



BROAD AGENCY ANNOUNCEMENT (BAA)

Solicitation Number: BAA 04-019
Due Date: 06 July 2004
Classification: A
Type: Procurement

Agency:
Office of Naval Research
Ballston Center Tower One
800 North Quincy Street
Arlington, VA 22217-5660

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), 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
Ballston Center Tower One
800 North Quincy Street
Arlington, VA 22217-5660

2. Research Opportunity Title -

Full Scale (Prototype), Superconducting DC Homopolar Motor Propulsion System
Technology Demonstrator

3. Program Name -

Advanced Capability Electrical Systems

4. Research Opportunity Number -

Broad Agency Announcement Number 04-019

5. Response Date -

Full Proposals are due by no later than 2:00 p.m. (Eastern Daylight Time) on 06 July 2004.

6. Research Opportunity Description -

The Office of Naval Research is interested in receiving full technical and cost proposals addressing the development of a full scale (prototype), 36.5MW, Superconducting DC Homopolar Propulsion System Technology Demonstrator, appropriate to future Navy ships. This advanced electric propulsion demonstrator must consist of a 36.5 MW/120 RPM direct drive propulsion motor compatible with podded propulsion applications, associated motor controller, transformer/switchgear, and controls and any ancillary equipment sufficient to demonstrate functionality and conduct system acceptance tests. The proposed system should be compatible with future Navy combatant designs using an integrated power system (IPS). The motor should also demonstrate viability for commercial/industrial applications such as cruise ship propulsion or large industrial drives. A key aspect of the electric warship concept is that electric propulsion power can be made available and apportioned to ship service loads, propulsion, future weapon systems, high power sensors or other loads as dictated by mission requirements. Desired performance characteristics for the system include low weight, low acoustic and magnetic signature, shock tolerance, high reliability, high efficiency and operability.

This Broad Agency Announcement is directed specifically to superconducting dc homopolar motor approaches that can provide significant improvements over ship propulsion motors currently available or under engineering development. Technical approaches are sought which will allow a substantial increase in torque and power density relative to the current state of the art, with weights, dimensions and aspect ratios that are also compatible with efficient podded propulsion of a Naval surface combatant. High system efficiency at all motor operating speeds is desirable in combatant ship applications. Technologies of interest include (but are not limited to) superconducting windings and magnetics, efficient cryogenic cooling, direct liquid cooling for heat removal, intrinsically low acoustic noise machine design, and/or others that may overcome existing barriers to achieving very high power/torque densities, while meeting Navy performance requirements. ONR is interested in system solutions that result in low weight for the overall electric drive system.

The intended award for this Broad Agency Announcement will include multiple phases. Offerors should propose phases which have meaningful decision points approximately yearly. The decision points should be based on milestones and deliverables, ideally with associated measurable achievements. The program will conclude with delivery of a motor, associated motor controller, transformer/switchgear, and controls and any ancillary equipment needed to test the motor at a U.S. Navy facility to be determined at a later date. For purposes of this BAA, it is assumed that the power interface at the Navy facility will be 2000VDC with up to a 36.5MW capacity.

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:

Mr. Scott Littlefield, Director
Naval Ship Science and Technology Office, ONR 33X
Ballston Center Tower One
800 North Quincy Street
Arlington, VA 22217-5660

Phone: (703) 588-2358
Fax: (703) 696-0001
Email: littlest@onr.navy.mil

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

Ms. Regina Williams
Senior Contract Specialist
Ballston Center Tower One
800 North Quincy Street
Arlington, VA 22217-5660

Telephone: (703) 696-2583
Fax: (703) 696-0993
E-mail: regina_williams@onr.navy.mil

8. Instrument Type(s) -

It is anticipated that ONR will award one or more procurement contracts for this effort.

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 –

ONR considers delivery of a motor (including motor drive and ancillaries) that is at or below system size and weight targets (including motor length-to-diameter ratio suitable for pod applications) to be highly desirable. As such, ONR encourages contractors to propose targets and incentives that could be written into the contract that would motivate the awardee to meet or improve upon the critical size/weight elements of this program.

II. AWARD INFORMATION

The Navy anticipates awarding one or more contracts to be incrementally funded over a period of six years. The total estimated budget for the program is \$30 million dollars.

III. ELIGIBILITY INFORMATION

Award will be limited to offeror teams with the capability to design and manufacture the Full Scale (Prototype), Superconducting DC Homopolar Motor Propulsion System Technology Demonstrator within the United States.

IV. APPLICATION AND SUBMISSION INFORMATION

1. Application and Submission Process -

Full Proposals - The due date for receipt of Full Proposals is 2:00 p.m. (EDT) on 06 July 2004. It is anticipated that final selections will be made by 28 July 2004. Proposals received after the published due date may be considered for funding at a later time if funding is available. As soon as the final proposal evaluation process is completed, the Offeror will be notified via email or letter of its selection or non-selection for an award. Proposals exceeding the page limit may not be evaluated.

