.sec.gov/answers/execomp.htm>).

Unless otherwise directed by the Contracting Officer, by the end of the month following the month of a first-tier subcontract with a value of \$25,000 or more, and annually thereafter, the Contractor shall report the names and total compensation of each of the five most highly compensated executives for each first-tier subcontractor for the subcontractor's preceding completed fiscal year at <http://www.fsr.gov>, if –

(a) In the subcontractor's preceding fiscal year, the subcontractor received –

(i) 80 percent or more of its annual gross revenues from Federal contracts (and subcontracts), loans, grants (and subgrants) and cooperative agreements; and

(ii) \$25,000,000 or more in annual gross revenues from Federal contracts (and subcontracts), loans, grants (and subgrants) and cooperative agreements; and

(b) The public does not have access to information about the compensation of the executives through periodic reports filed under section 13(a) or 15(d) of the Securities Exchange Act of 1934 (15 U.S.C. 78m(a), 78o(d)) or section 6104 of the Internal Revenue Code of 1986. (To determine if the public has access to the compensation information, see the U.S. Security and Exchange Commission total compensation filings at <http://www.sec.gov/answers/execomp.htm>).

If the Contractor in the previous tax year had gross income, from all sources, under \$300,000, the Contractor is exempt from the requirement to report subcontractor awards. Likewise, if a subcontractor in the previous tax year had gross income from all sources under \$300,000, the Contractor does not need to report awards to that subcontractor.

APPENDIX A: Hyperlinks

| | |
|---------------------------------------|---|
| ONR Industry Day Briefs | http://www.onr.navy.mil/en/Contracts-Grants/Funding-Opportunities/Special-Notices.aspx (Click on the expired tab at the top of the page to access briefs under the Industry Day notice the briefs) |
| MIL-STD-882D | https://assist.daps.dla.mil/docimages/A/0000/0003/6027/000000198718_000000141972_DJLKNMXRWC.PDF?CFID=24160174&CFTOKEN=97572158&jsessionid=5c30dbe089c6fbefce5740556634e187b109 |
| DI-SAFT 80101B | https://assist.daps.dla.mil/quicksearch/basic_profile.cfm?ident_number=209470 |
| MIL-STD-901D (Grade B) | http://www.assistdocs.com/search/document_details.cfm?ident_number=2640&StartRow=1&PaginatorPageNumber=1&doc%5Fid=MIL%2DS%2D901D&status%5Fall=ON&search%5Fmethod=BASIC |
| MIL-STD-167-1 | http://www.assistdocs.com/search/document_details.cfm?ident_number=35544&StartRow=1&PaginatorPageNumber=1&doc%5Fid=MIL%2DSTD%2D167%2D1&status%5Fall=ON&search%5Fmethod=BASIC |
| MIL-STD-461 (RE101,RE102,RS101,RS103) | http://www.assistdocs.com/search/document_details.cfm?ident_number=35789&StartRow=1&PaginatorPageNumber=1&doc%5Fid=MIL%2DSTD%2D461&status%5Fall=ON&search%5Fmethod=BASIC |
| MIL-STD-1366E | http://www.assistdocs.com/search/document_details.cfm?ident_number=35789&StartRow=1&PaginatorPageNumber=1&doc%5Fid=MIL%2DSTD%2D461&status%5Fall=ON&search%5Fmethod=BASIC |

APPENDIX B: General Description of LDUUV

General descriptions are as follows:

Nose section: the nose section is 5 feet in length with a maximum outer diameter of 48". This section is flooded and any technology should either be pressure tolerant or come inside a pressure vessel.

Tail Section: The tail section is 10 feet in length with a maximum outer diameter of 48". This section is flooded and any technology should either be pressure tolerant or be provided within its own pressure vessel.

The below table lists the components that are in each of the section along with their volume, power draw, and technical capabilities.

| Sub system | Performance | Power | Space |
|--|---|----------|----------|
| Navigation system - This system includes INU, GPS, DVL | Position: 10 m CEP (surface); .5% DT, CEPT underwater | 75 watts | 700 in^3 |

| | | | |
|------------------------------|--|----------------|----------------------|
| | Heading: 5.0 mils, rms Velocity: .05 m/sec Pitch roll: .5 mils, rms | | |
| Vehicle Controller | Controls al actuators and monitor s status of the vehicle | 200 watts | 1400 in ³ |
| Communications Controller | Iridium, acoustic communication, wifi | 25 watts | 300 in ³ |
| skin | Gel coated fiberglass. No special coating for drag reduction or bio fouling reduction | none | External shape |
| Motor & controller | 300vdc 50 hp motor | Efficiency 80% | 1400 in ³ |
| Ballast system | 400lbs of ballast displacement | Pump at 1000ft | 1000 in ³ |