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Indian Head

The Role of the Navy's Arsenal in Counter Unmanned Aerial System Capabilities

Presented to:

NDIA Emerging Technologies Institute

Presented by:

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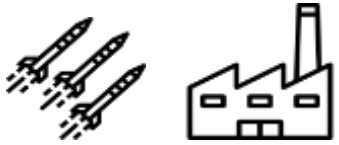
What is the role of the Navy's OIB (the Arsenal)?

"The DoD must leverage the USG-owned OIB which complements the commercial DIB by providing a ready and controlled source of technical competence to support the force structure and requirements"
National Defense Industrial Strategy

Three Core Roles:

1. **Advance energetics S&T and manufacturing state of the art**

2. **Maintain national industrial capabilities as the foundational backstop to CIB**



3. **Sustain Government expertise**

Catalyst to:

- **Invest in innovation**
- **Onboard new industrial partners**
- **Surge for war & protraction**
- **Maintain latent capacity during peacetime**

Drives energetics innovation.
Meets surge manufacturing requirements.
Sustains Navy's energetics expertise.

What are energetics?

Energetics power the performance of every munition:

- Range, Speed, Lethality, Signature, Safety, Logistics

Energetics include:

- Ingredients → Formulations → Energetic material systems

Energetics are essential to every warfighting domain:

- Undersea, Surface, Air, Space, Expeditionary, Ground

Development of advanced energetics will improve the performance of our legacy and future, state of the art munitions.

State of DoD energetics

Background: The energetics industrial base has degraded due to volatile demands, market consolidation, and fragile supply chains

- **Capability:** most Navy munitions use outdated energetics
- **Capacity:** energetic material systems are production bottlenecks

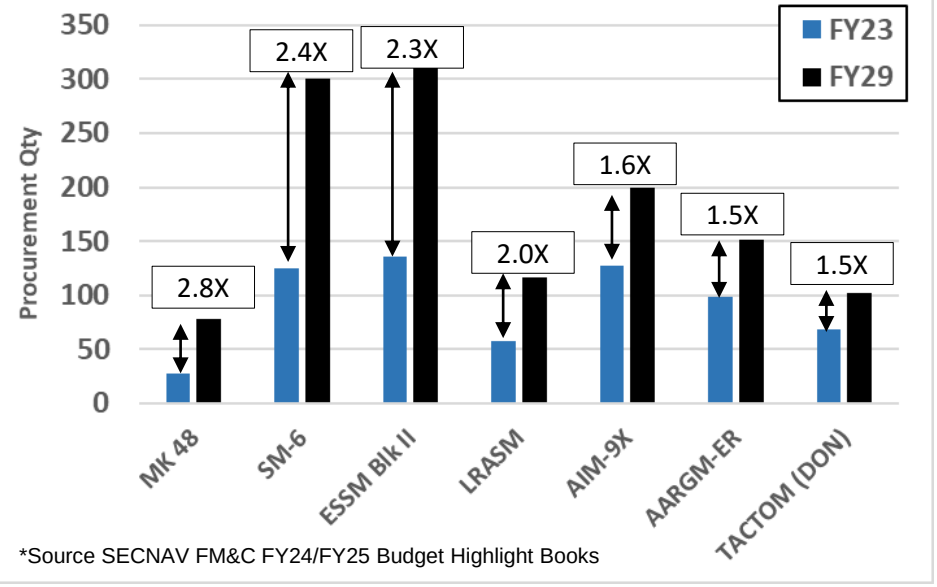
Challenges:

- **Capability:** energetics advancement is needed to keep pace and enable new warfighting concepts
- **Capacity:** munitions procurement more than doubled over PB24 FYDP
- **Readiness:**
  - Commercial Industrial Base (CIB): higher readiness, but operating near max capacity
  - Navy Organic Industrial Base (OIB): significant latent capacity available, but lower readiness

c-UAS will continue to stress the Navy's need for More, Better, and Affordable Munitions & Interceptors

Houthi Attacks = Navy Capability/Capacity Challenge

Increased Procurement = Industrial Base Challenge



*Source SECNAV FM&C FY24/FY25 Budget Highlight Books

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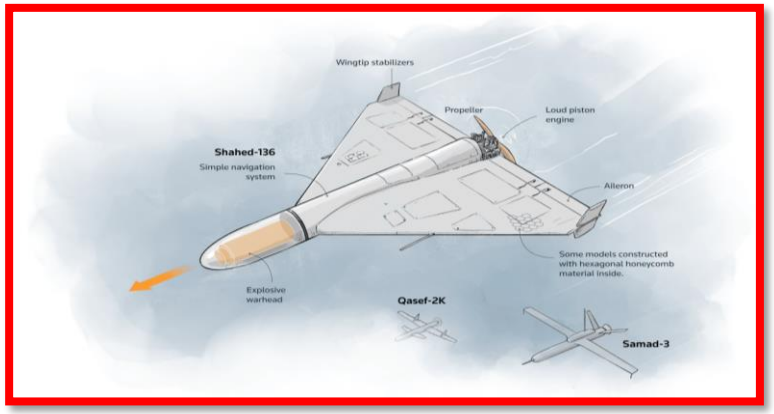
State of weaponized-UAS threat

