



DEPARTMENT OF THE NAVY
Small Business Innovation Research (SBIR)
Small Business Technology Transfer (STTR)

Navy SBIR Catapult Challenge
Ask Me Anything Session | 16 October 2024

Navy SBIR/STTR programs provide opportunities for domestic small businesses and start-ups to deliver solutions to meet naval needs through federal research/research and development. These competitive, three phase, awards-based programs advance innovations with an aim toward transitioning the resulting technologies to the Fleet/Force and commercialization in private markets.



Rules of Engagement

- Attendees are muted
- Put questions in chat
- Responses will be verbal, not in chat
- Presentation with audio will be posted to https://navysbir.com/Catapult_Challenge.htm

The DoD Preface and DON Instructions take precedence over ANYTHING in this brief or stated today!

Agenda



- Why Catapult Challenge
- Overview of the Process
- TPOC Briefs – NAVSEA and SSP
- Q&A
- Closing Remarks



Why Catapult Challenge

Ms. Maria Proestou

Assistant Secretary of the Navy (Research, Development
and Acquisition)

Strategic Acquisition Advisor



Overview of the Process

Navy Catapult Program

- Leverages prior SBIR investment through 2nd Phase II
- Accelerates technology development to meet Naval priorities
- Naval customer driven process

Catapult Challenge

- Leverages prior SBIR investment
- Soliciting Phase II proposals
- Meeting the needs of the topics identified in the BAA

Eligibility Summary



Each proposing small business concern must:

- Have received a Phase I or an initial Phase II award
- Have not yet received a second Phase II award to the same topic
- Have submitted a STEP ONE Catapult Challenge Proposal for evaluation
- Meet Offeror Eligibility and Performance Requirements (DoD SBIR/STTR Program BAA)
- Comply with primary employment requirements of the PI
- Have an active registration in System for Award Management (SAM)



Locating Instructions and Topics

- DON participates in the DoD Broad Agency Announcement (BAA)
- DoD 25.4 BAA Preface <https://www.dodsbirsttr.mil/submissions/solicitation-documents/active-solicitations>
 - Overarching Guidance/Requirements
 - Submission Requirements and Process
- DON 25.4 BAA Instructions https://navysbir.com/topics25_4-r1.htm
 - DoN-specific requirements and topics
 - Technical volume template will be posted to https://navysbir.com/links_forms.htm on the Open date of this BAA
 - Cost for Step One proposal NTE \$2M and PoP NTE 36 months

Read the DoD Preface and DoN Instructions

Key Dates



Catapult Challenge Topics (N254-C01 through N254-C04)

Pre-Release	2 October – 22 October 2024
Open	23 October – 20 November 2024
Close	20 November 2024 at 12:00 PM ET
Topic Q&A closes to new questions	6 November 2024



Step Two: Full Phase II Proposal

If selected, notification from the cognizant SYSCOM Program Office will include:

- Template for full Phase II
- Template for cost proposal
- Due dates and submission requirements



Participating Systems Commands

Naval Sea Systems Command (NAVSEA)

Engineers, builds, buys and maintains ships, submarines and combat system.

Strategic Systems Programs (SSP)

Develops, produces, secures, and provides lifecycle support for the Navy's submarine-launched ballistic missiles and strategic weapon system.



Programmatic Q&A

- Where does the Catapult funding come from?
- Is it two-year funding?
- What is the range of funding for individual projects?
- Will there be other FY25 Catapult topics issued after this 25.4 round?
- Are Phase IIs from AFWERX eligible to receive Catapult funding?
- How do we access funding for equipment to produce critical safety item (CSI) parts?
- If we have not won a Phase 1 yet, can we partner with someone who has to address these solicitations?
- Can we submit proposals to a topic area that is not currently advertised?
- Does the age of the original SBIR matter? Can we submit more than one proposal to a topic?
- Is there Govt. matching funds required?
- How many awards are planned?
- Would the Navy be interested in proposals that support enabling technologies but do not directly support the entire mission scenario described?



TPOC Briefs



PEO IWS N254-C01

ASW Multi-Platform Product Family Architecture



Overview of PEO IWS

- Engineers, acquires and maintains combat systems to meet current and emerging threats. PEO IWS leads the open architecture initiative and develops systems for USN, DoD, and our allies.
- Developing capability for both the Surface Warfare and Undersea Enterprises, PEO IWS systems include missiles, radars, launchers, electronic warfare systems, undersea warfare systems, gun systems, and combat systems.

