

BAA Call N0001425SBC01
Special Program Announcement for Office of Naval Research
Research Opportunity:
Advanced Capacity Maritime Effector (ACME)
Future Naval Capability (FNC)

I. INTRODUCTION

This announcement describes Advanced Capabilities Integration research and development in kinetic weapon propulsion and airframe technologies. The effort is entitled, “Advanced Capacity Maritime Effector (ACME) Future Naval Capability (FNC)” under the N0001425SB001, Long Range Broad Agency Announcement (BAA) 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(s) 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, and (2) the planned timetable for the submission of white papers and full proposals.

II. TOPIC DESCRIPTION

The proposed topic will mature state of the art (SOTA) airframe and propulsion technologies to a prototype demonstrator concept. The program will pursue technologies related to a kinetic weapon systems for a next generation, low cost, high quantity, and long-range air-launched STRIKE weapon concept.

The Science and Technology (S&T) problem ONR is seeking to address is continued maturation and integration of several technology efforts, which include: airframe materials (graphite/aramid composites/metal additive manufacturing), solid propellant rocket (Highly Loaded Grain), and supersonic propulsion systems (ramjet engines) and compact highly effective warheads. The goal is to mature these sufficiently and integrate them into a viable prototype weapon system that meets the goals outlined in this BAA call.

a. Background:

The U.S. Navy’s Direct and Time Sensitive Strike Program, PMA-242, is responsible for acquisition, development, and sustainment of future air-launched strike weapons. These weapons will provide sufficient stand-off launch capability that can be procured and deployed in large enough quantities to positively move the needle in a fight against a peer adversary. The desired solution will maximize weapon load-out and constrain unit costs to permit large production quantities and optimum inventory levels.

The ACME FNC program will address the long-term requirements for this capability by developing and maturing technologies related to requirements to support future PMA-242
BAA Call Number N0001425SBC01

acquisition programs. Targeting these future capabilities, ONR will invest in S&T to address multiple technical challenges with competing requirements for size, range, speed, and cost to present an opportunity for an Early Operational Capability for the next-gen direct and time sensitive strike in the ~FY31 timeframe.

The Office of Naval Research (ONR) intends to develop, test and mature kinetic weapons technologies from a Technology Readiness Level (TRL) 4 through to a TRL 6 to support the PMA 242's future acquisition programs.

b. Objective:

The objective of this effort is to mature and integrate advanced technologies into a functional prototype kinetic weapon concept. The effort shall prove through analysis and/or demonstration that the combinations of these technologies enable the production of a low cost, long-range, high quantity air-launched Strike Weapon concept that meets the Navy's need.

To meet this need, ONR is interested in receiving proposals developing these technologies based on the following (see classified addendum for additional details):

- **Range/Speed:** Develop and test a fully functional propulsion system that meets range/speed requirements.
- **Size:** Internal carriage in F-35A/C. Note: ONR is open to consider new launcher designs to maximize capacity. However, it is preferred for any design to be compatible with current launcher interfaces (i.e. LAU-147) to minimize transition risk/qualification costs.
- **Airframe:** Design, analysis, and prototype manufacturing featuring low-cost material and manufacturing solutions capable of supporting Early Operational Capability timelines
- **Cost Target:** Airframe/Propulsion cost of approximately \$500K (excluding seeker, warhead, fuzing, etc.)
- **Safety:** Multi-functional (single device for all primary energetic safing) integral electronic safety device (IESD) concept. Weapon Systems Explosives Safety Review Board (WSERB) compliant system.
- **Requirements include:**
 - Internal Carriage compatible on F-35A/C
 - WOSA-compliant modular weapon system
 - Weapons Systems Explosives Safety Review Board (WSESRB) compliant (carrier-compatible)
 - 30,000' MSL, 0.8 Mach launch envelope (to achieve required range)
 - Production Goal: 500+ AURs/year

- c. Approach:** ONR would like Offerors to use an agile approach (iterate fast and often, test, and learn) as much as possible as part of their proposed effort while at the same time, still employ a systems engineering framework. Within this system engineering framework, even though the S&T focus is on airframe and energetic critical technology elements, the vendor must demonstrate analytically or experimentally that vendor S&T solutions can be integrated into a missile system with viable aerodynamic, Guidance Navigation & Control (GNC), sensor and power system elements and which meet BAA technical, cost

and schedule goals. The systems engineering approach is based on an S&T perspective, and it is not a formal Acquisition milestone review. ONR would also like Offerors to implement the use of digital engineering throughout the development process. (i.e. Model Based Systems Engineering (MBSE), digital twin, and Mission Based Test and Evaluation (MBT&E)).

ONR plans to divide the contract into a Base and a single Contract Option.

