65th Annual Fuze Conference

OUSD(R&E) and Munitions Perspective

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Office of the Under Secretary of Defense
Research and Engineering

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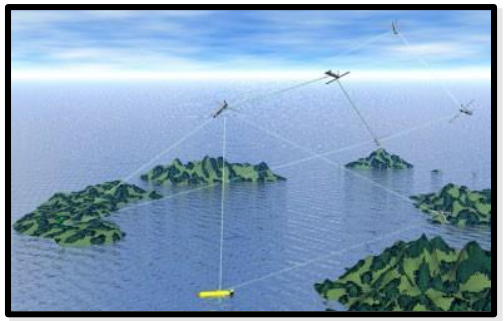
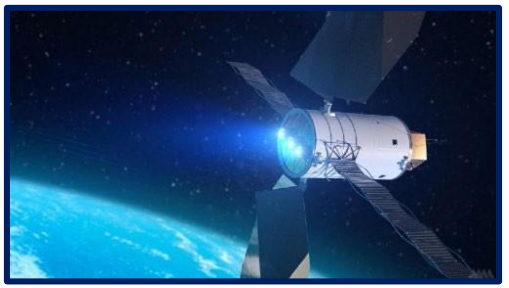
USD(R&E) Mission

- **Ensure U.S. Military Technological Superiority**
  - Set the technical direction for the Department of Defense
  - Champion and pursue new capabilities, concepts, and prototyping activities throughout the DoD research and development enterprise