Current State of Technology for ASW Architecture



- There is much capability sharing and key combat systems are moving toward open architecture, Agile, and virtualization.
- However, each system is doing things slightly differently, making it difficult to share capabilities effectively.
- Further, the time to pull together integrated systems of systems is measured in years, with additional years required to certify everything is safe and works properly with overarching systems (e.g., the Aegis Combat System).

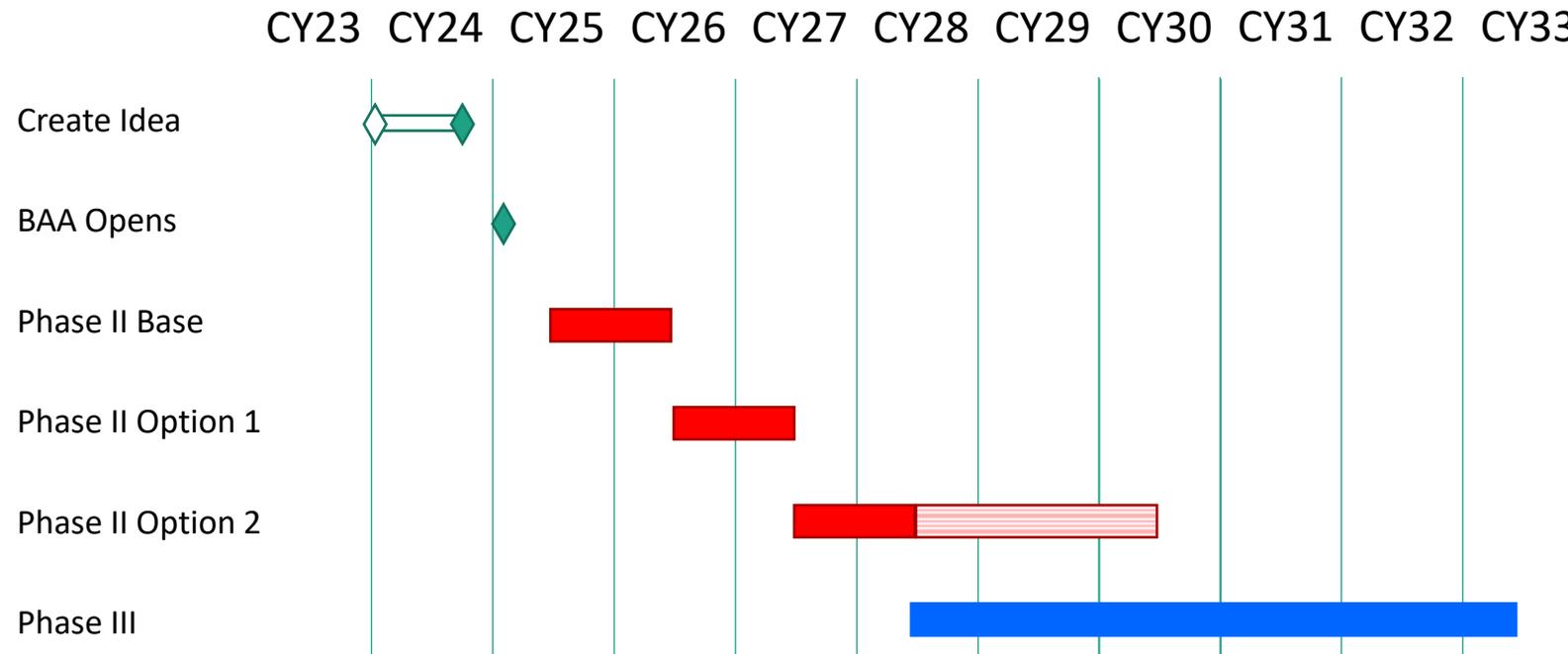
Catapult Challenge Technology



N254-C01 Anti-Submarine Warfare (ASW) Multi-Platform Product Family Architecture

- This topic is asking for innovations enabling fielding of advanced capabilities across all ASW systems (for submarines, surface ships, MPRA, and seabed protection).
- The Phase II prototype would be a roll-on, roll-off (RORO) that can field important capability to fill urgent warfighting gaps.
- It is intended that the innovations will also apply to the family of ASW systems.

Notional Lifecycle of an SBIR/STTR Topic (N254-C01)



To set up discussion before 23 Oct:

- browse to koalendar.com/e/meet-with-meg-stout
- select 30 minutes that align with the availability of your team

If no times are available, e-mail me before 23 Oct and I can send a video of the longer discussion.



