# Department of Defense
# Fiscal Year (FY) 2015 Budget Estimates

March 2014

## Defense Threat Reduction Agency

*Defense Wide Justification Book Volume 5 of 5*

## *Research, Development, Test & Evaluation, Defense-Wide*

## FY 2015 Budget Estimates

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## Table of Volumes

# Volume 5 Table of Contents

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**Exhibit R-1, RDT&E Programs**
**Defense Threat Reduction Agency**
**Fiscal Year 2015-2019 Budget Estimates**

**Appropriation: RDT&E, Defense-Wide** **Date: March 2014**

## OVERVIEW

The Defense Threat Reduction Agency (DTRA) is the Department of Defense's (DoD) Combat Support Agency and Defense Agency for countering weapons of mass destruction (CWMD).

DTRA's mission is to safeguard the United States and its allies from Global Weapons of Mass Destruction (WMD) threats by integrating, synchronizing, and providing responsive expertise, technologies, and capabilities unequalled by our adversaries. This mission directly reflects several national and Department of Defense guidance/vision documents. For Research, Development, Test & Evaluation (RDT&E), these documents include the National Security Strategy, National Strategy for Combating Terrorism, National Strategy for Countering Biological Threats, National Strategy for Biosurveillance, Defense Strategic Guidance (*Sustaining U.S. Global Leadership: Priorities for 21st Century Defense*), National Military Strategy for Combating WMD, and Nuclear Posture Review.

DTRA's RDT&E budget request responds to warfighter needs and supports DTRA's chartered responsibilities and national commitments. These focus on research and development across the Chemical, Biological, Radiological, Nuclear, and High-yield Explosives (CBRNE) spectrum. DTRA invests in science and technology (S&T) R&D efforts focused on lowering the risk for technical surprise, sustaining readiness, and maintaining U.S. technological superiority into the future. DTRA's RDT&E investment supports the entire Department of Defense through critical focus areas programmed to: modernize CWMD capabilities to provide broad-spectrum, flexible solutions and multi-use technologies to counter post-cold war threats; develop technological solutions to provide timely information to the warfighter, increase the probability of surviving attack, and speed the recovery from any such attack; collaborate across the DoD and intelligence community (IC) to fully synchronize CWMD technical and analytic capabilities and functions; apply a comprehensive systems approach to integrate cross-functional CBRN enabling technologies in modeling and simulation, persistent intelligence, surveillance and reconnaissance, data to decision support tools; and engage in international cooperation to leverage foreign S&T capability and investment.

The FY 2015 RDT&E budget submission reflects decreased investment across the entire Agency RDT&E portfolio, balancing strategic priorities and the growing CWMD demands in a declining fiscal environment. To assist the Department in its topline reduction, the DTRA reprioritized resources to ensure the success of those programs most critical to the DTRA and the Department. To achieve this, the DTRA evaluated all programs, eliminated some in their entirety, and reduced the funding levels of other programs.

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Department of Defense
FY 2015 President's Budget
Exhibit R-1 FY 2015 President's Budget
Total Obligational Authority
(Dollars in Thousands)

06 Feb 2014

| Appropriation | FY 2013 (Base & OCO) | FY 2014 Base Enacted | FY 2014 OCO Enacted | FY 2014 Total Enacted | FY 2015 Base |
|---|---|---|---|---|---|
| Research, Development, Test & Eval, DW | 459,577 | 488,882 | | 488,882 | 480,096 |
| Total Research, Development, Test & Evaluation | 459,577 | 488,882 | | 488,882 | 480,096 |

R-1C1: FY 2015 President's Budget (Published Version), as of February 6, 2014 at 10:24:50

Department of Defense
FY 2015 President's Budget
Exhibit R-1 FY 2015 President's Budget
Total Obligational Authority
(Dollars in Thousands)

06 Feb 2014

| Summary Recap of Budget Activities | FY 2013 (Base & OCO) | FY 2014 Base Enacted | FY 2014 OCO Enacted | FY 2014 Total Enacted | FY 2015 Base |
|---|---|---|---|---|---|
| Basic Research | 40,818 | 45,837 | | 45,837 | 37,778 |
| Applied Research | 158,844 | 156,111 | | 156,111 | 151,737 |
| Advanced Technology Development | 250,288 | 274,033 | | 274,033 | 283,694 |
| System Development And Demonstration | 5,173 | 12,901 | | 12,901 | 6,887 |
| Management Support | 4,454 | | | | |
| Total Research, Development, Test & Evaluation | 459,577 | 488,882 | | 488,882 | 480,096 |
| **Summary Recap of FYDP Programs** | | | | | |
| Research and Development | 459,577 | 488,882 | | 488,882 | 480,096 |
| Total Research, Development, Test & Evaluation | 459,577 | 488,882 | | 488,882 | 480,096 |

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Defense-Wide
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Defense-Wide
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06 Feb 2014

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Defense-Wide
FY 2015 President's Budget
Exhibit R-1 FY 2015 President's Budget
Total Obligational Authority
(Dollars in Thousands)

06 Feb 2014

Appropriation: 0400D Research, Development, Test & Eval, DW

| Line No | Program Element Number | Item | Act | FY 2013 (Base & OCO) | FY 2014 Base Enacted | FY 2014 OCO Enacted | FY 2014 Total Enacted | FY 2015 Base | Sec |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0601000BR | DTRA Basic Research Initiative | 01 | 40,818 | 45,837 | | 45,837 | 37,778 | U |
| | | Basic Research | | 40,818 | 45,837 | | 45,837 | 37,778 | |
| 23 | 0602718BR | Weapons of Mass Destruction Defeat Technologies | 02 | 158,844 | 156,111 | | 156,111 | 151,737 | U |
| | | Applied Research | | 158,844 | 156,111 | | 156,111 | 151,737 | |
| 30 | 0603160BR | Counterproliferation Initiatives - Proliferation Prevention and Defeat | 03 | 250,288 | 274,033 | | 274,033 | 283,694 | U |
| | | Advanced Technology Development | | 250,288 | 274,033 | | 274,033 | 283,694 | |
| 121 | 0605000BR | Weapons of Mass Destruction Defeat Capabilities | 05 | 5,173 | 12,901 | | 12,901 | 6,887 | U |
| | | System Development And Demonstration | | 5,173 | 12,901 | | 12,901 | 6,887 | |
| 152 | 0605502BR | Small Business Innovation Research | 06 | 4,454 | | | | | U |
| | | Management Support | | 4,454 | | | | | |
| Total Research, Development, Test & Eval, DW | | | | 459,577 | 488,882 | | 488,882 | 480,096 | |

