



SOLID OXIDE FUEL CELL BASED **TACTICAL ELECTRIC POWER** **DEMONSTRATION**

INTRODUCTION:

This publication constitutes a Broad Agency Announcement (BAA) as contemplated in Federal Acquisition Regulation (FAR) 6.102(d)(2). A formal Request for Proposals (RFP), 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
875 N. Randolph Street,
Arlington, VA 22203-1995

2. Research Opportunity Title – Solid Oxide Fuel Cell Based Tactical Electric Power Demonstration

3. Program Name – Solid Oxide Fuel Cell Based Power Generation

4. Research Opportunity Number - ONR BAA 09-034

5. Response Date - Full Proposal Due Date: 2 PM (Eastern Daylight Time) on 04 September, 2009.

6. Research Opportunity Description -

The Office of Naval Research (ONR) is interested in receiving proposals to develop and demonstrate a Solid Oxide Fuel Cell Tactical Electric Power (TEP). The intent of this BAA is to have a performer develop a single Solid Oxide Fuel Cell TEP design and deliver two identical prototypes for government demonstration.

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

6.1 Background:

Fuel cells systems are a promising technology for the next generation of power plants with high efficiency and extremely low pollution. Due to the wide range of power outputs, fuel cells have many commercial and military applications including Tactical Electric Power (TEP) for Medium Power Sources (5kW-60kW). Among the many types of fuel cells, solid oxide fuel cells (SOFCs) have one of the highest efficiencies due to their thermal operating range, typically between 600 °C and 1000 °C. The high operating temperature enables the exhaust energy from the SOFC to be recovered by other components enabling efficiencies of 50% depending upon fuel utilized and configuration.

Solid oxide fuel cells (SOFCs) require a fuel and an oxidant in order to generate electric power. Military fuel cell systems typically contain sub systems capable of processing logistics fuels into the fuel cell's desired fuels, namely hydrogen or hydrogen rich reformat. Such systems can consist of a fuel processing unit (reformer), a catalytic burner, and auxiliaries associated with air, fuel, and water management. In addition,

energy recovery subsystems can be utilized to increase overall system efficiency. This equipment is combined with the fuel cell itself, power electronics, and process control systems to create a fuel cell based TEP. Energy storage can also be utilized as stand-alone or in a hybrid fashion to enhance electrical transient or start up capability.

Current military operations suffer from high and growing battle-space fuel demand. This demand degrades capability, increases force balance problems, exposes support operations to greater risk, and increases support costs. More efficient platforms can enhance range, persistence and endurance. They can benefit the military not only by the direct savings in fuel costs, but also by increasing combat effectiveness through the redirection of resources currently utilized for resupply. The benefits of efficient platforms can allow for an increase war fighting capability.

According to the latest Defense Science Board Energy Report dated February 2008, for Army operations “during wartime, generators become the largest single fuel consumers on the battlefield”. A high efficiency, advanced power generation unit suitable for TEP Medium Power applications could help reduce the battlespace fuel burden and help meet the ever increasing power demands for our troops in the battlefield. Advanced fuel cell TEPs have the potential to significantly impact this logistics burden by providing high efficiency regardless of electrical load. In addition, these systems enable a reduction in noise signature with respect to other generation methods such as turbines and diesels.

6.2 Program Plan:

The objective of this program is to build and demonstrate two complete compact solid oxide fuel cell-based TEPs to provide high efficient, silent power for US Marine Corps (USMC) and other DoD applications. These units shall perform independent power generation and be capable of operating with low sulfur varieties of JP8 and No. 2 Diesel, as well as Ultra Low Sulfur Diesel. The fuel cell-based TEP system design must meet or exceed the system metrics described at the end of this section. The system should be delivered and able to demonstrate operation at Technology Readiness Level (TRL) 6 by May 2012, with capability of TRL 9 by 2015. For the purpose of this effort, TRL 6 represents a fully integrated system capable of standalone operation, multiple independent starts and stops, and demonstrated in a relevant but controlled environment at a government facility.

