



## Demonstration System Development for Advanced Shipboard Desalination FNC

### INTRODUCTION

This publication constitutes a Broad Agency Announcement (BAA) as contemplated in Federal Acquisition Regulation (FAR) 6.102(d)(2) and 35.016. A formal Request for Proposals (RFP), other solicitation, 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 fund all, some or none of the proposals received under this BAA. 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 Shipboard Desalination Demonstration System Development

**3. Program Name –** Future Naval Capability (FNC) Enabling Capability (EC)

**4. Research Opportunity Number -** ONR BAA 11-010

**5. Response Dates –**

White Papers Due: 5/2/2011 by 4:00 p.m. (Eastern Time)  
Full Proposals Due: 6/15/2011 by 4:00 p.m. (Eastern Time)

## **6. Research Opportunity Description –**

### **Synopsis:**

The Office of Naval Research (ONR), under the Advanced Shipboard Desalination FNC program, is interested in receiving proposals for the design, development, and fabrication of robust shipboard-ready desalination technology demonstration prototypes. The program goals are to develop/adapt/engineer desalination technologies for the constraints and operational demands on a Navy ship. The program is multi-phased with selections after each phase. The design phase is followed by the development phase in which fully functioning demonstration units are developed and put through government land-based testing. In the fabrication phase, fully robust shipboard-ready demonstration prototypes are fabricated for shipboard testing. Demonstration prototypes of two or more different production capacities are targeted in this solicitation. Overall system designs are sought that minimize system volume and mass with very little manning requirements for operation and maintenance to meet program objectives, while maximizing production of water that meets the EPA Primary and Secondary Drinking Water Standards.

### **Background:**

Reverse Osmosis (RO) desalination has become the Navy standard for the shipboard production of freshwater since its introduction into the Navy in the early 1990s. RO plants have provided significant operational and cost benefits over conventional distillers which have been used on Navy ships since before the introduction of steam propulsion. These benefits include reduced monitoring and manpower requirements and significant reductions in operational costs including: reduced power requirements, independence from ship steam systems, reduction in the use of chemical additives, and large improvements in reliability and maintainability.

Throughout industry over the past two decades, there has been a large increase in the use of membrane-based separations for both liquid and gas streams, much of this due to technical advancements such as improved membranes and pumps, novel membrane topologies and operational approaches, and staged separation processes. ONR has previously encouraged such technology development for water purification through the Expeditionary Unit Water Purification (EUWP) research program, which ran from 2003 through 2008. Under the EUWP Program, ONR developed modern military technology demonstrators using either ultrafiltration (UF) or microfiltration (MF) membrane pretreatment systems in front of advanced RO membranes operating with single pass recovery rates (ratio of product water to feed water) of up to 50%. These technology demonstrators are the starting point for this work.

In Fiscal Year (FY) 2009, ONR selected an Advanced Shipboard Water Desalination Enabling Capability topic for funding under the Future Navy Capability Program. The goals of this five year FNC program are to push the development of desalination technology relevant to the constraints of operating on a Navy ship and to build units for shipboard testing that demonstrate that these newer technologies are robust and offer operational advantages to the Navy as compared to current Navy systems. The overall strategy for the FNC is to, in a first stage, push the field as relevant to Navy shipboard systems by conducting two years of component

technological development and testing (development of pumps, RO membranes, pretreatment membranes and approaches, control strategies, etc). This will be followed by a second stage of up to three years to design/develop/fabricate robust components into two or more complete advanced shipboard desalination demonstration systems targeted for transition to specific ship classes. Selection for component technology development stage was competed under ONR Broad Agency Announcement 09-013, which is now closed. This solicitation, ONR Broad Agency Announcement 11-010, is for the second stage which consists of the design/development/fabrication of robust, desalination demonstration systems for shipboard deployment and testing.

Most RO-based water purification is done in large land-based facilities by public utilities. The major goal of those installations is to produce the water at minimal cost, and so plant capital cost and energy usage are primary drivers. The large public utility facilities typically have enough real estate available to store and mix water streams, to store and mix chemicals, and for settling ponds. The fixed facilities are designed for specific source water with seasonal variations in quality. Naval systems, on the other hand, must be compact because of the limited space on ships. These systems must operate unattended and should be very reliable and have very little required maintenance. Since ships go on long missions without resupply, chemical usage should be minimal or required chemicals should be generated in place. Energy cost is important, but the energy to make water is small compared with the overall shipboard energy demands. Capital cost is certainly a factor, but the Navy will build a system to last as long as the ship (30 to 50 years), so operating and maintenance costs become a significant portion of the total ownership costs.

### **Key Performance Requirements:**

The objective of the Advanced Shipboard Water Desalination FNC program is to develop compact, low energy, low maintenance advanced shipboard-ready demonstration systems capable of operating over a six month ship deployment with greater than 99% operational availability in open oceans and greater than 95% operational availability in littoral and coastal seawaters. Raw water quality in littoral and coastal seawaters varies with location and conditions, and often contains high concentrations of a variety of suspended particles (such as silt, algae, sand, plankton, and krill). The completed desalination demonstration systems should be capable of producing fresh water above 50 gal/day per cubic foot volume, above 2 gal/day per pound weight, and below 20 kilowatt hours electrical energy consumption per 1,000 gallons produced (on a total system basis). Improved performance metrics are expected for larger capacity systems.