R-1C1: FY 2015 President's Budget (Published Version), as of February 6, 2014 at 10:24:50

Defense Threat Reduction Agency
FY 2015 President's Budget
Exhibit R-1 FY 2015 President's Budget
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(Dollars in Thousands)

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R-1C1: FY 2015 President's Budget (Published Version), as of February 6, 2014 at 10:24:50

## Program Element Table of Contents (by Budget Activity then Line Item Number)

***Budget Activity 01: Basic Research***
***Appropriation 0400: Research, Development, Test & Evaluation, Defense-Wide***



***Budget Activity 02: Applied Research***
***Appropriation 0400: Research, Development, Test & Evaluation, Defense-Wide***



***Budget Activity 03: Advanced Technology Development (ATD)***
***Appropriation 0400: Research, Development, Test & Evaluation, Defense-Wide***

***Budget Activity 05: System Development & Demonstration (SDD)***
***Appropriation 0400: Research, Development, Test & Evaluation, Defense-Wide***



***Budget Activity 06: RDT&E Management Support***
***Appropriation 0400: Research, Development, Test & Evaluation, Defense-Wide***

## Program Element Table of Contents (Alphabetically by Program Element Title)

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## Acronyms

| | |
|---|---|
| ACES | Arms Control Enterprise System |
| AD | Agent Defeat |
| AEHF | Advanced Extremely High Frequency |
| AFX | Air Force Explosive |
| AI | Active Interrogation |
| AOR | Area of Responsibility |
| ARAT | Adversarial Route Analysis Tool |
| ARIEL | Autonomous Reconnaissance Infrared Electro-optical Loitering |
| ASIC | Application Specific Integrated Circuit |
| ATAC | Advanced Targeting Assessment Capability |
| ATD | Advanced Technology Development |
| AUV | Autonomous Underwater Vehicle |
| AWE | Atomic Weapons Establishment |
| BAA | Broad Agency Announcement |
| BDA | Battle Damage Assessment |
| BDI | Battle Damage Information |
| BLADE | BDI Link Advanced Demonstrator |
| BLU | Bomb, Live Unit |
| C4I | Command, Control, Communications, Computers, and Intelligence |
| CANES | Consolidated Afloat Network and Enterprise Services |
| CAPE | Cost Assessment and Program Evaluation |
| CATTS | Cost Analysis Tool for Test Sites |
| C-B | Chemical-Biological |
| CBP | Customs and Border Protection |
| CBRNE | Chemical, Biological, Radiological, Nuclear, and High-yield Explosives |

| | |
|---|---|
| CCDR | Combatant Commander |
| CFD | Computational Fluid Dynamics |
| CHAMP | Counter Electronics High Power Microwave Advanced Missile Project |
| CJCS | Chairman, Joint Chiefs of Staff |
| CNDSP | Computer Network Defense Service Provider |
| COCOM | Combatant Command |
| COE | Consequence of Execution |
| CoE-NI | Consequence of Execution – Nuclear Integration |
| COI | Community of Interest |
| CONOPS | Concept of Operations |
| CONUS | Continental United States |
| COOP | Continuity of Operations |
| COP | Common Operating Picture |
| CP | Counter-proliferation |
| CPGS | Conventional Prompt Global Strike |
| CSM | Computational Structure Mechanics |
| CTBT | Comprehensive Nuclear Test Ban Treaty |
| CT/CP | Counterterrorism / Counterproliferation |
| CTS | Component Test Structure |
| CTTS | CBRNE Tactical Training System |
| C-WAC | Counter-WMD Analysis Center |
| C-WMD | Counter-Weapons of Mass Destruction |
| CWMD | Combating Weapons of Mass Destruction |
| CWMD-T | Combating Weapons of Mass Destruction –Terrorism |
| DAPSS | Denied Area Persistent Sensor System |
| DEL | DTRA Experimentation Lab |

| | |
|---|---|
| DHS | Department of Homeland Security |
| DIAMONDS | Defense Integration and Management of Nuclear Data Services |
| DIOCC/DIA | Defense Intelligence Operations Coordination Center/Defense Intelligence Agency |
| DITEC | DTRA Integration Technical Experimentation Center |
| DoD | Department of Defense |
| DO | DISCREET OCULUS |
| DOE | Department of Energy |
| DOJ | Department of Justice |
| DPG | Dugway Proving Ground |
| DPPG | Defense Policy and Planning Guidance |
| DRDC | Defence Research and Development Canada |
| DSCS | Defense Satellite Communications System |
| DTRA | Defense Threat Reduction Agency |
| DT&E | Development, Test and Evaluation |
| EDTC | Engineering and Development Test Center |
| EM-1 | Capabilities of Nuclear Weapons: Effects Manual Number 1 |
| EMP | Electromagnetic Pulse |
| EMREP | Electromagnetic Reliability and Effects Predictions |
| EOD | Explosive Ordnance Disposal |
| EPA | Environmental Protection Agency |
| FEFLO | Finite Element Flow Solver |
| FFRDC | Federally Funded Research and Development Center |
| FinFets | Fin-Shaped Field Effect Transistors |
| FOC | Full Operational Capability |
| FYDP | Future Years Defense Program |

| | |
|---|---|
| GCC | Global Command and Control |
| GEF | Guidance for Employment of the Force |
| GKMC | Global Knowledge Management System |
| GSA | Global Situational Awareness |
| GSM | Global System for Mobile Communications |
| GUI | Graphical User Interface |
| HAMMER | Heated and Mobile Munitions Employing Rockets |
| HANE | High Altitude Nuclear Environments |
| HARP | High Altitude Radiological Phenomenology |
| HEBX | Hybridized Enhanced Blast Explosive |
| HEMP | High Altitude Electro Magnetic Pulse |
| HDBT | Hard and Deeply Buried Target |
| HPAC | Hazard Prediction and Assessment Capability |
| HPC | High Performance Computing |
| HPCMP | High Performance Computing Modernization Program |
| HTD | Hard Target Defeat |
| IBRD | Interagency Biological Restoration Demonstration |
| ICEPIC | Improved Concurrent Electromagnetic Particle-in-Cell |
| IED | Improvised Explosive Device |
| IMEA | Integrated Munitions Effects Assessment |
| IMS | International Monitoring System |
| IOC | Initial Operational Capability |
| IPODS | Integrated Precision Ordnance Delivery System |
| ISIS | Integrated Stand-off Inspection System |
| ISR | Intelligence, Surveillance, Reconnaissance |
| ISS | Integrated Sensor System |