The fuel cell TEP system will be installed on a light tactical trailer for transportation and operation at the Government facility. All components required to support operation shall be installed on the unit and packaged to manage the external elements. Items protruding from the unit will pose a risk of being damaged. The controls process shall include adequate controls and monitoring to safely operate the unit and track system performance. The unit start process shall be automated and initiated with a single command. The unit shut down shall be automated with a single command to a safe configuration.

The program will require monthly reports throughout the effort with a final report at the completion of the contract. A drawing package, equipment specifications, system models with model results, component and system operating data, and fully operable SOFC-based TEP systems are all expected deliverables. A Critical Design review will be conducted prior

to the commitment of major component build. A system validation run is required at the OEM to demonstrate performance prior to delivery. Testing at the Government facility will require training and technical support to ensure target objectives are met. Military power source testing includes a series of specific tests that demonstrate operation and performance in a realistic tactical environment. These tests will be conducted according to applicable Department of Defense Military Standards.

Table 1: Performance Parameters

Attribute Parameter	Objective
Power Output	10 kilowatts (threshold) 15 kilowatt (objective)
Efficiency - Lower Heating Value	30% (threshold) 35% (objective)
Fuel	ULSD, No.2 Diesel, JP-8, JP-5. Sulfur level of any fuel, under this effort, will not exceed 400 ppm.
Volumetric Density	30 Watts/Liter (threshold) 35 Watts/Liter (objective)
Gravimetric Density (dry)	35 Watts/kilogram
Onboard Fuel	Power sources shall have on board fuel storage for starting and operation for 8-hours (threshold); 12 hours (objective), of continuous operation at 75% of rated loads. Design shall allow safe refueling during operation.
System Size	Meet Light Tactical Trailer (Model #. LTT-MCC) trailer requirements for mounting and transportation. Height not to exceed 37 inches. Length no to exceed 62 inches Width not to exceed 32 inches
Configuration and Mobility	Standard ground, skid & trailer mounted (towed by off-road tactical vehicles). Trailer mounted system shall be consistent with the mobility of its towing vehicle. Towing the system shall not impose any new restrictions on the vehicle.
Auxiliary Fuel Capacity	Power source design shall allow safe use of standard external fuel tanks approved for military use to extend operation time beyond what the onboard fuel tank can provide. Auxiliary or external fuel tanks include any approved fuel container and a means to convey that fuel to the power source via a suitable hose for fuel line.
Electrical Output	AC output switchable to 120V 1-Phase, 120/240V 1-Phase and 120/208V 3-Phase
Frequency	60 Hz, Mode III (threshold), 50 and 60 Hz, Mode I (Objective)
Voltage characteristics:	4% (threshold), 3 % (objective)

Regulation	(Test Method MIL-STD-705 Section 608.1)
Voltage characteristic: Steady-state stability (var./bandwidth), Short term (30 seconds)	2% (Test Method MIL-STD -705, Section 608.1)
Voltage characteristic: Steady-state stability (var./bandwidth), Long term (4 hours)	4% (Test Method MIL-STD -705, Section 608.2)
Voltage characteristic: Transient performance, Application of rated load, Dip	30% (threshold), 20% (objective) (Test Method MIL-STD -705, Section 619.2)
Voltage Characteristic: Transient performance, Application of rated load, Recovery	3 seconds (Test Method MIL-STD -705, Section 619.2)
Voltage Characteristic: Transient performance, Rejection of rated load, Rise	30% (Test Method MIL-STD -705, Section 619.2)
Voltage Characteristic: Transient performance, Rejection of rated load, Recovery	3 seconds (Test Method MIL-STD -705, Section 619.2)
Voltage Characteristic: Transient performance, Application of simulated motor load, Dip	N/A (threshold), 40% (objective) (Test Method MIL-STD -705, Section 619.1)
Voltage Characteristic: Transient performance, Application of simulated motor load, Recovery to 95% of rated voltage (Note 1)	N/A (Threshold), 5 Seconds (Objective) (Test Method MIL-STD -705, Section 619.1)
Voltage Characteristic: Waveform, Maximum deviation factor (Note 2)	6% (threshold), 5% (objective) (Test Method MIL-STD -705, Section 601.1)
Voltage Characteristic: Waveform, Maximum individual harmonic (Note 2)	3% (threshold), 2% (objective) (Test Method MIL-STD -705, Section 601.4)
Voltage Characteristic: Voltage unbalance with unbalanced load (Note 3)	5% (Test Method MIL-STD -705, Section 620.2)
Voltage Characteristic: Phase balance voltage	2% (threshold), 1% (objective) (Test Method MIL-STD -705, Section 508.1)
Voltage Characteristic:	114 to 126 V