NAVSEA 05T – Technology Office N254-C02

At-Sea Reload Technologies

Overview of PEO SHIPS and NAVSEA 05T



PEO SHIPS (<https://www.navsea.navy.mil/Home/Team-Ships/PEO-Ships/>)

As one of the Defense Department's largest acquisition organizations, Program Executive Office Ships (PEO Ships) manages the design and construction of all destroyers, amphibious ships and craft, auxiliary ships, special mission ships, sealift ships and support ships. These platforms enable our nation and its allies to project presence in peace, power in wartime, and assured access at all times.

NAVSEA 05T – Technology Office

The Technology Office advises the NAVSEA Chief Technology Officer and executes a portfolio of research & development programs; provides oversight of Navy experimentation and demonstration efforts; conducts science and technology liaison with NAVSEA acquisition organizations, warfare centers, ONR, and other SYSCOMs; and supports NAVSEA technical authority to ensure systems are engineered effectively, and that they operate safely and reliably.

Current State of Technology



At-Sea Reload Technologies

- Ships and submarines are typically reloaded pier side at developed ports or in austere/protected anchorages that may be far from operational areas.
- Reloading VLS, and other ordnance, close to the point of need is challenging in higher sea states due to the relative motions between supply vessels and Combatants.
- The weight of ordnance and equipment may limit ability to transfer and shipboard infrastructure may not be sufficient or available.



Catapult Challenge Technology

- At-Sea reload of MK41 VLS, and other systems such as CIWS, SeaRAM, Nulka decoys, LEED, Naval Strike Missile, torpedoes, and submarine vertically launched weapons, close to the point of need is challenging in higher sea states due to the relative motions between supply vessels and Combatants.

- The Navy seeks innovation solutions that support and enable underway at-sea reloading of ordnance from Combat Logistics Force ships to surface combatants in Sea State 3 and above conditions.
 - Shipboard cranes
 - Connected Replenishment systems
 - Motion Compensation
 - Improved Ordnance Handling Equipment and PHS&T
 - Advanced Materials and Manufacturing for Weight reduction
 - Ship to Ship communications & data transfer
 - Sensors/monitoring for reload systems, relative ship motions and operational decision making
 - Intra-ship ordnance and Reload equipment handling
 - Advanced maintenance support and training systems