  - Conduct independent technical risk assessment
- **Bolster Modernization**
  - Pilot new acquisition pathways and concepts of operation
  - Accelerate capabilities to the Warfighter





PROVIDING SCIENCE AND TECHNOLOGY LEADERSHIP THROUGHOUT THE DOD TO MEET THE CHALLENGES OF TODAY AND TOMORROW

OUSD(R&E) Organizational Structure

Defense Agency
Field Activity

Under Secretary of Defense (R&E)
Honorable Heidi Shyu

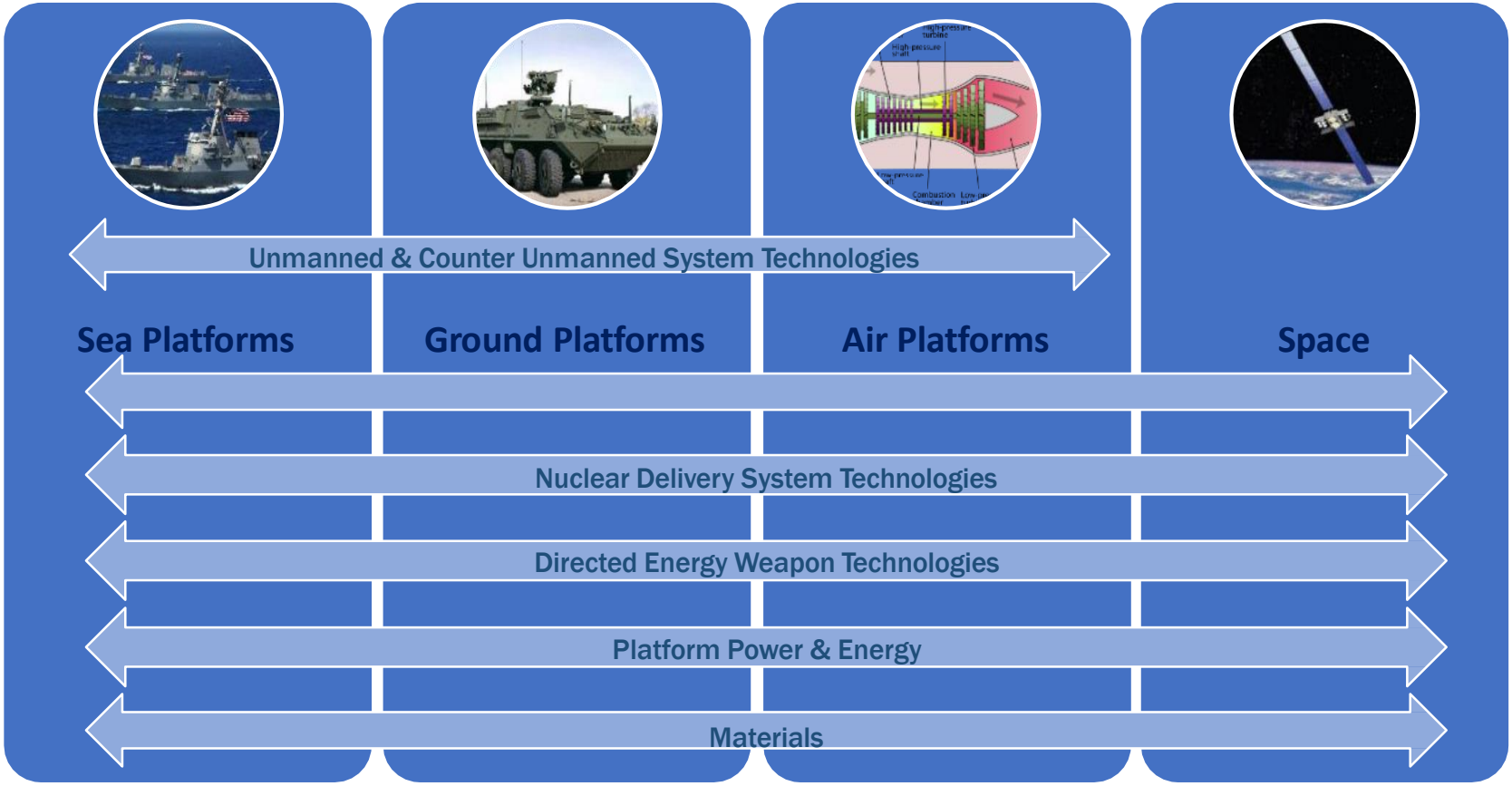
Deputy Under Secretary of Defense (R&E)
Honorable David Honey