Voltage adjustment range (Note 4)	228 to 252 V 205 to 240 V (Test Method MIL-STD -705, Section 511.1)
Frequency Characteristic: Regulation	3% (Test Method MIL-STD -705, Section 608.1)
Frequency Characteristic: Steady state stability (var./bandwidth), Short term (30 seconds)	4% (threshold), 2% (objective) (Test Method MIL-STD -705, Section 608.1)
Frequency Characteristic: Steady state stability (var./bandwidth), Long term (4 hours)	4% (threshold), 3% (objective) (Test Method MIL-STD -705, Section 608.2)
Frequency Characteristic: Transient performance, Application of rated load, Undershoot	4% (Test Method MIL-STD -705, Section 608.1)
Frequency Characteristic: Transient Performance, Application of rated load, Recovery	4 seconds (Test Method MIL-STD -705, Section 608.1)
Frequency Characteristic: Transient performance, Rejection of rated load, Overshoot	5% (threshold), 4% (objective) (Test Method MIL-STD -705, Section 608.1)
Frequency Characteristic: Transient performance, Rejection of rated load, Recovery	6 seconds (threshold), 4 seconds (objective) (Test Method MIL-STD -705, Section 608.1)
Frequency Characteristic: Frequency adjustment range	+/- 3% (Test Method Mil-Std-705, Section 511.2)
Electric fault	The system shall limit the fault current to protect the fuel cell stack and permit coordination of protective devices. The fault current will be limited to 2 p.u. and shall be accomplished by folding back the voltage. The current will remain in this limited condition with voltage fold-back for 5 seconds and then shut off safely.
System Starting	The power source shall start and accept full-rated load within 30 minutes.
Starts	<ul style="list-style-type: none"> - 80 cold starts (threshold) and 100 cold starts (objective). A cold start is defined as a start with fuel cell system at ambient (operational temperature defined below) temperature. - 120 total starts (threshold) and 200 total starts (objective). - A start shall be initiated at any system temperature.

Energy Storage for Starts	The unit shall have adequate energy storage (fuel and battery) to conduct three complete start attempts without external energy assistance.
Power Source Operating Hours	Minimum operating hours shall be 1250 (threshold) and 3600 (objective).
Extended Hours Profile	Open circuit to 100% full power at 25% intervals for full system operation. (Test Method MIL-STD -705, Section 690.1)
Lubricants and Coolants	DoD approved lubricants and coolants
Water Requirement	Water neutral with initial clean water fill
Operational Temperatures	-10F to 125 F (Test Method MIL-STD -705, Section 710.1)
Elevation	4000 ft at rated power and efficiency (Test Method MIL-STD -705, Section 720.1d)
Humidity	All possible relative humidity values at sea level with ambient temperatures of -10F to 125 F. (Test Method MIL-STD -705, Section 711.1d)
Operational Gradient	Operate on uneven terrain with omni-directional grades up to 15 ⁰ (Test Method MIL-STD -705, Section 660.1d)
Rain	Up to 5 inches of rain per hour impinging on the unit at angles from the vertical up to 45 ⁰ . (Test Method MIL-STD -705, Section 711.3c)
Dust	Sand and dust particle concentration of up to 1,400 mg/m ³ . Particle sizes shall range from less than 74 micrometers in diameter to 1,000 micrometers with the bulk of the particles ranging in size from 74 to 350 micrometers. (Test Method MIL-STD -705, Section 711.4b)
Airborne Contaminants	Manage airborne contaminants associated with operation of reciprocating engines in same vicinity with DOD fuels. Possible airborne contaminants include but not limited to Soot and SO ₂ .
Ice	Accumulation of ice glaze and freezing rain up to ½ inch. (Test Method MIL-STD -810F, Section 521.2)
Wind Speed	Steady wind speed of up to 50 miles/hr. (Test Method MIL-STD -705, Section 401.1b)
Noise	64 dBA at 7 meters (threshold) 60 dBA at 7 meters (objective) (Test Method MIL-STD -705, Section 661.2C)
Scheduled Maintenance	150 hours (threshold) 250 hours (objective)