| | |
|---|---|
| IR | Infrared |
| IT | Information Technology |
| ITD | Integrated Technology Demonstration |
| IWMDT | Integrated Weapons of Mass Destruction Toolset |
| JAIEG | Joint Atomic Information Exchange Group |
| JCAM | Joint Collaborative Analysis Model |
| JCDE | Joint Concept Development & Experimentation |
| JCIDS | Joint Capabilities Integration and Development System |
| JCTD | Joint Concept Technology Demonstration |
| JDAM | Joint Direct Attack Munition |
| JEM | Joint Effects Model |
| JSAF | Joint Semi-Automated Forces |
| KAFB | Kirtland Air Force Base |
| keV | kilo-electronvolt |
| LCP | Large Caliber Penetrator |
| LLE | Laboratory for Laser Energetics |
| LLNL | Lawrence Livermore National Laboratory |
| LTS | Large Test Structure |
| MACS | Modular Autonomous Countering WMD System |
| MASS | MILSATCOM Atmospheric Scintillation Simulator |
| MCNP | Monte Carlo N-Particle |
| MDA | Missile Defense Agency |
| M&S | Modeling and Simulation |
| MEEC | Maxwell's Equivalent Equations Circuit |
| MET | Modernization of Enterprise Terminals |
| MILSATCOM | Military Satellite Communications |

| | |
|---|---|
| MFK-R | Mobile Field Kit – Radiological |
| MIL STD | Military Standard |
| MPAS | Mission Planning and Assessment System |
| NACT | Nuclear Arms Control Technology |
| NATO | North Atlantic Treaty Organization |
| NAVSATCOMMFAC | Naval Satellite Communications Facility |
| NCPC | National Counterproliferation Center |
| NIF | National Ignition Facility |
| NLP | Natural Language Processing |
| nm | nanometer |
| NM | Nuclear Matters |
| NMCC | National Military Command Center |
| NNSA | National Nuclear Security Administration |
| NNSS | Nevada National Security Site |
| NSB | Navy Standardization Board |
| NSPD | National Security Presidential Directive |
| NST | New START Treaty |
| NTNF | National Technical Nuclear Forensics |
| NTPR | Nuclear Test Personnel Review |
| NuCS | Nuclear Capability Services |
| NWE | Nuclear Weapon Effects |
| NWEN | Nuclear Weapon Effects Network |
| NWEDS | Nuclear Weapons Effects Database System |
| NWRM | Nuclear Weapons Related Materiel |
| OCO | Overseas Contingency Operations |
| OCONUS | Outside the Continental United States |

| | |
|---|---|
| ODX | Operationally demonstrated/exercised |
| O&M | Operation and Maintenance |
| OSD CAPE | Office of the Secretary of Defense Capability Assessment and Program Evaluation |
| OSD-NM | Office of the Secretary of Defense, Nuclear Matters Office (in the Office of the Assistant Secretary of Defense for Nuclear, Chemical, and Biological Defense Programs) |
| OSTP | Office of Science and Technology Policy |
| PDCALC | Probability of Damage Calculator |
| PDV | Product Demonstration Vehicle |
| PITAS | Photonuclear Inspection and Threat Analysis System |
| PMESII | Political, Military, Economic, Social, Infrastructure, and Information |
| PNAF | Prime Nuclear Airlift Forces |
| PPD | Presidential Policy Directive |
| PTS | Provisional Technical Secretariat |
| QDR | Quadrennial Defense Review |
| R2TD | Rapid Reaction Tunnel Detection |
| R&D | Research and Development |
| RadHard | Radiation Hardened |
| RFIS | Robust Fuzewell Instrumentation System |
| RHBD | Radiation Hardened by Design |
| RHM | Radiation Hardened Microelectronics |
| RL-16 | US radionuclide laboratory |
| R/N | Radiological/Nuclear |
| ROM | Rough Order of Magnitude |
| S&T | Science & Technology |
| SBIR | Small Business Innovative Research |

| | |
|---|---|
| SCSP | Special Operations Command Combating Weapons of Mass Destruction-Terrorism Support Program |
| SGEMP | System-Generated Electromagnetic Pulse |
| SHAMRC | Second-order Hydrodynamic Automatic Mesh Refinement Code |
| SHAPE | Supreme Headquarters Allied Powers, Europe |
| SHIST | Seismic Hardrock in Situ Test |
| SMDC | US Army Space and Missile Development Command |
| SNM | Special Nuclear Material |
| SOF | Special Operations Forces |
| SOX | Standoff Operational Exercise |
| SPE | Source Physics Experiment |
| SPG | Short Pulse Gamma |
| SREMP | Source Region Electromagnetic Pulse |
| START | Strategic Arms Reduction Treaty |
| TACBRD | TransAtlantic Collaboration Biological Resiliency Demo |
| TB | Test Bed |
| TEAMS | Technical Evaluation Assessment and Monitor Site |
| TNF | Technical Nuclear Forensics |
| TOA | Total Obligation Authority |
| TPMM | Technology Program Management Model |
| TRAC | Threat Reduction Advisory Committee |
| TRL | Technology Readiness Level |
| TSG | Technical Support Group |
| TTL | Tag, Track, Locate |
| TVT | Treaty Verification Technology |
| TWAC | Targeting and Weaponeering Analysis Cell |
| TXL | Transportable Xenon Laboratory |

| | |
|---|---|
| UAS | Unmanned Aerial Systems |
| UCP | Unified Command Plan |
| UGF | Underground Facility |
| UGT | Underground Test |
| UHPC | Ultra-High Performance Concrete |
| UK | United Kingdom |
| USANCA | U.S. Army Nuclear and Combating WMD Agency |
| USEUCOM | U.S. European Command |
| USFK | U.S. Forces Korea |
| USG | United States Government |
| USNORTHCOM | U.S. Northern Command |
| USP | University Strategic Partnership |
| USPACOM | U.S. Pacific Command |
| USSOCOM | U.S. Special Operations Command |
| USSTRATCOM | U.S. Strategic Command |
| UTAS | Underground Targeting and Analysis System |
| VAPO | Vulnerability Assessment Protection Option |
| VOIP | Voice Over Internet Protocol |
| WACS | WMD Aerial Collection System |
| WCF | West Coast Facility |
| WEP | Weapon Effects Phenomenology |
| WESC | Weapon Effects Steering Committee |
| WMD | Weapons of Mass Destruction |
| WSMR | White Sands Missile Range |