- Defense Science Board
- Defense Innovation Board
- Business Operations
- Missile Defense Agency
- Defense Advanced Research Projects Agency
- Space Development Agency
- Defense Innovation Unit
- Director of Defense Research and Engineering (Research & Technology) Principal Deputy Director (R&T)
  - JRD
  - Administrator, Defense Technical Information Center
  - Director, Joint Hypersonics Transition Office
  - Deputy Director, Strategic Technology Protection & Exploitation
  - Deputy Director, Research, Technology & Laboratories
  - Deputy Director, Science & Technology
- Director of Defense Research and Engineering (Modernization)
- Director of Defense Research and Engineering (Advanced Capabilities) and Dir TRMC* Principal Deputy Director (AC)
  - Director, Test Resource Management Center

The DD, Science & Technology (S&T) champions the DoD S&T enterprise throughout the Department.

P&WT Mission & Functions

(U) Champion and shape investment in critical enabling technologies for kinetic and directed energy weapons, operational power and energy, materials and Aerospace Technologies research, and both manned and unmanned systems technologies across the domains of air, land, sea and space



OUSD(R&E) Critical Technology Areas

Categories of Critical Technology Areas (CTAs)

14 Critical Technology Areas

Areas of Emerging Opportunity

- Biotechnology
- Quantum Science
- Future G
- Advanced Materials

Effective Adoption Areas

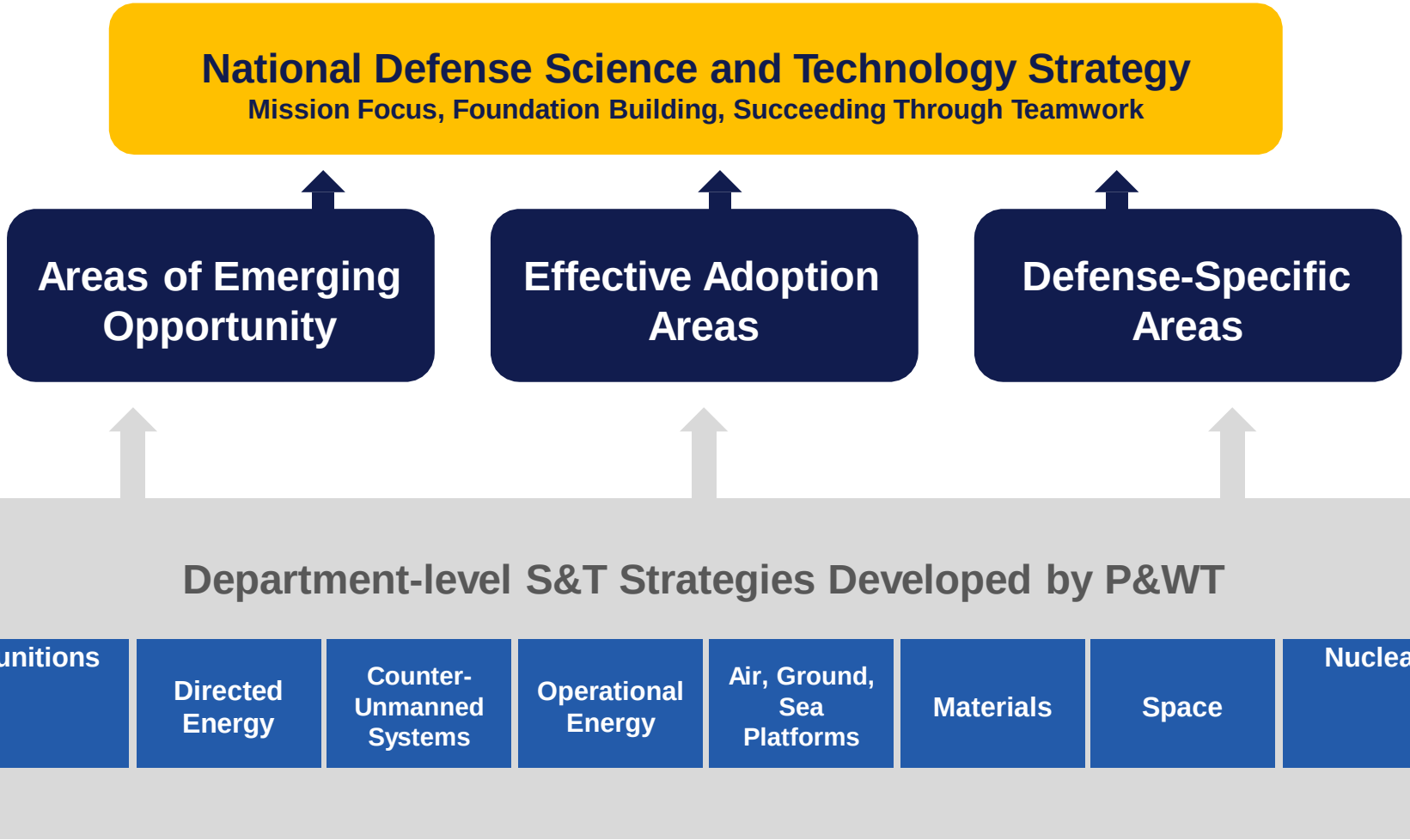
- Trusted AI and Autonomy
- Integrated Network Systems-of-Systems
- Microelectronics
- Space Technology
- Renewable Energy Generation Storage
- Advanced Computing & Software
- Human-Machine Interfaces