To accomplish the FNC objective, the Pretreatment Components shall be capable of treating all anticipated source waters (littoral, coastal, and deep blue seawater) to recommended reverse osmosis feed quality (15-minute silt density index values of less than 3.0 and turbidity values of less than 1.0 NTU) with minimal maintenance requirements. The Desalination Components shall be capable of operating at recovery rates of 35% or higher for the following feed seawater conditions: 1) salinities up to 36,000 mg/L total dissolved solids and temperatures between 34°F and 105°F, and 2) elevated salinities up to 45,000 mg/L total dissolved solids and temperatures between 60°F and 105°F. The desalination prototype systems should employ energy recovery

techniques to reduce energy consumption without an undue increase in system or operational complexity. Advanced reverse osmosis membranes should enable operation at higher recovery rates, should enable operation at higher average flux rates, result in lower fouling than current membranes, and be more stable to chemical oxidants (disinfectants).

Shipboard desalination equipment should be able to operate without damage on feed water as described above, with the performance metrics as described. Any equipment that goes on a Navy ship must be capable of withstanding shock loadings that may occur due to the effects of explosions in waters near or below the ship's hull and are usually required to meet the criteria of MIL-S-901. Equipment must also be capable of performing its principal functions under environmental vibrations caused by the hydrodynamic forces on the propeller blades interacting with the hull and ship attitude and motion and, if applicable, any internal excitation caused by unbalanced rotating components and are usually required to meet the criteria of MIL-STD-167-1. Additionally, the installed components must be electromagnetically compatible with surrounding shipboard equipment and are usually required to meet the criteria of MIL-STD-461, meet all ship noise requirements and are usually required to meet the criteria of MIL-STD-740, and be made from materials that will not create toxic fumes during fires in enclosed spaces or corrode from seawater service or in a salt atmosphere. Also, policies have been established in OPNAVINST 5090.1C to minimize or eliminate the storage, handling, and disposal of hazardous materials and chemicals on Navy ships. Procedures for the operation and maintenance of newly developed equipment should not conflict with these Navy hazardous materials policies. Proposal information provided should include discussion and examples of competency and experience in providing equipment capable of meeting these requirements for military or shipboard systems.

Shipboard desalination systems include integrated controls, monitor, alarm, startup and shutdown functions that are centralized. The *minimum* instrumentation for a reverse osmosis unit shall be as listed in Table I. Electronic data logging and diagnostics should be included and must be compatible with other shipboard systems. Electrical controls and instrumentation shall not be located in areas where they could be exposed to fluid leakage during calibration and maintenance.

TABLE I. List of monitors, alarms, and shutdowns.

Description	Gage/ Meter	Alarm Switch	Shutdown Switch
I. Pressure			
Feedwater	X		
HP pump suction	X		LO
HP pump discharge	X		HI
RO module brine discharge	X		
Filtration (each)			
Inlet	X		
Outlet	X		
II. Differential Pressure			
Filtration		HI	
III. Temperature			
Feed inlet	X		
Permeate	X		LO
IV. Flow			
Brine	X		
Permeate	X		
Permeate (totalizing)	X		
V. Salinity			
Feed Conductivity	X		
Permeate Conductivity controller (trips dumping system)	X	HI	
VI. Elapsed Operating Time	X		

It is the goal of this solicitation to develop up to three robust shipboard desalination systems to a Technical Readiness Level (TRL) 6/7. A description of Technical Readiness Levels is posted as an Appendix to this BAA. It is expected that the complete integrated systems will be lighter, more compact, more energy efficient, and have reduced operations and maintenance costs relative to current shipboard units.

Specific desalination systems of interest for this BAA are:

- (1) A 4,000 gal/day single-pass seawater RO desalination system capable of producing potable water with a total dissolved solids level below 500 PPM with the feed seawater conditions identified above. All components in the system shall be contained on a single skid with maximum dimensions of 56 in. long x 56 in. wide x 64 in. high and shall not weigh more than

2,550 lbs. wet. The full electrical requirements of the system shall not exceed 440VAC, 3-Phase, 60Hz, with a full load amp rating not to exceed 62 Amps.

(2) An 18,000 gal/day single-pass seawater RO desalination system capable of producing potable water with a total dissolved solids level below 500 PPM with the feed seawater conditions identified above. The components in the system may be contained on multiple skids that occupy less than 340 cu. ft. of total volume (with no vertical dimension greater than 7 ft., including any space required for parts installation/removal or maintenance) and shall not have a total weight of more than 10,000 lbs. wet. The full electrical requirements of the system shall not exceed 440VAC, 3-Phase, 60Hz, with a full load amp rating not to exceed 125 Amps.

(3) A 100,000 gal/day high purity RO desalination system capable of producing approximately 95,000 gal/day potable water with a total dissolved solids level below 500 PPM and 5,000 gal/day high purity water with a total dissolved solids level below 1.1 PPM with the feed seawater conditions identified above. All components in the system shall be skid-mounted with total dimensions of not-to-exceed 22 ft. long x 10 ft. 8 in. wide x 9 ft. 3 in. high and shall not weigh more than the weight of the Navy's current 100,000 gal/day desalination system (52,000 lbs. wet). The full electrical requirements of the system shall not exceed 440VAC, 3-Phase, 60Hz, with a full load amp rating not to exceed 250 Amps. For all systems, the feed water to the desalination system is sea water coarsely pre-filtered through an 800 micron mesh screen. Post treatment of the product water will be done by existing shipboard systems.

