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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Army **Date:** March 2024

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 2: Applied Research	R-1 Program Element (Number/Name) PE 0602147A / Long Range Precision Fires Technology
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	113.099	34.683	32.089	-	32.089	37.664	48.793	49.399	67.734	0.000	383.461
AF1: Long Range Maneuverable Fires (LRMF) Technology	-	2.595	-	-	-	-	-	-	-	-	0.000	2.595
AF3: Extended Range Propulsion Technology	-	8.667	11.201	-	-	-	4.170	17.437	17.594	30.541	0.000	89.610
AF8: Affordable Extended Range Precision Technology	-	9.385	9.929	9.151	-	9.151	9.169	9.187	9.292	9.385	0.000	65.498
AG4: Extended Range Artillery Munition Suite Technology	-	6.434	1.310	10.161	-	10.161	12.392	10.440	10.655	15.832	0.000	67.224
AG6: Energetic Materials and Advanced Processing Techno	-	3.664	-	-	-	-	-	-	-	-	0.000	3.664
AH4: Precision and Coop Weapons in a Denied Env Tech	-	9.124	8.950	9.260	-	9.260	9.114	8.909	9.006	9.096	0.000	63.459
BN5: Fuze and Power for Munitions	-	2.730	3.293	3.517	-	3.517	2.819	2.820	2.852	2.880	0.000	20.911
BO9: WEAPONS & MUNITIONS TECH PROGRAM INITIATIVE (CA)	-	70.500	-	-	-	-	-	-	-	-	0.000	70.500

A. Mission Description and Budget Item Justification

This Program Element (PE) is directly aligned to the Army Long Range Precision Fires (LRPF) Modernization Priority. Work in this PE investigates and develops LRPF technologies to destroy, neutralize, or suppress the enemy by cannon artillery and missile fire and enable integration of fire support assets into combined arms operations. Major Focus Areas for LRPF Science and Technology include: Missiles, Cannon Artillery, and Supporting LRPF Technologies covering Strategic, Operational and Tactical Fires Lines of Effort. LRPF Missiles Applied Research investigates and develops a broad range of Missile technologies to enhance Army integrated LRPF capabilities at extended range. Cannon Artillery Applied Research investigates and develops critical technologies to increase range, precision, and both point and area effects for cannon artillery. Supporting LRPF Technologies Applied Research investigates and develops a broad range of component technologies to address weapon cost drivers and enhance performance of future LRPF munitions and systems.

Research in this PE complements PE 0603464A (Long Range Precision Fires Advanced Technology).

The cited research is consistent with the Under Secretary of Defense for Research and Engineering priority focus areas and the Army Modernization Strategy.

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Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 2: Applied Research</i>	R-1 Program Element (Number/Name) PE 0602147A / <i>Long Range Precision Fires Technology</i>
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B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	128.529	34.683	30.525	-	30.525
Current President's Budget	113.099	34.683	32.089	-	32.089
Total Adjustments	-15.430	0.000	1.564	-	1.564
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-14.999	-			
• SBIR/STTR Transfer	-0.431	-			
• Adjustments to Budget Years	-	-	1.564	-	1.564

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: BO9: *WEAPONS & MUNITIONS TECH PROGRAM INITIATIVE (CA)*

- Congressional Add: *Program Increase - ADVANCED GRAPHITIC FOAM FOR LONG-RANGE PRECISION FIRES*
- Congressional Add: *Program Increase - ALUMINUM LITHIUM ALLOY SOLID ROCKET ADVANCEMENT*
- Congressional Add: *Program Increase - HIGH SPEED MISSILE MATERIALS*
- Congressional Add: *Program Increase - HIGH TEMPERATURE SUPER ALLOYS*
- Congressional Add: *Program Increase - LOW-COST MISSILE TECHNOLOGY DEVELOPMENT*
- Congressional Add: *Program Increase - REACTIVE MATERIALS*
- Congressional Add: *Program Increase - THERMODYNAMIC LATENT PROPULSION*

Congressional Add Subtotals for Project: BO9

Congressional Add Totals for all Projects

	FY 2023	FY 2024
	15.000	-
	15.000	-
	10.000	-
	5.000	-
	10.000	-
	10.500	-
	5.000	-
Congressional Add Subtotals for Project: BO9	70.500	-
Congressional Add Totals for all Projects	70.500	-

Change Summary Explanation

Funding increase is due to a realignment of funds for multidomain artillery munition and fuze and power tech munitions from platform agnostic armaments and optionally manned artillery.

