Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Navy	Date: April 2022
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603651M *I JT Non-Lethal Wpns Tech Dev*

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	0.000	12.882	13.429	14.048	-	14.048	15.556	16.967	17.504	17.855	Continuing	Continuing
3022: *Joint Non Lethal Weapons*	0.000	12.882	13.429	14.048	-	14.048	15.556	16.967	17.504	17.855	Continuing	Continuing

A. Mission Description and Budget Item Justification

The DoD Non-Lethal Weapons Program was established by the FY96 National Defense Authorization Act. The Office of the Secretary of Defense designated the Commandant of the Marine Corps (CMC) as the DoD NLW Executive Agent (EA). The EA exercises centralized responsibility for joint research and development of non-lethal weapons and technology through the Joint Non-Lethal Weapons Program (JNLWP). The Office of the Under Secretary of Defense for Acquisition and Sustainment (A&S) serves as the OSD Principal Staff Assistant and oversees, in consultation with the Under Secretary of Defense for Policy, the DoD NLW Executive Agent.

The efforts described in this Program Element (PE) reflect science and technology (S&T) investment decisions by the Joint Non Lethal Weapons (NLW) Integrated Product Team, a multi-service flag level corporate board that provides executive oversight and management for the JNLWP for the CMC. This direction is based on the requirements and capabilities sought by the Services and the Coast Guard, as identified in the DoD's Non-Lethal Weapons Joint Capabilities Based Assessment Document. This coordinated joint S&T development approach addresses mutual capability gaps and assures the most relevant non-lethal technologies, capabilities and equipment are provided to the operating forces while eliminating duplicative service S&T investment. These advanced technology development initiatives feed non-lethal capabilities which directly support the National Defense Strategy (NDS) objective of strategic competition by providing options to the joint force in pursuit of national objectives in legal or policy constrained scenarios, as well as complementing the use of lethal effects in complex combat scenarios, for example, in urban environments with large civilian populations. Ongoing NLW studies, analyses and exercise efforts with North Atlantic Treaty Organization (NATO) and Allies also support NDS objectives to strengthen alliances and partnerships. Resulting capabilities will facilitate a fully integrated non-lethal competency as a complement to lethal firepower, providing force application options for below lethal threshold engagements.

This program funds Advanced Technology Development of next-generation non-lethal capabilities and includes performing analysis, technology development efforts, and modeling and simulation necessary to ensure optimum weaponization and use of these capabilities. Investment areas include research and development of next-generation NLWs and Intermediate Force Capabilities (IFCs) such as: non-lethal directed energy weapons (lasers, millimeter wave and high power microwave) for counter-personnel and counter-materiel missions; non lethal counter-personnel technologies (acoustic, optical, and human electro-muscular disruption technologies), and advanced non-lethal materials (including materials for vehicle/vessel stopping and counter-facility applications). Next generation non lethal systems focus on long-range localized non-lethal effects to identified threat individuals (or groups of individuals) and/or their threat weapons systems operating in complicated environments such as urban areas, crowds, buildings, vehicles, vessels, and also in close proximity to high-value civilian facilities.

This Program Element (PE) funds Advanced Technology Development (ATD) that includes development of subsystems and components and efforts to integrate subsystems and components into system prototypes for field experiments and/or tests in a simulated environment. Efforts in this PE generally have Technology Readiness Levels TRL) of 4 (component and/or breadboard validation in laboratory environment.), 5 (component and/or breadboard validation in relevant environment.), or 6 (system/subsystem model or prototype demonstration in a relevant environment).

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Navy	Date: April 2022
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603651M *I JT Non-Lethal Wpns Tech Dev*

Due to the number of efforts in this PE, the programs described herein are representative of the work included in this PE.

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	13.243	13.429	0.000	-	0.000
Current President's Budget	12.882	13.429	14.048	-	14.048
Total Adjustments	-0.361	0.000	14.048	-	14.048
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.361	0.000			
• Rate/Misc Adjustments	0.000	0.000	0.000	-	0.000
• Adjustments to Budget Year	-	-	14.048	-	14.048

Change Summary Explanation

Funding: No significant change.

Technical: No significant change.