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| Exhibit R-2, RDT&E Budget Item Justification: PB 2015 Defense Threat Reduction Agency | | | | | | | | | | | Date: March 2014 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 1: *Basic Research* | | | | | R-1 Program Element (Number/Name)<br>PE 0601000BR / *DTRA Basic Research Initiative* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2013** | **FY 2014** | **FY 2015 Base** | **FY 2015 OCO #** | **FY 2015 Total** | **FY 2016** | **FY 2017** | **FY 2018** | **FY 2019** | **Cost To Complete** | **Total Cost** |
| Total Program Element | 93.819 | 40.818 | 45.837 | 37.778 | - | 37.778 | 38.436 | 39.119 | 39.824 | 40.500 | Continuing | Continuing |
| RU: *Fundamental Research for Combating WMD* | 93.819 | 40.818 | 45.837 | 37.778 | - | 37.778 | 38.436 | 39.119 | 39.824 | 40.500 | Continuing | Continuing |

# The FY 2015 OCO Request will be submitted at a later date.

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

The Defense Threat Reduction Agency (DTRA) safeguards America and its allies from Weapons of Mass Destruction (WMD) (chemical, biological, radiological, nuclear, and high-yield explosives) by providing capabilities to reduce, eliminate, counter the threat, and mitigate its effects. The Basic Research Initiative program provides for the discovery and development of fundamental knowledge and understanding by research performers drawn primarily from academia and world-class research institutions in government and industry. This leverages the Department of Defense's (DoD) $2 billion plus annual investment in basic research by ensuring a motivation within the scientific community to conduct research benefiting WMD-related defense missions and by improving Agency knowledge of other research efforts of potential benefit to DTRA nonproliferation, counter proliferation, and consequence management efforts.

These efforts are closely coordinated with the Chem-Bio Technology portfolio, which executes a basic research program under the joint Chem-Bio Defense Program. Agency research interests are coordinated with those of the Defense Advanced Research Projects Agency and Service basic research programs through the Defense Basic Research Advisory Group. DTRA reviews research interests annually to focus on technology areas not clearly addressed by other basic research efforts.

The DTRA's Basic Research portfolio supports several National and Department initiatives directly related to countering WMD including: Office of Science and Technology Policy (OSTP) Nuclear Defense Research and Development Roadmap, FY2013-2017; Defense Budget Priorities and Choices for FY14 (2013); Countering Weapons of Mass Destruction Science and Technology Priority Steering Council Roadmap (2012); National Military Strategy (2011); and the 2010 Quadrennial Defense Review. In general, these documents direct capability enhancements, projects and S&T that support countering WMD and reducing global nuclear dangers. Specifically they include: accelerating the development of standoff radiological/nuclear detection capabilities; researching countermeasures and defenses to non-traditional agents; enhancing nuclear forensics; securing vulnerable materials; developing new verification technologies; developing an in-depth understanding of the capabilities, values, intent, and decision making of potential foes, whether they are states, networks, or individuals; defeating WMD agents; researching biologically-based or inspired materials for DoD applications; and leveraging science, technology, and innovation through domestic and international partnerships and agreements. Basic research supporting all of these needs is included in this program element under Project RU-Fundamental Research for Combating WMD. Details are provided in the R-2a exhibit.

| Exhibit R-2, RDT&E Budget Item Justification: PB 2015 Defense Threat Reduction Agency | Date: March 2014 |
|---|---|
| **Appropriation/Budget Activity**<br>0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 1: *Basic Research* | **R-1 Program Element (Number/Name)**<br>PE 0601000BR / *DTRA Basic Research Initiative* |

| B. Program Change Summary ($ in Millions) | FY 2013 | FY 2014 | FY 2015 Base | FY 2015 OCO | FY 2015 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 45.071 | 45.837 | 46.662 | - | 46.662 |
| Current President's Budget | 40.818 | 45.837 | 37.778 | - | 37.778 |
| Total Adjustments | -4.253 | - | -8.884 | - | -8.884 |
| • Congressional General Reductions | -0.059 | - | | | |
| • Congressional Directed Reductions | -3.628 | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | -0.566 | - | | | |
| • Realignments | - | - | 0.567 | - | 0.567 |
| • Other Reductions | - | - | -9.451 | - | -9.451 |

**Change Summary Explanation**

The decrease in FY 2013 from the previous President's Budget submission is predominately due to Congressional reductions. The decrease from FY 2014 to FY 2015 reflects a reduced effort in combating WMD basic research resulting in reductions to the number of active basic research awards.

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | | Date: March 2014 |
|---|---|---|---|
| Appropriation/Budget Activity<br>0400 / 1 | R-1 Program Element (Number/Name)<br>PE 0601000BR / *DTRA Basic Research Initiative* | Project (Number/Name)<br>RU / *Fundamental Research for Combating WMD* | |

| COST ($ in Millions) | Prior Years | FY 2013 | FY 2014 | FY 2015 Base | FY 2015 OCO # | FY 2015 Total | FY 2016 | FY 2017 | FY 2018 | FY 2019 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RU: *Fundamental Research for Combating WMD* | 93.819 | 40.818 | 45.837 | 37.778 | - | 37.778 | 38.436 | 39.119 | 39.824 | 40.500 | Continuing | Continuing |

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This project provides for the discovery and development of fundamental knowledge and understanding by research performers drawn primarily from academia and world-class research institutions in government and industry. This leverages the Department of Defense's (DoD) $2 billion annual investment in basic research by ensuring a motivation within the scientific community to conduct research benefiting Weapons of Mass Destruction (WMD)-related defense missions and by improving Agency knowledge of other research efforts of potential benefit to Defense Threat Reduction Agency (DTRA) nonproliferation, counter proliferation and consequence management efforts.

These efforts are closely coordinated with the Chem-Bio Technology Portfolio, which executes a basic research program under the joint Chem-Bio Defense Program. Agency research interests are coordinated with those of Defense Advanced Research Projects Agency and Service basic research programs through the Defense Basic Research Advisory Group. DTRA reviews research interests annually to focus on technology areas not clearly addressed by other basic research efforts.