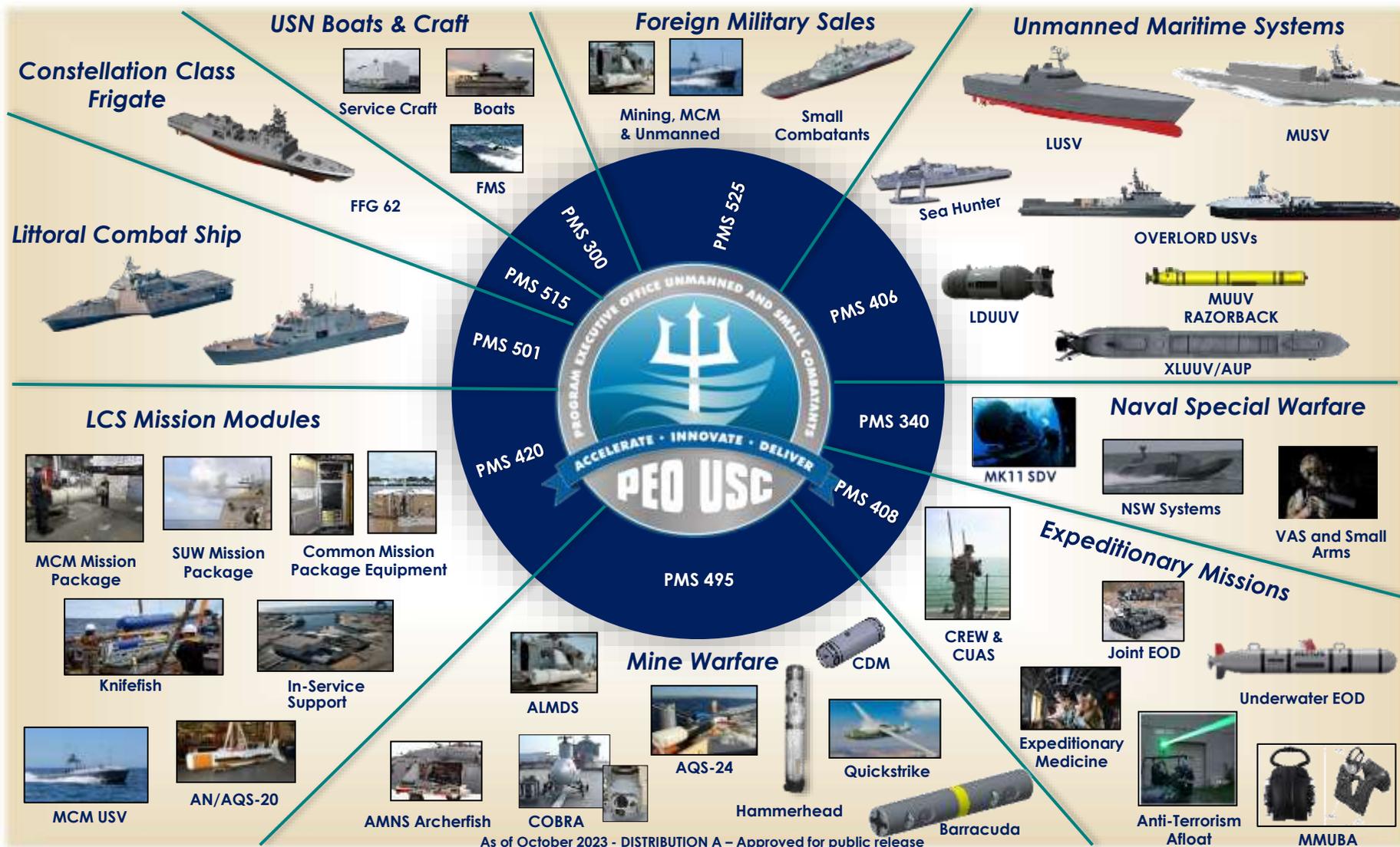


PEO USC N254-C03

*Modular Electronic Warfare Counter- Unmanned
Aerial System (C-UAS) Payload*



PEO USC Overview



As of October 2023 - DISTRIBUTION A – Approved for public release

CUI: Distribution authorized to Department of Defense and US DoD Contractors Only. Other US requests shall be referred to PEO USC S&T.



PMS 408 Program Overview

6 Lines of Effort



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Current State of Technology

- The growing threat of adversarial Unmanned Aerial System (UAS) of various sizes and shapes for defense, commerce, monitoring, and other applications has increased at an expeditious pace
- Successful counter small UAS requires the ability to detect, identify, discriminate, and engage in a cost-effective manner
- Future commercial UAS platforms will utilize commercial 5G cellular frequency range (FR)2 and FR3 standalone Command and Control (C2) links



Catapult Challenge Technology

- Detection, identification, tracking, and defeat of class I commercial UASs
 - Counter UAS (C-UAS) RF C2 links
- Modular payload version Government C-UAS capabilities
 - Deployable on UAS/USV platforms, expand the coverage area
 - Government furnished Software Defined Radio (SDR), software, and techniques
 - Deploy a C-UAS RF capability for 5G cellular FR2 and FR3 standalone C2 links



Catapult Challenge Technology (cont.)

- Payload compatible with the Zynq UltraScale+ RF system on chip (RFSoc) based Government-owned SDR
 - Utilize existing C-UAS electronic warfare functions
 - Government-owned SDR is 3U form factor dual half duplex transceiver
 - C5ISR Modular Open Suite of Standards (CMOSS) interface and requires 38 Watts of power
- Low swap for deployment on UAS and USV