Base Contract: The base contract period of performance shall initiate on contract award and last approximately 36 months. The Base contract will cover the following formal reviews:

- System Requirements Review: Verify all system level requirements have been defined and are testable, and the design concept will support achieving those requirements.
- Preliminary Design Review: Verify that the system under review can proceed into detailed design and can meet the stated performance requirements through both developmental testing and modeling as appropriate.
- Critical Design Review: Ensure that a system can proceed into fabrication, demonstration, and test and can meet stated performance requirements.
- Test Readiness Review prior to all critical test milestones: Verify the Item Under Test (IUT) meets design intent, test objectives are clear and the test item, instrumentation/set-up & execution can support test objectives.
- Post-test Review after all critical test milestones: Offeror provides assessment of whether test event met objectives and an overview of key results, findings and conclusions from test event.

Contract Option: The Option period will start approximately 24 months after contract award and will run concurrently with the Base for at least 1 year to allow for the procurement and development of any long-lead items for fabrication. Offerors should plan that the option will last approximately 24 months. The contract Option will cover prototype fabrication and demonstration. In addition, Offerors should propose concurrent Engineering and Manufacturing Development activities to support a rapid production capability.

Seeker:* The Navy will provide Size, Weight and Power Cost (SWAP-C) requirements as Government Furnished Information (GFI) and will continue to explore the trade space based on size/weight/range requirements for the Arch User Repository (AUR) working with the Offeror in their role as AUR systems integrator.

Warhead:* It is anticipated that the Navy will seek the use of an effector providing both penetration and incendiary effects. Offeror team ability to analytically model or use empirical models to assess warhead effects against surface targets is desirable.

Offeror's should plan to attend meetings at Naval Air Warfare Center – Weapons Division (NAWC-WD) China Lake and Naval Surface Warfare Center (NSWC)-Indian Head to explore potential leveraging opportunities/collaborations for the seeker/warhead. ONR will fund both labs separately and their cost should not be included in proposal submissions. It is

expected that Offerors will have to travel to both Navy Labs on multiple occasions and that travel/participation should be included in the cost proposal.

Thermal Battery:* In addition to the Seeker/Warhead, ONR working under a separate effort will explore novel thermal battery concepts (novel electrochemistry, anode/cathode) to reduce size/weight. The Navy will provide SWAP-C requirements as GFI and will continue to explore the trade space based on size/weight/range requirements for the AUR.

***Note:** Although the Navy might provide Seeker/Warhead/Thermal Battery as a GFI (and potentially as Government Furnished Equipment (GFE), Offerors have the option to propose technology development/solutions in these areas as part of their AUR solution. Teaming is encouraged to achieve an AUR solution. However, ONR will not consider bids separately for these technologies under this BAA Call. Potential bidders interested in specific technology areas are encouraged to submit under the N0001425SB001 Long Range BAA.

Entrance Criteria:

- Operational gap identified and quantified (i.e. difference between starting range/speed using current SOTA and objective range/speed).
- Technology solution-set identified to close gap (i.e. propulsion/airframe concept feasible for integration with weapon system elements at an Engineering and Manufacturing Development (EMD) by 2030)
- Technology gap and plan to close gap identified for intended form factor and application (i.e. key technology milestones identified and defined, program development schedule)
- System and subsystem requirements defined

Exit Criteria:

All key technology elements demonstrated to meet technical, cost and schedule goals at TRL 6 and ready for EMD Phase in FY30.

- Propulsion: Component and integrated propulsion system level testing followed by environmental testing (All concepts)
- Free-jet transition test demonstration (Booster (internal or external) firing, port cover/nozzle release, ramjet firing) of the integrated flight weight system at relevant flight conditions (Airbreathing concepts)
- Air Inlet: Port Covers and flow demonstrated through integrated test at relevant temperatures if required (Airbreathing concepts)
- Airframe: Prototype design and hardware with attachments points for platform and subsystems integration
- System Concept: Range/speed by analysis and subsystem concepts shown ready for system integration via analysis or prototype integration testing
- Energetic Safety Device(s): Environmental and integrated performance demonstrated through testing
- Power systems: Environmental testing and performance demonstrated with use of control section at relevant temperatures
- Platform: Internal carriage integration studies and demonstration of compatibility with the F-35A/C internal bay and launcher interfaces

d. **Projected Contract Deliverables:** (Notional – Offerors should define deliverables Contract Data Requirements List (CDRLs)/software (SW)/hardware (HW) as part of their full proposal Statement of Work (SOW) submission)

- The primary deliverables are prototype hardware and a knowledge product design data package of a tactical weapon concept, which includes the demonstrated design details, supporting design artifacts, and demonstrated performance on all matured critical technology elements and system concepts, with examples as follows:
 - Airframe concept satisfying internal carriage (F-35)
 - Tactical propulsion system
 - *Highly Loaded Grain (HLG) providing high Isp (specific impulse) with integrated metalized propellant*
 - *If proposing solid fuel ramjet (SFRJ) propulsion technology, then fuel should utilize high-energy Boron fuel SFRJ engine with bypass*
 - Novel/advanced airframe materials and manufacturing processes design concept
 - Multi-functional (single device for all primary energetic safing) integral electronic safety device (IESD) concept

There will also be software products in the form of engineering performance models for the various components.

