| Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy | | | | | | | | | | | Date: February 2016 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 2: *Applied Research* | | | | | R-1 Program Element (Number/Name)<br>PE 0602651M *I JT Non-Lethal Wpns Applied Res* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2015** | **FY 2016** | **FY 2017 Base** | **FY 2017 OCO** | **FY 2017 Total** | **FY 2018** | **FY 2019** | **FY 2020** | **FY 2021** | **Cost To Complete** | **Total Cost** |
| Total Program Element | 0.000 | 5.728 | 6.114 | 6.327 | - | 6.327 | 6.425 | 6.425 | 6.425 | 6.425 | Continuing | Continuing |
| 0000: *JT Non-Lethal Wpns Applied Res* | 0.000 | 5.728 | 6.114 | 6.327 | - | 6.327 | 6.425 | 6.425 | 6.425 | 6.425 | Continuing | Continuing |

**A. Mission Description and Budget Item Justification**

The DOD Non-Lethal Weapons Program was established by the Office of the Secretary of Defense, which 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, Technology and Logistics provides direct oversight of the JNLWP.

The efforts described in this Program Element (PE) reflect science and technology (S&T) investment decisions provided 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 needs and capabilities of the Services, the Special Operations Command, 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 best 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 three pillars of the 2014 Quadrennial Defense Review and comprise a fundamental part of DoD's security cooperation efforts to build partner capacity. The resulting capabilities will facilitate a fully integrated non-lethal competency as a complement to lethal firepower, providing force application options for short-of-lethal scenarios.

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 stun, ocular, and acoustic based non-lethal technologies; and developing models of crowd behavior and dynamics. This program transitioned from PE 0602114N, Power Projection Applied Research, by order of the Under Secretary of Defense for Acquisition, Technology, and Logistics, to this separate PE for Joint Non-Lethal Weapons Applied Research.

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

| Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy | | | | | Date: February 2016 |
|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 2: *Applied Research* | | R-1 Program Element (Number/Name)<br>PE 0602651M *I JT Non-Lethal Wpns Applied Res* | | | |
| **B. Program Change Summary ($ in Millions)** | **FY 2015** | **FY 2016** | **FY 2017 Base** | **FY 2017 OCO** | **FY 2017 Total** |
| Previous President's Budget | 5.880 | 6.119 | 6.327 | - | 6.327 |
| Current President's Budget | 5.728 | 6.114 | 6.327 | - | 6.327 |
| Total Adjustments | -0.152 | -0.005 | 0.000 | - | 0.000 |
| • Congressional General Reductions | - | -0.005 | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | -0.152 | 0.000 | | | |

**Change Summary Explanation**

Technical: Not applicable.

Schedule: Not applicable.

| Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy | | | Date: February 2016 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 2 | R-1 Program Element (Number/Name)<br>PE 0602651M / *JT Non-Lethal Wpns Applied Res* | Project (Number/Name)<br>0000 / *JT Non-Lethal Wpns Applied Res* | |

| COST ($ in Millions) | Prior Years | FY 2015 | FY 2016 | FY 2017 Base | FY 2017 OCO | FY 2017 Total | FY 2018 | FY 2019 | FY 2020 | FY 2021 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0000: *JT Non-Lethal Wpns Applied Res* | 0.000 | 5.728 | 6.114 | 6.327 | - | 6.327 | 6.425 | 6.425 | 6.425 | 6.425 | Continuing | Continuing |

**A. Mission Description and Budget Item Justification**

This project 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 stun, ocular, and acoustic based non-lethal technologies; and developing models of crowd behavior and dynamics.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2015 | FY 2016 | FY 2017 Base | FY 2017 OCO | FY 2017 Total |
|---|---|---|---|---|---|
| ***Title:*** (U) JOINT NON-LETHAL WEAPONS | 5.728 | 6.114 | 6.327 | 0.000 | 6.327 |
| ***FY 2015 Accomplishments:***<br>- Continued academic research into technology areas with relevance to non-lethal weapon capabilities.<br>- Continued investigations of alternative technologies with potential to address emerging capability gaps.<br>- Continued to evaluate methodologies for measuring directed energy effects (millimeter - wave, high powered microwave, etc.)<br>- Continued human effects investigation of alternative physical phenomena to non-lethally suppress humans beyond small arms range.<br>- Continued investigations of advanced materials and emergent technologies suitable for extended range non-lethal weapon payload applications.<br>- Continued transition of foundational effects associated with advanced electro-muscular disruption technologies to higher levels of technology development and demonstration.<br>- Continued feasibility assessment and evaluation of candidate technologies with potential to mitigate technology challenges impeding Non-Lethal Effects (NLE) capability gap resolution.<br>- Continued applied research to develop a framework to analyze behavioral response to non-lethal weapons<br>- Completed incorporation of suitable sensors capable of measuring Non-Lethal (NL) stimuli into surrogate test models as part of the Human Effects Modeling Analysis Program (HEMAP) under PE 0603651M.<br>- Completed refinement of models. Continued applied research into characterization of non-lethal phenomena and assessment of human effects and weapon effectiveness, including development of dose response and injury correlates. | | | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy | | Date: February 2016 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 2 | **R-1 Program Element (Number/Name)**<br>PE 0602651M / *JT Non-Lethal Wpns Applied Res* | **Project (Number/Name)**<br>0000 / *JT Non-Lethal Wpns Applied Res* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2015 | FY 2016 | FY 2017 Base | FY 2017 OCO | FY 2017 Total |
|---|---|---|---|---|---|
| - Completed applied research for potential emergent technologies with applicability to the clear-a-space counter-personnel mission.<br>- Completed Laser Induced Plasma (LIP) capability to deliver novel NL effects.<br>- Completed feasibility study of most promising LIP concepts and applications.<br>- Initiated evaluation of the feasibility and practicality study of advanced vehicle stopping design concepts.<br>- Initiated investigation of component High Power Microwave (HPM) technologies and transition results to higher levels of technology development and demonstration.<br>***FY 2016 Plans:***<br>- Continue all efforts from FY 2015, except those noted as completed.<br>- Initiate evaluation of the susceptibility of targets to candidate vehicle and vessel stopping designs.<br>***FY 2017 Base Plans:***<br>- Continue all efforts from FY 2016, unless noted as completed above.<br>***FY 2017 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 5.728 | 6.114 | 6.327 | 0.000 | 6.327 |

**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.