Reliability - System	750 hours between essential function failure (threshold) and 1250 hours between essential function failures (objective). Essential function failure is defined as any failure that prevents the power source from providing power.
Remote Operation	MMI interface to operate and monitor power source via a remotely located commercial computer, provided with delivered system. MMI interface at unit to ensure safe operation and monitoring of the power source unit.
Data Acquisition	Real time data acquisition system with remote hookup, and associated Remote Operation equipment to gather essential data to monitor operation and conduct performance evaluation of the process.
System Safety	Mil-Std-882D shall be implemented for design and build
EMI	Grounding and shielding shall be incorporated to minimize the radiated and conductive EMI emissions and susceptibility. MIL-STD-461E shall be used as guidance for design of the system.
Shock and Vibration	Power sources are to withstand shock and vibration from traveling on roads, highways and dirt roads without sustaining structural or functional damage. Unit will be transported by either towed or as cargo by military tactical vehicle. Trailer vibration characteristics on various surfaces will be provided. MIL-STD 810F, Annex C, Method 514.5 provides vibration exposures.

(Note 1) The voltage shall stabilize at or above this voltage.

(Note 2) Specified values are for three phase output; for single phase, add additional 1%.

(Note 3) With generator set connected for three phase output and supplying a single line-to-line, unity power factor, load of 25% of rated current and with no other load on the set. (Not applicable for single phase connections of sets.)

(Note 4) For Mode I power sources operating at 50 Hz, upper voltage adjustment may be limited to the nominal voltages show in Table IV of MIL-STD-332B.

7. Point(s) of Contact –

Questions of a technical nature should be submitted to:

Mr. Donald J. Hoffman
Office of Naval Research, ONR 331, Suite 271
875 N. Randolph Street
Arlington, VA 22203-1995
E-Mail Address: Donald_Hoffman@navy.mil

Questions of a business nature should be submitted to:

Mr. Joseph F. Pletscher (CACI)
Contract and Grant Awards Management Division
875 N. Randolph Street
ONR Code 254
Arlington, VA 22203-1995
Email Address: Joseph.Pletscher.CTR@.navy.mil

Note: All communications shall be submitted via e-mail. All questions to the Technical Point of Contact (POC) shall be sent via e-mail with a copy to the designated Business POC. Questions submitted within 2 weeks prior to a deadline may or may not receive a response.

8. Instrument Type(s) -

Awards will take the form of contracts. The contracts are expected to be cost-type.

9. Catalog of Federal Domestic Assistance (CFDA) Number – N/A

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

11. Other Information -

Contracts made under this BAA are for scientific study and experimentation directed towards advancing the state of the art and increasing knowledge or understanding.

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

II. AWARD INFORMATION

The amount and period of performance of each selected proposal will vary depending on the technical approach to be pursued by the selected offeror.

The estimated total amount of awards is \$9M anticipated to be made available over a three year period.

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

FY10	FY11	FY12	FY13	FY14	Total
3700	3700	1600	0	0	9000

Anticipated Number of Awards:

One award to a performer to develop a single Solid Oxide Fuel Cell TEP design, as described in the Research Opportunity Description, and deliver two identical prototypes for government demonstration. An Offeror may submit more than one proposal.

Anticipated Period of Performance:

Up to three (3) years

Anticipated Award Types:

Awards will take the form of contracts. ONR will not issue grants, cooperative agreements, or other transaction agreements under this BAA.

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 part of the program described herein, the organization should contact an appropriate ONR POC to discuss its area of interest. 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. 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.

Some aspects of SOFC design are export control technologies. Research in these areas is limited to "U.S. persons" as defined in the International Traffic in Arms Regulations (ITAR) - 22 CFR § 120.1 et seq. (See Section VII, Other Information). In accordance with 22 CFR § 121.1 the following ITAR restrictions apply. Energy conversion devices for producing electrical energy from nuclear, thermal, or solar energy, or from chemical

reaction that are specifically designed, developed, modified, configured or adapted for military application.