For Planning and Estimating Purposes, please use the below funding profile:

FY	FY25	FY26	FY27	FY28	FY29
ONR (S&T)	\$0.5M	\$6.5M	\$9.0M	\$9.0M	\$6.0M

III. WORKSHOPS, INDUSTRY DAYS:

There are no planned workshops, industry days, webinars, etc. for this effort.

IV. ACME DESIGN METRICS SUPPLEMENTAL

Prior to submitting a proposal, potential Offerors should review the ACME Design Metrics Supplemental, which is available upon request to companies with the proper security and handling classifications.

The request shall be on company letterhead and shall include the company name, company Cage Code, company mailing address, and current Department of Defense contract number along with the government point of contact (POC) for that contract and the contract information for the Joint Certification Program POC. ONR will use this information to verify eligibility to receive information associated with Security Classification Guidance.

The request shall be sent to Mr. James Farnsworth (contracting officer) at james.e.farnsworth8.civ@us.navy.mil with a copy sent to Mr. Cody Robinson at cody.l.robinson24.civ@us.navy.mil.

The deadline to request the GFI is **19 December 2024** at 5:00 PM Eastern Standard Time (EST).

V. 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 10 single-sided pages, exclusive of cover page, 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 Cover Page can be found at <https://www.nre.navy.mil/work-with-us/how-to-apply/submit-contract-proposal> for contract submissions and at <https://www.nre.navy.mil/work-with-us/how-to-apply/submit-grant-application> for grant submissions.

The 10-page body of the white paper should include the following information:

- Technical Concept: A description of the technology innovation and technical risk areas.
- Rough Order of Magnitude (ROM) cost estimate
- Program Plan

A resume of the principal investigator, not to exceed 1 page, should also be included after the 10-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 N0001425SBC01.

To ensure full, timely consideration for funding, white papers should be submitted **no later than 13 January 2025**. 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 **27 January 2025**.

VI. FULL PROPOSAL SUBMISSION AND AWARD INFORMATION

Full proposals should be submitted under N0001425SBC01 by **20 February 2025**. Full proposals submitted after that due date should be submitted under N0001425SB001 and will be considered as time and availability of funding permit.

ONR anticipates that contract(s) will be issued for this effort.

Full proposals for contracts should be submitted in accordance with the Appendix 2 of the N0001425SBC01.

The period of performance for projects may be from August 2025 through August 2030 (5 years).

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

Funding decisions should be made by **14 March 2025**. Selected projects will have an estimated award date of **15 August 2025**.

VII. SIGNIFICANT DATES AND TIMES

Event	Date	Time
Recommended White Paper Submission Date*	13 January 2025	1700 Eastern Standard Time (EST)
Notification of White Paper Valuation*	27 January 2025	1700 (EST)
Recommended Full Proposal Submission	20 February 2025	1700 (EST)
Notification of Award Selection*	14 March 2025	1700 (EST)
Awards*	15 August 2025	1700 (EST)

Note: * These are approximate dates.

VIII. Small Business Subcontracting

As indicated in ONR Broad Agency Announcements large businesses and non-profit organizations must submit a subcontracting plan along with their research proposal. While large businesses and non-profits are responsible for making these subcontracting arrangements, ONR will 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 large businesses and/or non-profits considering your technology for this program, please provide the following information by email, to the ONR Small Business Director at ellen.simonoff.civ@us.navy.mil with the subject line, "BC N0001425SBC01". Provide this information:

- 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.

IX. POINTS OF CONTACT

In addition to the points of contact listed in N0001425SBC01 the specific points of contact for this announcement are listed below:

Technical Point of Contact:

Cody Robinson, Program Officer (Detailee)

ONR Code 35, Naval Air Warfare and Weapons

Email: cody.l.robinson24.civ@us.navy.mil

Business Point of Contact/Contracting Officer:

James Farnsworth, Contracting Officer

ONR Code 251

Email: james.e.farnsworth8@us.navy.mil

VIII. 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 no later than **19 December 2024**.

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/opportunities>
- 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 No later than two weeks before the dates recommended for receipt of White Papers and/or Full Proposals. Questions after this date may not be answered.