**PROPOSALS UNDER THIS BAA WILL ONLY BE ACCEPTED FOR COMPLETE SYSTEMS. PROPOSALS FOR INDIVIDUAL COMPONENT TECHNOLOGIES WILL NOT BE ACCEPTED.**

### **Program Plan/Phasing:**

#### **Phase I: Concept System Architecture Design**

Phase I is the concept design system architecture phase, in which awarded performers will develop the design for a robust, common-interface, open-architecture system to a TRL 3 concept system architecture. Individual components of the proposed system design should be at TRL 5 or higher. This work may include analytical and laboratory studies to physically validate analytical predictions of separate elements of technology. Level 1 Conceptual Design Drawings shall be completed as defined in Section 5.7.1 MIL-STD-31000.

The desalination system designs should incorporate an open-architecture approach from the beginning of the program to ensure that different components can be incorporated across the life of the system design. The performer should specify alternative components (pumps, replacement membranes, etc...) that can be used without a loss in performance. Where it makes sense, the design should be modular so that components or subsystems can easily be replaced.

The performer should be prepared to work with the government integration team to incorporate any Government Furnished Information (GFI) and/or Government Furnished Equipment (GFE)

that may be provided after contract award to improve the performance or reliability of their system. A demonstrated open-architecture approach and articulated commitment and ability to incorporate GFI/GFE or other improved component technologies will be a critical factor in the decision on whether to exercise the Phase II Option and/or provide a down-selection (if any) from Phase I to Phase II (Option).

### **Phase II (Option): Technology Readiness Level 5 State-of-the-Art System Demonstration**

At the end of this Phase I there may be a down-selection process by ONR for continued development. If there is a down-selection, it will be based on the Government's evaluation of the Phase I system concept design. Phase II (Option) will require awarded performers to develop a proof-of-concept demonstration system of their Concept System Architecture Design. During this system and hardware development, the performers will develop their TRL 3 concept design, system architecture, and technology pieces into hardware which will be demonstrated at a Navy land-based natural seawater test site. It is anticipated that this TRL 5 demonstration system will have limited maturity and durability compared to the eventual TRL 6/7 system. This TRL 5 demonstration is intended to show how far state-of-art technology can be leveraged to meet the objective of the Advanced Shipboard Water Desalination FNC program, with the intent to further this technology to a higher degree of fidelity and performance in the Phase III system in a shipboard environment. Level 2 Developmental Level Drawings shall be completed (see Section 5.7.1 MIL-STD-31000).

It is anticipated that the Phase II system may incorporate Government Furnished Information and/or Government Furnished Equipment (GFI/GFE) pieces.

### **Phase III (Option): Technology Readiness Level 6/7 System Demonstration**

Phase III is for further development of the Phase I design and Phase II demonstration system into a robust, military ready demonstration prototype to TRL 6/7. Robust, military systems are built from highly non-flammable and highly corrosion resistant materials. All components are mounted to a support substrate that can then be mounted to the ship and meet all the key performance requirements previously identified in this BAA. If more than one contractor has been awarded a Phase II Option in any of the three system sizes, the Government expects a down-selection for the Phase III Option, but reserves the right to exercise more than one Option, or none, if in the best interest of the Government. Government implementation of this option will be based on progress on the Phase II demonstration system. The final deliverable will incorporate all of the necessary technologies to demonstrate capabilities of achieving the Advanced Shipboard Water Desalination FNC program objective, and can be demonstrated at a TRL 6/7 during the final year of the program (FY 2014). The system must be at TRL 6/7 in order to be deployed and tested on a Navy ship. It is anticipated that this demonstration will be performed through government testing at a Navy land-based natural seawater test site and subsequently installed on Navy ships for at-sea operation.

It is anticipated that the Phase III system may incorporate Government Furnished Information and/or Government Furnished Equipment (GFI/GFE) pieces.

## **Delivery or Performance Period Requirements:**

**Phase I:** Phase I will have a period of performance of six (6) months. There will be a kick-off meeting conducted by the performer in order to clarify what will be required during the performance period. A midterm system review will be conducted in the third month of the Phase I period to assess current progress. The final system review will occur one (1) month before the end of the Phase I period of performance at which time the performer will present the results of its Phase I system architecture development. This will allow the ONR Program Office time to evaluate whether the Phase II (Option) will be exercised. The Final Report will be due at the end of the period of performance. At the end of Phase I, a list of all major components and parts with significant lead time is needed. Monthly Technical and Financial Progress Reports will be required from each performer as well as Presentation Materials.

The final deliverable for Phase I will be a technical report, including Level 1 Conceptual and Developmental Design Drawings, detailing the TRL 3 Concept System Architecture Design. This report should detail the performer's technical approach for meeting the objective of the Advanced Shipboard Water Desalination FNC program, its methodology for designing an open architecture system, and its approach for integrating its technical components into a complete system for the TRL 5 demonstration in Phase II (Option). If private funds have been used to develop technologies or concepts related to the proposed system design, the U.S. Government desires, at a minimum, Government Purpose Rights on all Level 1 Conceptual Design Drawings.

**Phase II (Option):** Phase II (Option) will have a period of performance of twelve (12) months and will begin once the Option has been exercised. There will be a kick-off meeting conducted by the performer in order to clarify what will be required during the performance period. Factory performance and safety assessment testing shall be accomplished on the TRL 5 proof-of-concept demonstration system by the contractor within the first eight (8) months of the Phase II (Option) period. Delivery of the demonstration system to a Navy land-based natural seawater test site for demonstration by the government will occur at approximately nine (9) months. Required material and a spare set of routinely replaced parts in addition to technical manuals detailing all procedures required for operation, periodic maintenance, and corrective maintenance shall be delivered with the system for this demonstration. Support shall be provided by the contractor at the Navy land-based natural seawater test site for system installation, shakedown, and operator training during government demonstration, including spare parts and consumables.