The DTRA's Basic Research Initiative program element Project RU (Fundamental Research for Combating WMD) supports several National and Department initiatives directly related to countering WMD including: Office of Science and Technology Policy (OSTP) Nuclear Defense Research and Development Roadmap, FY2013-2017; Defense Budget Priorities and Choices for FY14 (2013); Countering Weapons of Mass Destruction (WMD) Science and Technology Priority Steering Council Roadmap (2012); National Military Strategy (2011); and the 2010 Quadrennial Defense Review. In general, these documents direct capability enhancements, projects, and Science &Technology (S&T) that support countering WMD and reducing global nuclear dangers. Specifically they include: accelerating the development of standoff radiological/nuclear detection capabilities; researching countermeasures and defenses to non-traditional agents; enhancing nuclear forensics; securing vulnerable materials; developing new verification technologies; developing an in-depth understanding of the capabilities, values, intent, and decision making of potential adversaries, whether they are individuals, networks, or states; defeating WMD agents; researching biologically-based and inspired materials for DoD applications; and leveraging science, technology, and innovation through domestic and international partnerships and agreements. Specific activities for Project RU can be described as follows: Sensing and Recognition – Generation of information that provides knowledge of the presence, identity, and/or quantity of material or energy in the environment that may be significant; Network Sciences – Enhance fundamental knowledge of theory, representations, and mapping to improve the WMD-related robustness, resiliency, recovery of, and informational and operational utility associated with and derived from, complex disparate but interdependent networks; Protection Sciences – Advance knowledge for protection of personnel, resources, sensitive systems and infrastructure from WMD; Sciences to Defeat WMD – Phenomena that improves success of defeat actions (use of weapons) including explosives, accessing and defeating target WMDs such as bio agents and weapons modeling; Sciences to Secure WMD – Improve understanding of phenomena for verification and compliance with treaties, including test detection. Discover revolutionary control methods to monitor and secure components, materials, and weapons, as well as disrupt proliferation pathways; and Cooperative Research with Global Partners – Research to reduce the global threat of WMD in collaboration with a broad range of international partners. Finally, this project supports and administers the Cooperative Biological Engagement

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | Date: March 2014 |
|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601000BR / *DTRA Basic Research Initiative* | **Project (Number/Name)**<br>RU / *Fundamental Research for Combating WMD* |

Program for academic engagements, which has the core goals to secure dangerous pathogens, promote open and active disease reporting and response, advance transparent research to understand pathogens, and develop potential countermeasures.

The increase from FY 2013 to FY 2014 is due to the relative net impact of Congressional reductions in FY 2013 and increased investment in Fundamental Research in FY 2014 to maintain zero real growth in funding per the Defense Planning Guidance for activities related to the discovery and development of fundamental knowledge for the benefit of Counter WMD-related defense missions. The decrease from FY 2014 to FY 2015 reflects a reduced effort in combating WMD basic research resulting in reductions to the number of active basic research awards.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2013 | FY 2014 | FY 2015 |
|---|---|---|---|
| ***Title:*** Project RU: Fundamental Research for Combating WMD | 40.818 | 45.837 | 37.778 |

***Description:*** This project provides for the discovery and development of fundamental knowledge and understanding by research performers drawn primarily from academia and world-class research institutions in government and industry.

***FY 2013 Accomplishments:***
- Managed over 200 active basic research awards on a three to five year cycle. The Agency's Basic Research portfolio directly addressed the DoD CWMD Science and Technology (S&T) priority and supported the DoD S&T Priorities on Autonomy, Data to Decisions, Electronic Protection and Engineered Resilient Systems.
- Supported the development of the future Science, Technology, Engineering and Mathematics workforce by supporting world-class talent in WMD research at universities and laboratories.
- Conducted an annual technical review of each grant to assess the scientific advancements and progress in meeting the award's technical objectives and to foster collaboration and build relationships within the scientific community.
- Conducted an annual external panel review of the basic research program, which was opened to DoD research stakeholders, to assess the focus and scope of the program with respect to the CWMD challenges, and to assess the coordination of CWMD basic research across DoD mission space and across the broader basic research community to avoid unintended duplication and ensure successful partnerships.
- Transitioned a new nanomaterial-based method of detecting nuclear radiation that could be significantly less expensive with reduced size, weight, and power to applied research.
- Transitioned new models for understanding power and communication networks that could produce cost-effective methods to protect and recover from WMD effects such as Electromagnetic Pulse to applied research.
- Transitioned two new explosive formulations shown during small scale tests to be more effective than state of the art at destroying biological weapons to applied research.

***FY 2014 Plans:***
- Manage over 200 active basic research awards on a three to five year cycle. The Agency's Basic Research portfolio is expected to continue the CWMD grand challenge for the DoD.

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | Date: March 2014 |
|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601000BR / *DTRA Basic Research Initiative* | **Project (Number/Name)**<br>RU / *Fundamental Research for Combating WMD* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2013 | FY 2014 | FY 2015 |
|---|---|---|---|
| - Support the development of the future Science, Technology, Engineering and Mathematics workforce by supporting world-class talent in WMD research at universities and laboratories.<br>- Conduct an annual technical review of each grant to assess the scientific advancements and progress in meeting the award's technical objectives and to foster collaboration and build relationships within the scientific community.<br>- Conduct an annual external panel review of the basic research program, that will be open to DoD research stakeholders, to assess the focus and scope of the program with respect to the CWMD challenges, and to assess the coordination of CWMD basic research across DoD mission space and across the broader basic research community to avoid unintended duplication and ensure successful partnerships.<br>***FY 2015 Plans:***<br>- Manage over 150 active basic research awards on a three to five year cycle. The Agency's Basic Research portfolio directly addresses the DoD C-WMD S&T priority and supports the DoD S&T Priorities on Autonomy, Data to Decisions, Electronic Protection, and Engineered Resilient Systems.<br>- Support the development of the future Science, Technology, Engineering and Mathematics workforce by supporting world-class talent in WMD research at universities and laboratories.<br>- Conduct an annual technical review of each grant to assess the scientific advancements and progress in meeting the award's technical objectives and to foster collaboration and build relationships within the scientific community.<br>- Conduct an annual external panel review of the basic research program, which will be open to DoD research stakeholders, to assess the focus and scope of the program with respect to the CWMD challenges, and to assess the coordination of CWMD basic research across DoD mission space and across the broader basic research community to avoid unintended duplication and ensure successful partnerships. | | | |
| **Accomplishments/Planned Programs Subtotals** | 40.818 | 45.837 | 37.778 |

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

| Line Item | FY 2013 | FY 2014 | FY 2015 Base | FY 2015 OCO | FY 2015 Total | FY 2016 | FY 2017 | FY 2018 | FY 2019 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • 23/0602718BR: *WMD Defeat Technologies* | 3.499 | 0.516 | - | - | - | - | - | - | - | - | - |

**Remarks**

**D. Acquisition Strategy**

Procurement methods include competitive selection awards through the Defense Threat Reduction Agency Broad Agency Announcement and collaborative funding through other organizations.