IV. APPLICATION AND SUBMISSION INFORMATION

1. Application and Submission Process -

Full Proposal Submission

The due date for receipt of Full Proposals is 2:00 p.m. (Eastern Time) on 4 September 2009. It is anticipated that final selections for awards will be on or about 2 October 2009. As soon as the final proposal evaluation process is completed, each Offeror will be notified via email or letter of its selection or non-selection for an award.

2. Content and Format of Full Proposals –

Full Proposals submitted under the BAA are expected to be unclassified; however, confidential/classified proposals are permitted. If a classified proposal is submitted, the resultant contract will be unclassified.

Unclassified Proposal Instructions:

Unclassified proposals shall be submitted directly to the Technical Point of Contract (TPOC).

Office of Naval Research
BAA 09-034
Attn: Mr. Don Hoffman
ONR Code 331
875 North Randolph Street
Arlington, VA 22203-1995

Classified Proposal Instructions:

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

The proposal format and content identified below are applicable to the submission of proposals for contracts.

a. FULL PROPOSALS

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

- 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 - The Technical Volume (Vol. 1) shall not exceed more than **40** pages. The Cover page, Table of Contents, and personnel resumes shall not be included in the page limit. There are no page limitations to the Cost Proposal, Volume 2.
- Copies – one (1) original, two (2) hard copies and one electronic copy on a DVD (in Microsoft® Word or Excel 97 compatible or .PDF format).

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:** An alphabetical/numerical listing of the sections within the proposal, including corresponding page numbers.

- **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, the 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.

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

- **Technical Approach and Justification:** The major portion of the proposal should consist of a clear description of the technical approach being proposed. This discussion should provide the technical foundation/justification for pursuing this particular approach/direction and why one could expect it to enable the objectives of the proposal to be met.

- **Technical Concept:**

The Technical Concept shall include thorough description of the concept of technology innovation and relevant technical risk areas. This section should detail the S&T challenges, plan to address the challenges, and resultant benefits of performing this effort.

This section should also include a description of the potential 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.

Identification of the following should be included with respect to the conceptual detailed design:

- Exotic materials, hazardous materials, or materials requiring special storage or handling
- High risk areas associated with meeting Navy/Marine Corps needs identified in the Section 6.2 Program Plan of this BAA

• **Operational Naval Concept:** Describe how the proposed build for a modular, compact solid oxide fuel cell system will provide high efficiency, silent power for US Marine Corps (USMC) and other DoD TEP Medium Power applications.

Explain also how this detailed design-and-build effort will provide (1) a better understanding of how the technologies operate with respect to startup, steady and transient operation, and (2) better insight into the optimal strategies for meeting the operational requirements of a battlefield generator.

• **Operational Utility Assessment Plan:** A plan for initial proof-of-concept demonstration of the operational effectiveness of the proposed Solid Oxide Fuel Cell TEP Medium Power at the Offeror's facilities. The plan should also include the Offeror providing technical and logistics support during the demonstration and evaluation of the operational effectiveness of the Offeror's proposed products in field experiments at a relevant DoD testing facility.

• **Project Schedule and Milestones:** A summary of the schedule 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/VDFDARA.HTM>

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

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

- **Deliverables:** The offeror must provide a detailed description of the results and products to be delivered inclusive of the timeframe in which they are to be delivered. The objective of this program is to build and demonstrate two complete compact solid oxide fuel cell based TEPs to provide high efficient, silent power for US Marine Corps (USMC) and other DoD applications. These units shall perform independent power generation and be capable of operating with low sulfur varieties of JP8 and No. 2 Diesel, as well as Ultra Low Sulfur Diesel. The fuel cell based TEP system must meet or exceed the performance parameters described in Table 1. The proposal should include a summary listing of these deliverables.

- **Management Approach:** 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.

- **Facilities:** A description of the facilities that are required for the proposed effort with a description of any Government Furnished Equipment, Hardware, Software, or Information required, by version and/or configuration.

- **Current and Pending Project and Proposal Submissions:** Offerors are required to provide information on all current and pending support for ongoing projects and proposals, including subsequent funding in the case of continuing contracts, grants, and other assistance agreements. Offerors shall provide the following information of any related or complementary proposal submissions from whatever sources (e.g., ONR, Federal, State, local or foreign government agencies, public or private foundations, industrial or other commercial organizations).