Defense-Specific Areas

- Directed Energy
- Hypersonics
- Integrated Sensing Cyber

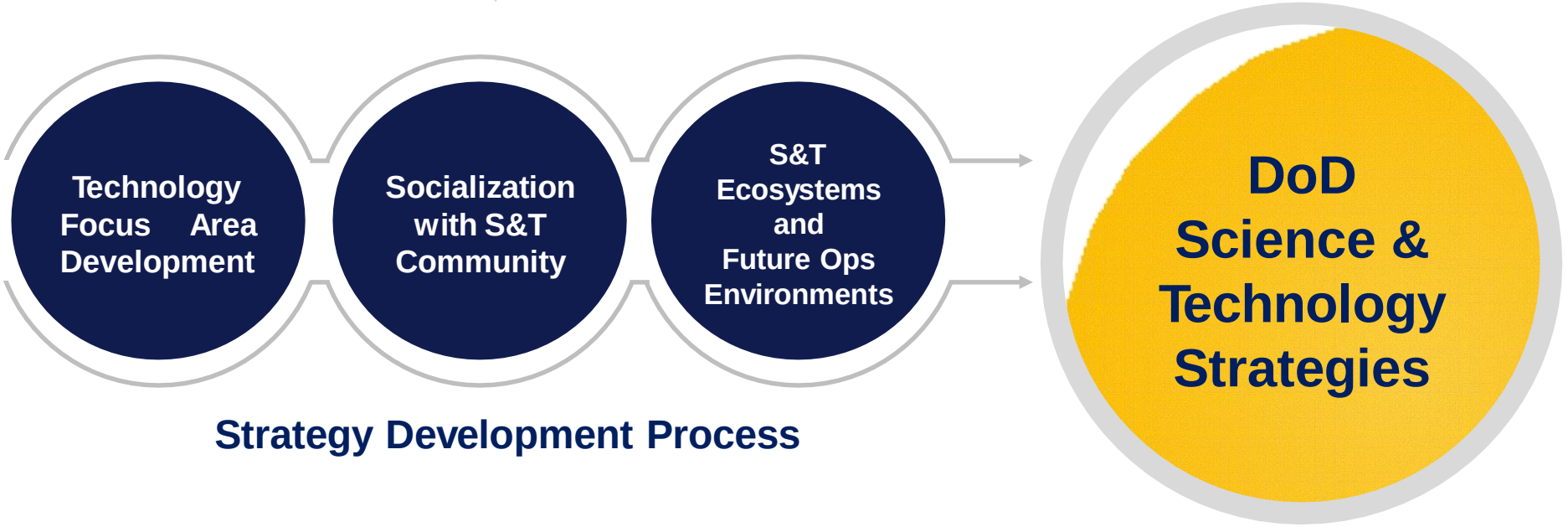
These categories and CTAs represent the broad and different approaches that are required to advance technologies crucial to the Department.

Connection Between OUSD(R&E) CTAs and S&T Strategies



DoD S&T Strategy Development

P&WT developed strategies to guide Department S&T efforts



Strategy Development Process

Munitions S&T Strategy Objectives

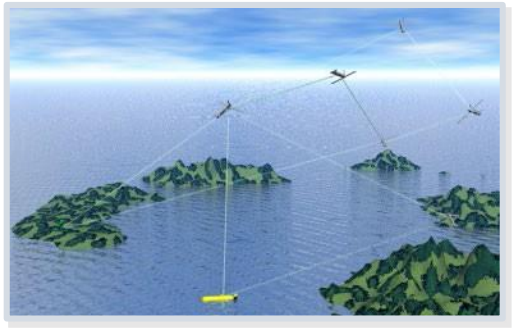
Munitions Effectiveness

Ensure decisive results by increasing range capability, increasing speed, and improve effects to allow effective target prosecution

Munitions Readiness

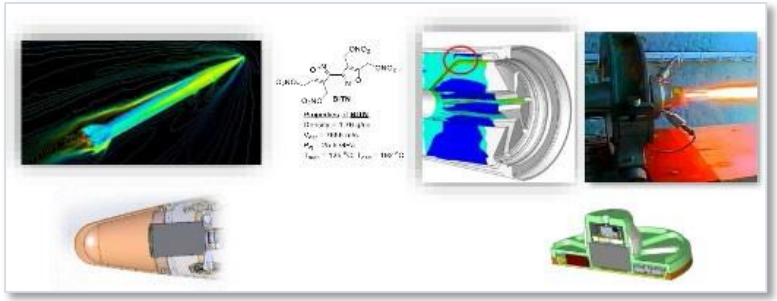
Secure capability by affirming munitions safety, improving producibility and availability to support the Joint Force.

