

**ONR BAA Announcement # 07-025**

**OFFICE OF NAVAL RESEARCH  
BROAD AGENCY ANNOUNCEMENT (BAA)  
FOR PAYLOAD IMPLOSION AND PLATFORM  
DAMAGE PREDICTION AND VALIDATION**

**INTRODUCTION:**

This publication constitutes a Broad Agency Announcement (BAA) as contemplated in Federal Acquisition Regulation (FAR) 6.102(d)(2) and the Department of Defense Grants and Agreements (DoDGARS) Subpart 22.315(a). 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. 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

**2. Research Opportunity Title –**

Payload Implosion and Platform Damage Prediction and Validation

**3. Program Name –**

Future Naval Capability: Underwater Total Ship Survivability

**4. Research Opportunity Number -**

**BAA 07-025**

## **5. Response Date -**

See Section IV-3 for anticipated schedule of milestones under this BAA.

## **6. Research Opportunity Description -**

### ***Background***

Implosion is the sudden inward collapse of a pressure resistant structure. For example, a submerged pressure housing with an internal pressure well below the ambient sea pressure may fail due to the external pressure. Following the collapse, a strong pressure wave is radiated into the surrounding fluid. This pressure wave depends sensitively on the exact form of the collapse. The resulting energetic pressure pulse can potentially damage nearby structures.

The Navy requires an improved capability to design and qualify submarine external payloads for implosion avoidance and platform survivability. Validated, user-friendly tools are required that enable the designer to predict implosion effects, especially the magnitude of the resulting shock waves: In particular, the Navy needs 1) a parametric payload design tool for conventional payloads, and 2) a physics-based model for complex analyses. This requires both algorithm and software development, and carefully controlled measurements to validate the software.

### ***Required Effort***

The government requires the performance of five tasks. The government will issue one or more awards in each task area. Potential performers may bid to perform work in one or more task areas, or to perform some part of the work in a particular task area. Proposals must contain a separate technical description and cost for work in each task area. It should be noted that not all tasks may be awarded. The required tasks are:

- ***Task A - Deep Water Implosion/UNDEX Experiments***

The performer shall conduct deep-water tests to provide data on:

- 1) Combined Underwater explosion and Implosion (CUI) pulse at depth; and
- 2) The effects of implosions and underwater explosions (UNDEX) on adjacent submerged structures at depth. A series of at least eight tests is envisioned with provision for two repeat tests or additional tests. Testing depth will be between 500 feet and 1500 feet. The water depth at the site shall be deep enough to preclude reflections of shock waves from contaminating recorded data. The tests shall be sufficiently instrumented to record both the UNDEX and implosion pressure pulses, both in close proximity to the origin of the pulses, and at sufficient distances away to determine the free field propagation characteristics of the pulses. At least twenty-four channels of data shall be recorded for each test. In tests that involve an adjacent submerged structure,

strain-time histories occurring in the adjacent structure in the vicinity of the implosion shall be recorded. The depth at which implosion occurs shall be recorded, and the speed of sound in the water determined.

Unless otherwise approved by the government, the test series will include eight tests. The first four tests shall include an UNDEX charge near a single structure:

- \*Test (1) UNDEX initiated implosion of a large unstiffened cylinder;
- \*Test (2) UNDEX initiated implosion of a smaller unstiffened cylinder;
- \*Test (3) UNDEX loading on a submerged stiffened structure. The submerged stiffened structure shall be a stiffened steel cylinder, designed to not implode, with the geometry defined in Task B; and
- \*Test (4) UNDEX initiated implosion of a stiffened or unstiffened cylinder.

Each of the remaining four tests (5 – 8) shall involve an implodable volume, similar to test 4, and the submerged stiffened structure:

- \*Test (5) shallow hydrostatic implosion next to the submerged stiffened structure;
- \*Test (6) deep hydrostatic implosion next to the submerged stiffened structure;
- \*Test (7) shallow UNDEX initiated implosion next to the submerged stiffened structure; and
- \*Test (8) deep UNDEX initiated implosion next to the submerged stiffened structure, where the implodable volume is between the UNDEX charge and the submerged stiffened structure.

The implodable volume in each of these tests shall have the geometry defined in Task B. The performer shall insure that the specified standoff between the UNDEX charge and the implodable volume or submerged stiffened structure is maintained. The performer shall insure that the structures used to mount the implodable volumes, the stiffened submerged structure, the explosive charge and instrumentation shall not significantly alter the UNDEX pressure pulse and the pulse resulting from the implosion. Additionally, the performer shall make provisions for capturing and retrieving the submerged adjacent structures and the imploded structures or their fragments, and shall return these to the government.

