

SOLICITATION
CEROS-CORE-06-02

Ocean Technology Development, Application, and Demonstration In Support of Maritime Military Operations with Three Priority Focus Areas: Undersea Navigation, Communication, and Obstacle Avoidance Technologies for High Speed Underwater Vehicles

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The National Defense Center of Excellence for Research in Ocean Sciences (CEROS) funds research, concept development, and demonstration of ocean-related technologies applied to maritime military needs in the following areas:

- Shallow Water Surveillance Technologies
- Ocean Environmental Preservation
- New Ocean Platform and Ship Concepts
- Ocean Measurement Instrumentation and Ocean Engineering Tools
- Unique Properties of the Deep Ocean Environment

In this solicitation, CEROS is soliciting proposals focused on the concept development and demonstration of three specific priority areas of undersea navigation, communication, and obstacle avoidance technologies for high speed (20-100 knots) underwater vehicles, including infrastructure that supports the development of these technologies. Innovative proposals in the above five broad areas, not previously submitted in Solicitation CEROS-CORE-06-01, will also be accepted.

Over the next decade, ongoing technology programs will significantly increase the speed of undersea vehicles. To fully utilize the anticipated speed advantage, the vehicles must be able to avoid obstacles, navigate, and communicate effectively.

- **Obstacle Avoidance at up to 100 knots:** Sensing obstacles at high speed presents an additional challenge to existing sensors and may require entirely new sensing modalities.

The system proposed must sense the local environment and detect and avoid navigation hazards to include unmapped bathymetric features, surface craft, sea buoys and markers, marine mammals, and fishing nets. The obstacle avoidance system must detect hazards out to 0.5 nm and alter course to avoid collisions. Lateral accelerations for course alterations for the undersea vehicle shall be limited to 3 G's.

- **Navigation:** Few techniques exist for reliable navigation for small underwater vehicles. The proposed system may have components offboard the undersea vehicle such as seen in a long baseline acoustic navigation system. However, such components must not inhibit the use of the undersea vehicle. Deployment and recovery (as appropriate) of such components shall be part of the system concept and not require significant time or resources. The offeror shall propose metrics that are appropriate for their system concept/technology and contrast the expected system performance to the state-of-the-art.
- **Communication:** Communication at speed (>10 knots) and depth (>100 feet) remains an issue for all undersea vehicles (manned or unmanned). The proposed communication system should enable rapid two-way communication to the undersea vehicle and a surface or shore command node. Offerors shall specify system bandwidth and two-way communication range. The metrics associated with undersea communication systems are modality and speed dependent. Therefore, the offeror shall propose metrics that are appropriate for their system concept/technology and shall contrast their expected system performance to the state-of-the-art.

Offerors may propose system concepts or technologies that address any of the above areas. Offerors shall clearly identify the core research issue involved in their system concept and describe the innovative technology or approach that will lead to a solution. CEROS is not interested in incremental changes to existing systems or minor variations to previously vetted system concepts that do not have a clearly identified research issue. CEROS encourages commercial entities that may not be aware of the latest advances in the state-of-the-art to team with organizations likely to have that knowledge and innovative ideas/concepts such as universities, Navy University Affiliated Research Centers, Federally Funded Research and Development Centers, Naval Research Laboratory, and the Navy Warfare Centers.

CEROS plans to make approximately \$1.5 - 2M available to fund proposals in response to this solicitation. One to two contract awards are anticipated as a result of this solicitation. Proposed work should be structured with a base period of performance not to exceed 12 months. The offeror can propose additional phases and a Rough Order of Magnitude (ROM) cost but will have to submit a new proposal every year to continue under CEROS funding.

CEROS is placing high emphasis on new innovative ideas and approaches supported by scientific and technical analysis. Teaming is encouraged to leverage capabilities and talents that reside in separate companies. To be eligible for consideration, the offeror must be a commercial enterprise; non-commercial, or not-for-profit and/or government and academic entities may be part of project teams as subcontractors to a commercial enterprise.

PROPOSAL PROCESS

CEROS will use a two-step submission process to award contracts submitted under this solicitation. The first step requires submission of a Proposal Abstract. CEROS will evaluate all abstracts against the evaluation criteria herein without regard to other abstracts submitted. For the second step, CEROS will request full technical and cost proposals from selected offerors for proposed efforts deemed as best qualified for potential negotiation under this solicitation. CEROS will specify the format for full proposals and other relevant information in a letter of invitation to submit a full proposal. No selection for negotiation or subsequent funding will be made under this solicitation without full technical and cost proposals.

To be considered for award, offerors shall submit an unclassified abstract of the proposed effort to CEROS by 12:00 Noon, Hawaii Standard Time, 06 March 2006. The abstract should provide an overview of the project and associated costs. Each proposed project shall have a separate submission. Abstracts must be submitted electronically through the website www.ceros.org/fy06-2abstract.html according to the procedure described on the website. The submissions shall be prepared in either PDF or Microsoft Word formats readable by IBM-compatible personal computers. Abstracts submitted by any means other than the specified website will be disregarded.