Advantages of weaponized UAS:

- Low cost / COTS
- Small / low observable
- Quiet / low emission
- Small / man portable
- Loitering capabilities
- Swarming capabilities



The Innovation Challenge: Speed of Change

- Low cost and lower barriers to entry allows for faster technology evolution than traditional weapon systems:
  - ➢ Increasing technology sophistication and improved tactics observed on the various battle fields today

"Basically every 90 days, the environment completely changes. Whatever capabilities they are fielding, countermeasures are developed for those and so they have to keep staying ahead of the curve." –Aditi Kumar, Deputy Director, DIU

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How to counter UAS threat

Offensive (Launch sites)		Defensive (in flight)		
Kinetic				Non-Kinetic
Precision Bombs	Missiles	Missile-Based Interceptors	Gun-Based	EW / DE / Other





Reliance on kinetic solutions is not going away.
Demand for Capability (technology development) and Capacity (production)

Kinetic c-UAS Technology at NSWC IHD:	**Missiles and Rockets:** Provide the greatest distance. Can be guided.	**Guns and Projectiles:** Shorter range. Lower cost. Fired manually or remotely.
Kinetic c-UAS Production at NSWC IHD:	**Rocket Motors and Warheads:** High Volume Extrusion; Unique Material Scale Up	

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IKECSG against Houthi threats

9-month deployment:

Offensive	Defensive
Kinetic	
Missiles	Missile-Based Interceptors
• 135 Tomahawk Land Attack Missiles • 420 various air to surface missiles	• 155 Standard-Missile variants • 60 various air to air missiles

Munition expenditures countering Red Sea UAS threats are significant

https://www.navy.mil/Press-Office/News-Stories/Article/3838261/unprecedented-dwight-d-eisenhower-carrier-strike-group-returns-from-combat-depl/

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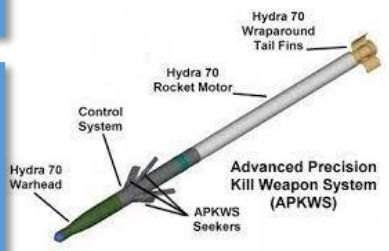
Example: 2.75” Rocket Proximity Fuze

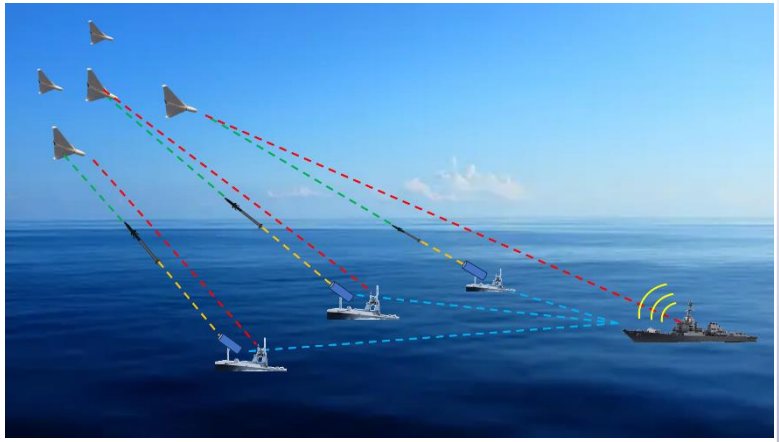
Goal: Convert 2.75” weapon into use for c-UAS mission

Background:

The Hydra 2.75” rocket is a tri-service, low-cost weapon:

- Historically used for air-to-ground/surface missions
- Utilizes semi-active laser guidance
- Typically fired from close-in attack aircraft





L3H Vehicle-Agnostic Modular Palletized ISR Rocket Equipment (VAMPIRE)

Solution:

- Integrate a proximity fuze for the 2.75” warhead
- Incorporate RF Seeker, enabling APKWS to target Group 2/3 UAS

Benefits:

- Multi-domain applications
- Reliable & effective terminal effects against fast moving targets
- Efficient targeting and engagement for multiple targets