The government shall approve the final configuration of each test including the implodable volume, location of the implodable volume with respect to submerged adjacent structure, UNDEX charge size, location of UNDEX charge relative to the implodable volume or submerged stiffened structure, and the instrumentation plan prior to each test.

Deliverables to the government shall be a final report including electronic files of recorded pressure-time histories, strain-time histories, implosion depth, and

the speed of sound in the water. Drawings showing the structural configuration and geometry of all submerged structure and implodable volumes shall be provided to the government. Appropriate material properties, such as stress-strain curves, shall be provided to the government. In addition, diagrams showing the location of all instrumentation shall be provided to the government.

o ***Task B - Fabrication of Structures to be Tested in Task A***

The first four tests involve models which are cylinders closed by flat plate end closures. The first model shall be an unstiffened mild steel cylinder with an outside diameter of 26 inches, and a length of 171 inches. Model test depth is approximately 1200 feet. The second model shall be an unstiffened mild steel cylinder with an outside diameter of 18 inches, a length of 120 inches. Model test depth is approximately 800 feet. The submerged stiffened structure for test 3 shall be an internally stiffened steel cylinder with an outside diameter of between four and eight feet and a maximum L/D ratio of 2.0. The static collapse depth of this cylinder shall be approximately 1800 feet. Model dimensions for test 4 shall be dependent on the dimensions of the submerged stiffened structure used for test 3. The ratio of the outside diameter of the implodable volume to the outside diameter of the submerged stiffened structure shall be 0.265, or as approved by the government. The length-to-diameter (L/D) ratio of the implodable volume shall be approximately 1.75. The design collapse depth of the implodable should be slightly greater than the depth at which the test is conducted (500 to 1000 feet). The implodable structures shall be stiffened or un-stiffened metal shells with no other internal structure.

Tests 5 - 8 involve test configurations consisting of an implodable volume and the submerged stiffened structure. In tests 5 and 6 the implosion is initiated hydrostatically and in tests 7 and 8 it is initiated by an UNDEX event. The implodable volume and the submerged stiffened structure are of the same geometry described in the previous paragraph for tests 3 and 4, except that the implodable volume for test 5 shall be designed to implode at approximately 500 ft and the implodable volume for test 6 shall be designed to implode at approximately 1000 ft. Similarly, the implodable volumes for test 7 and 8 shall be designed to implode at approximately 500 and 1000 ft, respectively.

An additional submerged stiffened structure cylinder and two additional implodable volumes of the design used in tests 5 - 8 shall be fabricated to allow the option to be used in case retesting of a certain configuration is necessary or repeating a test at a different depth.

The government shall approve the final design of each structural component prior to construction. Construction is to be completed in the second performance year of the contract.

○ **Task C - Material Constitutive Relations Data Base**

The performer will provide a material constitutive relations data base for the materials listed in Table IV. Data must be sufficient to accurately model the brittle or ductile failure of each material, and must be of a form amenable to being easily incorporated into a physics-based computational tool. The government will identify additional materials as needed.

○ **Task D - Physics-based Implosion/UNDEX Computational Model**

The performer shall provide a physics-based and test-validated computational model (analysis tool) with the capabilities listed below. This tool is to be designed to be exercised by a user familiar with Finite Element Analysis in order to determine the implosion of payloads of all sizes, the resulting pressure pulse, its effects on the adjacent structure, and mitigation techniques. The physics-based and test-validated Computational Model shall predict:

- The implosion of a structure due to hydrostatic pressure, and due to the combination of hydrostatic pressure and UNDEX
- The pressure pulse in the ambient fluid resulting from the structure implosion at depth
- The pressure pulse in the ambient fluid resulting from a combined UNDEX and Implosion (CUI) pulse from the structure at depth.
- The pressure pulse effects on adjacent structure integrity; specifically, damage predictions from both hydrostatic implosion and CUI loading at depth
- The effectiveness of mitigation techniques
- The effect of an implosion within a surrounding structure, i.e. tube, on the integrity of that structure for both hydrostatic and CUI loading.
- And identify when volume certification testing is required

A mature software tool is to be provided to evaluate the computational model. The software must be able to model a complex three-dimensional structure, including shell and solid components. This includes the ductile or brittle failure of the structure, and the resulting fluid motion, including cavitation. In addition the software must provide an accurate prediction of the pressure pulse propagation from the hydrostatic and UNDEX induced implosion and its effects on adjacent (and possibly surrounding) structures. The key parameters to be included in the determination of the effects of the pressure pulse on adjacent structure will be approved by the government.