Schedule: No significant change

FY 2023 funding increase reflects the fact that the FY 2022 President’s Budget request did not include out-year funding.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy			Date: April 2022
Appropriation/Budget Activity 1319 / 3	R-1 Program Element (Number/Name) PE 0603651M / *JT Non-Lethal Wpns Tech Dev*	Project (Number/Name) 3022 / *Joint Non Lethal Weapons*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
3022: *Joint Non Lethal Weapons*	0.000	12.882	13.429	14.048	-	14.048	15.556	16.967	17.504	17.855	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project funds the research and development of next-generation Non-Lethal Weapons and includes performing analysis, technical development efforts, and modeling and simulation necessary to ensure optimum weaponization and use of these NLWs. Investment areas include research and development of next-generation Non-Lethal Weapons (NLW) such as: non-lethal directed energy weapons (lasers, millimeter wave and high power microwave) for counter-personnel and counter-materiel missions; non-lethal counter-personnel technologies (acoustic, optical, and human electro-muscular disruption technologies), and advanced non-lethal materiels (including materiels for vehicle/vessel stopping and counter-facility applications). Next-generation Non-Lethal Weapon systems focus on long-range localized Non-Lethal effects to identified threat individuals (or groups of individuals) and/or their threat weapons systems operating in complicated environments such as urban areas, crowds, buildings, vehicles, vessels, and also in close proximity to high-value civilian facilities.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Joint Non-Lethal Weapons	12.882	13.429	14.048	0.000	14.048
Articles:	-	-	-	-	-
FY 2022 Plans: - Conduct research and investigation of intermediate force effects and emergent technologies with the potential to further address the Joint Requirements Oversight Council (JROC) approved non lethal counter-personnel and counter-materiel capability gaps. Specifically, explore new non-lethal effects and evaluate alternative innovative applications of existing technologies to address future non-lethal capability needs as escalation of force platforms. Some examples of counter-personnel research include further optimization of non-lethal human effects, and enhanced understanding of human target behavioral effects. -Characterize non-lethal phenomena and to assess target human effects and weapon effectiveness, including the development of dose response and injury correlates for new Non-Lethal Weapons technologies. -Other research includes the assessment and study of new technologies to NLW effectiveness and behavioral response, such as advancing the understanding of Flash Bang effects on humans to support novel non-explosive alternatives to pyrotechnic non-lethal IFC devices. Some examples of counter-materiel research					

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 3	**R-1 Program Element (Number/Name)** PE 0603651M / *JT Non-Lethal Wpns Tech Dev*	**Project (Number/Name)** 3022 / *Joint Non Lethal Weapons*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
include the investigation of novel intermediate force capabilities for increased delivery and employment options for applications such as vehicle and vessel stopping and the further optimization of intermediate force materials for integration into future escalation of force platforms. -Other research includes feasibility and design studies for high peak power radio frequency directed energy sources and other high power microwave directed energy technologies (e.g., lasers, millimeter-waves) with extended range applications an longer duration of effect. Other examples of counter-materiel research include the investigation and conceptual design of high power microwave technologies to reduce overall size, weight, power consumption, thermal cooling requirements, and overall system costs (SWaP-C) performance. Results will support the transition of viable technologies. ***FY 2023 Base Plans:*** Continue: - Research and investigation of Non-Lethal Weapons (NLWs) and Intermediate Force Capability (IFC) effects and emergent technologies with the potential to further address the Joint Requirements Oversight Council (JROC) approved non-lethal counter-personnel and counter-materiel capability gaps. Specifically, explore new non-lethal effects and evaluate alternative innovative applications of existing technologies to address future non-lethal capability needs as escalation of force platforms. Examples of counter personnel research include further optimization of non-lethal human effects, and enhanced understanding of human target behavioral effects. - Characterize non-lethal phenomena and to assess target human effects and weapon effectiveness, including the development of dose response and injury correlates for new Non-Lethal Weapons technologies. - Assess and study of new technologies to NLW effectiveness and behavioral response, such as advancing the understanding of Flash Bang effects on humans to support novel non-explosive alternatives to pyrotechnic non-lethal IFC devices. - Counter-materiel research to include the investigation of novel intermediate force capabilities for increased delivery and employment options; for applications such as vehicle and vessel stopping and the further optimization of intermediate force materials for integration into future escalation of force platforms. - Perform feasibility and design studies for high peak power radio frequency directed energy sources and other high power microwave directed energy technologies (e.g., lasers, millimeter-waves) with extended range applications and longer duration of effect. - Investigation and conceptual design of high power microwave technologies to enable improved performance and reduce overall size, weight, power consumption, thermal cooling requirements, and overall system costs					

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 3	**R-1 Program Element (Number/Name)** PE 0603651M / *JT Non-Lethal Wpns Tech Dev*	**Project (Number/Name)** 3022 / *Joint Non Lethal Weapons*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
(SWaP-C). Results will support the transition of viable technologies to higher levels of development and demonstration. Complete: - Operational tests and support of electric "direct-injection" vehicle stopping prototypes over an extended duration of time in an operationally relevant environment to assess its effectiveness, suitability, maintainability, availability, and other performance indicators. Results from these extended operational tests now prescribe operationally suitable design and performance parameters for future directed energy (DE) vehicle stopping technologies. Initiate: - Integrate various human effects(HE) dose response studies into a generalized repel and thermodynamic model of relevant human effects that are safe for operational engagements with Non-lethal Weapon (NLWs) and Intermediate Force Capabilities (IFCs). - Prototype multiple long-range adaptive hardware and software systems; to validate Non-lethal Weapon (NLW) and Intermediate Force Capability (IFC) Directed Energy (DE) emissions are safely aimed on human targets. - Subsystem and component design and development of high peak-power, both for wide-band and for narrow-band Radio Frequencies (RFs), in support of longer range and more compact Non-Lethal Weapon (NLW) and Intermediate Force Capability (IFC) DE effects. ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** There is no significant funding change from FY 2022 to FY 2023.					
Accomplishments/Planned Programs Subtotals	12.882	13.429	14.048	0.000	14.048

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A