Conceptual use of 2.75” Rocket for c-UAS Mission

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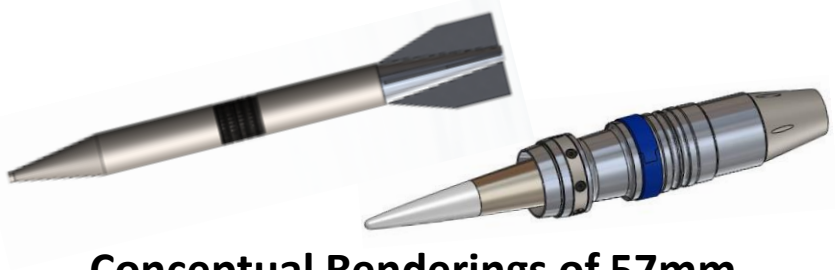
Affordable and Effective 57mm Ammo

Goal: Provide a cost relevant 57mm ammo solution, meeting demand capacity for emerging threats

Solution:

- Use of Navy NISE 219 funding
- Co-development by NSWC IHD and NSWC Dahlgren
- Portfolio of low-cost, continuously guided interceptors
- Addresses designs for:
  - Airframe
  - Guidance
  - Propulsion
  - Terminal effects
  - System integration

Mk110 Naval Cannon, Firing 57mm Ammunition



Conceptual Renderings of 57mm Affordable and Effective Ammo Solutions

Benefits:

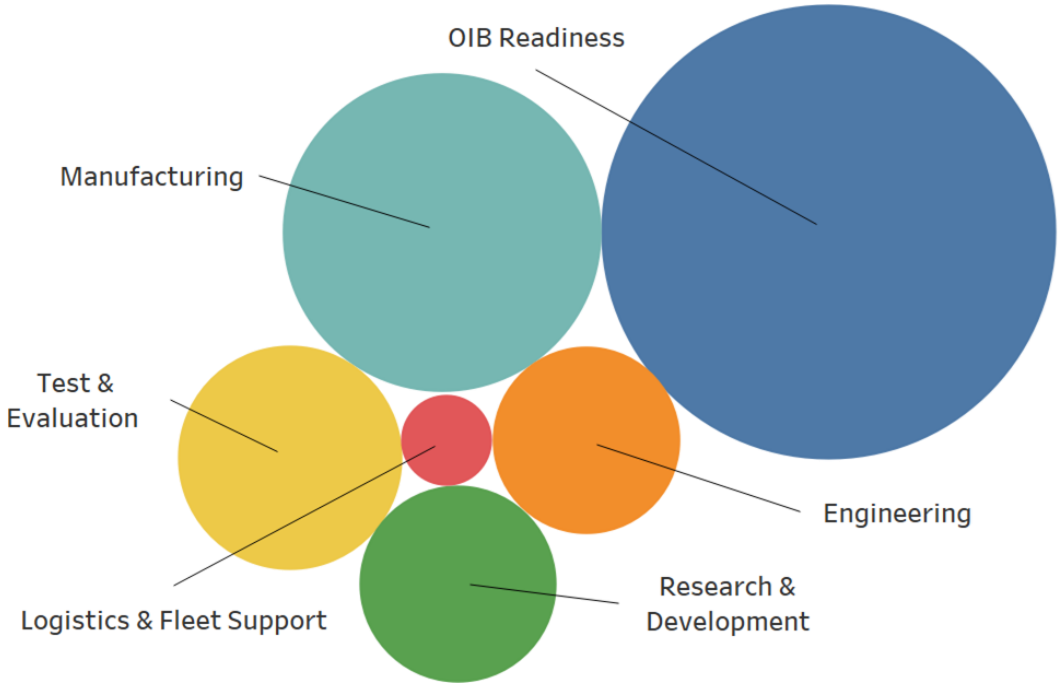
- Additional range (platform standoff) via state-of-the-art propulsion
- Advanced lethality warhead to defeat emerging threats
- Warfare Center technical competency in naval gunnery (Government TDP)
- Industrial base competition for manufacturing

Energetics Comprehensive Modernization Plan

Goal: Improve the capacity of the Navy's Energetics' Organic Industrial Base

- $2.7 billion, 15-year modernization plan
- Over 500 projects across three phases:
  1. Unlock near-term latent capacity by improving safety & readiness
  2. Expand capacity through renovation of existing facilities
  3. Further expand capability/capacity through modernization

ECMP Summary (FY23 – FY37)



Near: Improved Safety + Readiness
Mid: Expansion through Renovation
Far: State of the Art Modernization

ECMP has already started
FY23: $120 million obligated
FY24: $200 million+ obligation plan

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How can we work together?