SSP N254-C04

*Modular Alternate Navigation Fusion Architecture for
High Speed Systems*

Conventional Prompt Strike Overview



DISTRIBUTION STATEMENT A

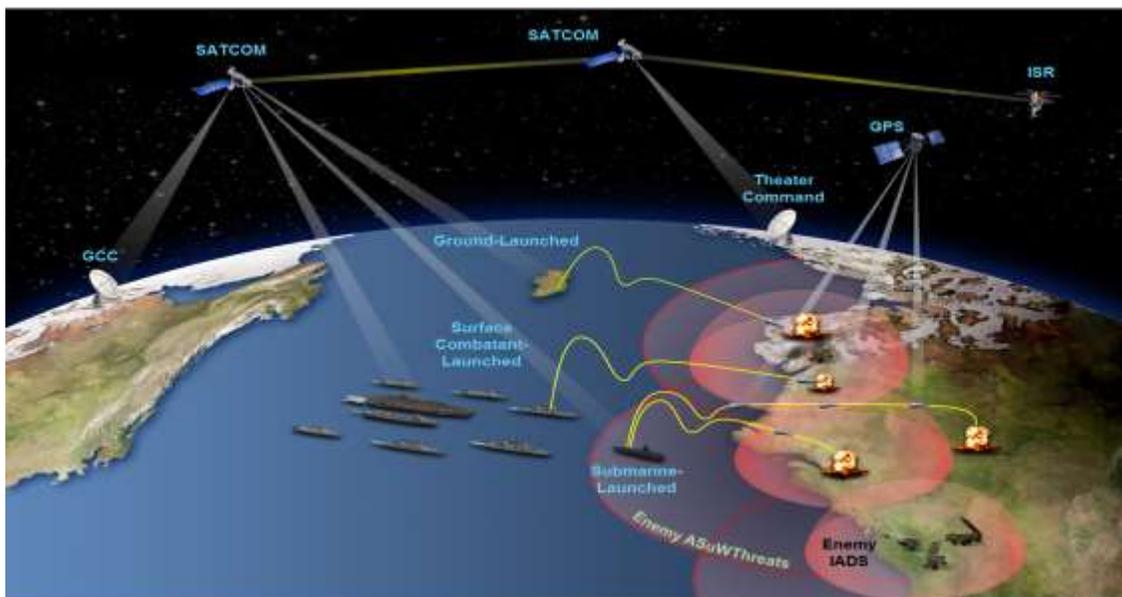
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CPS Mission



- **Mission:** We design, build, and sustain an evolving multi-service hypersonic capability at the speed of relevance for the warfighter, by aligning national resources, strengthening partnerships, and fostering an agility-centered culture
- **Objective:** deliver a conventional warhead to target in a means that –
 - Penetrates A2AD (anti-access and area denial) capabilities
 - Quickly delivers effects on target
 - Provides sufficient capability against the given target type



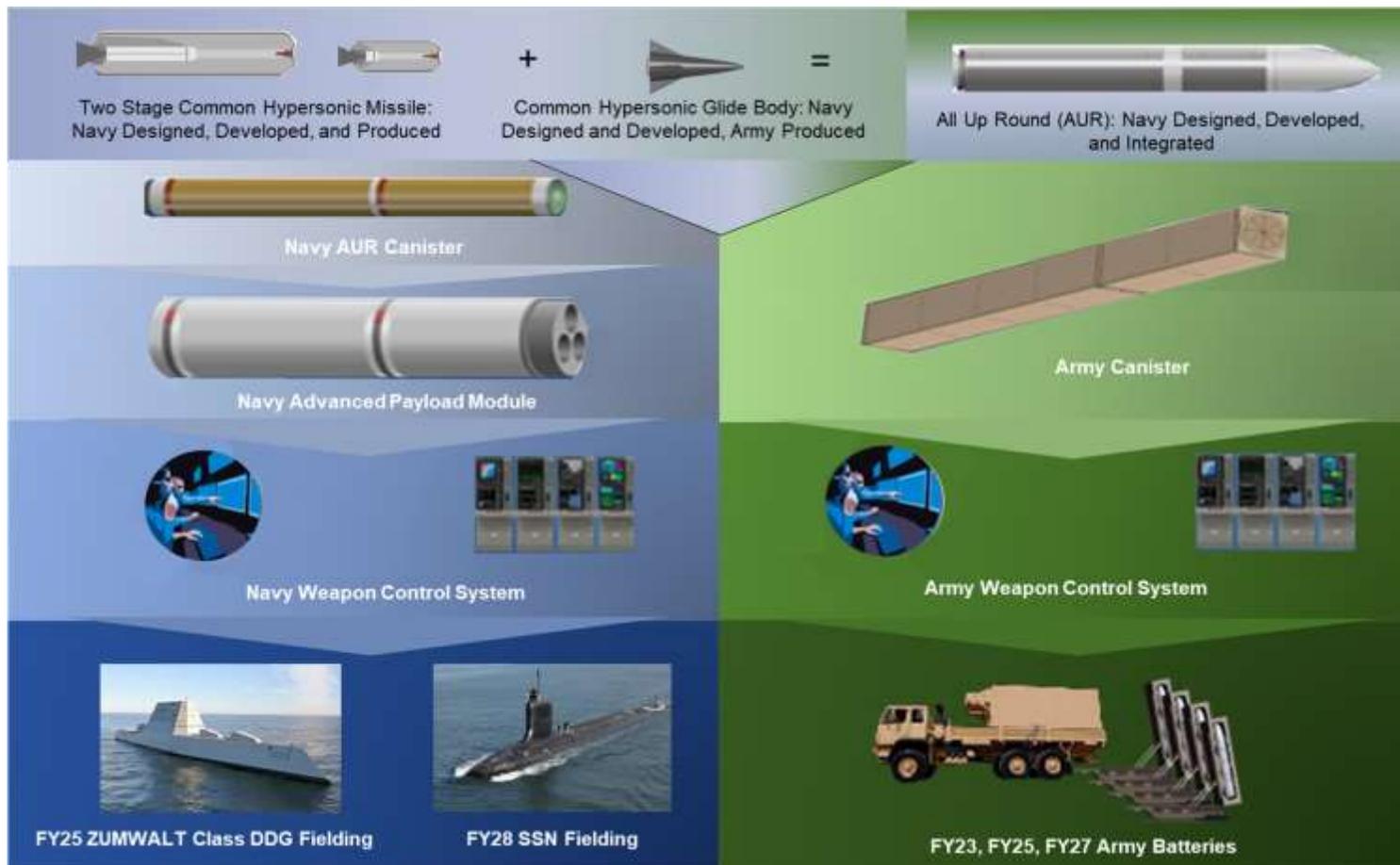
“Our biggest R&D effort is in hypersonics — to deliver that capability in 2025 on a surface ship and then on Block V [Virginia-class] submarines.”
– CNO Admiral Mike Gilday