Munitions Versatility



Expand effects options and use-cases to be able to rapidly adapt to changing requirements

Operational Efficiency



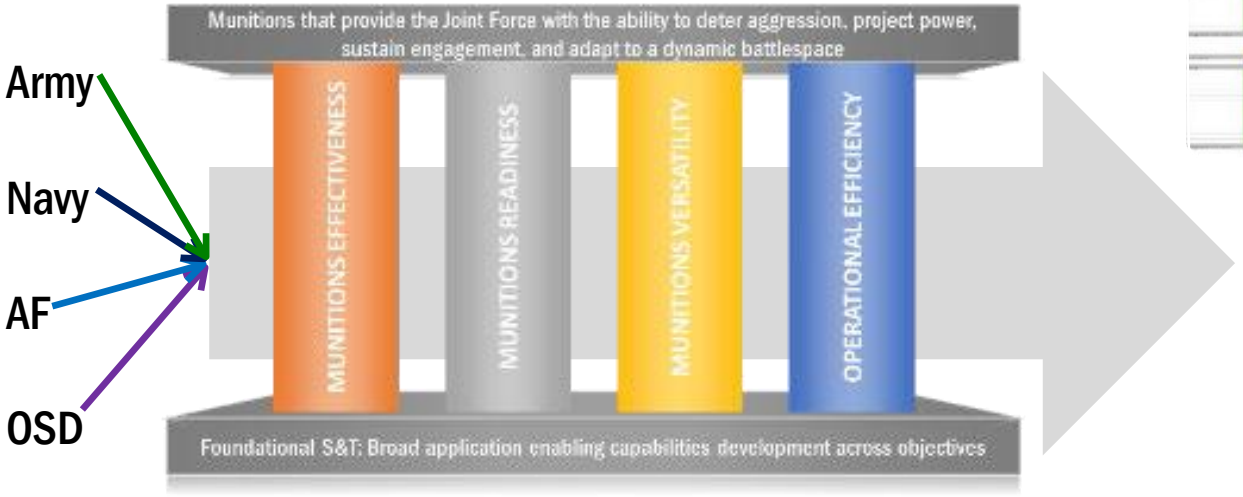
Enable forces to optimize effects and effectively using the fewest resources

Munitions S&T Strategy and Roadmapping

Portfolio Inputs Received → Munitions Strategy Mapping compiled → Strong alignment with the Munition Effectiveness and Munition Readiness Pillars of the Munitions Strategy. → Validate inputs and additional analysis → Next Steps: Draft Integrated S&T Roadmaps

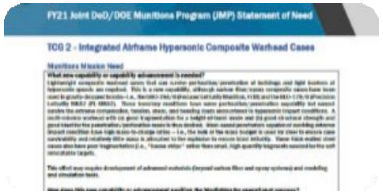
State of S&T Investments

Munitions S&T Strategy:

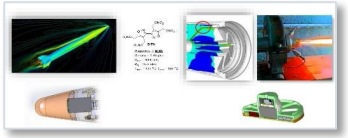


Munitions S&T Roadmaps

S&T Statements of Need



JMPO and DoD Investments



R&E Munitions S&T Programs

Joint DOD DOE Munitions Technology Development PE # 0603225D8Z

$K	FY 2021 Actual	FY 2022 Enacted	FY 2023 PBR
PE TOTAL	18,873	19,063	18,898
Joint DOD/DOE Munitions Technology Development	18,873	19,063	18,898

- Purpose: Equip the future Joint Force with munitions capabilities to ensure military superiority
  - Championing and pursuing new capabilities with threat-informed technology prioritization
  - Driving innovation and accelerating advancement of technology for Joint Force capabilities
- OSD Program: Priority driving, responsive and agile S&T projects that leverage Department of Energy (DOE) weapon lab capabilities
  - Resourced by DoD (OUSD(R&E)) and matched by DOE (National Nuclear Security Administration)
  - Executed by NNSA Laboratories, Lawrence Livermore National Laboratory, Los Alamos National Laboratory, Sandia National Laboratory
  - S&T Program, TRL 3-6, 6.3 PE line, must have synergistic DoD and DOE value
- Program Partners:
  - OUSD(R&E) – Joint Enhance Munitions Technology Program
  - Services – Costumer of JMP technologies

