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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Navy										Date: March 2019		
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 2: Applied Research					R-1 Program Element (Number/Name) PE 0602651M / JT Non-Lethal Wpns Applied Res							
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	0.000	6.230	6.299	6.346	-	6.346	6.343	6.468	6.600	6.732	Continuing	Continuing
0000: JT Non-Lethal Wpns Applied Res	0.000	6.230	6.299	6.346	-	6.346	6.343	6.468	6.600	6.732	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 applied research 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 NATO and Allies also support NDS objectives to strengthen alliances and partnerships. Resulting capabilities 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 the applied research, study, assessment, and demonstration of technologies that could provide a non-lethal capability or target effect. Investment areas include applied research related to: non-lethal directed energy weapons (lasers, millimeter wave and high power microwave) for counter-personnel and counter-materiel missions; non-lethal acoustic and optical technologies; advanced non-lethal materials (including materials for vehicle/vessel stopping and counter-facility applications); associated human effects and effectiveness for new non-lethal stimuli; injury potential and effectiveness of directed energy, electric incapacitation, ocular, and acoustic based non-lethal technologies; and developing models of crowd behavior and dynamics.

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

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B. Program Change Summary (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	6.425	6.349	6.346	-	6.346
Current President's Budget	6.230	6.299	6.346	-	6.346
Total Adjustments	-0.195	-0.050	0.000	-	0.000
• Congressional General Reductions	-	-0.050			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.162	0.000			
• Rate/Misc Adjustments	0.001	0.000	0.000	-	0.000
• Congressional General Reductions Adjustments	-0.034	-	-	-	-
Change Summary Explanation					
Technical: Not applicable.					
Schedule: Not applicable.					

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy										Date: March 2019		
Appropriation/Budget Activity 1319 / 2					R-1 Program Element (Number/Name) PE 0602651M / JT Non-Lethal Wpns Applied Res				Project (Number/Name) 0000 / JT Non-Lethal Wpns Applied Res			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
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B. Accomplishments/Planned Programs (\$ in Millions)								FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: (U) JOINT NON-LETHAL WEAPONS								6.230	6.299	6.346	0.000	6.346
FY 2019 Plans: Continue research and investigation of emergent technologies and effects with the potential to address non-lethal counter-personnel and counter-materiel capability gaps. Some examples of counter-personnel research include non-lethal weapon (NLW) effectiveness and behavioral research studies, feasibility and conceptual design studies for next-generation electro-muscular incapacitation and directed energy technologies (e.g., lasers, millimeter-waves) suitable for extended range applications and to achieve longer duration of effect. Investigation and initial design of component high power microwave system technologies and advanced materials for counter-materiel applications will continue in order to enable reduced system sizes, increased energy efficiency, improved performance, and increased delivery and employment options. Continue applied research to characterize non-lethal phenomena and assess target human effects and weapon effectiveness, including development of dose response and injury correlates for new NLW technologies. Initiate exploration of new non-lethal effects and evaluation of innovative applications of existing technologies to address future non-lethal capability needs. Transition results to higher levels of technology development and demonstration as feasibility is determined.												
FY 2020 Base Plans: Conduct research and investigation of emergent technologies and effects with the potential to address non-lethal counter-personnel and counter-materiel capability gaps. Some examples of counter-personnel research include optimizing known NLW effectiveness and discovery of new human target behavioral effects which mitigate these Joint Requirements Oversight Counsel-approved joint non-lethal effects capability-gaps. Other examples are												

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B. Accomplishments/Planned Programs (\$ in Millions)						
		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
<p>the assessment and study of new NLW technologies related to: (1) increasing the range of current NLWs; (2) increasing their duration of effect; and (3) increasing the volume of fire associated with NLWs. This includes developing longer range, more compact: (1) NL sound and light devices; (2) smaller, lighter, and more power efficient high power microwave systems; and (3) developing new non-lethal laser induced plasma weapons for long range counter-personnel and counter-materiel applications. The objective is to further reduce non-lethal directed energy weapon system size, weight, power consumption, thermal cooling requirements and overall system cost while increasing counter-personnel and counter-materiel capabilities. Continue applied research to characterize new non-lethal phenomena and assess new target human effects and weapon effectiveness, including development of dose response and injury correlates for new NLW technologies. Continue concept exploration of novel NLW capabilities for integration into future escalation of force platforms. Transition results to higher levels of technology development and demonstration as feasibility is determined.</p> <p>FY 2020 OCO Plans: N/A</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: There is no significant change from FY 2019 to FY 2020.</p>						
Accomplishments/Planned Programs Subtotals		6.230	6.299	6.346	0.000	6.346
C. Other Program Funding Summary (\$ in Millions) N/A						
Remarks						
D. Acquisition Strategy N/A						
E. Performance Metrics The primary objective of this Program Element is the development of technologies that lead to the next-generation of Non-Lethal Weapons. The program consists of a collection of projects that range from studies and analyses to the development and evaluation of feasibility demonstration models. Individual project metrics reflect the technical goals of each specific project. Typical metrics include both the effectiveness of the technology, human effects and effectiveness, and potential for compliance with policy and legislation. Overarching considerations include the advancement of related Technology Readiness Levels and Human Effects Readiness Levels, the degree to which project investments are leveraged with other performers, reduction in life cycle cost upon application of the technology, and the identification of opportunities to transition technology to higher categories of development.						