“Conventional hypersonic weapons will fill an important role by providing options to hold high-value, time-sensitive and other targets at risk...”
– Admiral Charles Richard, Commander USSTRATCOM

CPS is providing a common hypersonic weapon system and delivering a sea-based hypersonic capability to the warfighter by the mid- to late-2020's



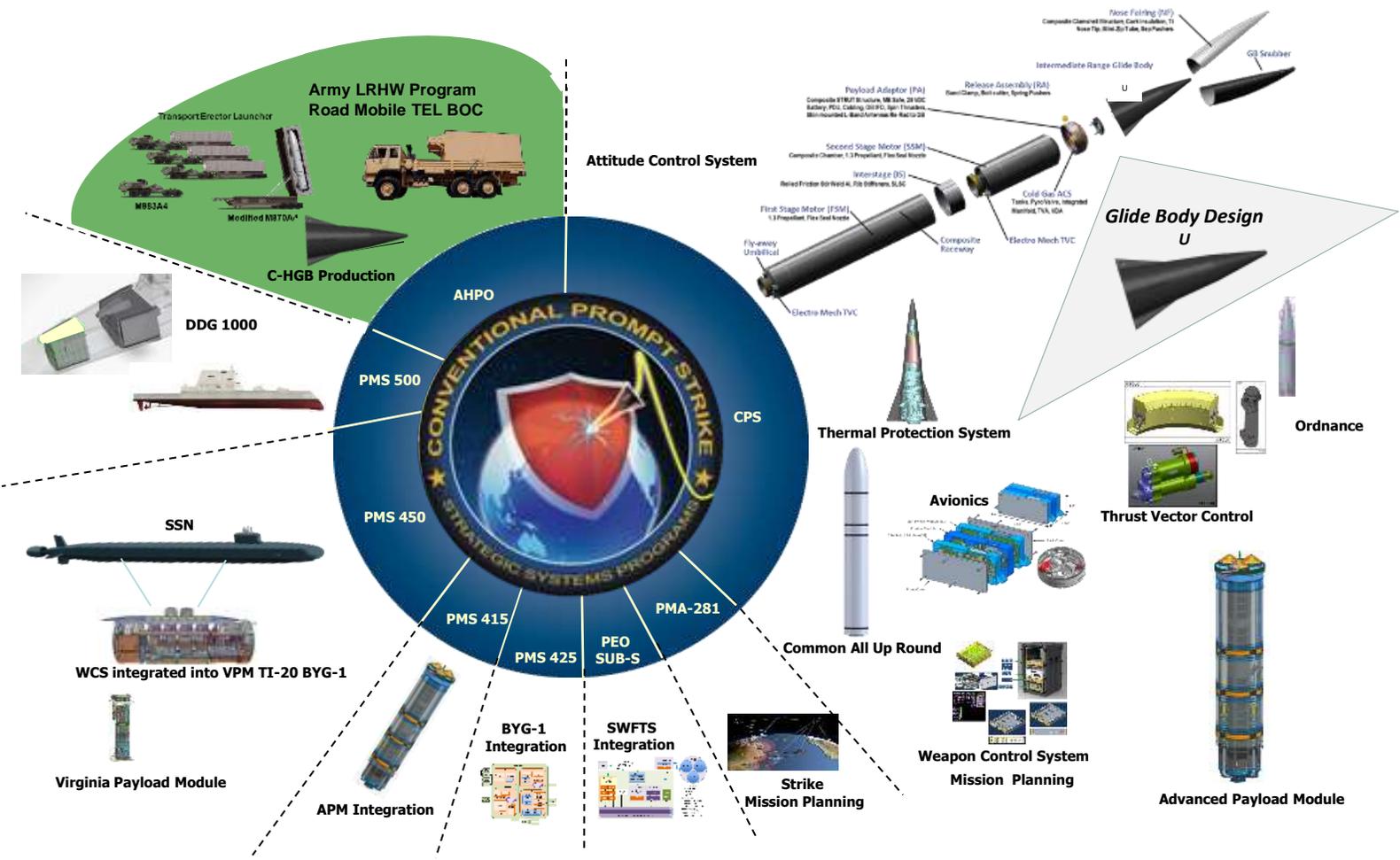
CPS Overview Same Missile – All Platforms