This Broad Agency Announcement constitutes all the information to be provided regarding this solicitation. No Pre-Proposal Conferences or Briefings are anticipated prior to the proposal submission date.

2. Content and Format of Full Proposals -

The Proposals submitted under this BAA are expected to be unclassified. However, confidential/classified proposals are permitted. The 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.

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

- Paper Size – 8.5 x 11 inch paper, also will allow up to 11X17 inch paper for schedule foldouts
- Margins – 1” inch
- Spacing – single or double-spaced
- Font – Times New Roman, 12 point
- Number of Pages – Volume 1 is limited to no more than 60 pages. Volume 2 does not have a page limitation. Double sided printing is encouraged. Limitations within sections of the proposal are indicated in the individual descriptions shown below. The Cover Page, Table of Contents, Statement of Work and Resumes are excluded from the page limitations. Full Proposals exceeding the page limit may not be evaluated.
- Copies – one (1) original, 2 copies and one electronic copy on a 3.5” Diskette or CD-ROM, (in Microsoft® Word or Excel 97 compatible or .PDF format).

Full Proposal Content

Volume 1: Technical Proposal

- **Cover Page:** (Not included in Page Limitations)

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;
 - Duration of effort (differentiate basic effort and options)
- **Table of Contents:** (Not included in Page Limitations)
 - **Statement of Work:** (Not included in Page Limitations)
A Statement of Work (SOW) clearly detailing the scope and objectives of the effort and the technical approach. The SOW should clearly define the tasks for each of the following: 36.5 MW motor, motor drive, ancillaries and risk reduction development proposed. 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.
 - **Technology Description:** A description of the key technologies to be used in the 36.5 MW motor and motor drive and why they are considered superior to more conventional or alternative approaches. Include a description of risk reduction technology development or demonstrations, if any, required prior to preliminary or detail design.
 - **Description of Proposed Motor and Motor Drive:** A description of the proposed full-scale motor, motor drive, and required ancillaries including projected sizes, weights, dimensions and operating characteristics. Weight and size estimates are to include all major system components required in order to interface the various elements of the propulsion system, including such items as transformer, switchgear, etc. Explain how size and weight of each major component were calculated and provide detailed backup material to support the estimates. Drawings or sketches to illustrate significant features are encouraged. A description of proposed approach to acceptance testing. Explain any departure from ratings or requirements provided in the Broad Agency Announcement.

- **Ship System Description:** A brief description of the potential ship power system concept(s) associated with the proposed propulsion system approach. A definition of the benefits to the Navy derived from the technology in terms of performance and affordability. A description of how Navy performance requirements are to be met and the relationship of the proposed system to potential commercial versions.
- **Project Schedule and Milestones:** The proposal should include a detailed listing of the technical tasks/subtasks in Work Breakdown Structure format and also organized by year. The proposal should also include a schedule of events and milestones for the proposed program keyed to the work breakdown structure and program phases. Deliverables and program review dates should be included.
- **Assertion of Data Rights:** Include here a summary of any proprietary rights to pre-existing results, prototypes, or systems supporting and/or necessary for the use of the research, results, and/or prototype. Any data rights asserted in other parts of the proposal that would impact the rights in this section must be cross-referenced. If there are proprietary rights, the Offeror must explain how these affect its ability to deliver research data, subsystems and toolkits for integration. Additionally, Offerors must explain how the program goals are achievable in light of these proprietary limitations. If there are no claims of proprietary rights in pre-existing data, this section shall consist of a statement to that effect.
- **Deliverables:** A detailed description of the results and products to be delivered.
- **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 relationships; government research interfaces; and planning, scheduling and control practice. Identify which personnel and subcontractors (if any) will be involved. Include a description of the facilities that are required for the proposed effort with a description of any Government Furnished Equipment/Hardware/Software/Information required, by version and/or configuration.
- **Experience:**
A description of the experience and qualifications of the offeror, subcontractors, and key personnel relevant to the proposed effort. Specific examples of work accomplished similar in complexity, magnitude and technical content to that proposed should be provided. Brief resumes (Not Included in Page Limitations) of key prime and subcontractor personnel may be included.

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 Gov't 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.

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 Gov't 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 cost proposal can be provided in a sealed envelope with the Offeror's cost proposal or will be requested from the subcontractor at a later date
- 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.)
- Fee/Profit including fee percentage.

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 *		
Event	Date (MM/DD/YEAR)	Time (Local Eastern Time)
Full Proposals Due Date	07/06/04	2 PM
Notification of Selection for Award	07/28/04	
Contract Award	09/28/04	
Kickoff Meeting	10/15/04	

***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 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 Full Proposals –

Office of Naval Research
Ballston Center Tower One
800 North Quincy Street
Arlington, VA 22217-5660

Attn: Mr. Scott Littlefield
Ballston Tower 3, Room 1229
Telephone Number: (703) 588-2358

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

V. EVALUATION INFORMATION

1. Evaluation Criteria –

The following evaluation criteria apply to the Full Proposals. Proposals will be selected through a technical/scientific decision process. Criteria A-D are listed in descending order of priority. Any sub criteria listed under A-D 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 of the state-of-the-art and understanding of scope of the problem and the technical effort needed to address it.