The performer may choose to formulate the algorithms used in the physics-based prediction, or may adopt algorithms to be provided by the government, which have been demonstrated in existing research codes. The performer may

make use of existing commercial software, such as structural finite element analysis codes, or damage prediction codes to perform portions of the calculation. However, the final software must be linked into a user-friendly package, with a single GUI-driven front end and output stream

Computational efficiency will be a paramount evaluation criterion. Proposals should address the approach to be taken to achieve such efficiency, and provide estimates of the computational time required to solve the demonstration problem shown below, and the specific hardware for which the estimate pertains.

Accuracy of the finished product is to be demonstrated against the Deep Water Implosion/UNDEX Experiment of Task A. In addition, the government will provide a series of small and mid-scale test results for validation and testing in the software development phase.

Offeror must either commit to delivering source code to the government as the final deliverable, or should spell out a long-term maintenance plan for the delivered software, and the expected annual cost

- o ***Task E - Implosion Design/Assessment Tool***

The performer shall provide a test-validated computational development tool to be rapidly exercised by a component designer on a PC to 1) design the implodable structure to preclude implosion due to hydrostatic and UNDEX loading, 2) determine if a structure implodes due to hydrostatic and hydrostatic plus UNDEX loading, and the resulting pressure pulse at user specified locations, 3) assess the pressure pulse effects on adjacent and/or surrounding structure, and 4) allow for mitigation techniques of the implodable volumes.

It is expected that the physics-based computational model described in Task D, as well as experimental data, will be used to provide data for the implosion design/assessment (DA) tool. The DA tool may be a response surface model spanning the coordinates and coordinate ranges listed in Table I, or another approach to rapidly evaluate the inputs of Table II, and provide the outputs of Table III. The performer may make use of existing commercial software, or damage prediction codes which have been demonstrated in existing research codes to perform portions of the calculation. However, the final software must be linked into a user-friendly package, with a single GUI-driven front end and output stream.

Parts 2, 3 and 4 of the DA tool shall be valid for the range of volumes tested and provided by the government for Part D. Part 1 requires additional tests to validate the range of its applicability for predicting the ability of the implodable structure to survive the UNDEX loading. This additional testing may done in a depth simulator provided the effects of depth, and the proper UNDEX loading can be developed and maintained for the duration of the test. The DA tool shall

be applicable for the materials listed in Table IV. The DA tool shall also identify when qualification testing is required.

***Demonstration Problem - The Hydrostatic Implosion of a 10" OD Aluminum Cylinder***

The test article is a 6061-T6 aluminum cylinder (10" OD x 53.4" L x 0.250" thk) with thick flat endcaps (2.5" total thickness with a 0.38" shoulder, 6061-T651 aluminum). An aluminum cylinder was imploded in seawater at a depth of 1268 ft. Cylinder imperfection data will be provided (thickness and out-of-roundness variations). Results from the physics based code will be compared with the measured pressure sensor data from the test.

**Table I: Parameters**

The following parameters and ranges need to be addressed, not all may need to be included in the DA tool. Government approval of the selected parameters is required.

Depth	0-2000 feet
Volume size	100 cubic inches to 40 cubic feet
Volume shape:	Spheres Cylinders Stiffened Unstiffened 1.0 < Length / Diameter <10.0
Internal volume pressure	Atmospheric to 5000 psi,
Materials	Table IV
Volume collapse depth / ambient depth ratio	1.1 to 2.0
Key effect parameters	To be provided by the government
UNDEX charge size, and location	Specifics to be provided by the government
Adjacent structure	- Geometry: To be provided by the government - Existing damage: none to the maximum provided by the government
Distance of implodable to UNDEX load	To be provided by the government
Distance of implodable to adjacent structure	0 to greater of either 20 feet or 10 diameters of the imploding volume

**Table II – DA Tool Input Parameters:**

Design Assessment Tool Parameters		
Parameter	DA tool Input	Comment
Depth	Evaluation Depth	Provide capability to automatically

		perform analysis from specified depth to the surface in at least 10 depth increments
Implodable	Volume	
	Geometry	Diameter, length, shell thickness, frame scantlings
	Material	
	Standoff to adjacent structure	
	Energy damping	Coating
	Existing Damage/ Imperfections	
	Internal structural details	Structure that effects implosion
	Internal pressure	Allows explodable volumes
Bulk Charge	Weight	
	Material	If not specified as TNT equivalent
	Standoff to Implodable	
	Standoff to adjacent structure	
	Depth	
Adjacent Structure	Type	Pressure boundary, other implodable volume, external system
	Geometry	Diameter, shell thickness, frame scantlings
	Material	
	Existing Damage/ Imperfections	
Other	Locations to be evaluated	Provide results at user specified locations
	Volume located in a tube	If so, provide tube strength parameters