Navy is responsible for design and development of a common missile (propulsion and C-HGB), production of the missile booster, and integration of missile booster with the Army produced C-HGB to deliver and AUR for platform integration by Army and Navy



CPS Stakeholders





Industry Support

- March 2020 Flight Experiment 2 (FE-2) test success demonstrated that hypersonic technology is mature and can provide desired warfighting capability
- CPS industry partners have worked diligently with the Government National Team to transition science and technology hypersonic projects to industry for production, platform integration, and delivery of capability into the hands of warfighters
- CPS has worked closely with industry partners and OSD to identify supply chain issues and put mitigation plans in place as part of the Hypersonics Industrial Base War Room
- CPS partners have risen to the challenge in many ways to keep the program on schedule



Common Hypersonic Glide Body

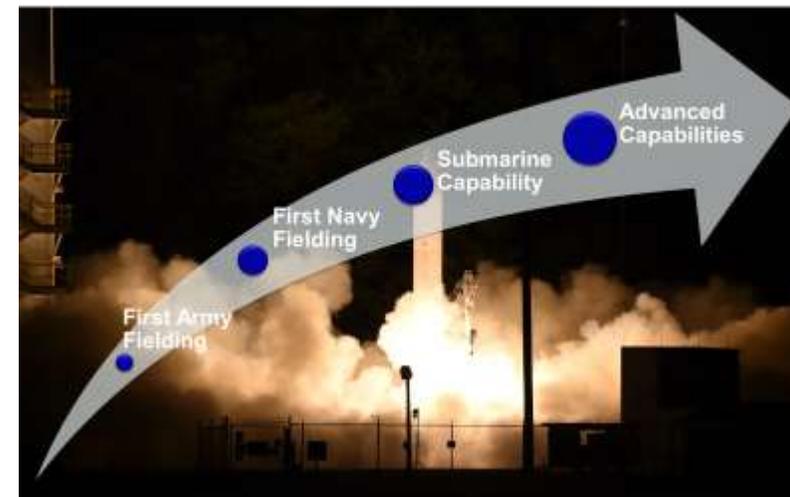
"We want to make sure that we fully leverage the talent and industrial base not only in the United States, but with our allies..."

- Michael White, Principal Director for Hypersonics, OUSD R&E



Fast Track from BLK 1 to Technology Insertions

- Each Technology Insertion (TI) is a four-year effort (from ADA to Fielding) to deliver baseline upgrades & Science & Technology / Advanced Capability (STAC) technologies
 - Baseline upgrades include: Platform Integration (DDGX, SSN) and Platform, Launcher, and Weapon Control System unique updates; producibility / affordability enhancements; Obsolescence & logistics management concerns
- CPS Science and Technology and Advanced Capability (STAC) efforts will drive warfighting capability improvements for both Navy and Army to ensure battlefield dominance
 - Navigation, Guidance, and Control improvements
 - Survivability improvements against Integrated Air Defense Systems
 - Provide lethality against expanded target sets
 - Increased integration with Joint All-Domain Command and Control (JADC2) kill-chains
- STAC process manages technology maturation and integration planning prior to ADA when technology graduates into the appropriate TI