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Army	Date: March 2024
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Appropriation/Budget Activity 2040 / 2					R-1 Program Element (Number/Name) PE 0602147A / Long Range Precision Fires Technology				Project (Number/Name) AF1 / Long Range Maneuverable Fires (LRMF) Technology			
COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
AF1: Long Range Maneuverable Fires (LRMF) Technology	-	2.595	-	-	-	-	-	-	-	-	0.000	2.595

A. Mission Description and Budget Item Justification

This Project directly supports Long Range Precision Fires Modernization Priority capabilities by developing next generation Multi-Domain Operations extended range weapon system technology for Precision Strike Missile to increase survivability, penetration, and range in anti-access/area-denial (A2/AD) and denied environments.

Research in this Project complements Program Element (PE) 0603464A (Long Range Precision Fires Advanced Technology) / AF2 (Long Range Maneuverable Fires (LRMF) Advanced Tech).

The cited research is consistent with the Under Secretary of Defense for Research and Engineering priority focus areas and the Army Modernization Strategy.

Research in this Project is performed by the Aviation and Missile Center.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
Title: Long Range Maneuverable Fires (LRMF) Technology	2.595	-	-
Description: Investigates and develops critical technologies for next generation Multi-Domain Operations extended range weapon system technology for Precision Strike Missile to increase survivability, penetration, and range in complex A2/AD and denied environments.			
Accomplishments/Planned Programs Subtotals	2.595	-	-

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Army **Date:** March 2024

Appropriation/Budget Activity 2040 / 2	R-1 Program Element (Number/Name) PE 0602147A / Long Range Precision Fires Technology	Project (Number/Name) AF3 / Extended Range Propulsion Technology
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
AF3: <i>Extended Range Propulsion Technology</i>	-	8.667	11.201	-	-	-	4.170	17.437	17.594	30.541	0.000	89.610

Note

In Fiscal Year (FY) 2025 funding in this Project has a Skip Year

A. Mission Description and Budget Item Justification

This Project directly supports Long Range Precision Fires Modernization Priority capabilities by designing, fabricating, and investigating missile enabling propulsion technologies to enable range extension and/or block speed improvement for long range applications; and enables improvement in High Performance Propellants (HPP) via gains in energy density and burn rate control.

Work in this Project complements Program Element (PE) 0602147A (Long Range Precision Fires Technology) / Project AF8 (Affordable Extended Range Precision Tech) and Program Element (PE) 0603464A (Long Range Precision Fires Advanced Technology) / Project AF2 (Long Range Maneuverable Fires (LRMF) Advanced Tech).

The cited work is consistent with the Under Secretary of Defense for Research and Engineering priority focus areas and the Army Modernization Strategy.

Work in this Project is performed by the Aviation & Missile Center (AvMC).

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
Title: Extended Range Propulsion Technology	8.667	11.201	-
Description: Designs, fabricates, and investigates missile enabling propulsion technologies to enable significant range extension and/or block speed improvement for long range applications and enables improvement in HPP via gains in energy density and burn rate control.			
FY 2024 Plans: Will conduct a flight weight air-breathing propulsion system experiment to validate and advance the component design; conduct a static test to determine capability of new mixing techniques to produce higher performance and minimized smoke propellants; determine feasibility and applicability of air-breathing pressure-gain combustion technology; continue to conduct experiments to establish understanding of solid thermodynamic latent propulsion technology for potential to enable throttling of solid rocket propellants, enhancing system capabilities and survivability.			
FY 2024 to FY 2025 Increase/Decrease Statement:			