**Table III – DA Tool Output:**

Government approval of the specific output is required. At a minimum, the following parameters are to be output from the DA tool:

- Identify ability of the volume to withstand input hydrostatic pressure, and the input hydrostatic plus UNDEX loading
- Pressure time history of the hydrostatic implosion pulse
- Pressure time history of the CUI pulse.
- The propagation of the above pressure pulses
- Peak pressure and Impulse of the implosion pulse
- Key effects to the adjacent structure as identified by the government
- Rate of energy release (power)
- Damage to volume from UNDEX loading
- Damage to adjacent structure

- Survivability of adjacent structure with above damage
- Criticality of volume (implosion causes unacceptable damage to adjacent structure)

***Table IV – Materials***

Government approval of the specific material/ alloy / heat treatment is required prior to testing.

- Aluminum 6061
- Aluminum – 5000 series (e.g. 5083, 5086, 5052, etc.)
- Aluminum 7075
- Titanium alloys 5111, 6Al-4V, CP2LO, 6AL4V ELI
- HY-80, HY100, HSS
- 17-4PH
- CRES
- SS 314
- Inconel
- 4 additional metallic materials to be identified by the government at a later time

**7. Point(s) of Contact –**

Questions of a technical nature shall be directed to the cognizant Technical Point of Contact, as specified below:

Science and Technology Point of Contact:

Point of Contact Name:	Luise S. Couchman
Point of Contact Occupation Title:	Program Officer
Division Title:	Ship Systems and Engineering Research Division
Division Code:	331
Address:	875 North Randolph Street Arlington, Va. 22203-1995
Telephone Number:	703-696-0786
Email Address:	couchml@onr.navy.mil

Questions of a business nature shall be directed to the cognizant Contract Specialist, as specified below:

Business Point of Contact:

Point of Contact Name:	Brenda Pickett
Point of Contact Occupation Title:	Contract Specialist
Division Title:	Contract & Grant Award Management
Division Code:	ONR Code 254
Address:	875 North Randolph Street Arlington, Va. 22203-1995
Telephone Number:	703-696-2607

Facsimile Number: 703-696-3365  
Email Address: [picketb@onr.navy.mil](mailto:picketb@onr.navy.mil) or  
[Brenda.Pickett@onr.navy.mil](mailto:Brenda.Pickett@onr.navy.mil)

**8. Instrument Type(s) -**

Awards may take the form of contracts, grants, cooperative agreements, and other transaction agreements, as appropriate.

**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 -**

**II. AWARD INFORMATION**

The estimated total amount of awards is \$18.255M anticipated to be made available over a five year period. ONR may issue BAAs annually with a potential open period of one year. ONR may award less than \$18.255M under this BAA and apply subsequent funding as it is made available in the out-years.

\*Estimated Total Amount of Funding Available (\$K):

FY08	FY09	FY10	FY11	FY12	Total
1900	2695	6217	4145	3268	18225

\*Anticipated Number of Awards:

One or more awards per Task, as described in the Research Opportunity Description. An Offeror may propose on more than one Task.

\*Anticipated Range of Individual Award Amounts:

As required to complete each Task. There may be more than one performer per Task.

\*Anticipated Period of Performance:

Up to five (5) years

### **III. ELIGIBILITY INFORMATION**

All responsible sources may submit proposals, which shall be considered by the Government. Government Laboratories may not submit proposals directly under this BAA; however, they may offer proposals independently, or provide subcontractor assistance to (or partner with) other proposers.

Foreign companies/entities may be considered under this announcement.

Federal Funded Research and Development Centers (FFRDCs) may submit proposals under this BAA, if permitted under their agreements with their sponsoring agencies.

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.

Independent organizations and teams are encouraged to submit proposals in any or 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 any system integrators that may be selected by ONR.

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

#### **1. Application and Submission Process -**

The Application and Submission Process will consist of three-phases:

- Phase 1: White Papers
- Phase 2: Oral Presentations
- Phase 3: Full Proposals

#### **Phase 1: White Papers**

Process: White papers are solicited in each of the Task areas. A single Offeror may propose in one or more Task areas. In that case, costs should be itemized by Task area. It is not required that a Proposer performs all the Sub-Tasks listed in a Task area; multiple awards may be issued in each Task area.

Due Date: See Section IV-3 for anticipated schedule of milestones under this BAA.

Evaluation/Notification: Oral presentations will be scheduled for those Offerors who have been notified by e-mail that their technologies are “of particular interest” to the Navy. Selection of white papers as being “of particular interest” to the Navy does not assure a subsequent award.

