BAA Call N0001426SBC01
Special Program Announcement for Office of Naval Research
Research Opportunity:
"Transient Reducing Active Power System (TRAPS)"

I. INTRODUCTION

This announcement describes a technology area, entitled "Electric Power Components and Systems," under the N0001425SB001, 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 contracts will be carried out as described in the above Long Range Broad Agency Announcement.

The purpose of this announcement is to focus attention of the scientific community on (1) the area to be studied, (2) dialogue among those interested in this arena, and (3) the planned timetable for the submission of white papers and full proposals.

II. TOPIC DESCRIPTION

The Office of Naval Research (ONR) is interested in receiving white papers and full proposals in support of the development of an advanced power system architecture, consisting of controls, power conversion, and energy storage, to modify and condition the transient power demand profile of shipboard mission loads to ensure their compatibility with ship service power generating system capabilities for present and future Navy ship 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:

The Navy's current and future efforts to field advanced shipboard weapons and sensors may be performance-limited by the power quantity, quality, and transient capability of today's MIL-STD-1399 Section 300 power provided by the ship's electric generation plant. MIL-STD-1399 Section 300 places strict limits on the pulsed power characteristics that the power system is subjected to by mission loads. Many projected modern mission loads have power demands that can be characterized as high transient, high power, high frequency load cycles that exceed the MIL-STD-1399 Section 300 pulsed power limits. If not mitigated, the transient power characteristics of these loads also degrade power generation system efficiency, reliability, and longevity as well as potentially causing power quality and emissions non-compliances on the power bus. Existing mitigation strategies to smooth this power draw can lead to higher-than-necessary average power demands, add excessive size and weight, and degrade overall system performance. The Navy is working towards addressing these challenges by introducing a new low voltage direct current (LVDC) MIL-STD-1399 Section 300 Part 3 Type 3. In the draft MIL-STD-1399 Section 300 Part 3 Type 3 pulsed power limits were substantially relaxed to permit greater mission load transients. However, the technology to continuously filter those transients results in additional space and weight requirements and adds new risks associated with equipment life, safety, and power quality.

Objective:

The Office of Naval Research (ONR) is interested in receiving proposals to develop a Transient Reducing Active Power System (TRAPS) to convert continuously transient LVDC mission load profiles to a smooth MIL-STD-1399 Section 300 compliant mission load profile. As part of this, the effort should demonstrate and assess the functional and performance capability improvements of TRAPS against metrics while examining the high-risk technologies defined by the offeror to evaluate their readiness for integration into a future fully operational prototype.

White papers for potential FY26 Applied Research (Budget Category 6.2) projects are sought to achieve the following:

1. **Develop a conceptual Transient Reducing Active Power System (TRAPS) topology design and corresponding MATLAB models that provide the functional and performance capabilities required to convert continuously transient LVDC mission load power demand profiles into a MIL-STD-1399 Section 300 compliant demand profile compatible with current Navy ship electric power generating systems.**

- The TRAPS should be designed to meet the metrics identified in Table 1 and account for information provided in Figures 1 and 2 as well as Government Furnished Information (GFI).
- The TRAPS design activity should identify, assess, and assign a TRL per the definitions to the components, subsystems, and innovative technologies (singularly or as a range of alternative technology options) proposed for the future implementation of a TRAPS functional demonstrator. The definition of TRL is provided as Government Furnished Information (GFI). The TRAPS components or subsystems TRLs should evaluate, at a minimum, the controls, power conversion, and energy storage necessary for the TRAPS functionality.
- The TRAPS should support each mission load, from one to at least four loads, operating with a power profile continuously while the Navy ship platform is deployed.
- The TRAPS should safely supply the power profiles without performance degradation for the system life.
- The TRAPS should have a sufficiently long life and reliability to minimize equipment replacement and maximize mission availability.
- The TRAPS should support other mission load profiles, within tailored LVDC MIL-STD-1399 Section300 Part 3 constraints, which may be infrequently or continuously applied at any power level from light to full load.
- The TRAPS should communicate with mission loads as required to support power up sequencing, restart sequencing, fault management, and load management/shed functionalities.
- The TRAPS should communicate with electrical and machinery control systems as required to support fault management and load management/shed functionalities.
- The TRAPS should be developed to minimize size and weight without sacrificing power quality performance, availability, or equipment life.
    - It is anticipated that a future ship installation of a notional TRAPS will be made in a severely space and weight constrained area. Therefore, for this effort, volumetric and gravimetric density improvements should be incorporated utilizing