Bi-monthly (every two months) Product Reviews will be established for the performer to present its current system development status. Monthly Technical as well as Financial Progress Reports will be required from each performer. The final deliverable for the Phase II will be a technical report, including Level 2 Production Prototype and Limited Production Drawings, detailing the TRL 5 proof-of-concept demonstration design, results from factory performance and safety assessment testing, and required modifications necessary for developing a robust, shipboard-quality desalination demonstrator for TRL 6/7 demonstration under Phase III (Option). If private funds have been used to develop technologies or concepts related to the proposed system design, the U.S. Government desires, at a minimum, Government Purpose Rights on all Level 2 Developmental Level Drawings. Concerning the Phase II prototype deliverable, the Contractor

must budget for shipment to and shipment from Navy test site. The exact period (3 months nominally) of Navy testing depends on resource availability at Navy test site. If the Phase III Option is exercised, the Phase II prototype can be shipped back to the contractor's site for additional use in Phase III. If the Phase III Option is not exercised, the Phase II prototype will be retained at the Navy test site.

**Phase III (Option):** Phase III (Option) will have a period of performance of eighteen (18) months. There will be a kick-off meeting conducted by the performer in order to clarify what will be required during the performance period. Factory performance and safety assessment testing shall be accomplished on the TRL 6/7 demonstration system by the contractor within the first twelve (12) months of the Phase III (Option) period. Delivery of the demonstration system to a Navy land-based natural seawater test site for demonstration by the government will occur at approximately thirteen (13) months. Technical manuals detailing all procedures required for operation, periodic maintenance, and corrective maintenance, in addition to any required material and a spare set of routinely replaced parts, shall be delivered with the system for this demonstration. Support shall be provided by the contractor at the Navy land-based natural seawater test site for system installation, shakedown, operator training, and limited operational and maintenance assistance during government demonstration.

Quarterly Product Reviews will be established for the performer to present its current system development status. Monthly Technical as well as Financial Progress Reports will be required from each performer. The final deliverable for the Phase III (Option) will be the TRL 6/7 demonstration system and all technical manuals and reports detailing the design and factory performance and safety assessment testing of this system.

## **7. Point(s) of Contact -**

Questions of a technical nature shall be directed to the Science and Technology Primary Point of Contact:

Dr. Paul Armistead  
Office of Naval Research  
Code: ONR332  
875 North Randolph Street  
Arlington, VA 22203-1995  
Email: [paul.armistead@navy.mil](mailto:paul.armistead@navy.mil)

Questions of a business nature should be submitted to:

Mike Evonick  
ONR Code 253  
Office of Naval Research  
875 N. Randolph Street  
Arlington, VA 22203-1995  
Email: [michael.evonick@navy.mil](mailto:michael.evonick@navy.mil)

Any questions regarding this solicitation must be provided to both the Technical Point of Contact and Business Point of Contact listed in this solicitation. All questions / communication shall be submitted in writing by electronic mail.

Answers to questions submitted in response to this BAA will be addressed in the form of an Amendment and will be posted to 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)** - Awards are expected to take the form of CPFF completion type contracts. 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** – N/A

**10. Catalog of Federal Domestic Assistance (CFDA) Titles** – N/A

**11. Other Information** –

Work funded under a BAA may include basic research, applied research and some advanced research. 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 Category 1 (Basic Research), whether performed by universities or industry or (b) funded by Budget Category 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. Non-fundamental research is normally awarded under contracts and may require restrictions during the conduct of the research and DoD pre-publication review of such research results due to subject matter sensitivity.

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. The funds available to support awards under this BAA are Budget Activity 2 (Applied Research) and Budget Activity 3 (Advanced Technology Development).

**THIS ANNOUNCEMENT IS NOT FOR THE ACQUISITION OF TECHNICAL, ENGINEERING AND OTHER TYPES OF SUPPORT SERVICES.**

## **II. AWARD INFORMATION**

Total amount of funding the Program Office expects to award through the Announcement:

- \$6.9M in total funding available.

Anticipated Number of Awards: ONR anticipates that more than one contract award will result from this BAA.

- For the 4,000 gal/day single-pass seawater RO desalination system the following awards are anticipated under this project:
  - one (1) to four (4) base contract awards for Phase I Concept System Architecture
  - one (1) to two (2) contract option modifications for Phase II TRL 5 System Development
  - one (1) to two (2) contract option modifications for Phase III TRL 6/7 Total System Development

- For the 18,000 gal/day single-pass seawater RO desalination system the following number of contract awards are anticipated under this project:
  - zero (0) to two (2) base contract awards for Phase I Concept System Architecture
  - zero (0) to two (2) contract option modifications for Phase II TRL 5 System Development
  - zero (0) to one (1) contract option modifications for Phase III TRL 6/7 Total System Development
- For the 100,000 gal/day high purity RO desalination system the following awards are anticipated under this project:
  - one (1) to two (2) base contract awards for Phase I Concept System Architecture,
  - one (1) to two (2) contract option modifications for Phase II TRL 5 System Development
  - one (1) contract option modifications is anticipated for the Phase III TRL 6/7 Total System Development

Expected Amounts of Individual Awards:

- For the 4,000 gal/day single-pass seawater RO desalination system the following amounts for contract awards are anticipated under this project:
  - Phase I Base effort CLIN up to \$125K
  - Phase II Option CLIN up to \$225K
  - Phase III Option CLIN up to \$350K
- For the 18,000 gal/day single-pass seawater RO desalination system the following amounts for contract awards are anticipated under this project:
  - Phase I Base effort CLIN up to \$150K
  - Phase II Option CLIN up to \$300K
  - Phase III Option CLIN up to \$500K
- For the 100,000 gal/day high purity RO desalination system the following amounts for contract awards are anticipated under this project:
  - Phase I Base effort CLIN up to \$200K
  - Phase II Option CLIN up to \$1.2M
  - Phase III Option CLIN up to \$2.0M

Anticipated Period of Performance:

- Phase I project has a six (6) month period of performance.
- Phase II (Option) project has a twelve (12) month period of performance.
- Phase III (Option) project has an eighteen (18) month period of performance.