An Offeror with a white paper submission determined not to be of particular interest to the Navy may give an oral presentation by contacting the ONR Program Manager identified above and requesting an oral presentation opportunity.

## **Phase 2: Oral Presentations**

The purpose of the Oral Presentation is to better acquaint the Government with the offeror's proposal.

Offerors whose white papers are selected for oral presentations will be invited by e-mail to make oral presentations not less than five (5) working days prior to the commencement of the oral presentation event. See Section IV-3 for schedule of milestones under this BAA.

Process: A detailed format for the presentation will be provided in the e-mail invitation. Each presentation may be up to one (1) hour in duration. An additional one-half (1/2) hour will be allowed for questions.

Evaluation/Notification: Following oral presentations, Offerors will be notified by e-mail regarding the Navy's response to their oral presentations. Those Offerors whose technology is still considered as having particular interest to the Navy will be encouraged to submit detailed technical and cost proposals. The evaluation provided after white papers and oral presentations should give offerors some indication of whether a later full proposal would likely result in an award.

## **Phase 3: Full Proposals**

Due Date: See Section IV-3 for a schedule of milestones under this BAA.

Evaluation/Notification: As soon as the final proposal evaluation process is completed, the offeror will be notified via email of its selection or non-selection for an award.

Any Offeror who did not participate under Phase I – White Paper and/or Phase II – Oral Presentation may submit a Full Proposal for consideration.

## **2. Content and Format of White Papers/Full Proposals –**

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

### **White Paper Format**

- 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 \_\_\_\_\_5\_\_\_\_\_ single-sided pages (excluding cover page and resumes)
- Copies – one (1) original, \_\_\_\_\_5\_\_\_\_\_ copies, and one electronic copy on a CD-ROM.

**Full Proposal Format – Volume 1 - Technical and Volume 2 - Cost Proposal**

- Paper Size – 8.5 x 11 inch paper
- Margins – 1” inch
- Spacing – single spaced
- Font – Times New Roman, 12 point
- Number of Pages –
  - \*Volume 1, Technical Proposal - is limited to no more than \_25\_ pages.
  - \*Volume 2, Cost Proposal - has no page limit.
  - \*Limitations within sections of the Technical Proposal are indicated in the individual descriptions shown below.
  - \*The cover page, table of contents, and resumes are excluded from the page limitations.
  - \*Full Proposals exceeding the page limit may not be evaluated.
- Copies – one (1) original, \_\_\_\_\_5\_\_\_\_\_ copies and one electronic copy on a CD-ROM, (in Microsoft® Word or Excel 97 compatible or .PDF format)

**White Paper Content**

White papers are limited to five (5) pages and should include the following items:

- Cover Page – The Cover Page shall be labeled “PROPOSAL WHITE PAPER”, and shall include the BAA number, proposed title, Offeror’s administrative and technical points of contact, with telephone numbers, facsimile numbers, and Email addresses. The white paper shall be signed by an authorized officer.

Technical Description: A clear discussion of the overall scientific and technical merits inclusive of the following:

- \*The degree of innovation
- \*The soundness of technical concept
- \*The Offeror’s awareness of the state of the art and understanding of the scope of the problem and the technical effort needed to address it.

Also discuss the potential naval relevance and contributions of the effort to the program’s specific mission.

Performer Qualifications: Discuss of potential Offeror's capabilities, related experience, and past performance, including the qualifications, capabilities and experience of the proposed principal investigator and personnel inclusive of the following:

- \*The quality of technical personnel proposed;
- \*The Offeror's experience in relevant efforts with similar resources
- \*The ability to manage the proposed effort

Cost Description: A cost estimate on a yearly basis partitioned by major tasks.

## **Full Proposal Content**

Volume 1: Technical Proposal

- **Cover Page**: This should include the words "Technical Proposal" and the following:

- 1) BAA number;
- 2) Title of Proposal;
- 3) Identity of prime Offeror and complete list of subcontractors, if applicable;
- 4) Technical contact (name, address, phone/fax, electronic mail address)
- 5) Administrative/business contact (name, address, phone/fax, electronic mail address) and;
- 6) Duration of effort (differentiate basic effort and any proposed options)

- **Table of Contents**

- **Statement of Work**: A Statement of Work (SOW) clearly detailing the scope and objectives of the effort and the technical approach. It is anticipated that the proposed SOW will be incorporated as an attachment to the resultant award instrument. To this end, such proposals must include a severable, self-standing SOW without any proprietary restrictions, which can be attached to the contract or agreement award. Include a detailed listing of the technical tasks/subtasks organized by year.

- **Project Schedule and Milestones**: A summary of the schedule of events and milestones.