advanced energy storage and converter components (TRL5 and below), installation and packing density techniques, etc. to the maximum extent possible accounting for a maximum equipment height of 7 feet including structure and mounting equipment.
    - The proposed Navy TRAPS is to be compared against a TRAPS using TRL7 or above components and system architecture in order to highlight the benefits of incorporation of the proposed advanced developments.
    - Both white papers and full proposals should provide an initial projected baseline total TRAPS of volume (ft^3) and weight (lbs).
    - During the proposed period of performance, effort will be made to update the calculation of total Navy ship system volume and weight against the initial baseline.
- The MATLAB 2024a Simscape (Specialized Power Systems preferred) transient electrical and life models should incorporate the following characteristics:
    - A transient electrical model(s) that address all modes of the system with the capabilities of the component and control dynamics necessary to analyze:
        - Dynamic transient response to input or output changes,
        - Power quality,
        - Large signal stability,
        - Small signal stability, including input/output impedance, and
        - Individual component current, voltage, and impedances as required to support thermal or component life analysis (e.g. capacitor ripple current).
    - The transient electrical model should be configured to run in Fixed Step Solver Code3 with a configurable timestep inclusive of 50 microseconds.
    - The life model should address the impact of voltage profiles, current profiles, temperature profiles, and/or other attributes necessary to define the expected useful life of the TRAPS.
    - Models should include a Model Description Document.
    - TRAPS Transient and Life Models should utilize standard and open (e.g. no P-code) model components blocks.

2. **Demonstrate high risk topology subscale components, subsystems, and innovative technologies to validate feasibility for the overall system operational capability to meet defined TRAPS metrics**

- Develop and adapt novel and new technology to improve power density, life, robustness, and performance in the overall system design.
- Innovative technology components and approaches leveraged from universities and small businesses will be given favorable consideration.
- Component technologies should emphasize power quality, minimize size and weight, continuous operation, and life/robustness in a shipboard environment.
- Demonstrations of these innovative technologies should support electrical transient and/or life model validation.

3. **Provide a technology development program plan that will mature the proposed design from TRL 4 to a full scale TRL 5/6 or greater operational prototype to meet the defined operational metrics in Table 1.**

4. **Provide an option phase in the provided white paper and full proposal to develop a detailed design for a full scale TRAPS prototype.**

ATTRIBUTE	OBJECTIVE RANGE OF FULL SYSTEM OPERATING PARAMETERS	THRESHOLD BAA PROPOSED TOPOLOGY OPERATING PARAMETERS	NOTES
Nominal mission load interface	375, 850, 1000 VDC	1000VDC	MIL-STD 300 Part 3 Type 3 (tailored to support the nominal values or mission load profile parameters)
Quantity of mission loads	1 to 5+	1 to 4	Minimum to maximum quantity of interfaces to mission load(s).
Nominal source interface	440, 4160, & 13,800VAC, 1000VDC	1000VDC for DC topologies or 4160VAC for AC-DC topologies	MIL-STD-1399 Section 300 Parts 1, 2, & 3 (Type 1)
Average operating power	150 kW/500 kW To 1MW/5MW	650 kW/2.6MW	Individual mission load / total system Figure 1 provides a notional profile for an Individual Mission Load
System Energy Storage Life	10+yrs	6+yrs	Minimum useable energy storage life under continuous usage.

