Special Notice N00014-21-S-SN04
Special Program Announcement for 2021
Office of Naval Research
Applied Research Opportunity:
Robust Unmanned Platform Power Systems
Amendment 01

I. INTRODUCTION

This announcement describes a research thrust entitled "Robust Unmanned Platform Power Systems" to be launched under the current Fiscal Year (FY) 21 Long Range Broad Agency Announcement (BAA), N00014-21-S-B001, entitled "Long Range Broad Agency Announcement for Navy and Marine Corps Science and Technology" which can be found at https://www.onr.navy.mil/work-with-us/funding-opportunities/announcements. The submission of proposals, their evaluation and the placement of research contract will be carried out as described in the above Long Range Broad Agency Announcement.

The purpose of this announcement is to (1) focus the attention of the scientific and technical community on specific areas of interest related to the advancement of power generation systems, (2) encourage dialogue amongst those interested in this arena with ONR, and (3) provide a timetable for the submission of white papers and proposals.

II. TOPIC DESCRIPTION

The Office of Naval Research (ONR) is interested in receiving white papers and proposals in support of advancing power generation technology for future unmanned naval applications. Work under this program will consist of applied research, and it will be funded under Budget Activity 2 (as defined in DoD Financial Management Regulation Vol. 2B, Ch. 5). The overall Science and Technology (S&T) effort is envisioned to be conducted at Technology Readiness Level (TRL) 3-4.

Background and Objectives:

The United States Navy is interested in developing low cost high endurance reconfigurable ships that can accommodate various payloads to support a Navy shift to a more distributed fleet architecture. These ships and vessels can be more accurately described as optionally or lightly manned ships for they might at times have a few onboard crewmembers, particularly in the near term as the Navy works out enabling technologies and operational concepts.

This S&T effort seeks to develop advanced power generation system technology for highly efficient, long-endurance Unmanned Surface Vessels (USV). The power generation system is envisioned to be modular and scalable across class 2-4 USV platforms, and support some or all of the mission power needs such as propulsion, ship service, sensors and/or mission payloads, and achieve continuous and reliable operation in a naval environment.

This further supports the Naval Research & Development (R&D) Framework in the areas of Integrated & Distributed Forces (Increase flexibility and reach of the naval force through incorporation of autonomous and disaggregated systems) and Operational Endurance (Enable maneuverability, efficiency and resiliency for sustained operations by warfighters, systems and platforms, Improve platform-level energy storage/efficiency for propulsion and weapons systems)

For United States Marine Corps (USMC) use, this effort supports the Commandant's Planning Guidance (CPG) with respect to Stand-In Forces by enhancing the capability of unmanned platforms, to operate with greater operational endurance and ability to stay on site to overwhelm enemy platforms.

In addition, this effort supports Future Force Development for beyond over the horizon operational capability to applications such as reconnaissance, mine warfare, logistics support, deception, and warfighting while reducing exposure of expensive platforms and individual Marines and Sailors.

Interested parties are welcome to propose against one or more topics listed below.

Topic Area 1: Small Power System 25-250kW for Small (Class 2) USV

- Develop a conceptual power generation system to reduce maintenance, and increase operation availability and endurance of a small USV. Offerors are encouraged to compare their concept against a commercial marine diesel either as an engine (mechanical output) or generator set (electrical output) accounting for power level, size, weight, and efficiency.
- This conceptual design shall, at a minimum, account for the following;
  - Operate with Military Fuels including NATO F-76, JP-5 and JP-8.
  - Operate with no scheduled maintenance for 4000 hour (threshold), 8000 hour (objective).
  - Operate in a marine environment conditions such as salt air ingestion
  - Operate with ships motion in high sea states
  - Scalable and/or modular to support multiple platforms and power loads
- Generate calculations/analysis for each of the following small power system attributes and characteristics;
  - Physical (including auxiliary systems) such as size, weight, reserves etc.
  - Performance such as power, efficiency, and response.
  - Operation such as start, operation, and shutdown.
  - Reliability such as MTBF and MTBO and operating life
  - Maintenance strategy
  - Ship interface such as intake, exhaust, cooling fuel
  - Power integration
  - Safety requirement such as fire suppression.
  - Survivability
  - Noise

  - Working media availability
- Perform component and/or scaled system demonstration(s) to validate high risk areas to achieve applicable aforementioned requirements as needed.
- Proposals utilizing nuclear and renewable technologies are not encouraged.