- **Assertion of Data Rights and/or Rights in Computer Software**: For a contract award an Offeror may provide with its proposal assertions to restrict use, release or disclosure of data and/or computer software that will be provided in the course of contract performance. The rules governing these assertions are prescribed in Defense Federal Acquisition Regulation Supplement (DFARS) clauses 252.227-7013, -7014 and -7017. These clauses may be accessed at the following web address:

<http://farsite.hill.af.mil/VFDFARA.HTM>

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

- **Contract Deliverables:** Deliverable items are provided under contracts. A detailed description of the results and products to be delivered under contracts should be provided inclusive of the timeframe in which they will be delivered.

- **Grant Reports:** Offerors seeking grants shall provide a list of the reports to be submitted to describe the results of the research effort.

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

## **VOLUME 2: Cost Proposal**

The Cost Proposal shall consist of a cover page and two parts. Part 1 will provide a detailed cost breakdown of all costs by cost category by calendar or Government fiscal year, and Part 2 will provide a cost breakdown by task/sub-task corresponding to the task numbers in the proposed Statement of Work. Options must be separately priced.

**Although not required and provided for informational purposes only, detailed instructions, entitled “Instructions for Preparing Cost Proposals for Contracts and Agreements”, including a sample template for preparing costs proposals for contracts and agreements, may be found at ONR’s website listed under the ‘Acquisition Department – Contracts & Grants Submitting a Proposal’ link at: [http://www.onr.navy.mil/02/how\\_to.asp](http://www.onr.navy.mil/02/how_to.asp)**

**Cover Page:** The use of the SF 1411 is optional. The words “Cost Proposal” should appear on the cover page in addition to the following information:

- BAA number
- Title of Proposal
- Identity of prime Offeror and complete list of subcontractors, if applicable
- Technical contact (name, address, phone/fax, electronic mail address)
- Administrative/business contact (name, address, phone/fax, electronic mail address) and
- Duration of effort (separately identify basic effort and any proposed options)

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

- Direct Labor – Individual labor category or person, with associated labor hours and unburdened direct labor rates
- Indirect Costs – Fringe Benefits, Overhead, G&A, COM, etc. (Must show base amount and rate)
- Travel – Number of trips, destination, duration, etc.
- Subcontract – A cost proposal as detailed as the Offeror’s cost proposal will be required to be submitted by the subcontractor. The subcontractor’s or subrecipient’s cost proposal can be provided in a sealed envelope with the Offeror’s cost proposal or will be obtained from the subcontractor prior to award.
- Consultant – Provide consultant agreement or other document which verifies the proposed loaded daily/hourly rate
- Materials should be specifically itemized with costs or estimated costs. An explanation of any estimating factors, including their derivation and application, shall be provided. Include a brief description of the Offeror's procurement method to be used (Competition, engineering estimate, market survey, etc.)
- Other Directs Costs, particularly any proposed items of equipment or facilities. Equipment and facilities generally must be furnished by the contractor/recipient. (Justifications must be provided when Government funding for such items is sought). Include a brief description of the Offeror's procurement method to be used (Competition, engineering estimate, market survey, etc.)
- Proposed fee/profit (contract proposals only)

**Part 2 :** Cost breakdown by task/sub-task using the same task numbers in the Statement of Work

**3. Significant Dates and Times -**

**Anticipated Schedule of Events**

<u>EVENT</u>	<u>DATE *</u>	<u>TIME (EASTERN DAYLIGHT TIME)</u>
FY08 White Papers Due Date	June 1, 2007	2:00 pm
Notification of Initial Navy Evaluations of FY08 White Papers	June 30, 2007	
Oral Presentation of FY08 White Papers	July 1-July 15, 2007	White paper should specify requested date in this range.
Notification of Navy Evaluations of Oral Presentations	July 20, 2007	

Full FY08 Proposal Due Date	Aug 20, 2007	2:00 pm
Notification of Selection for FY08 Award	Sep 20, 2007	
Issued FY08 Awards	Nov 29, 2007	

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

#### **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 extend to the same time of day specified in the announcement on the first work day on which normal Government processes resume.

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

## 5. Submission of Grant Proposals –

Grant proposals may be submitted through Grants.gov or by hard copy. Regardless of whether Grants.gov is used or “hardcopy” submission, the offeror must use the Grants.gov forms from the application package template associated with the BAA on the Grants.gov website. To be considered for award, applicants must include the ONR Department Code in Block 4 entitled ‘Federal Identifier’ of the Standard Form (SF) 424 R&R. **Please be sure to enter the Department Code that best relates to your proposal in Block 4 (Federal Identifier) of the SF 424 R&R to ensure that it is properly routed to the correct Program Office. Only one Department Code may be selected.** Please choose at the sub-Department level (i.e., ONR Code 331). A list of the Department Codes can be found at <http://www.onr.navy.mil/> on the right side of the screen. For those Applicants who fail to provide a Department Code identifier will receive notification that their proposal submission has been rejected.