Table 1: TRAPS Program Metrics

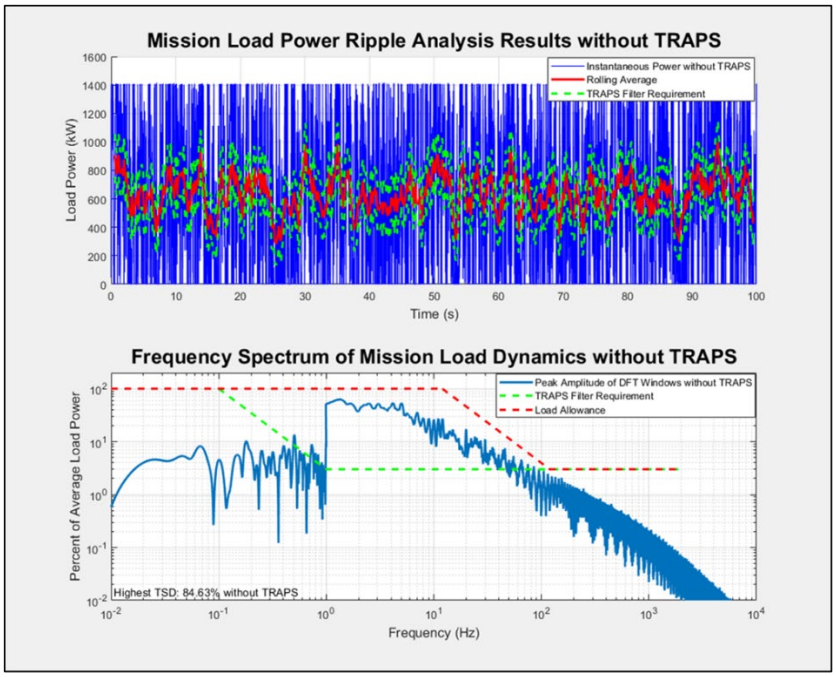

Figure 1: Mission Load Profile

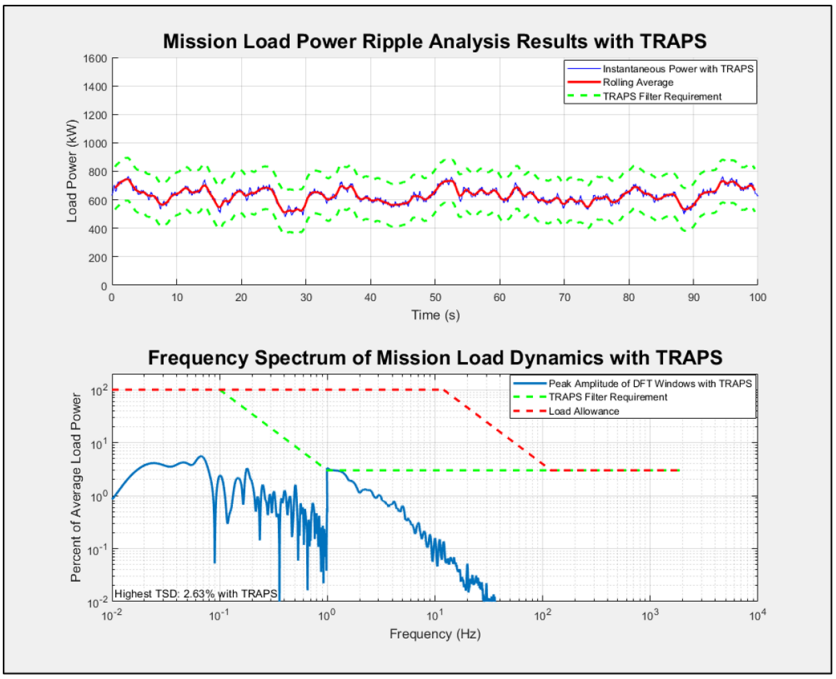

Figure 2: Power Draw supplied by Ship Generation with TRAPS filtering the Mission Load Profile

III. EVENTS

ONR is not planning any workshops, industry days, webinars, etc for this topic.

IV. WHITE PAPER SUBMISSION

Although not required, white papers are strongly encouraged for all offerors seeking funding. Each white paper 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 should not exceed 5 single-sided pages, exclusive of references and resume of principal investigator, and should be in 12-point Times New Roman font with margins not less than one inch. White papers shall be in Adobe PDF format (preferred) or in Microsoft Word format compatible with at least Microsoft Word 2016.

The 5-page body of the white paper should include the following information:

- Technical Concept: A full description of the proposed TRAPS concept, addressing power conversion, energy storage, and controls, as identified in this BAA Call Objective Section. This includes, but not limited to, TRAPS conceptual design, projected size and weight, electrical and life model description, and identification of high risk topology subscale components, subsystems, and innovative technologies to be demonstrated.
- Operational Naval Concept – Description of the TRAPS concept of operation for the new capabilities to be delivered, and the expected operational performance improvements to meet program metrics and goals.
- Operational Utility Assessment Plan – Plans for demonstrating and evaluating the operational effectiveness of the Offeror's proposed TRAPS design in a simulated environment and high risk topology subscale components, subsystems products or processes in a facility lab. This should include a description of performers' simulated environment and facility test capability to successfully perform demonstrations.

- Offeror's capabilities and related experience to achieve the proposal objectives; to integrate novel technologies from other sources, such as universities, small businesses, or emerging commercial; and to commercialize, deploy and maintain technologies.
- Rough Order of Magnitude (ROM) cost estimate.

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 ONR Submission Portal at https://submissions.nre.navy.mil/ in accordance with Section F, Submission Requirements and Deadline, Section 4. White Paper Submissions in N0001425SB001.

To ensure full, timely consideration for funding, white papers should be submitted **no later than 17 July 2026 1400 Eastern Time**. White papers received after that date may be considered as time and availability of funding permits.