The information must be provided for all proposals already submitted or submitted concurrently to other possible sponsors, including ONR. Concurrent submission of a proposal to other organizations will not prejudice its review by ONR:

- 1) Title of Proposal and Summary;
- 2) Source and amount of funding (annual direct costs; provide contract and/or grant numbers for current contracts/grants);
- 3) Percentage effort devoted to each project;
- 4) Identity of prime Offeror and complete list of subcontractors, if applicable;
- 5) Technical contact (name, address, phone/fax, electronic mail address)
- 6) Administrative/business contact (name, address, phone/fax, electronic mail address);

- 7) Duration of effort (differentiate basic effort);
- 8) The proposed project and all other projects or activities requiring a portion of time of the PI and other senior personnel must be included, even if they receive no salary support from the project(s);
- 9) The total award amount for the entire award period covered (including indirect costs) must be shown as well as the number of person-months per year to be devoted to the project, regardless of source of support; and
- 10) State how projects are related to the proposed effort and indicate degree of overlap.

• **Qualifications:** Provide the qualifications of the Principal Investigator and any key personnel proposed. Resumes will be attached to the proposal and will not count toward the page limitations. Include full curricula vitae for investigators and consultants. Limit the number of pages of each resume/curricula vitae to 5.

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 contractor fiscal year, and Part 2 will provide a cost breakdown by task/sub-task and government fiscal year corresponding to the task numbers in the proposed Statement of Work. Options must be separately priced.

The detailed cost breakdown required in Part 1 below must be provided in the format provided in the spreadsheet file found with this solicitation at FedBizOpps or at the link: <http://www.onr.navy.mil/02/baa/docs/09-006CostProposalFormat.xls>. This spreadsheet format is also required for subcontractors. This spreadsheet should be appropriately modified to include any of the Offeror's indirect rates not mentioned above and otherwise be consistent with the Offeror's cost accounting system. 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, with notation or color, within each appropriate cell, any and all inputs, formulas, calculations, links, etc. The Offeror shall in no way provide "value only spreadsheets" liken to that of a hard copy. The Offeror shall submit with its cost proposal supporting information for each aforementioned cost element consistent with Offeror's cost accounting system. The Offeror shall provide exhibits as necessary to substantiate the cost elements.

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 – Contract Costs (See web link to required format for Part 1 above)

Detailed breakdown of all costs by cost category by calendar or contractor fiscal year:

- Direct Labor – Individual labor categories or persons, with associated labor hours and unburdened direct labor rates. Provide escalation rates for out years;
- Indirect Costs – Fringe Benefits, Overhead, G&A, COM, etc. and their applicable allocation bases. If composite rates are used, provide the calculations used in deriving the composite rates.
- Travel – The proposed travel cost should include the following for each trip: the purpose of the trip, origin and destination if known, approximate duration, the number of travelers, and the estimated cost per trip must be justified based on the organizations historical average cost per trip or other reasonable basis for estimation. Such estimates and the resultant costs claimed must conform to the applicable Federal cost principals.
- Subcontracts – A cost proposal as detailed as the Offeror’s cost proposal will be required to be submitted by the subcontractor. The subcontractor’s cost proposal can be provided in a sealed envelope with the Offeror’s cost proposal or may be sent directly to the Government. Subcontractor proposals must be received and reviewed prior to contract award. The prime contractor should perform and provide a cost/price analysis of each subcontractor’s cost proposal.*
 ***Note:** DoD Federal Acquisition Regulation provision 252.215-7003 (48 CFR §252.215-7003) is incorporated into this solicitation by reference. The offeror is to exclude excessive pass-through charges from subcontractors. The offeror must identify in its proposal the percentage of effort it intends to perform and the percentage to be performed by each of its proposed subcontractors. If more than 70 percent of the total effort will be formed through subcontractors, the offeror must include the additional information required by the above-cited clause.
- Consultants – Provide a breakdown of the consultant’s hours, the hourly rate proposed, any other proposed consultant costs, a copy of the signed Consulting Agreement or other documentation supporting the proposed consultant cost, and a copy of the consultant’s proposed statement of work if it is not already separately identified in the prime contractor’s proposal.
- Materials & Supplies – Provide an itemized list of all proposed materials and supplies including quantities, unit prices, proposed vendors (if known), and the basis for the estimate (e.g., quotes, prior purchases, catalog price lists).
- Contractor Acquired Equipment or Facilities – Equipment and/or facilities are normally furnished by the Contractor. If acquisition of equipment and/or facilities is proposed, a justification for the purchase of the items must be provided. Provide an itemized list of all equipment and/or facilities costs and the basis for the estimate (e.g., quotes, prior purchases, catalog price lists).

