FY 2009 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: February 2008
Exhibit R-2

BUDGET ACTIVITY: 02
PROGRAM ELEMENT: 0602651M
PROGRAM ELEMENT TITLE: JOINT NON-LETHAL WEAPONS APPLIED RESEARCH

COST: (Dollars in Thousands)

Project Number & Title	FY 2007 Actual	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
JOINT NON-LETHAL WEAPONS APPLIED RESEARCH	5,875	5,997	6,084	6,087	6,082	6,033	6,022

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The DOD's Joint Non-Lethal Weapons Program (JNLWP) was established by the Secretary of Defense, who assigned centralized responsibility for DOD joint research and development of non-lethal technology to the Commandant of the Marine Corps as the Executive Agent. 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 NLW Integrated Product Team, a multi-service flag level corporate board that executes the JNLWP for the Commandant of the Marine Corps. 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 Document. This coordinated joint S&T development approach addresses mutual capability gaps and assures the best non-lethal technologies and equipment areprovided to the operating forces while eliminating duplicative service S&T investment.

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-material missions; non-lethal acoustic and optical technologies; advanced non-lethal materials (including materials for vehicle/vessel stopping and advanced anti-traction materials); 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, USD(AT&L), to a separate PE for Joint Non-Lethal Weapons Applied Research and established the Marine Corps as the executive agent for DoD Joint Non-Lethal Weapons RDT&E.

BUDGET ACTIVITY: 02
PROGRAM ELEMENT: 0602651M
PROGRAM ELEMENT TITLE: 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.

BUDGET ACTIVITY: 02
PROGRAM ELEMENT: 0602651M
PROGRAM ELEMENT TITLE: JOINT NON-LETHAL WEAPONS APPLIED RESEARCH

B. PROGRAM CHANGE SUMMARY:

	FY 2007	FY 2008	FY 2009
FY 2008/FY 2009 President's Budget Submission	6,013	6,081	6,101
Congressional Undistributed Reductions/Rescissions	0	-39	0
Rate Adjustments	0	0	-17
SBIR Assessment	-138	-45	0
FY 2009 President's Budget Submission	5,875	5,997	6,084

PROGRAM CHANGE SUMMARY EXPLANATION:
Technical: Not applicable.

Schedule: Not applicable.

C. OTHER PROGRAM FUNDING SUMMARY:
Not applicable.

D. ACQUISITION STRATEGY:
Not applicable.

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.

FY 2009 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: February 2008
Exhibit R-2a

BUDGET ACTIVITY: 02
PROGRAM ELEMENT: 0602651M PROGRAM ELEMENT TITLE: JOINT NON-LETHAL WEAPONS APPLIED RESEARCH
PROJECT TITLE: JOINT NON-LETHAL WEAPONS APPLIED RESEARCH

COST: (Dollars in Thousands)

Project Number & Title	FY 2007 Actual	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
JOINT NON-LETHAL WEAPONS APPLIED RESEARCH	5,875	5,997	6,084	6,087	6,082	6,033	6,022

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-material missions; non-lethal acoustic and optical technologies; advanced non-lethal materials (including materials for vehicle/vessel stopping and advanced anti-traction materials); 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 PROGRAM:

	FY 2007	FY 2008	FY 2009
JOINT NON-LETHAL WEAPONS APPLIED RESEARCH	5,875	5,997	6,084

FY 2007 Accomplishments:

- Continued examination of target effects/characterization and assessed the resulting crowd behavior and effectiveness of non-lethal acoustic and optical (light stun/distract) technologies.
- Continued investigation of the characteristics, optimization, and control of Laser Induced Plasma (LIP) phenomena for its non-lethal applications to both counter-personnel and counter-material missions. LIP is a phenomenon of high energy, short pulse lasers that have several potential applications to produce or transmit non-lethal stimuli.
- Continued investigation of several advanced non-lethal material technologies with non-lethal weapons applications, including engine suffocates, morphing materials for new non-lethal rounds or flight bodies, and new non-lethal nano-materials.

BUDGET ACTIVITY: 02
PROGRAM ELEMENT: 0602651M PROGRAM ELEMENT TITLE: JOINT NON-LETHAL WEAPONS APPLIED RESEARCH
PROJECT TITLE: JOINT NON-LETHAL WEAPONS APPLIED RESEARCH

- Continued examination of specific non-lethal effects and effectiveness associated with the laser-induced plasma phenomenon.
- Completed evaluation of advanced non-lethal material technologies, such as new anti-traction materials, for advanced non-lethal weapons.
- Initiated refinement of directed energy weapon models through research into non-lethal phenomena and assessment of human effects and weapon effectiveness.
- Initiated exploration of the use of light and sound combinations to produce non-lethal human effects, to include saccade motion, discomfort and disability glare, flash-blindness, and potential cognitive effects, with level of light/sound stimuli below hazardous levels.
- Initiated exploration of long range, wireless, extended duration electrically induced neuromuscular incapacitation.
- Initiated applied research in the development of counter-personnel and counter-material directed energy non-lethal weapons, including counter-vehicle and advanced active denial activities.
- Initiated the Advanced Total Body Model (ATBM) development effort to enable modeling and simulation of human effects from non-lethal weapons in support of legal, treaty and policy decisions.

FY 2008 Plans:

- Continue all efforts of FY 2007, less those noted as completed above.
- Complete the ATBM development effort to enable modeling and simulation of human effects from non-lethal weapons in support of legal, treaty and policy decisions.
- Complete exploration of long range, wireless, extended duration electrically induced neuromuscular incapacitation.
- Complete examination of specific non-lethal effects and effectiveness associated with the laser-induced plasma phenomenon.
- Initiate academic research into technology areas with relevance to non-lethal weapon capabilities.

FY 2009 Plans:

- Continue all efforts from FY 2008, less those noted as complete above.
- Complete and transition to higher categories of development the use of light and sound combinations to produce non-lethal human effects, to include saccade motion, discomfort and disability glare, flash-blindness, and potential cognitive effects, with level of light/sound stimuli below hazardous levels.
- Initiate investigations of alternative technologies with potential to address emerging capability gaps.

BUDGET ACTIVITY: 02
PROGRAM ELEMENT: 0602651M PROGRAM ELEMENT TITLE: JOINT NON-LETHAL WEAPONS APPLIED RESEARCH
PROJECT TITLE: JOINT NON-LETHAL WEAPONS APPLIED RESEARCH

- Initiate characterization efforts of alternative directed energy technologies by building upon the ATBM model as part of the Human Effects Modeling Analysis Program (HEAP) to incorporate suitable sensors capable of measuring directed energy effects (millimeter – wave, high powered microwave, etc).
- Initiate investigation of candidate technologies applicable to delivering laser induced plasma effects.

C. OTHER PROGRAM FUNDING SUMMARY - NAVY RELATED RDT&E:
PE 0603651M Joint Non-Lethal Weapons Technology Development

OTHER PROGRAM FUNDING SUMMARY - NON-NAVY RELATED RDT&E:
Not applicable

D. ACQUISITION STRATEGY:
Not applicable.