Joint Enhanced Munitions Technology Program PE # 0602000D8Z and PE # 0603000D8Z

$K	FY 2021 Actual	FY 2022 Enacted	FY 2023 PBR
Joint Munitions Technology - PE # 0602000D8Z	24,098*	20,591*	18,961
Joint Munitions Advanced Technology - PE # 0603000D8Z	21,625	30,140*	34,065

* Includes Congressional Adds

- **Purpose:** Develop and demonstrate enabling (6.2) and advanced (6.3) munitions technologies to provide weapons capabilities that address future joint fight capability needs.
- **Program Partners:**
  - National Armaments Consortium (NAC) – Industry and academic activities in munitions research and development base
  - Department of Energy: applied research munitions technologies.
  - DoD Fuze IPT: Gov't and Industrial fuze base and stakeholders for fuzing science and technology exchange and collaboration.
  - DoD Munitions Development Community: Primary recipient of JEMTP technologies to incorporate in next generation systems.

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JEMTP/JFTP Merge

- Joint Fuze Technology Program (JFTP)
  - Focus on enabling and common fuze technologies
  - Set technical direction for fuze solutions and technologies that enable munitions
  - Four Fuze Area Technology Groups (FATG)
    - Extreme Environment Survivable Fuzing
    - Tailorable effects and Initiation
    - High Reliability Safety and Arming Devices
    - Target Detection and Burst Point Control

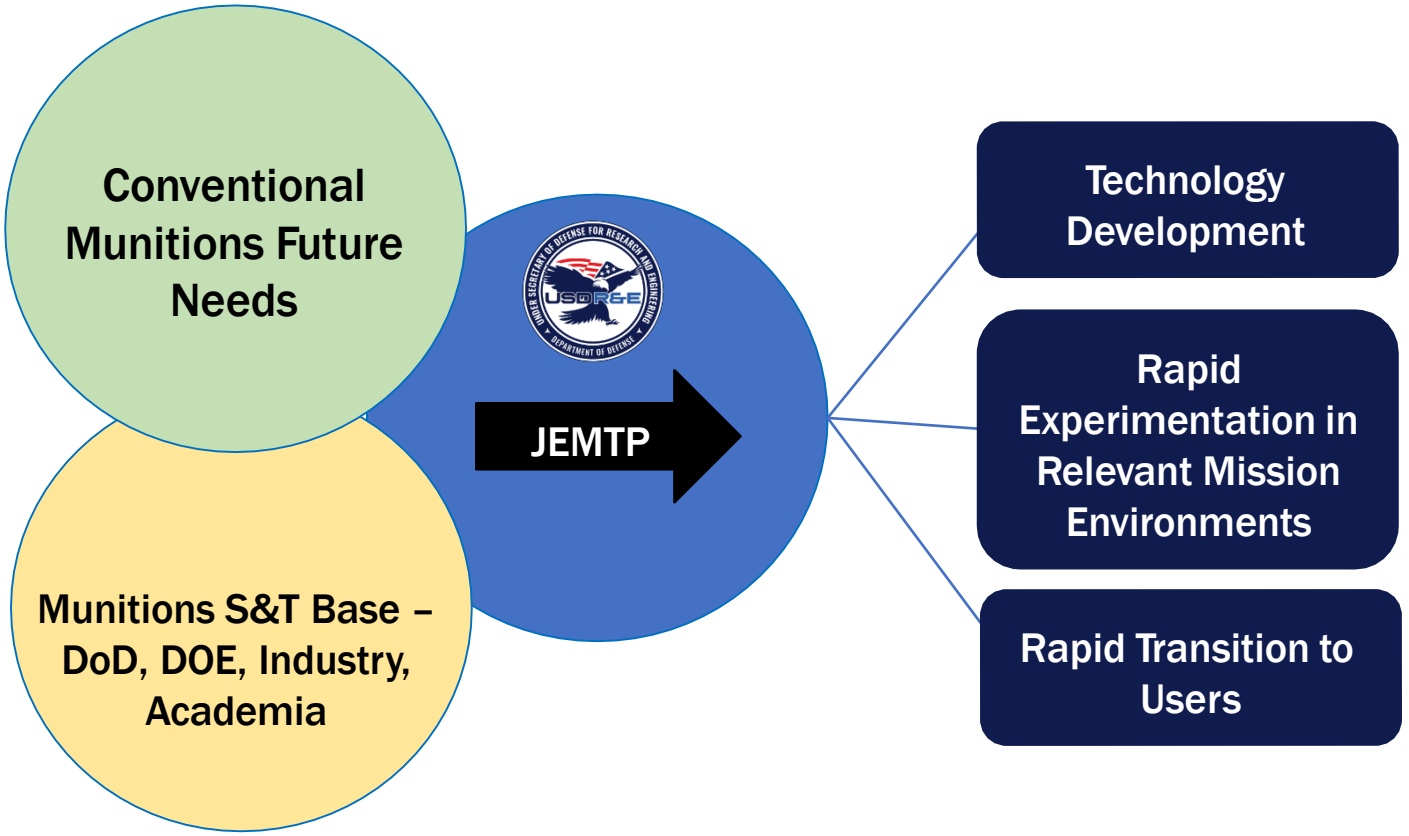
- JEMTP
  - Focus on performance enhancing technologies for munitions
  - Prioritize common technology gaps across services for increased performance, range, and lethality of weapons systems
  - Utilize developed IM technologies for risk mitigation
  - Emphasis on technology development and relevant capability demonstrations (TRL-5)