However, it should be noted that “white papers” should not be submitted through Grants.gov Apply process; the only acceptable media will be hard copy. White papers may be submitted in hard copy (either electronically or paper) directly to ONR Code 331, Attn: Dr. Luise Couchman. Refer to Paragraph 6 below, for applicable mailing address and email address.

For electronic submission, there are several one-time actions that must be completed in order to submit an application through Grants.gov (e.g., obtain a Dun and Bradstreet Data Universal Numbering System (DUNS) number, register with the Central Contract Registry (CCR), register with the credential provider, and register with Grants.gov). See [www.grants.gov](http://www.grants.gov), specifically [www.grants.gov/GetStarted](http://www.grants.gov/GetStarted).

Use the Grants.gov Organization Registration Checklist at <http://www.grants.gov/assets/OrganizationRegCheck..doc> [http://www.grants.gov/applicants/register\\_your\\_organization.jsp](http://www.grants.gov/applicants/register_your_organization.jsp) which will provide guidance through the process. Designating an E-Business Point of Contact (EBiz POC) and obtaining a special password called ‘MPIN’ are important steps in the CCR registration process. Applicants who are not registered with CCR and Grants.gov, should allow at least 21 days to complete these requirements. It is suggested that the process be started as soon as possible. Additionally, in order to download the application package, applicants will need to install PureEdgeViewer. This small, free program will allow applicants to access, complete and submit applications electronically and securely. For a free version of the software, visit the following website: [www.grants.gov/DownloadViewer](http://www.grants.gov/DownloadViewer). If any questions that may arise relating to the registration process, system requirements, how an application form works, or the submittal process must be directed to Grants.gov at 1-800-518-4726 or [support@grants.gov](mailto:support@grants.gov).

Assistance awards greater than \$100,000 require a certification of compliance with a national policy mandate concerning lobbying. Applicants may provide this certification in one of two (2) ways:

- 1) By signing and submitting the Standard Form (SF)-424 (R&R), as a part of a hard copy proposal submission (complete Blocks 18 and 19) proposers are providing the certification required by 32 CFR Part 28; or
- 2) By hard copy submission of the full text lobbying certification found at [http://www.onr.navy.mil/02/rep\\_cert.asp](http://www.onr.navy.mil/02/rep_cert.asp)

By submitting a grant proposal in excess of \$100,000 using the SF-424, applicants are certifying to the truth of the following restrictions on lobbying:

- (1) No Federal appropriated funds have been paid or will be paid by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, or cooperative agreement.
- (2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
- (3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontractors, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, title 31, U.S.C. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

Detailed instructions entitled, “Grants.Gov Electronic Application and Submission Information”, on how to submit a Grant proposal through Grants.gov may be found at the ONR website listed under the ‘Acquisition Department – Contracts & Grants Submitting a Proposal’ link at: [http://www.onr.navy.mil/02/how\\_to.asp](http://www.onr.navy.mil/02/how_to.asp)

## **6. Address for the Submission of Hard Copy White Papers and Full Proposals for Contracts and Assistance Agreements**

Hard copies of white papers and full proposals for Contracts and Grants should be sent to the Office of Naval Research at the following address:

Point of Contact Name:	Luise S. Couchman
Point of Contact Occupation Title:	Program Officer
Division Title:	Ship Systems and Engineering Research Division
Division Code:	331
Address:	875 North Randolph Street Arlington, Va. 22203-1995
Telephone Number:	703-696-0786
Email Address:	couchml@onr.navy.mil

## **V. EVALUATION INFORMATION**

### **1. Evaluation Criteria –**

The following evaluation criteria will apply to both the White Papers and the Full Proposals.

These submissions will be selected through a technical/scientific/cost decision process with technical and scientific considerations being more important than cost. Cost is less importance than any of the technical factors. The degree of its importance will increase with the degree of equality of the proposals in relation to the other factors on which selection is based, or when the cost is so significantly high as to diminish the value of the technical superiority to the Government. Criteria A through D are listed in descending order of importance. Any subcriteria listed under a particular criterion are of equal importance to each other:

#### **A. Overall scientific and technical merits of the proposal:**

1. The degree of innovation
2. The soundness of technical concept
3. The Offeror’s awareness and understanding of the scope of the problem and the technical effort needed to address it

#### **B. Potential naval relevance and contributions of the effort to the program’s specific mission.**

C. Offeror's capabilities, related experience, and past performance, including the qualifications, capabilities and experience of the proposed principal investigator and personnel.