NSWC IHD Designation as a **Center for Industrial and Technical Excellence (CITE)** for:

- Energetics and Ordnance Systems Depot Maintenance
- Arsenal activities

CITE provides legal authority for NSWC IHD to form **Public-Private Partnerships (P3s)**.

- Promotes the use of existing, unique facilities with established technical expertise, equipment, processes and procedures without significant fixed cost investment
  - Workloads critical plant complexes
- Facilitates flexible development, manufacture, test, maintenance, and storage of energetic materials and ordnance systems

Come explore new partnerships using the Navy's only full spectrum public arsenal to develop, test, and manufacture your c-UAS concepts.

The Navy's Arsenal is open for business.

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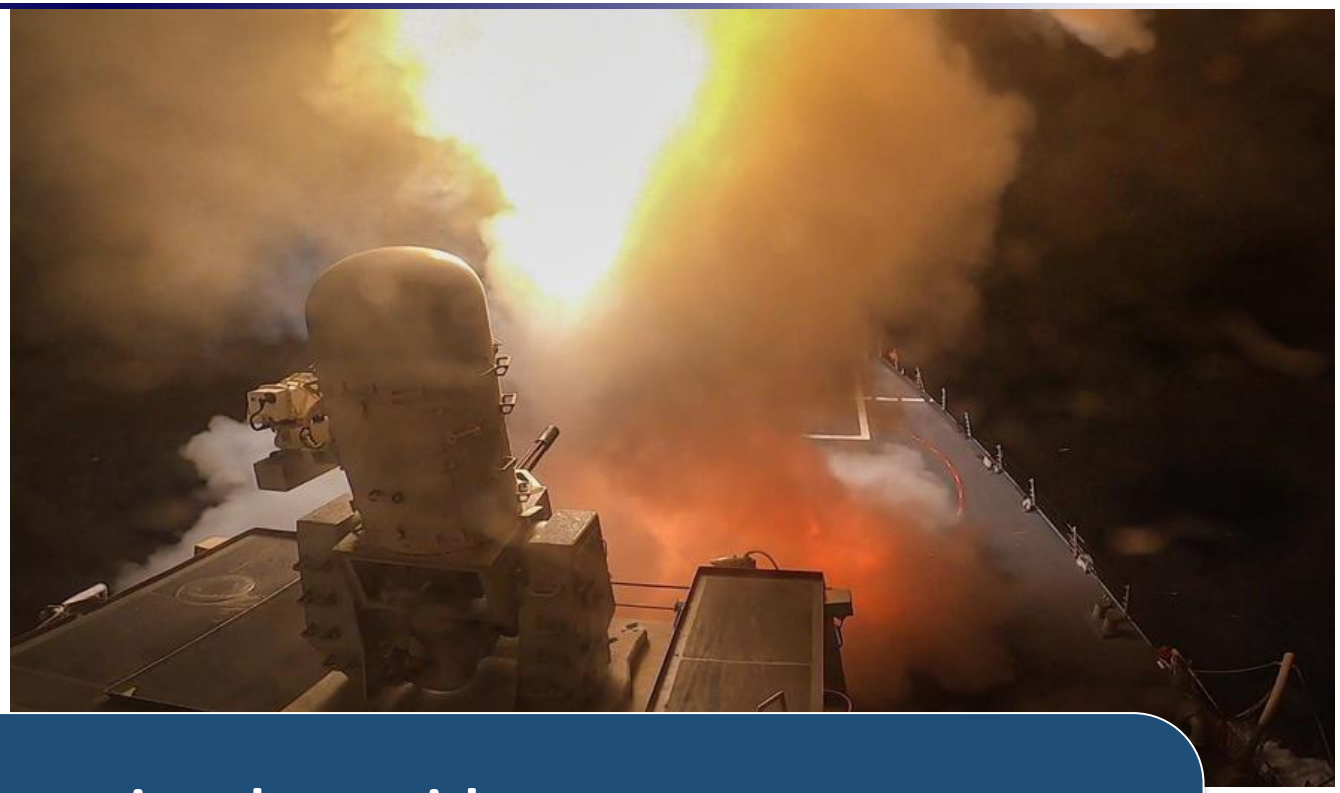
Energetics are required for kinetic c-UAS solutions

Investment in energetics enables our forces to:

- Deliver a stronger punch
- Prosecute additional targets
- Lengthen our reach
- Keep our platforms more survivable
- Remain in the fight for as long as possible



Formidable and determined adversaries along with non state actors are advancing UAS capabilities at an incredible pace.

Energetics provide the means for more effective c-UAS kinetic defeat solutions.

Questions?

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