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | Date: March 2014 |
|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 1 | **R-1 Program Element (Number/Name)**<br>PE 0601000BR / *DTRA Basic Research Initiative* | **Project (Number/Name)**<br>RU / *Fundamental Research for Combating WMD* |

**E. Performance Metrics**

Project performance is measured via a combination of statistics including the number of publications generated, number of students trained in sciences and engineering supporting Department of Defense educational goals, number of research organizations participating, and percentage of participating universities on the US News & World Report “Best Colleges” list.

| Exhibit R-2, RDT&E Budget Item Justification: PB 2015 Defense Threat Reduction Agency | | | | | | | | | | | Date: March 2014 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 2: *Applied Research* | | | | | R-1 Program Element (Number/Name)<br>PE 0602718BR / *WMD Defeat Technologies* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2013** | **FY 2014** | **FY 2015 Base** | **FY 2015 OCO #** | **FY 2015 Total** | **FY 2016** | **FY 2017** | **FY 2018** | **FY 2019** | **Cost To Complete** | **Total Cost** |
| Total Program Element | 374.382 | 158.844 | 156.111 | 151.737 | - | 151.737 | 154.537 | 157.318 | 160.215 | 163.683 | Continuing | Continuing |
| RA: *Information Science and Applications* | 87.202 | 24.872 | 26.284 | 29.079 | - | 29.079 | 29.814 | 30.033 | 30.443 | 30.827 | Continuing | Continuing |
| RE: *Counter-Terrorism Technologies* | 2.409 | 2.607 | - | - | - | - | - | - | - | - | Continuing | Continuing |
| RF: *Detection and Forensics Technologies* | 89.267 | 41.343 | 36.102 | 35.061 | - | 35.061 | 35.548 | 36.522 | 37.382 | 38.223 | Continuing | Continuing |
| RG: *Defeat Technologies* | 34.313 | 13.544 | 15.059 | 10.982 | - | 10.982 | 11.769 | 11.492 | 11.804 | 12.072 | Continuing | Continuing |
| RI: *Nuclear Survivability* | 38.131 | 19.133 | 19.649 | 19.416 | - | 19.416 | 19.319 | 19.405 | 19.807 | 20.424 | Continuing | Continuing |
| RL: *Nuclear & Radiological Effects* | 41.674 | 25.395 | 31.398 | 32.352 | - | 32.352 | 33.322 | 34.250 | 34.555 | 35.104 | Continuing | Continuing |
| RM: *WMD Counterforce Technologies* | 34.344 | 18.026 | 14.444 | 13.787 | - | 13.787 | 13.583 | 13.807 | 14.133 | 14.607 | Continuing | Continuing |
| RR: *Combating WMD Test and Evaluation* | 30.150 | 10.425 | 12.659 | 11.060 | - | 11.060 | 11.182 | 11.809 | 12.091 | 12.426 | Continuing | Continuing |
| RU: *Fundamental Research for Combating WMD* | 16.892 | 3.499 | 0.516 | - | - | - | - | - | - | - | - | - |

# The FY 2015 OCO Request will be submitted at a later date.

**Note**

*RR Project title change from Test Infrastructure starting in FY 2015

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

The mission of the Defense Threat Reduction Agency (DTRA) is to safeguard the United States and its Allies from Global Weapons of Mass Destruction (WMD) threats by integrating, synchronizing, and providing responsive expertise, technologies, and capabilities unequalled by our adversaries. This mission directly reflects several national and Department of Defense (DoD) level guidance/vision documents to include the National Security Strategy, Unified Command Plan, National Strategy to Combat WMD, Counterproliferation Interdiction, National Strategy for Combating Terrorism, National Military Strategy, Global Development of Forces, Global Employment of Forces, National Military Strategy for Combating WMD, National Military Strategic Plan for the War on Terrorism, Joint Strategic Capabilities Plan (including the Nuclear Annex), and Nuclear Posture Review. To achieve this mission, DTRA has identified principal objectives along with strategies and tasks to ensure the objectives are met. These objectives are:

| Exhibit R-2, RDT&E Budget Item Justification: PB 2015 Defense Threat Reduction Agency | Date: March 2014 |
|---|---|
| **Appropriation/Budget Activity**<br>0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 2: *Applied Research* | **R-1 Program Element (Number/Name)**<br>PE 0602718BR / *WMD Defeat Technologies* |

1) Ensure a safe, secure, and effective nuclear deterrent;
2) Anticipate emerging WMD threats;
3) Provide Combating WMD situational awareness;
4) Assess infrastructure and personnel vulnerabilities;
5) Prevent proliferation and use of WMD;
6) Defend against WMD threats;
7) Defeat WMD threats;
8) Recover from WMD consequences;
9) Synchronize countering WMD activities.

A focused and strong threat reduction technology base is critical to meeting these objectives and ultimately achieving DTRA's mission. This technology base is closely tied with the operational support programs that make up DTRA's combat support mission. DTRA has taken the steps to develop this technology base and provide a foundation for transformational activities within the WMD arena.

Activities funded by Program Element 0602718BR implement a wide set of National Security Presidential Directive (NSPD) 17 and emerging Presidential Policy Directive (PPD) guidance for prevention of proliferation of WMD and WMD terrorism. Projects support strengthening nonproliferation, through the development of the Arms Control Enterprise System (ACES) and Arms Control inspection training and operational capabilities. Through development of new sensor systems, sensor networks, counterforce and fundamental CWMD research, these programs contribute to securing and interdicting WMD, WMD delivery systems and related materials. Finally, programs in this area fund development and operational support of the DTRA Technical Reachback analysis center, which supports United States (U.S.) and Allied Forces, interagency and civil authorities with 24/7 Chemical, Biological, Radiological, Nuclear, and High-yield Explosives (CBRNE) event analysis support.