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Army		Date: March 2024
Appropriation/Budget Activity 2040 / 2	R-1 Program Element (Number/Name) PE 0602147A / <i>Long Range Precision Fires Technology</i>	Project (Number/Name) AF3 / <i>Extended Range Propulsion Technology</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
In Fiscal Year (FY) 2024 this effort is completed. Propulsion technologies will be further developed in PE 0602147A (Long Range Precision Fires Tech)/ Project AF8 (Affordable Extended Range Precision Tech) and matured and demonstrated in PE 0603464A (Long Range Precision Fires Adv Tech) / Project AF2 (Long Range Maneuverable Fires (LRMF) Advanced Tech)			
Accomplishments/Planned Programs Subtotals	8.667	11.201	-

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Army **Date:** March 2024

Appropriation/Budget Activity 2040 / 2					R-1 Program Element (Number/Name) PE 0602147A / Long Range Precision Fires Technology				Project (Number/Name) AF8 / Affordable Extended Range Precision Technology			
COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
AF8: Affordable Extended Range Precision Technology	-	9.385	9.929	9.151	-	9.151	9.169	9.187	9.292	9.385	0.000	65.498

A. Mission Description and Budget Item Justification

This Project directly supports Long Range Precision Fires (LRPF) Modernization Priority capabilities by investigating the design and fabrication of components and subsystems critical to produce affordable extended range precision missiles as well as critical component technologies including: advanced propulsion, seekers/sensors, fire control, datalink, guidance, navigation and controls, airframes, and additional high payoff areas.

Work in this Project complements Program Element (PE) 0602147A (Long Range Precision Fires Technology) / AF1 (Long Range Maneuverable Fires (LRMF) Technology) and PE 0603464A (Long Range Precision Fires Advanced Technology) / AF2 (Long Range Maneuverable Fires (LRMF) Advanced Tech)

The cited research is consistent with the Under Secretary of Defense for Research and Engineering priority focus areas and the Army Modernization Strategy.

Research in this Project is performed by the Aviation & Missile Center (AvMC).

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
Title: LRPF High Payoff Missile Technology	9.385	9.929	9.151
Description: Identify and explore potential breakthrough technologies to mitigate or eliminate warfighter gaps in Long Range Precision Fires to gain overmatch against potential peer and near-peer adversaries.			
FY 2024 Plans: Will complete assessments and validation of improved target state estimation techniques for strategic hypersonic missiles to enhance endgame performance; conduct experiments to validate analysis tools for high temperature structural composites; investigate reachback datalinks to support employment of on-board missile sensors for deep fires targeting; research missile battery size, weight, power, and cost upgrades over existing off the shelf components; develop alternative navigation technology and guidance algorithms to allow operation in GPS denied environments.			
FY 2025 Plans: Will continue to research missile battery size, weight, power, and cost upgrades over existing off the shelf components; conduct experiment of a fully integrated software defined receiver for alternative navigation to allow operation in GPS degraded and denied environments; conduct experiments to mature and validate solid thermodynamic latent propulsion technology for potential to enable throttling of solid rocket propellants, enhancing system capabilities and survivability; continue investigations into high energy propellants utilizing novel ingredients and formulations; conduct proof of principle experiment for a reachback datalink			

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Army		Date: March 2024		
Appropriation/Budget Activity 2040 / 2	R-1 Program Element (Number/Name) PE 0602147A / <i>Long Range Precision Fires Technology</i>	Project (Number/Name) AF8 / <i>Affordable Extended Range Precision Technology</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
to support employment of on-board missile sensors for deep fires targeting; continue investigating survivability and effector technologies for long range fires. FY 2024 to FY 2025 Increase/Decrease Statement: Funding decrease reflects planned lifecycle of this effort.				
Accomplishments/Planned Programs Subtotals		9.385	9.929	9.151
C. Other Program Funding Summary (\$ in Millions) N/A				
Remarks				
D. Acquisition Strategy N/A				

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Army										Date: March 2024		
Appropriation/Budget Activity 2040 / 2					R-1 Program Element (Number/Name) PE 0602147A / Long Range Precision Fires Technology				Project (Number/Name) AG4 / Extended Range Artillery Munition Suite Technology			
COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
AG4: Extended Range Artillery Munition Suite Technology	-	6.434	1.310	10.161	-	10.161	12.392	10.440	10.655	15.832	0.000	67.224

A. Mission Description and Budget Item Justification

This Project directly supports Long Range Precision Fires Modernization Priority capabilities by investigating critical enabling component technologies and designing high precision terminal guidance in denied environments, capable of surviving high gun shock loads, at extended ranges, and automated cannon artillery technologies to increase operational tempo and unburden the soldier.