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

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.

### **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 encouraged to 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.

### **IV. APPLICATION AND SUBMISSION INFORMATION**

#### **1. Application and Submission Process – Industry Day, White Paper, Full Proposals**

##### **a. Industry Day - Demonstration System Development for Advanced Shipboard Desalination FNC**

An Industry Day for this solicitation is scheduled to take place on March 31, 2011 from 3:00 to 6:00 pm at the Hyatt Regency Hotel in Long Beach, CA. For more information go to:

Registration link: <https://secure.onr.navy.mil/events/regdetail.asp?cid=741>

##### **b. White Paper / Full Proposals**

White Papers are required prior to submitting a Full Proposal. Each White Paper will be evaluated by the government to determine whether the research proposed appears to be of "particular value" to the Department of the Navy. Results of white paper evaluation will be issued via email notification on or about the date stated in paragraph # 4 below.

Those offerors whose technology is considered as having "particular value" will be encouraged to submit detailed technical and cost proposals. Such encouragement after review of a white paper does not assure a subsequent award, however. If the offeror receives notification that its technology is not considered at this point as having "particular value" to the Navy, the offeror may still choose to submit a full proposal. However, the white paper evaluation is usually a strong indicator of how a full proposal on the same project will be rated.

White Papers and Full Proposals submitted under the BAA are expected to be unclassified.

Each White Paper and Full Proposal shall contain information for only one capacity demonstration system. If your intent is to propose to develop more than one capacity demonstration system, then a separate White Paper and Full Proposal shall be submitted for each capacity system.

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.

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

## **2. WHITE PAPERS**

### **White Paper Format and Submission:**

- Paper Size – 8.5 x 11 inch paper
- Margins – 1 inch
- Spacing – single or double-spaced
- Font – Times New Roman, 12 point
- Number of Pages – No more than eight (8) single-sided pages (excluding cover page and resumes). White Papers exceeding the page limit may not be evaluated.
- **Copies** – Electronic e-mail submissions shall be accepted up to the date and time stated in the BAA. Hard copies will not be accepted. The electronic copy of the white paper is to be in either Adobe Acrobat 9, Microsoft Word 2003, or Microsoft Word 2007 compatible format. Adobe PDF format is preferred. Email file size should not exceed 5MB and shall be submitted to the attention of Dr. Paul Armistead at [paul.armistead@navy.mil](mailto:paul.armistead@navy.mil).

### **White Paper Content**

- **Cover Page:** The Cover Page shall be labeled “WHITE PAPER” and shall include the following:
  1. BAA number,

2. Proposed title, including capacity of proposed demonstration system,
3. Relevant Topic Area within this BAA,
4. Offeror's administrative and technical points of contact along with their telephone numbers, facsimile numbers, and email addresses.

The cover page shall be signed by an authorized officer.

- **Technical Concept:** A maximum five (5) page technical section which clearly describes the proposed design of the demonstration system, technical issues to be resolved to accomplish objectives, the technical approach proposed to resolve these issues, an assessment of the proposed new capability over the existing state of the art, and a comparison against competing technological developments. Discussion of competency and experience of the Offeror in providing equipment capable of meeting military or shipboard systems requirements should be included. This section should include references / footnotes . Please address issues mentioned in the Technical Concept and Operational Utility Assessment areas of the Full Proposal format section below. Offeror is expected to discuss any Data Rights Assertions to include any expected data rights restrictions. If there will be no data rights restrictions, please confirm.
- **Deliverables:** A one (1) page list of proposed deliverables for the effort.
- **Programmatic Section:** A one (1) page programmatic section that includes milestones and a timetable.
- **Cost:** A one (1) page summary of costs segregated by tasks.
- **Resumes:** – A single page (each) summary resume (including previous relevant experience and pertinent publications) for the Principal Investigator (PI) and other key personnel.

### 3. **FULL PROPOSALS**

Each White Paper and Full Proposal shall contain information for only one capacity demonstration system. If your intent is to propose to develop more than one capacity demonstration system, then a separate White Paper and Full Proposal shall be submitted for each capacity system.

*NOTE: Submission instructions for BAAs issued after FY2010 have changed significantly from previous requirements. Potential Offerors 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 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 both ONR's Technical and Cost Proposal Template as well as its Cost Proposal Spreadsheet. The Template can be found by following this link:*

*<http://www.onr.navy.mil/Contracts-Grants/submit-proposal/contracts-proposal/cost-proposal.aspx>. 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” and “Operational Utility Assessment Plan”. Also note that the sections in the *Technical and Cost Proposal Template* for “Future Naval Relevance” and “Operational Naval Concept” are not required for this solicitation. Any related information should be included in the “Technical Approach and Justification” section as shown below.