Project RA (Information Science and Applications) develops innovative technologies and modeling and simulation (M&S) capabilities; collaborative net-centric CBRNE modeling access and support capabilities between DoD and key interagency and international partners; and provides Technical Reachback support to create decision advantage for the U.S. and our Allies through improved situational understanding across the complete CWMD mission space.

Project RE (Counter Terrorism-Technologies) provides research and development support to Joint U.S. Military Forces, specifically U.S. Special Operations Command (USSOCOM) in the areas of Explosive Ordnance Disposal (EOD) Device Defeat and counter-WMD technologies for warfighters.

Project RF (Detection and Forensics Technologies) develops technologies, systems and procedures for post detonation nuclear forensics, and to detect, identify, track, tag, locate, monitor and interdict strategic and improvised nuclear and radiological weapons, components, materials, or infrastructure in support of Department of Defense (DoD) requirements for combating terrorism, counterproliferation and nonproliferation, homeland defense, and international initiatives and agreements.

Project RG (Defeat Technologies) develops advanced technologies and weapon concepts and validates their applicability as counter WMD weapon systems.

| Exhibit R-2, RDT&E Budget Item Justification: PB 2015 Defense Threat Reduction Agency | Date: March 2014 |
|---|---|
| **Appropriation/Budget Activity**<br>0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 2: *Applied Research* | **R-1 Program Element (Number/Name)**<br>PE 0602718BR / *WMD Defeat Technologies* |

Project RI (Nuclear Survivability) provides the capability for DoD nuclear forces and their associated control and support systems and facilities in wartime to avoid, repel, or withstand attack or other hostile action, to the extent that essential functions can continue or be resumed after the onset of hostile action.

Project RL (Nuclear & Radiological Effects) develops nuclear and radiological assessment modeling tools to support military operational planning, weapon effects predictions, and strategic system design decisions.

Project RM (WMD Counterforce Technologies) provides (1) novel and enhanced weapons energetic materials and structures, full-scale testing of counter WMD weapons effects, weapons effects modeling, and weapon delivery optimization, (2) WMD sensor, surveillance and data processing technologies, and (3) the DTRA Experimentation Lab.

Project RR (Combating WMD Test and Evaluation) provides a unique national test bed capability for simulated WMD facility characterization, weapon-target interaction, and WMD facility defeat testing to respond to operational needs by developing and maintaining test beds used by the DoD, the Services, the Combatant Commanders and other federal agencies to evaluate the implications of WMD, conventional, and other special weapon use against U.S. military or civilian systems and targets.

Project RU (Fundamental Research for Combating WMD) fosters transition of early applied research into technology development. Provides (1) strategic studies to support DoD, (2) decision support tools and analysis to support combating WMD research and development investments, and (3) early applied research for technology development.

| B. Program Change Summary ($ in Millions) | FY 2013 | FY 2014 | FY 2015 Base | FY 2015 OCO | FY 2015 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 172.352 | 175.282 | 178.437 | - | 178.437 |
| Current President's Budget | 158.844 | 156.111 | 151.737 | - | 151.737 |
| Total Adjustments | -13.508 | -19.171 | -26.700 | - | -26.700 |
| • Congressional General Reductions | -0.227 | - | | | |
| • Congressional Directed Reductions | -12.085 | -19.000 | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | -1.196 | - | | | |
| • Realignments | - | - | 0.671 | - | 0.671 |
| • Other Reductions | - | - | -27.371 | - | -27.371 |
| • FFRDC | - | -0.171 | - | - | - |

**Change Summary Explanation**

The decrease in FY 2013 from the previous President's Budget submission is predominately due to Congressional reductions and the Small Business Innovation Research (SBIR) transfer. The decrease in FY 2014 from the previous President's Budget submission is predominately due to Congressional reductions. The

| Exhibit R-2, RDT&E Budget Item Justification: PB 2015 Defense Threat Reduction Agency | Date: March 2014 |
|---|---|
| **Appropriation/Budget Activity**<br>0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 2: *Applied Research* | **R-1 Program Element (Number/Name)**<br>PE 0602718BR / *WMD Defeat Technologies* |

decrease in FY 2015 from the previous President's Budget submission is predominantly due to reduced investment in concept studies and prototype testing of CWMD defeat technologies and from reduced investment in nuclear weapons targeting support and consequence of execution. Reduced investment impacted RF-Detection and Forensics Technologies, RG-Defeat Technologies, RI-Nuclear Survivability, RL- Nuclear and Radiological Effects, RM-WMD Counterforce Technologies, RR-Combating WMD Test and Evaluation, and RU-Fundamental Research For Combating WMD.

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | | Date: March 2014 |
|---|---|---|---|
| Appropriation/Budget Activity<br>0400 / 2 | R-1 Program Element (Number/Name)<br>PE 0602718BR / *WMD Defeat Technologies* | Project (Number/Name)<br>RA / *Information Science and Applications* | |

| COST ($ in Millions) | Prior Years | FY 2013 | FY 2014 | FY 2015 Base | FY 2015 OCO # | FY 2015 Total | FY 2016 | FY 2017 | FY 2018 | FY 2019 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RA: *Information Science and Applications* | 87.202 | 24.872 | 26.284 | 29.079 | - | 29.079 | 29.814 | 30.033 | 30.443 | 30.827 | Continuing | Continuing |

# The FY 2015 OCO Request will be submitted at a later date.

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

The Information Science and Applications project provides (1) advanced data analytics, knowledge management, and systems engineering (SE) support across all other projects, (2) innovative counterproliferation research and development, (3) Technical Reachback support on Weapons of Mass Destruction (WMD) effects and consequences, and (4) collaborative Combating WMD analysis capabilities between Department of Defense (DoD) and key interagency and international partners through a globally accessible net-centric framework. The advanced analytics program provides SE and research and development with requirements, technology, architecture analyses and proof-of-principle capabilities necessary for making decisions on strategic planning, research and development investments, new initiatives, cooperation, and ventures with new customers, and accomplishment of high-level, short notice special projects. It also conducts the development, validation, and fielding of the Arms Control Enterprise System (ACES) as a part of the United States commitment under arms control treaties. The innovative counterproliferation effort conducts research and development to investigate, identify, develop, and transition short term, high payoff technologies from Defense Threat Reduction Agency (DTRA), other government agencies, industry, academia, and international Science and Technology (S&T) partners into the respective DTRA, and other research and development programs, and to end user organizations. The Technical Reachback effort provides 24 hour/7 days per week information and analyses on potential impacts of WMD events to Warfighters and First Responders in consult with DTRA's Combating Weapons of Mass Destruction (CWMD) Research and Development subject matter experts. Net-centric modeling access and support provides a real-time accessible framework which enables the DTRA Chemical, Biological, Radiological, Nuclear, and High-yield Explosives (CBRNE) modeling and simulation codes to provide an integrated suite of CWMD decision support capabilities. This project also provides support to international Counter-WMD science and technology cooperation by developing modifications and improvements to new technologies and information tools suitable for foreign release and cooperative efforts.