Work in this Project complements Program Element (PE) 0603464A (Long Range Precision Fires Advanced Technology) / AG5 (Extended Range Artillery Munition Suite Adv Tech).

The cited research is consistent with the Under Secretary of Defense for Research and Engineering priority focus areas and the Army Modernization Strategy.

Work in this Project is performed by the Armaments Center.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
<p>Title: Extended Range Artillery Munition Suite Enabling Technologies</p> <p>Description: This effort develops, matures and integrates a gun hardened suite of components (software, sensors, navigation and communications) to enable the application of distributed, cooperative and collaborative tactics for munitions and Radio Frequency (RF) seeking components.</p>	2.133	-	-
<p>Title: Large Caliber Cannon Technologies</p> <p>Description: This effort will advance the current state of the art in cannon and barrel technology for compatibility with higher velocity and precision munitions, harder rotating bands, high temperature operation, robustness against non-firing loads, and minimized weight and imbalance. This effort will investigate cannon concepts focused on residual stress & dynamic strain reduction, coating metallurgy, and barrel cooling to increase tube life and performance in high demand environments.</p> <p>FY 2025 Plans: Will assess novel materials to improve the expected life and performance of large caliber cannons to include: cannon cooling methods, high temperature composites, refractory coatings, and advanced methods of heat rejections/ transmission for new cannon designs.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement:</p>	3.198	-	3.258

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Army		Date: March 2024		
Appropriation/Budget Activity 2040 / 2	R-1 Program Element (Number/Name) PE 0602147A / Long Range Precision Fires Technology	Project (Number/Name) AG4 / Extended Range Artillery Munition Suite Technology		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
Funding increase in FY25 reflects the planned work to improve the expected life and performance of large caliber cannon systems.				
<p>Title: Precision Munitions Technology</p> <p>Description: This effort develops technology enablers which are critical to increasing precision and effectiveness for large caliber armaments at extended ranges in extreme launch and flight environments. These technology enhancements are required for sustaining and increasing mission capabilities in degraded and contested environments.</p> <p>FY 2024 Plans: Will develop munition technology enablers which will increase precision and effectiveness for large caliber armaments at extended ranges. These technologies will include: RF converged and multimodal seeker technologies, gun hardened inertial navigation systems, on-board targeting algorithms, and munition self-protection capabilities. Will design small form factor gun hardened components to investigate the performance against aerial and ground targets. Will validate prior modeling and simulation results of Integrated Aerial Defense Systems penetration of precision artillery munitions.</p> <p>FY 2025 Plans: Will mature munition components to include: radio frequency convergence and multimodal seeker technologies, gun-hardened inertial navigation systems, on-board targeting algorithms, and munition self-protection capabilities to increase precision and effectiveness for large caliber armaments at extended ranges; investigate small form factor gun hardened components against aerial and ground targets; design and develop hardware and software in the loop for a full array of precision subsystems.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: Funding increase reflects the planned maturation of munition components.</p>		1.103	1.310	3.056
<p>Title: Multidomain Artillery Munition</p> <p>Description: Multi-Domain Artillery Munition will develop components required to integrate novel payload components within conventional and developmental airframe carriers. Develops precision capabilities, collaborative engagement, automated on-board trajectory/engagement processing, and counter-counter measures for current and future munition platforms.</p> <p>FY 2025 Plans: Will investigate the operational effectiveness of component payloads at current and extended ranges; investigate data requirements across the setter, projectile, and payload subsystems for operation at extended ranges in austere environments; design and develop key interfacing munition component features to enable integration within munition airframe volume constraints; mature munition and sub-munition payload component designs for gun-launch survivability.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement:</p>		-	-	3.847