- **Technical Approach and Justification:** This section shall include thorough description of the concept of the proposed demonstration system and relevant technical risk areas. This section should detail the design and fabrication challenges, plan to address the challenges, and resultant benefits of performing this effort. This section should also include a description of the potential Navy relevance and contributions of the proposed effort to the goals of this BAA. This section should include a synopsis of the Offeror’s proposed conceptual detailed design along with system process diagrams (including expected flow rates). Identification of the following should be included with respect to the detailed design:
  - Exotic materials, hazardous materials, or materials requiring special storage or handling.
  - Anticipated electrical power requirements.
  - If required, anticipated compressed air requirements.
  - Anticipated effluent discharges. At a minimum, these details should include identification of any of the following that are expected to be increased from the feed seawater prior to discharge: fluid temperature, turbidity, total suspended solids, oil and grease, residual oxidants, cadmium, copper, lead, mercury, nickel, selenium, silver, or zinc. Any anticipated differences in effluent pH from the feed seawater should also be identified.
  - Anticipated equipment environmental protection. It is expected that during Government test and evaluation some or all equipment will be operated outdoors at a natural seawater test site with minimal shelter. Appropriate protection (e.g., NEMA 4X enclosures) should be included as part of the developed product(s) to allow safe operation and maintain the principal functions of the equipment during the entire test and evaluation period. Projected problems and limitations with operating the equipment in this type of environment shall be identified in the full proposal.
  - High risk areas associated with meeting Navy needs identified in this BAA.

Additional details regarding the testing requirements and capabilities at government facilities will be provided as part of the Industry Day presentation materials to the ONR BAA website.

- **Operational Utility Assessment Plan:** A detailed plan for demonstrating the operational effectiveness of the Offeror’s proposed product(s) shall be included in the proposal. As stated in the solicitation, it is expected that developed products will be delivered to the Navy and be ready for evaluation nine (9) months from the date of Phase II (Option) contract award for the TRL 5 proof-of-concept demonstration system and thirteen (13) months from the date of Phase III (Option) contract award for the TRL

6/7 demonstration system. Government testing will be done at the Seawater Desalination Test Facility (SDTF) located at the Naval Facilities Engineering Service Center (NFESC), Port Hueneme, CA or other government test facility and it is expected that the contractor will work with the Government personnel as an active consultant in the test and operation of the proposed product(s) throughout all government land-based demonstrations. Performers are encouraged to begin working with government personnel as early as possible after award.

The government will fully and fairly evaluate the prototypes and associated technologies obtained as a part of this BAA. The evaluations of these prototypes and other deliverables will be the basis for down-selections in Phases II and III, if any. To support this, the selected contractors must maintain communications with the government evaluators, work with them, provide technical support, and have a certain amount of flexibility. Examples of this are:

- Allow the government to modify the test equipment for purposes of evaluation (for example adding sample ports and meters if necessary)
- Contractor will replace any damaged or defective components.
- Contractor will provide recommended spare parts and consumable items.
- Contractor's prototype system should not rely on government computers/equipment for operation. A manual with operating instructions, parts list with manufacturer and part number information, and routine maintenance instructions will be supplied.
- Contractor will support the evaluation of its device at government facilities by being available to diagnose problems and repair and/or modify equipment.

Please note that all the attachments listed in Section III.8 of the Template can be incorporated into the Template file for submission.

The text boxes in the template do not allow the use of figures. Proposals under this BAA are expected to require flow diagrams and other figures. It is allowed for this one section “III. Technical Content, I. Technical Approach and Justification” to be submitted as a properly titled PDF attachment not to exceed 15 pages for easy inclusion of figures on the part of the proposal submitter and for improved readability. Please note in the template boxes that the input was presented as an attachment and state the file name. The format requirements for any attachments to the *Technical and Cost Proposal Template* are as follows:

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

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 inter-organizational 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.

Page Limitations – There is no overall page limitation for the “*Technical and Cost Proposal Template*”. However, the template includes subsection limitations that shall be adhered to. Also, note the page restriction on the attachment related flow diagrams and other figures shown above. Other subsection limits are provided in the template. Proposals with subsections and attachment exceeding these page limitations may not be evaluated. There are no page limitations to the Cost Proposal Spreadsheet, any backup documentation for the cost proposal, as well as any administrative documentation required in Section VI.

Electronic files submitted on CD must be submitted in the pdf format for the Technical and Cost Proposal Template, in Microsoft Excel 2007 compatible format for the Cost Proposal Spreadsheet, and in Microsoft Office or pdf compatible format for any attachments, although pdf compatible formats are preferred. The electronic submission of this Excel spreadsheet shall be in a "useable condition" to aid the Government with its evaluation. The term "useable condition" indicates that the spreadsheet shall visibly include and separately identify within each appropriate cell, any and all inputs, formulas, calculations, etc. The Offeror shall in no way provide "value only spreadsheets" liken to that of a hard copy.

It is anticipated that final selections will be made on or about the date specified in the Anticipated Schedule of Events section below. Each Offeror will be notified via email of its project's selection or non-selection for funding.

#### 4. Significant Dates and Times

##### Anticipated Schedule of Events

Event	Date	Time
White Paper Due Date	5/2/2011	4:00 PM Eastern Daylight Time
Notification of White Paper Evaluation*	5/16/2011	
Full Proposal Due Date	6/15/2011	4:00 PM Eastern Daylight Time
Notification of Selection: Full Proposals*	7/15/2011	
Awards*	1/7/2012	

*\*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 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.

#### 5. 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:

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

## **6. Address for the Submission of Full Proposals–**

The only acceptable methods for submission of full proposals are 1) by mailing to the technical point of contact by the United States Postal Service (USPS), 2) via a commercial carrier (FedEx, DHL, and UPS), or 3) by hand delivery. NOTE: Full proposals sent by email, fax, or other means not in accordance with the requirements herein will not be considered. Delivery of materials by USPS, even when sent as Express Mail, may take a week or more due to current security procedures in place to ensure the safety of U.S. mail to DoD activities.