Topic Area 2: Large Power System 250-2500kW for Medium (Class 3) and Large (Class 4) USV

- Develop a conceptual power generation system to reduce maintenance, and increase operation availability and endurance of a small USV. Offerors are encouraged to compare their concept against a commercial marine diesel either as an engine (mechanical output) or generator set (electrical output) accounting for power level, size, weight, and efficiency.
- This conceptual design shall, at a minimum, account for the following;
  - Operate with Military Fuels including NATO F-76, JP-5 and JP-8.
  - Operate with no scheduled maintenance for 4000 hour (threshold), 8000 hour (objective).
  - Operate in a marine environment conditions such as salt air ingestion
  - Operate with ships motion in high sea states
  - Scalable and/or modular to support multiple platforms and power loads
- Generate calculations/analysis for each of the following small power system attributes and characteristics.
  - Physical (including auxiliary systems) such as size, weight, reserves etc.
  - Performance such as power, efficiency, and response.
  - Operation such as start, operation, and shutdown.
  - Reliability such as MTBF and MTBO and operating life
  - Maintenance strategy
  - Ship interface such as intake, exhaust, cooling fuel
  - Power integration
  - Safety requirement such as fire suppression.
  - Survivability
  - Noise
  - Working media availability
- Perform component and/or scaled system demonstration(s) to validate high risk areas to achieve applicable aforementioned requirements as needed.
- Proposals utilizing nuclear and renewable technologies are not encouraged.

III. NO EVENTS ARE PLANNED

IV. WHITE PAPER SUBMISSION

Although not required, white papers are strongly encouraged for all offerors seeking funding. White Papers will be evaluated by the Government to determine whether the technology advancement proposed appears to be of particular value to the Department of the Navy. Initial Government evaluations and feedback will be issued via e-mail notification from the

Technical Point of Contact. The initial white paper appraisal is intended to give entities a sense of whether their concepts are likely to be funded.

Detailed Full Proposal (Technical and Cost volumes) will be subsequently encouraged from those Offerors whose proposed technologies have been identified through the above referenced e-mail as being of "particular value" to the Government. However, any such encouragement does not assure a subsequent award. Full Proposals may also be submitted by any offeror whose white paper was not identified as being of particular value to the Government or any offeror who did not submit a white paper.

For white papers that propose efforts that are considered of particular value to the Navy but either exceed available budgets or contain certain tasks or applications that are not desired by the Navy, ONR may suggest a full proposal with reduced effort to fit within expected available budgets or an effort that refocuses the tasks or application of the technology to maximize the benefit to the Navy.

White papers shall comply with the requirements of BAA N00014-21-S-B001, both as to form and content.

A resume of the principal investigator, not to exceed 1 page, should also be included after the 5-page body of the white paper.

White papers must be submitted through Fedconnect at www.fedconnect.net in accordance with Section D. Application and Submission Information, Section 2. Content and Form of Application Submission, paragraph d. White Paper Requirements, ii. White Paper Submission in N00014-21-S-B001.

To ensure full, timely consideration for funding, white papers should be submitted **no later than** 29 March 2021. White papers received after that date will be considered as time and availability of funding permit.

The planned date for completing the review of white papers is 23 April 2021.

V. FULL PROPOSAL SUBMISSION AND AWARD INFORMATION

ONR anticipates that multiple awards will be issued for this effort and will consist of applied (6.2) research activities subject to availability of funding.

ONR anticipates that contracts will be issued for this effort.

Full proposals for contracts should be submitted in accordance with the requirements of the FY21 Long Range BAA, N00014-21-S-B001. The Technical Content shall be single spaced and not exceed 20 pages. The cover page, resumes, bibliographies, project schedule, and table of contents are excluded in the page count.

ONR plans to fund up to two (2) awards with an approximate value of up to $1,500,000.00 each for a total period of performance of 24 months.

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

VI. SIGNIFICANT DATES AND TIMES

Event	Date	Time
White Paper Submission	29 MAR 2021	1400 Eastern Time
Notification of White Paper Valuation*	23 APR 2021	
Full Proposal Submission	17 MAY 2021	
Full Proposal Selections*	18 JUN 2021	
Awards*	30 SEP 2021	

Note: *These are approximate dates

VII. POINTS OF CONTACT

In addition to the points of contact listed in N0014-21-S-B0001 the specific points of contact for this announcement are listed below:

Technical Point of Contact:

Donald Hoffman
Advanced Naval Platforms Division, Code 331
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H. Scott Coombe
Advanced Naval Platforms Division, Code 331
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Business Point of Contact:
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VIII. SUBMISSION OF QUESTIONS

Any questions regarding this announcement must be provided to the Technical Point of Contact and Business Point of Contact listed in Section VII above. All questions shall be submitted in writing by electronic mail.

Answers to questions submitted in response to this Special Notice will be addressed in the form of an Amendment and will be posted to the following web pages:

- Beta.same.gov Webpage –Contract Opportunities – https://beta.sam.gov/
- ONR Special Notice Webpage- http://www.onr.navy.mil/Contracts-Grants/FundingOpportunities/ Special-Notices.aspx

Questions regarding White papers or Full proposals should be submitted no later than two weeks before the dates recommended for receipt of White papers and/or Full Proposals. Questions after these dates may not be answered.

*Questions regarding White papers will not be answered as of 22 Mar 2021.

Reference Documentation:

1. Navy Large Unmanned Surface and Undersea Vehicles: Background and Issues for Congress (https:// https://fas.org/sgp/crs/weapons/R45757.pdf)
2. Naval Research and Development Framework (https://www.onr.navy.mil/en/our-research/naval-research-framework)