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Army		Date: March 2024
Appropriation/Budget Activity 2040 / 2	R-1 Program Element (Number/Name) PE 0602147A / <i>Long Range Precision Fires Technology</i>	Project (Number/Name) AG4 / <i>Extended Range Artillery Munition Suite Technology</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
Funding increase reflects planned initiation of this effort. Funding realigned from Program Element (PE) 0603116A (Lethality Advanced Technology) / Project DB2 (Future Armaments Scalable Technologies)			
Accomplishments/Planned Programs Subtotals	6.434	1.310	10.161

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

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Appropriation/Budget Activity 2040 / 2	R-1 Program Element (Number/Name) PE 0602147A / Long Range Precision Fires Technology	Project (Number/Name) AG6 / Energetic Materials and Advanced Processing Techno
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
AG6: <i>Energetic Materials and Advanced Processing Techno</i>	-	3.664	-	-	-	-	-	-	-	-	0.000	3.664

A. Mission Description and Budget Item Justification

This Project directly supports Long Range Precision Fires Modernization Priority capabilities by investigating critical component technology of propellants and energetic materials to increase the range of artillery and mortar rocket assisted projectiles.

Research in this Project complements (Program Element) PE 0602141A (Lethality Technology) / AH9 (Advanced Warheads Technology) and PE 0603464A (Long Range Precision Fires Advanced Technology) / AG5 (Extended Range Artillery Munition Suite Adv Tech).

The cited research is consistent with the Under Secretary of Defense for Research and Engineering priority focus areas and the Army Modernization Strategy.

Research in this Project is performed by the United States Army.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
Title: Scale-up of Insensitive Energetic Materials	3.664	-	-
Description: Conduct research to advance the maturity of disruptive energetic materials.			
Accomplishments/Planned Programs Subtotals	3.664	-	-

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Army										Date: March 2024		
Appropriation/Budget Activity 2040 / 2					R-1 Program Element (Number/Name) PE 0602147A / Long Range Precision Fires Technology				Project (Number/Name) AH4 / Precision and Coop Weapons in a Denied Env Tech			
COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
AH4: Precision and Coop Weapons in a Denied Env Tech	-	9.124	8.950	9.260	-	9.260	9.114	8.909	9.006	9.096	0.000	63.459

A. Mission Description and Budget Item Justification

This Project investigates technologies to deliver accurate fires from extended ranges in denied environments and informs future close- and deep-range Long Range Precision Fires (LRPF) capabilities (e.g., Extended Range Cannon Artillery, Precision Strike Missile).

Work in this Project research technologies for navigation of munitions without Global Positioning System (GPS) and flying munitions to much greater distances against advanced threat Area Denial Assets by delivering navigation technology for multiple munitions with complementary sensors and maneuverability technology for munitions with enhanced lift and control characteristics.

Work in this Project transitions foundational research obtained in PE 0601102A (Defense Research Sciences) / AA7 (Mechanics and Ballistics) and complements PE 0602141A (Lethality Technology) / Project AH6 (Disruptive Energetics and Propulsion Technologies), Project AH7 (Lethal and Scalable Effects Technologies), and Project AH8 (Lethality Materials and Processes Technology).

The cited work is consistent with the Under Secretary of Defense for Research and Engineering priority focus areas and the Army Modernization Strategy.

Work in this Project is performed by the Army Research Laboratory (ARL).