Effective Fiscal Year 22

Joint Enhanced Munitions Technology Program (JFTP/JEMTP Merged)

- Rapidly adapt new technologies to drive munitions S&T
- Expanded development of munitions relevant technology to address gaps and rapidly exploit new technologies
- Coordinated with DOE through JMP; shared Statements of Need (SONs)

Joint Enhanced Munitions Technology Program



The JEMTP is the focal point for the DoD to leverage the resources and talent from U.S. munitions S&T base and accelerate development and demonstration of enabling and advanced capabilities

JEMTP Success Stories

Munitions Effectiveness

Advanced Proximity Target Detection Device

JFTP advanced sensor technology is being produced in the DSU 43/B bomb proximity sensor replacing the DSU-33 for general purpose and Joint Direct Attack Munition (JDAM) bombs. Improved height of burst performance to maximize warhead effectiveness.

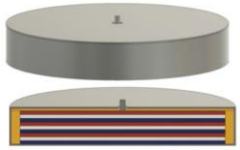
MOFA2 Fuze

DSU 43/B bomb proximity sensor

Munitions Readiness

Munitions / Fuzing Power Sources

Completed R&D and transitioned to Industry development and manufacturing of conformal and scalable reserve batteries for munitions



Schematic image and cross-section of initial advanced thin film thermal battery

R&E and Munitions S&T Priorities

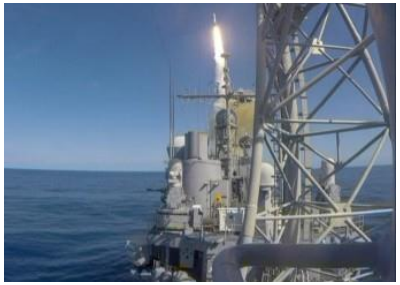
- Mission focus
  - Align technology to mission objectives
  - Incorporate technology intelligence
- Foundation building
  - Invest in technology infrastructure
  - Develop technology policies
- Succeed through teamwork
  - Collaborate with diverse partners
  - Focus efforts on issues unique to national defense

- Roadmapping efforts with Munitions stakeholders
- Continued focus on future operating environment
- Continued socialization of Munitions S&T strategy

What to look forward to…

Further munitions partnership across DoD/Industry/Academia/DOE along with U.S. Allies

Focus on technology transition pathways



Deliberate technology planning and agility in modernization and manufacturability