One (1) paper original, one (1) paper copy, and one CD containing of all required sections of the full proposal shall be submitted to the following address:

Office of Naval Research  
Attn: Dr. Paul Armistead  
ONR Sea Warfare and Weapons Department  
Code 332, Room 656  
875 North Randolph Street  
Arlington, VA 22203-1995

## **V. EVALUATION INFORMATION**

### **1. Evaluation Criteria –**

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

- 1) The overall scientific and technical merits of the proposal as well as the extent the

desalination system design enables the affordable insertion of future, new technologies and interoperability at the system, subsystem, and component level through a common-interface, open-architecture approach and/or the Government's rights in the resulting technology, which includes the rights described in the Level I and II drawings as specified in Section I.6.

- 2) Potential for the product under development to meet the Navy's mission as identified in this solicitation as well as the potential of the proposed product under development to be militarized to meet applicable Navy qualification testing;
- 3) The Offeror's capabilities, related experience, facilities, techniques, management plan, or unique combinations of these which are integral factors for achieving the proposal objectives and bringing product under development to production as well as the potential of the proposed product under development to be production-ready and available for shipboard application in Fiscal Year 2014;
- 4) The qualifications, capabilities and experience of the proposed principal investigator, team leader and other key personnel who are critical in achieving the proposal objects;
- 5) Reasonableness and realism of the proposed costs to meet the proposed objectives.

Overall, the Technical Factors (Factors 1 – 4 above) are significantly more important than the Cost Factor (Factor 5), with the Technical Factors all being of equal value.

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.

The Office of Naval Research is strongly committed to providing meaningful subcontracting opportunities for small businesses, small disadvantaged businesses, woman-owned small businesses, HUBZone small businesses, veteran-owned small business, service disabled veteran-owned small businesses, historically black colleges and universities, and minority institutions 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 they intend to provide meaningful subcontracting opportunities to support this policy.

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.

## **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 Program Officer and other Government scientific experts will perform the evaluation of technical proposals in accordance with the above criteria. 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**

### **1. 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”.

\*Central Contractor Registration: All Offerors 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. Information on CCR registration is available at <http://www.onr.navy.mil/02/ccr.htm>.

- Subcontracting Plans – All successful contract proposals, with the exception of small business concerns, that exceed \$650,000, shall be required to submit a Subcontracting Plan. Subcontracting Plans will be required prior to award in accordance with FAR 52.219-9.

**NOTE:** Central Contractor Registry (CCR), Subcontracting Plan requirements and Certification requirements are all set forth in the ONR Technical and Cost Proposal Template.

## **VII. OTHER INFORMATION**

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

Each proposer must provide a very specific description of any equipment/hardware that it needs to acquire to perform the work. This description should indicate whether or not each particular piece of equipment/hardware will be included as part of a deliverable item under the resulting award. Also, this 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 special test equipment or other 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.

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. Security Classification**

Reserved

## **3. Use of Animals and Human Subjects in Research**

Reserved

## **4. Recombinant DNA**

Reserved

## **5. Department of Defense High Performance Computing Program**

Reserved

## **6. Organizational Conflicts of Interest**

All Offerors 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 offeror 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 offeror 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 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.

## **7. Project Meetings and Reviews**

For costing purposes, Offerors should assume that 1/3 of these meetings will be at or near ONR Arlington VA, 1/3 in Port Hueneme CA, and 1/3 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.

## **8. Executive Compensation and First-Tier Subcontract Reporting**

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.fsr.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.

## 9. Submission of Questions

Any questions regarding this solicitation must be provided to the Science and Technology Point of Contacts and/or Business Point of Contact listed in this solicitation. All questions shall be submitted in writing by electronic mail.

Questions regarding **White Papers** must be submitted by 2:00 p.m. Eastern Time two weeks before the date and time for receipt of White Papers. Questions after this date and time may not be answered, and the due date for submission of the white papers will not be extended.

Questions regarding **Full Proposals** must be submitted by 2:00 p.m. Eastern Time two weeks before the date and time for receipt of Full Proposals. Questions after this date and time may not be answered, and the due date for submission of the proposals will not be extended.

MIL-STD-31000  
5 November 2009  
SUPERSEDING  
MIL-DTL-31000C  
9 July 2004

DEPARTMENT OF DEFENSE  
STANDARD PRACTICE

TECHNICAL DATA PACKAGES

5.7.1 TDP Levels.

5.7.1.1 Conceptual level - A conceptual design TDP shall consist of those TDP elements necessary to define design concepts in graphic form, and include appropriate textual information required for analysis and evaluation of those concepts. The data will generally consist of simple sketches/models, artist renderings and/or basic textual data.

5.7.1.2 Developmental level - A developmental prototype/limited production TDP shall consist of those TDP elements necessary to provide sufficient data to support the analysis of a specific design approach, the fabrication of prototype materiel for test or experimentation, and limited production by the original design organization or with assistance from the original design organization.

5.7.1.3 Production level - A production level TDP shall consists of those TDP elements necessary to provide the design, engineering, manufacturing, inspection, packaging and quality assurance provisions information necessary to enable the procurement or manufacture of an item. The product shall be defined to the extent necessary for a competent manufacturer to produce an item, which duplicates the physical, interface, and functional characteristics of the original product, without additional design engineering effort or recourse to the current design activity. Production data shall reflect the approved, tested, and accepted configuration of the defined delivered item.