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
Title: Foundational Weapons Flight and Guidance Technology in Extreme Environments	9.124	8.950	9.260
Description: This effort investigates, designs, and develops technologies to improve guidance (e.g., better accuracy, more information/aim-point refinement, reduce GPS dependency) and flight (extended range glide, intercept moving target, course correct to imperfectly located target, perform evasive terminal maneuver to increase survivability) of munitions subject to extreme environments (e.g., set-back, set-forward and balloting load, electro-magnetic spectrum contested, counter-measures). Key navigation technologies include algorithms for image processing, state estimation, communications, embedded processing and electronics, and sensors (e.g., inertial, imagers with optics, software-defined radios and antennae). Key maneuvering technologies include the airframe, control actuation, and flight control algorithms.			
FY 2024 Plans: Will investigate novel flight control algorithms and vehicle control mechanisms to improve stability and maneuverability while surviving high-G cannon launch, high thermal load in flight, and defenses from integrated air defense systems; recommend design paths for high-lift, low-drag munition configurations for future Army cannon and missile fires; define limitations of algorithms for			

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Appropriation/Budget Activity 2040 / 2	R-1 Program Element (Number/Name) PE 0602147A / <i>Long Range Precision Fires Technology</i>	Project (Number/Name) AH4 / <i>Precision and Coop Weapons in a Denied Env Tech</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
<p>image-based mid-course navigation of Army munitions in Global Positioning System (GPS)-denied environments; formulate algorithms for delivering collaborative weapons in contested environments using multi-agent simulation and surrogate unmanned aerial system experiments; develop Army launch and flight platform and improved instrumentation for laboratory firing range facilities; confirm maturity of select weapon flight and guidance technologies in extreme Army environments of high mechanical and thermal loading, terminal survivability, and contested electro-magnetic spectrum; improve understanding of complex weapon flight and guidance problems through advancing combined experimental-modeling capabilities.</p> <p>FY 2025 Plans: Will explore high-level control algorithms for high-speed weapons that employ data-driven or model-based approaches to include formation flight, trajectory shaping, and optimal real-time information gathering and evasion; improve aerodynamic modeling and understanding of complex, high-speed maneuvering weapon vehicle dynamics via free-flight experimentation (spark range, onboard sensor) and computational studies; formulate parameter estimation algorithms and use for onboard sensor gun firing data analysis to confirm aerodynamic performance of high-speed weapon; incorporate onboard electronics, sensors, and actuators into lab-scale experimental platform for research range gun firings; conduct all-digital and hardware-in-the-loop simulation to assess full spectrum and edge case delivery accuracy performance; perform assessments focused on confirming technology readiness level of maneuvering flight and mid-course navigation technologies; complete analysis of artificial intelligence and image-based geo-registration algorithms for Army indirect fires applications; formulate algorithms and conduct studies for accurately delivering multiple payloads to targets when subject to threat detection, engagement, and contested electromagnetic spectrum.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: Funding increase is an economic adjustment.</p>				
Accomplishments/Planned Programs Subtotals		9.124	8.950	9.260
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
D. Acquisition Strategy				
N/A				

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Appropriation/Budget Activity 2040 / 2	R-1 Program Element (Number/Name) PE 0602147A / Long Range Precision Fires Technology	Project (Number/Name) BN5 / Fuze and Power for Munitions
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
BN5: Fuze and Power for Munitions	-	2.730	3.293	3.517	-	3.517	2.819	2.820	2.852	2.880	0.000	20.911

A. Mission Description and Budget Item Justification

This Project directly supports Long Range Precision Fires Modernization Priority capabilities by investigating critical component technologies and designs capable to enable advanced lethality and scalable warheads for future munitions as well as exploring new power technologies for extended run time and extended range munitions.

The cited research is consistent with the Under Secretary of Defense for Research and Engineering priority focus areas and the Army Modernization Strategy.

Research in this Project is performed by the Armaments Center.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
<p>Title: Advanced Energetics</p> <p>Description: This effort develops advanced fuze and power technologies for future munition applications that enable an increase in range and lethality, of ammunitions.</p> <p>FY 2024 Plans: Will design fuze and power component technology supporting electronic countermeasure evaluations for proximity. Will develop wireless synchronization between GPS components. Will conduct experiments on advanced initiation scheme for lethality concepts. Will develop advanced thermal batteries for future munitions.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: Funding decrease restructured to Fuze and Power Technologies for Munitions within this project.</p>	2.730	3.293	-
<p>Title: Fuze and Power Technologies for Munitions</p> <p>Description: This effort develops advanced fuze and power technologies for future munition applications that enable an increase in range and lethality, of ammunitions.</p> <p>FY 2025 Plans: Will investigate novel fuze and power technologies including tracking proximity sensor single chip technology, aimpoint refinement sensing, energy transfer mechanisms for advanced initiation schemes and high-power density technology for munitions and</p>	-	-	3.517

