Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Office of the Secretary Of Defense	Date: March 2023
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide I* BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603225D8Z *I Joint DOD DOE Munitions Technology Development*

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	-	18.341	17.279	19.567	-	19.567	19.985	20.430	20.858	21.295	Continuing	Continuing
225: *Joint DOD DOE Munitions*	-	18.341	17.279	19.567	-	19.567	19.985	20.430	20.858	21.295	Continuing	Continuing

Note

New Start (Y/N): N

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Deter Aggression and Prevail in Conflict, Defend the Homeland, Build Sustainable and Long-Term Advantage, and Build a Resilient Joint for and Defense Ecosystem.

The Department of Defense (DoD)/Department of Energy (DOE) Joint Munitions Technology Development Program (JMP) enables military superiority by setting and driving the critical path for cutting-edge capability-driven munitions science and technology (S&T) to equip the Joint Force for the future fight. The JMP portfolio comprises essential cross-cutting and foundational S&T investments that enable Future Force operational capabilities in the near, mid, and far term. In setting the technical direction for the DoD, the Joint DoD/DOE Munitions Program performs S&T to advance the state of the art for non-nuclear munitions technology in the focus areas of decision tools, delivery, munition controls, lethal effects, and readiness.

A Memorandum of Understanding between the DoD and DOE provides the basis for the cooperative effort. Through this interdepartmental cooperation and joint investment (DOE matches the DoD's investment at 1:1), DoD leverages the DOE's substantial investments in intellectual capital and highly specialized skills, advanced scientific equipment and facilities, and computational tools not available within the DoD, bolstering good stewardship of taxpayer dollars. The portfolio is monitored by a panel of Tri-Service subject matter experts who conduct rigorous technical and programmatic review to prioritize essential investments. The technology, resources, and capabilities return for DoD in this program is estimated at two to three times its investment.

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B. Program Change Summary ($ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	19.003	18.898	19.457	-	19.457
Current President's Budget	18.341	17.279	19.567	-	19.567
Total Adjustments	-0.662	-1.619	0.110	-	0.110
• Congressional General Reductions	-	-1.619			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.659	-			
• Program Adjustments	-0.003	-	0.110	-	0.110

Change Summary Explanation

FY 2024 minimal increase due to programmatic adjustments.

Exhibit R-2A, RDT&E Project Justification: PB 2024 Office of the Secretary Of Defense			Date: March 2023
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603225D8Z / *Joint DOD DOE Munitions Technology Development*	Project (Number/Name) 225 / *Joint DOD DOE Munitions*	

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
225: *Joint DOD DOE Munitions*	-	18.341	17.279	19.567	-	19.567	19.985	20.430	20.858	21.295	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Projects within the Joint Munitions Technology Development Program (JMP) portfolio enable capability advancements in: higher speed and hypersonic delivery, counter unmanned aerial systems, microelectronics, longer range precision effects, networked and collaborative systems of systems, agility at the engagement level, logistics in contested environments, increased capacity/affordable mass, survivability during deployment and target engagement, rapid technology refreshes/adaptation to changing threats, post-launch re-programming, open systems architectures, and weapon cyber-resiliency. JMP investments may be leverageable for nuclear deterrence, space, quantum science, and 5G, but the portfolio does not specifically focus on these capability areas.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Title: Joint DoD/DOE Munitions Technology Development	18.341	17.279	19.567

Description: DoD/DOE Munitions Technology Development focuses on the following key areas: (1) the development of in silico decision tools for munition design and in-theater function; (2) innovation of munitions delivery technology to include weapon bodies, propulsion systems, propellants, and environment/target hardening; (3) development of state-of-the-art munition controls for fuzing, microelectronics, power, sensors, kill chains, and survivable components; (4) design of lethal effects through explosive, formulation, warhead, and target damage innovations; and (5) development and transition of decisive readiness technology for munitions through the full munitions lifecycle (design through end-of-life).

FY 2023 Plans:
In FY 2023, the portfolio will address priority DoD S&T capability advancements and leverages DOE investment.

• The Decision Tools focus area will a) experimentally validate a high-fidelity damage model to produce datasets suitable for training machine learning algorithms supporting lethality assessments/weaponeering, b) transfer a high-performance decision tool code to a graphical processing unit platform to accelerate calculation speed, c) apply experimental high-explosives data to simulations and validate predictions for high explosives encountering complex shock environments during employment, and d) develop particle package testing and extraction for accurate prediction of primary and secondary debris flows from weapon-target interactions.
• The Delivery focus area will a) validate a multi-fidelity aerodynamic database for relevant weapon geometries and package a predictive code to reduce development and fielding times of advanced flight body geometries.
• Munition Controls will a) develop a prototype production process for high energy density supercapacitor and b) demonstrate a hardware component capable of a single-radar mode for a GPS-denied navigation solution.

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
• Lethal Effects will a) integrate advanced diagnostics into an arena-test alternative to improve munitions effectiveness measurements, and b) validate machine-learning approach for designing energetic material prototype production. • Readiness will a) determine local corrosion disparities between conventional and additively-manufactured parts in operational use, b) validate a test method for a power system failure mode analysis, and c) develop, verify, and validate a predictive model for adhesive failures in components. ***FY 2024 Plans:*** • Develop weaponeering and decision tools for assessment of target interaction effects to enhance lethality modeling codes. • Develop novel imaging methods and models of high explosive fracture behavior to enable lighter munitions and increased range and speed. • Develop reactive flow models to enable warhead geometries necessary for miniature swarming munitions and extreme environment applications. • Demonstrate a numerical integration methodology for hydrocodes to reduce the computational cost and schedule of munition simulations by >20X for designers and weaponeers. ***FY 2023 to FY 2024 Increase/Decrease Statement:*** The increase of $2.288 million between FY 2023 and FY 2024 supports the development of decision tools and models to improve or enhance munitions.			
Accomplishments/Planned Programs Subtotals	18.341	17.279	19.567

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A