1. The quality of technical personnel proposed;
2. The Offeror's experience in relevant efforts with similar resources
3. The ability to manage the proposed effort

D. The realism of the proposed cost.

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

Industry-Academia Partnering – ONR highly encourages partnering among industry and academia with a view toward speeding the incorporation of new science and technology into fielded systems. Proposals that utilize industry-academic partnering which enhances the development of novel S&T advances will be given favorable consideration

Industry-Government Partnering – ONR highly encourages partnering among industry and Government with a view toward speeding the incorporation of new science and technology into fielded systems. Proposals that utilize industry-Government partnering which enhances the development of novel S&T advances will be given favorable consideration.

Offerors proposing to partner with Government Laboratories or Federally Funded Research and Development Centers (FFRDCs) should provide the "partnering proposal" from the Government or FFRDC entity with its proposal. However, these partnering proposals must be severable from the Industry or Academia main proposal since ONR will fund these partnering proposals directly. As such, Industry/Academia cost proposals should not include any direct costs or pass-through fees (indirect costs or fixed fee) associated with the partnering proposal from the government Laboratory or FFRDC.

Evaluation of 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 option(s).

## **2. Evaluation Panel -**

The evaluation of White Papers, Oral Presentations and Full Proposals will be performed by the cognizant ONR Program Officer and other naval and defense activities/agencies personnel, as needed.

The Government may use selected support contractor personnel to assist in the

administrative processing of any White Papers and proposals arising from this announcement. These support contractors will be bound by appropriate non-disclosure agreements to protect proprietary and source-selection information.

## **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 “**541710**” with a small business size standard of “**500 employees**”.
- CCR - Successful Offerors not already registered in the Central Contractor Registry (CCR) will be required to register in CCR prior to award of any grant, contract, cooperative agreement, or other transaction agreement. Information on CCR registration is available at <http://www.onr.navy.mil/02/ccr.htm>.
- Certifications – Proposals for contracts and assistance agreements should be accompanied by a completed certification package which can be accessed on the ONR Home Page at Contracts & Grants located at [http://www.onr.navy.mil/02/rep\\_cert.asp](http://www.onr.navy.mil/02/rep_cert.asp).

For contracts, in accordance with FAR 4.1201, prospective contractors shall complete electronic annual representations and certifications at <http://orca.bpn.gov>. The Online Representations and Certifications Application (ORCA) must be supplemented by DFARS and contract specific representations and certifications found at [http://www.onr.navy.mil/02/rep\\_cert.asp](http://www.onr.navy.mil/02/rep_cert.asp). This requirement is also applicable for other transaction proposals involving prototypes (Section 845 agreements).

For grant proposals and proposals for cooperative agreements or other transaction agreements (other than for prototypes), the certification package is entitled "Certifications for Grants and Agreements"; or by signing and submitting the Standard Form (SF)-424 (R&R), as a part of a hard copy proposal submission (complete Blocks 18 and 19)

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

### **2. Deliverables and Reports - Please Note: “Deliverables” are not applicable for assistance (grant) instruments.**

Deliverables: White papers and proposals for Contracts should specify deliverables under each Task area in each of the following categories:

- Software
- Software Documentation

- Measured Data
- Test Articles
  - Pre-test
  - Post-test
- Technical and Financial Progress Reports
- Final Report

In the case of software, the exact form of the software deliverable should be specified, i.e. source code, executable, etc. Measurement data must be delivered in electronic form.

Reports: White papers and proposals for Assistance Instruments should specify reports under each Task area in each of the following categories:

- Technical and Financial Progress Reports
- Final Report

## **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. The use of these facilities and resources will be negotiated as the program unfolds. Offerors should explain as parts of their proposals which of these facilities are critical for the project's success.

### **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 Offeror must clearly identify such need prominently in its proposal.

### **3. Project Meeting 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; however offerors should assume that a preponderance of the meetings will be at or near ONR, Arlington, VA and the remainder at other contractor or government facilities. Interim meetings are likely, but these will be accomplished via video teleconferences, telephone conferences, or via web-based collaboration tools.

#### **4. Disclosure of Information**

Due to the potential sensitivity of the release of unclassified information, regardless of the medium used, all information/data must be approved by the Program Officer before public release of any and all information generated resulting contracts/assistance instruments and/or related to this program. If the resultant award is a contract, DFARS Clause 252.204-7000 entitled "Disclosure of Information" will be incorporated into all contract award documents.

#### **5. 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/>.