B. Potential naval relevance and contributions of the effort to the agency's specific mission.

1. Net performance and cost payoffs (considering both pros and cons).
2. Compatibility of approach with unique Navy requirements such as signature, shock tolerance, ship operating conditions, podded propulsion, etc. System size and weight estimates, and the backup for these estimates, will be strongly emphasized.
3. Degree to which U.S. industrial technology and infrastructure for high-efficiency electrical machinery will be enhanced.

C. Capabilities, facilities, related experience, and past performance of the Offeror and the Offeror's team. Included are the qualifications, capabilities and experience of the proposed principal investigator and other key personnel.

1. The quality and quantity of technical personnel proposed with superconducting dc homopolar motor experience
2. The offeror's experience in relevant efforts with similar resource requirements.
3. The ability to manage the proposed effort.

D. The realism of the proposed cost and the availability of funds.

1. Total cost to Navy of the proposed demonstrator system relative to benefit, including proposed cost sharing.
2. Realism of cost levels for facilities and staffing.

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.

2. Evaluation Panel -

Government technical experts from the Office of Naval Research and the Naval Sea Systems Command, and possibly other Federal entities, will perform the evaluation of proposals. The Government may use selected non-government personnel or support contractor personnel to assist in the administrative functions of any proposals ensuing from this solicitation. If called upon, they may provide technical assistance to the Government evaluation panel. Such non-government personnel 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.
- CCR - Successful Offerors not already registered in the Central Contractor Registry (CCR) will be required to register in CCR prior to award of a contract. Information on CCR registration is available at <http://www.onr.navy.mil/02/ccr.htm>.
- Certifications – Contract proposals should be accompanied by a completed certification package which can be accessed on the ONR Home Page at Contracts & Grants. The certification package is entitled, "[Representations and Certifications for Contracts](#)."
- Subcontracting Plans – Successful contract proposals that exceed \$500,000, submitted by all but small business concerns, will be required to submit a Small Business Subcontracting Plan in accordance with FAR 52.219-9, prior to award.

2. Reporting/Deliverables -

Specific deliverables should be proposed by the offeror and will be finalized with the technical program officer and the contract specialist. Reports and hardware deliverables that the Navy anticipates for the proposed program are as follows:

- Monthly technical and financial status reports.
- Detailed schedule for the total program.
- Quarterly progress review presentation material and record of meeting.
- Preliminary design report for the demonstration system, including motor, motor controller, transformer/switchgear, and ancillary equipment. The report should include and explain any design tradeoffs made among size, weight, efficiency and cost, and provide scaling relationships. Calculated performance parameters, including acoustic and electromagnetic signatures should be included.
- Preliminary manufacturing and test plan including the physical and intellectual resources to be used for motor and controller manufacture and system acceptance testing.

- Detailed design report for the demonstration system, including motor, motor controller, transformer/switchgear, and ancillary equipment. The report should include and explain any design tradeoffs made among size, weight, efficiency and cost, and provide scaling relationships. Calculated performance parameters, including acoustic and electromagnetic signatures should be included.
- Detailed assembly and test plan including the physical and intellectual resources to be used for motor and controller assembly and system acceptance testing.
- Assessment of the industrial base and potential market for the motor and motor drive technology. Assessment should address the availability and affordability of production and support capability as it may affect the acquisition and life cycle cost of this electric drive technology to the Navy. In particular, podded propulsion should be addressed in the assessment.
- Ship integration assessment indicating the approach to supplying ship service power from the proposed electric propulsion plant and integrating the podded propulsion motor drive.
- Detailed motor design report, including major subassembly and assembly drawings with dimensions.
- Detailed motor controller design report, including major subassembly and assembly drawings with dimensions.
- Detailed test system design report, including control system, interconnection and protection equipment drawings, software and data.
- Test plan and facility design report, including description of power source, motor load, other required test equipment, test agenda and test capabilities for system acceptance testing.
- System interface and installation documentation
- Detailed acceptance test plan, test procedures and test schedule at the component and system level.
- Installation and Checkout procedures (INCO) for system acceptance test.
- Operating and maintenance documentation for motor, motor controller, controls and interconnect equipment.
- Interface Control Drawings sufficient for shipboard or test site installation planning.
- Test report(s) for all testing done at the component and system level.
- Final technical report summarizing program accomplishments and results.
- 36.5 MW / 120 RPM motor in working order.

- 36.5 MW motor controller in working order.
- All control, interconnect, support equipment and test equipment produced or bought at government expense.

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. It is the Government's desire to have the contractors purchase the equipment/hardware for deliverable items under their contract. 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 the Advanced Capability Electrical Systems Program. The use of these facilities and resources will be negotiated as the program unfolds. Offerors should explain which of these facilities they recommend.

2. Department of Defense High Performance Computing Program

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