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Army		Date: March 2024		
Appropriation/Budget Activity 2040 / 2	R-1 Program Element (Number/Name) PE 0602147A / <i>Long Range Precision Fires Technology</i>	Project (Number/Name) BN5 / <i>Fuze and Power for Munitions</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
extreme environments; validate wireless fuze setting for increased fuze setting speed and future automation; develop algorithms and architectures for dynamic triggering. FY 2024 to FY 2025 Increase/Decrease Statement: Funding restructured from Advanced Energetics within this project.				
Accomplishments/Planned Programs Subtotals		2.730	3.293	3.517
C. Other Program Funding Summary (\$ in Millions) N/A				
Remarks				
D. Acquisition Strategy N/A				

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Army **Date:** March 2024

Appropriation/Budget Activity 2040 / 2	R-1 Program Element (Number/Name) PE 0602147A / Long Range Precision Fires Technology	Project (Number/Name) BO9 / WEAPONS & MUNITIONS TECH PROGRAM INITIATIVE (CA)
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
BO9: WEAPONS & MUNITIONS TECH PROGRAM INITIATIVE (CA)	-	70.500	-	-	-	-	-	-	-	-	0.000	70.500

Note
Congressional Interest Item funding provided for Weapons and Munitions Tech Program Initiative.

A. Mission Description and Budget Item Justification

Congressional Interest Item funding provided for Weapons and Munitions Tech Program Initiative.

The cited work is consistent with the Under Secretary of Defense for Research and Engineering priority focus areas and the Army Modernization Strategy.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024
Congressional Add: Program Increase - ADVANCED GRAPHITIC FOAM FOR LONG-RANGE PRECISION FIRES	15.000	-
FY 2023 Accomplishments: Congressional Interest Item funding provided for ADVANCED GRAPHITIC FOAM FOR LONG-RANGE PRECISION FIRES		
Congressional Add: Program Increase - ALUMINUM LITHIUM ALLOY SOLID ROCKET ADVANCEMENT	15.000	-
FY 2023 Accomplishments: Congressional Interest Item funding provided for ALUMINUM LITHIUM ALLOY SOLID ROCKET ADVANCEMENT		
Congressional Add: Program Increase - HIGH SPEED MISSILE MATERIALS	10.000	-
FY 2023 Accomplishments: Congressional Interest Item funding provided for HIGH SPEED MISSILE MATERIALS		
Congressional Add: Program Increase - HIGH TEMPERATURE SUPER ALLOYS	5.000	-
FY 2023 Accomplishments: Congressional Interest Item funding provided for HIGH TEMPERATURE SUPER ALLOYS		
Congressional Add: Program Increase - LOW-COST MISSILE TECHNOLOGY DEVELOPMENT	10.000	-

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Army	Date: March 2024
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Appropriation/Budget Activity 2040 / 2	R-1 Program Element (Number/Name) PE 0602147A / Long Range Precision Fires Technology	Project (Number/Name) BO9 / WEAPONS & MUNITIONS TECH PROGRAM INITIATIVE (CA)
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024
FY 2023 Accomplishments: Congressional Interest Item funding provided for LOW COST MISSILE TECHNOLOGY DEVELOPMENT		
Congressional Add: Program Increase - REACTIVE MATERIALS	10.500	-
FY 2023 Accomplishments: Congressional Interest Item funding provided for Reactive Materials		
Congressional Add: Program Increase - THERMODYNAMIC LATENT PROPULSION	5.000	-
FY 2023 Accomplishments: Congressional Interest Item funding provided for THERMODYNAMIC LATENT PROPULSION		
Congressional Adds Subtotals	70.500	-

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A