AP6. APPENDIX 6TECHNOLOGY READINESS LEVELS AND THEIR DEFINITIONSAP6.1. TECHNOLOGY READINESS LEVELS

The following matrix lists the various technology readiness levels and descriptions from a systems approach for both HARDWARE and SOFTWARE. DoD Components may provide additional clarifications for Software. Supplemental definitions follow the table.

<b>Technology Readiness Level</b>	<b>Description</b>
1. Basic principles observed and reported.	Lowest level of technology readiness. Scientific research begins to be translated into applied research and development. Examples might include paper studies of a technology's basic properties.
2. Technology concept and/or application formulated.	Invention begins. Once basic principles are observed, practical applications can be invented. Applications are speculative and there may be no proof or detailed analysis to support the assumptions. Examples are limited to analytic studies.
3. Analytical and experimental critical function and/or characteristic proof of concept.	Active research and development is initiated. This includes analytical studies and laboratory studies to physically validate analytical predictions of separate elements of the technology. Examples include components that are not yet integrated or representative.
4. Component and/or breadboard validation in laboratory environment.	Basic technological components are integrated to establish that they will work together. This is relatively "low fidelity" compared to the eventual system. Examples include integration of "ad hoc" hardware in the laboratory.
5. Component and/or breadboard validation in relevant environment.	Fidelity of breadboard technology increases significantly. The basic technological components are integrated with reasonably realistic supporting elements so it can be tested in a simulated environment. Examples include "high fidelity" laboratory integration of components.
6. System/subsystem model or prototype demonstration in a relevant environment.	Representative model or prototype system, which is well beyond that of TRL 5, is tested in a relevant environment. Represents a major step up in a technology's demonstrated readiness. Examples include testing a prototype in a high-fidelity laboratory environment or in simulated operational environment.

7. System prototype demonstration in an operational environment.	Prototype near, or at, planned operational system. Represents a major step up from TRL 6, requiring demonstration of an actual system prototype in an operational environment such as an aircraft, vehicle, or space. Examples include testing the prototype in a test bed aircraft.
8. Actual system completed and qualified through test and demonstration.	Technology has been proven to work in its final form and under expected conditions. In almost all cases, this TRL represents the end of true system development. Examples include developmental test and evaluation of the system in its intended weapon system to determine if it meets design specifications.
9. Actual system proven through successful mission operations.	Actual application of the technology in its final form and under mission conditions, such as those encountered in operational test and evaluation. Examples include using the system under operational mission conditions.

**DEFINITIONS:**

**BREADBOARD:** Integrated components that provide a representation of a system/subsystem and that can be used to determine concept feasibility and to develop technical data. Typically configured for laboratory use to demonstrate the technical principles of immediate interest. May resemble final system/subsystem in function only.

**"HIGH FIDELITY":** Addresses form, fit and function. High-fidelity laboratory environment would involve testing with equipment that can simulate and validate all system specifications within a laboratory setting.

**"LOW FIDELITY":** A representative of the component or system that has limited ability to provide anything but first order information about the end product. Low-fidelity assessments are used to provide trend analysis.

**MODEL:** A functional form of a system, generally reduced in scale, near or at operational specification. Models will be sufficiently hardened to allow demonstration of the technical and operational capabilities required of the final system.

**OPERATIONAL ENVIRONMENT:** Environment that addresses all of the operational requirements and specifications required of the final system to include platform/packaging.

**PROTOTYPE:** The first early representation of the system that offers the expected functionality and performance expected of the final implementation. Prototypes will be sufficiently hardened to allow demonstration of the technical and operational capabilities required of the final system.

**RELEVANT ENVIRONMENT:** Testing environment that simulates the key aspects of the operational environment.

**SIMULATED OPERATIONAL ENVIRONMENTAL:** Either 1) a real environment that can simulate all of the operational requirements and specifications required of the final system, or 2) a simulated environment that allows for testing of a virtual prototype; used in either case to determine whether a developmental system meets the operational requirements and specifications of the final system.

**BAA 11-010 “Demonstration System Development for Advanced  
Shipboard Desalination FNC”**

**March 31, 2011 Hyatt Regency, Long Beach, CA**

**Preliminary Agenda**

3:00-	3:20	Opening Remarks	Paul Armistead Office of Naval Research
3:20 -	3:40	Current Navy Desalination Capability: Description, Strengths and Weaknesses	Dave Nordham Navy NSWCCD-SSES
3:40-	4:00	Current Army Desalination Capability: Second Generation RO Systems	Mark Miller Army TARDEC
4:00-	4:20	Progress of Advanced Military Demonstration Units under Expeditionary Unit Water Purification Program	Dave Nordham Navy NSWCCD-SSES
4:20-	4:40	break	
4:40 -	5:00	The FNC Program and Phase II BAA	Paul Armistead Office of Naval Research
5:00-	5:20	BAA Details, Dates, Procedures	Mike Evonick Office of Naval Research
5:20 -	5:30	Government Testing Capabilities for Evaluation of Delivered BAA Products	Bill Varnava Navy NFESC
5:30 -	6:00	Questions and Discussion	All speakers

Registration is required. The Broad Agency Announcement should be read before attending. The program has tight performance periods with down selections after the 6 month design period and 12 month technology demonstrator fabrication and evaluation period prior to an 18 month period for the delivery and testing of robust demonstrators for shipboard evaluation. Multiple systems will be developed. (BAA: <http://www.onr.navy.mil/en/Contracts-Grants/Funding-Opportunities/Broad-Agency-Announcements.aspx>)  
(Registration: <https://secure.onr.navy.mil/events/regdetail.asp?cid=741>)