Technology Insertion Roadmap

	FY22	FY23	FY24	FY25	FY26	FY27	FY28
TI-22	▲	★					
TI-24			▲	★			
TI-26					▲	▶	
TI-28							▲ ▶

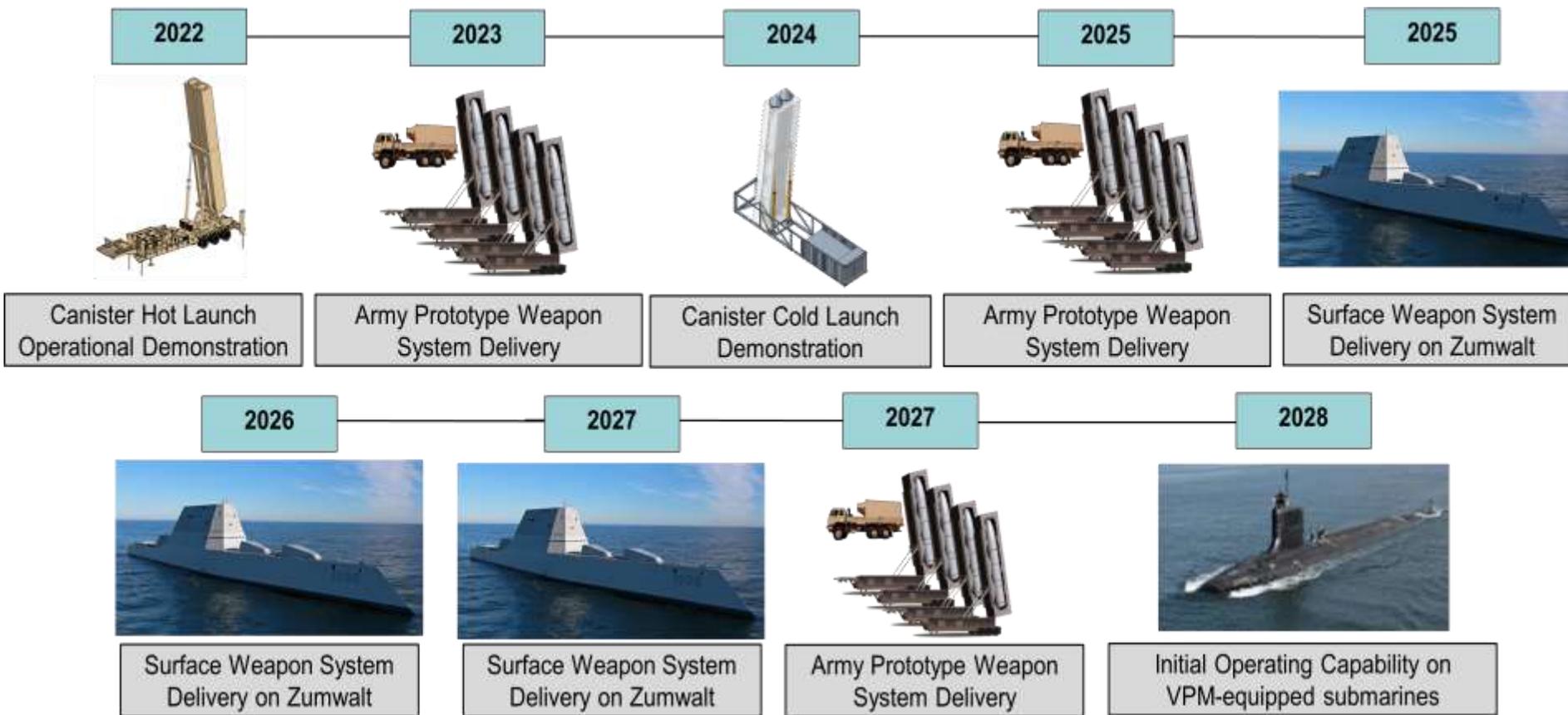
▲ ADA ★ Fielding

- **Block 1:** Building baseline configuration to support Army Deployment in FY23
- **TI-22:** Designing TI-22 changes now to support surface ship deployment in FY25
 - Held ADA Decision 19 Nov 2021
- **TI-24:** Conducting future technology/capability assessments to support subsurface deployment in FY28
 - Kickoff Feb 2022
 - ADA Decision Q1FY24

CPS is fast paced, requiring a different approach



Major Milestones



CPS is moving rapidly to deliver a land and sea-based hypersonic strike capability to the warfighter



Technical Q&A

- What challenges do SYSCOMs NAVSEA and SSP foresee in scaling these technologies to the operational level?
- How will the long-term sustainability of these innovative solutions be addressed?
- Is there any interest or discovery into utilizing nano coatings to increase the survivability electronics for servers drones drone inspection and other electronic devices for the Navy, SBIRs aren't really targeting advanced materials?

Closing