The abstract shall consist of a cover page and up to four additional pages of project information, including figures and tables. Abstracts exceeding five (5) pages in total length will be rejected. Abstracts shall be prepared in the following format: 8.5 x 11 inch pages; at least ten point type; margins not less than one inch on all sides; and pages numbered. The Cover Page shall include the following: title of the proposed effort; intended product or result; name, company affiliation, phone number, fax number, and electronic and postal mailing addresses of the Principal Investigator and Administrative Point of Contact; proposed period of performance; funding required to produce the proposed products; names and affiliations of sub-contractors and co-investigators; and special requirements or considerations. The balance of the Abstract should clearly describe the projects objective, Product to be Delivered, Process, Existing State-of-the-Art, Schedule, and Price. The Abstract shall include the following sections, each clearly labeled:

- A. **Objective**, state the technical objective, describing the technical rationale for the proposed effort. **Clearly identify the research issues involved in achieving the technical objective.**
- B. **Products**, describing the expected results and planned deliverables and plans for follow-on development or technical transitions, and patents or other intellectual property that may result from the work.
- C. **Process**, describing the planned technical approach and methods to be used, including the works schedule, task assignments, and major developmental milestones and summarizing special capabilities of the work team, planned risk mitigation efforts, and special techniques or facilities to be used for the proposed work.
- D. **Existing State-of-the-Art**, stating the specific technical advances and innovation that will be demonstrated by the work, describing the works anticipated residual benefits to maritime military and/or commercial marine technology and discussing the advances to state-of-the-art technology expected and their technical relevance to CEROS program objectives.
- E. **Schedule**, consisting of a timeline chart by work task/subtask covering the period of the proposed work.
- F. **Price**, consisting of an estimate for a firm, fixed price level of effort project, including the principal cost elements, direct material costs, direct labor costs, other direct costs, indirect costs, facilities capital cost of money, and profit or fee.

The Abstract (within the page limitation) may also contain any other information deemed germane to the proposed effort, such as descriptions of leveraged assets, co-funding arrangements, consultant commitments, or technical references.

SIGNIFICANT DATES AND TIMES

Event	Date
FY06 Solicitation issued	06 February 2006
Abstracts due	06 March 2006, 12:00 noon
Request for full proposals	approx. 12 April 2006
Proposals due	approx. 12 May 2006
Notify successful offerors	approx. 18 July 2006
Begin project work	Sep 2006

EVALUATION CRITERIA

The following evaluation criteria apply to both Abstracts and full proposals requested under this solicitation. CEROS will select for award those projects offering the best value and will assign the specified number of points to each criterion.

- A. **Quality (40 points).** Technical quality of the proposed effort and its potential to successfully address the technical problem involved and to advance the technical state-of-the-art and maritime military technical competence; relevance to DoD technical needs and the CEROS mission; and potential importance to intended recipients of the developed technology. Each technically qualified project will be scrutinized for importance to maritime military needs and potential for near-term application or transition.
- B. **Approach and Capabilities (20 points).** Realism of technical approach and methods proposed and potential for attaining stated objectives and milestones on schedule using the techniques and resources described; corporate and individual qualifications for the work; adequacy of equipment, materials and facilities proposed; and quality of technical risk management and transition plans.
- C. **Anticipated Benefits (20 points).** Potential for significant technical advancement in maritime military and/or commercial marine technical capabilities at reasonable cost and in a timely manner; benefit to the DoD and residual value to the region; military or commercial transition potential and potential for generating intellectual property or follow-on support from sources other than CEROS.
- D. **Costs and Budget (20 points).** Cost realism and value of anticipated results for funding requested; schedule and resource efficiency; leveraged, cost-saving, or value added aspects to the proposed effort. Cost is considered a substantial evaluation criterion but is secondary to technical excellence.

OTHER REQUIREMENTS

Abstracts received after the due date will not be considered. Offerors responding to this solicitation are wholly responsible for timely submissions.

It is CEROS policy to treat all submissions as competitive information and to disclose the contents only for the purposes of evaluation. CEROS may use selected consultants as special resources to evaluate abstracts and proposals. These consultants are restricted by agreement from disclosing proposal information or using it for purposes other than the technical assessments for CEROS. By submitting an abstract to CEROS, an offeror agrees that the projects technical and management information may be disclosed to selected consultants and evaluators for the limited purpose stated above or unless otherwise required by law.

All abstracts submitted under this solicitation must be unclassified. If offerors propose to undertake classified work or require access to classified information, they must certify that they have a proper facility clearance, and key personnel must be certified as holding a Secret clearance. Abstracts must clearly state that the proposed work will be classified, if applicable.

An invitation from CEROS to submit a full proposal does not assure subsequent award. CEROS may request that particular topics be addressed in detail in the full proposal. The decision to submit or not submit a full proposal is the responsibility of the offeror submitting the abstract.

Successful offerors will be required to execute a State of Hawaii Contract for Goods and Services with the Natural Energy Laboratory of Hawaii Authority pursuant to its statutory authority provided under Chapter 227, Hawaii Revised Statutes and Procurement Exemption No. 06-11-C. The Contract General Conditions and Special Conditions, which may be viewed at the CEROS website (www.ceros.org), are subject to negotiation.

Offerors are advised that if awarded a contract under this solicitation, offerors shall, upon award of the contract, furnish proof of compliance with the requirements of section 3-122-112, Hawaii Administrative Rules. This shall include Chapter 237, tax clearance; Chapter 383, unemployment insurance; Chapter 386, workers compensation; Chapter 392, temporary disability insurance; and Chapter 393, prepaid health care. In addition, to be eligible for award, offerors must either be registered and incorporated or organized under the laws of the State of Hawaii; or be registered to do business in the State of Hawaii.

Pursuant to section 103-10, Hawaii Revised Statutes, contract payments shall be contingent upon the receipt of federal funds.

CEROS reserves the right to select for award all, some, or none of the proposals received in response to this solicitation.