- Other Direct Costs – Provide an itemized list of all other proposed other direct costs and the basis for the estimate (e.g., quotes, prior purchases, catalog price lists).
- Options – The Base Period of Performance and Option Periods must be priced at the submission of the proposal. Unpriced options will not be included in any resulting contract or agreement.
- Fee/Profit (Contract Proposals Only) – Profit or fee is not allowed on direct costs for facilities or in cost-sharing contracts.

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

Part 2 : Cost breakdown by task/sub-task and Government fiscal year corresponding to the same task breakdown in the proposed Statement of Work. When options are contemplated, options must be separately identified and priced by task/subtask.

3. Significant Dates and Times –

Anticipated Schedule of Events

<u>EVENT</u>	<u>DATE</u>	<u>TIME</u> <u>(EASTERN TIME)</u>
Full FY09 Proposal Due Date	9/4/2009	2:00 pm
Notification of Selection for FY10 Award	10/2/2009*	
Issued FY10 Awards	1/29/2010*	

*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 though the U.S. Postal Service, for example, may take seven days or more to be received, even then 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.

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:

- 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.

5. Address for the Submission of Hard Copy Full Proposals for Contracts.

Hard copies of Full Proposals should be sent to the Office of Naval Research at the following address:

Office of Naval Research
Attn: Donald Hoffman
ONR Department Code: 331
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) Overall scientific and technical merits of the proposal;
- 2) Potential and contributions of the effort to the agency's specific mission;
- 3) The offeror's capabilities, related experience, facilities, techniques or unique combinations of these which are integral factors for achieving the proposal objectives;
- 4) The qualifications, capabilities and experience of the proposed Principal Investigator (PI), team leader and key personnel who are critical in achieving The proposal objects; and
- 5) The realism of the proposed costs and availability of funds.

Overall, the Technical Factors (Factors 1 – 4 above) combined 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.

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

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

VI. AWARD ADMINISTRATION INFORMATION

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 Registry (CCR) - Successful Offerors not already registered in the 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>.
- 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.
- Certifications – Proposals for contracts should be accompanied by a completed certification package.

For contracts, in accordance with FAR 4.1201, prospective contractors shall complete and submit electronic annual representations and certifications at <http://orca.bpn.gov>. In addition to completing the Online Representations and Certifications Application (ORCA), proposals must be accompanied with a completed DFARS and contract specific representations and certifications. These "DFARS and Contract Specific Representations and Certifications", i.e., Section K, may be accessed under the Contracts and Grants Section of the ONR Home Page at http://www.onr.navy.mil/02/rep_cert.asp

2. Reporting -

Additional data deliverables may be proposed and finalized during negotiations. Monthly programmatic reports (expenditure/schedule updates) and quarterly technical reports will be required.

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

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. Department of Defense High Performance Computing Program

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

4. Project Meetings and Reviews

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

5. Submission of Questions

Any questions regarding this solicitation must be provided to the Science and Technology Point of Contact and/or Business Point of Contact listed in this

solicitation. All questions shall be submitted in writing by electronic mail.

Questions regarding full proposals must be submitted by 2:00 P.M. Eastern Time on **24 Aug 2009**. Questions after this date and time may not be answered, and the due date for submission of the proposals will not be extended.

Answers to questions submitted in response to this BAA will be addressed in the form of an Amendment and will be posted to one or more of the following webpages:

- Federal Business Opportunities (FEDBIZOPPS) Webpage – <https://www.fbo.gov/>
- Grants.gov Webpage – <http://www.grants.gov/>
- ONR Broad Agency Announcement (BAA) Webpage - <http://www.onr.navy.mil/02/baa/>