The planned date for completing the review of white papers is **21 August 2026.**

Reference Documentation:

1. D. Temkin, T. Boehmer, and A. Billups, "Adaptive Power System for Managing Large Dynamic Loads," IEEE Transactions on Power Delivery, Vol. 31, No. 2, April 2016.
2. J.R. Miller, S.M. Butler, and S. McNeal, "Life Performance of Large Electrochemical Capacitors," In Proceedings of the 46th Power Sources Conference, 2014.
3. Microsoft, OpenAI, NVIDIA, "Power Stabilization for AI Training Datacenters," arXiv:2508.14318v2, August 2025.
4. R. Dimitrov, H. Petty, N. Srivastava and M. Blake "How New GB300 NVL72 Features Provide Steady Power for AI," NVIDIA Technical Blog, July 2025.

Government Furnished Information (GFI) provides additional reference information to support the offer's proposal and potential technology development program:

1. Mission load power profile
2. Notional DC Shunt and Series Topologies
3. TRL Definitions and Assessment Criteria
4. S. Swindler, H. Lopez, J. Heinzel, "DRAFT MIL-STD-1399 Section 300 Part 3: The Navy's New Low Voltage Direct Current Power Interface Standard," ASNE ISS 2025.
5. D. Wetz, C. Nybeck, "Study of Ultracapacitors under Pulsed Loading Condition," 2019

Requests for Government Furnished Information should be submitted to the Technical Point of Contact, Nathan Spivey, at nathan.n.spivey.civ@us.navy.mil. Requests for GFI should be submitted NLT two weeks before the dates recommended for receipt of White Papers and/or Full Proposals. Requests after this date may not be answered.

V. FULL PROPOSAL SUBMISSION AND AWARD INFORMATION

Full proposals should be submitted under N0001426SBC01 by **25 September 2026 1400 Eastern Time**. Full proposals submitted after that due date should be submitted under N0001425SB001 and will be considered as time and availability of funding permits.

ONR anticipates that contracts and/or OTs (Other Transactions) will be issued for this effort.

Full proposals for contracts should be submitted in accordance with Appendix 2 of the N0001425SB001.

ONR plans to fund multiple contracts for the base program. Each individual contract base program will not exceed $2.5M. However, lower and higher cost proposals will be considered.

The period of performance for projects will be 2 years.

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

An optional full scale prototype detailed design period of performance is two years from the date of the option contract award.

Funding decisions should be made by **30 October 2026**. Selected projects will have an estimated award date of **31 March 2027**.

VI. SIGNIFICANT DATES AND TIMES

Event	Date	Time
Recommended White Paper Submission Date*	17 July 2026	1400 Eastern Time
Notification of White Paper Valuation*	21 August 2026	
Recommended Full Proposal Submission	25 September 2026	1400 Eastern Time
Notification of Selection: Full Proposals *	30 October 2026	
Awards *	31 March 2027	

Note: * These are approximate dates**.**

VII. Small Business Subcontracting

Other-than small businesses (i.e. large businesses, non-profit organizations and educational institutions) must submit a subcontracting plan along with their research proposal. While other-than small businesses are responsible for making these subcontracting arrangements, ONR can help facilitate prime contractor/small business contracting connections by posting to the ONR external website contact information of small businesses that have indicated their subcontracting interests and technological niche for prime contractor consideration for this program. This is not an endorsement, but an effort by ONR to help bring these parties together to provide superior solutions.

If you are a small business and your company is interested in subcontracting activities with other-than small businesses, please provide the following information by email to the ONR Small Business Director at onr.smallbiz@us.navy.mil with the subject line "N0001426SBC01 – Small Business Subcontracting Interest":

1) Company Name and Website
2) Individual (POC) name and POC email address
3) Business Size and socio-economic category
4) Brief Technology Description (no more than 3 sentences)
5) Technology Key Words (no more than 10 words)

Note: Do not include ANY proprietary information. This information will be posted on the ONR website under this BAA call and will be available to the public.

VIII. POINTS OF CONTACT

In addition to the points of contact listed in N001425SB0001 the specific points of contact for this announcement are listed below:

Technical Points of Contact:
Nathan Spivey
Sea Warfare and Weapons, Code 33
nathan.n.spivey.civ@us.navy.mil

Business Point of Contact/Contracting Officer:
Leila Hemenway
Contracting Officer, Code 251
leila.k.hemenway.civ@us.navy.mil

IX. SUBMISSION OF QUESTIONS

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

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

- Sam.gov Webpage –Contract Opportunities – https://sam.gov/
- ONR BAAs, FOAs and Special Program Announcements Webpage - https://www.onr.navy.mil/work-with-us/funding-opportunities/announcements

Questions regarding **White Papers or Full Proposals** should be submitted NLT two weeks before the dates recommended for receipt of White Papers and/or Full Proposals. Questions after this date may not be answered.