The increase from FY 2013 to FY 2014 is predominately due to the relative impact of Congressional reductions in FY 2013. The increase from FY 2014 to FY 2015 is predominantly due to the net effect of reduced investment in systems engineering collaboration with external partners/customers, slowing development and fielding of innovative technologies to the warfighter, and increased investment in advanced analytics, modeling and simulation, and hazardous effects characterization.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2013 | FY 2014 | FY 2015 |
|---|---|---|---|
| ***Title:*** RA: Information Science and Applications | 24.872 | 26.284 | 29.079 |
| ***Description:*** Project RA (Information Sciences and Applications) develops innovative technologies and modeling and simulation (M&S) capabilities and provides Technical Reachback support to create decision advantage for the U.S. and our Allies through improved situational understanding across the complete CWMD mission space. | | | |
| ***FY 2013 Accomplishments:*** | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | Date: March 2014 |
|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 2 | **R-1 Program Element (Number/Name)**<br>PE 0602718BR / *WMD Defeat Technologies* | **Project (Number/Name)**<br>RA / *Information Science and Applications* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2013 | FY 2014 | FY 2015 |
|---|---|---|---|
| - Completed requirements and gap analyses to enable research and development efforts to meet combating WMD capability gaps.<br>- Supported program and project managers by translating Agency goals and Concept of Operations into actionable products.<br>- Supported STRATCOM requirements for an integrated strategic stockpile force structure planning tool.<br>- Integrated first person virtual environments into the suite of CWMD Modeling and Simulation capabilities.<br>- Facilitated Joint Concept Development & Experimentation (JCDE) for the CWMD Community of Interest.<br>- Supported Office of the Secretary of Defense-Cost Assessment and Program Evaluation (OSD-CAPE) and OSD-Nuclear Matters Office (NM) strategic planning efforts and force analyses.<br>- Deployed advanced Combating WMD (CWMD) operational virtual/live training capabilities for Technical Support Group (TSG) and related DoD activities.<br>- Began integrating DTRA Reachback WMD atmospheric transport code with 1st generation real time radiation modeling capabilities.<br>- Solicited and initiated innovative research projects for developing needed new technologies and increased end-user capabilities (leveraging other DoD and United States Government resources where possible) focused on CBRNE detection, CWMD, Improvised Explosive Device (IED) detection and defeat, and/or Special Nuclear Materials (SNM) detection.<br>- Improved capability to model secondary and tertiary effects supporting optimal course of action and tactical decisions for WMD operations, including power and communication infrastructures.<br>- Refined and enhanced WMD lessons learned process with international staff and across the other COCOMs, incorporating lessons learned from partner activities.<br>- Developed and updated DTRA Support Plan as directed in the Defense Planning and Programming Guidance (DPPG) to further the Combating WMD mission across all theaters while balancing DTRA assets and managing risks as prioritized within the Guidance for Employment of the Force (GEF).<br>- Utilized institutionalized linkage with North Atlantic Treaty Organization/Supreme Headquarters Allied Powers, Europe (NATO/SHAPE) and United States European Command (USEUCOM) in international research and development collaboration to further develop international research and development collaboration within the Pacific Region in accordance with the GEF.<br>- Conducted strategic analyses and assessments on emerging WMD threats using various strategic research methodologies.<br>- Expanded the use of Second Track Dialogues to meet future CWMD challenges.<br>- Managed the Threat Reduction Advisory Committee (TRAC).<br>- Built a professional network of up-and-coming professionals (post-BS/BA and pre-PhD) through effective management of the Bio Initiative for the Next Generation.<br>- Modernized infrastructure and extended enhanced enterprise services.<br>- Completed documentation and architecture design for migrated mission systems.<br>- Began code-based vulnerability scanning and documentation. Expanded capability to perform code analysis earlier in the life-cycle development as well as interfacing passive code exploitation reporting to the DTRA Computer Network Defense Service Provider (CNDSP). | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | Date: March 2014 |
|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 2 | **R-1 Program Element (Number/Name)**<br>PE 0602718BR / *WMD Defeat Technologies* | **Project (Number/Name)**<br>RA / *Information Science and Applications* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2013 | FY 2014 | FY 2015 |
|---|---|---|---|
| - Improved software to assist our allies in assessing vulnerability of structures to WMD.<br>- Integrated common terrain translation tools into the DoD/Department of Homeland Security (DHS)/Department of Energy (DOE) radiation particle transport code suite, providing a direct capability of automatically ingesting scenario topographical features for physics-based particle transport computation.<br>-Integrated high fidelity 3D Monte Carlo physics particle code along with high fidelity 3D deterministic based physics particle transport code to form the DoD/DHS/DOE single graphical user interface-based radiation particle transport scenario design tool<br>- Finalized detector modeling analysis in support of the DTRA's future radiation detector campaign.<br>- Integrated Technical Reachback capabilities into the CBRNE Tactical Training System allowing for a deployable CBRNE asset with real-time simulated detector/source instruments that reflect real-life detector/source characteristics<br>- Began to incorporate a classified weapon database along with classified weapon time profiles into models that simulate real life nuclear weapon radiation propagation.<br>- Developed initial prototype of an updated digital WMD Facility, Equipment, and Munitions Identification Handbook, deployed on Defense Advanced Research Projects Agency's (DARPA) TransApps framework, and demonstrated during United States Forces Korea (USFK) exercise. | | | |
| ***FY 2014 Plans:***<br>- Continue to solicit innovative research projects for developing new technologies and increased end-user capabilities to support "Data to Decisions" S&T development.<br>- Provide Open Innovation and Technology Watch/Scouting in support of "Data to Decisions" S&T development for DTRA and other government agencies.<br>- Continue to conduct strategic analyses and assessments on emerging WMD threats using various strategic research methodologies.<br>- Continue to manage the Threat Reduction Advisory Committee (TRAC).<br>- Continue requirements and gap analyses to enable research and development efforts to meet CWMD capability gaps.<br>- Support program and project managers by translating Agency goals and Concept of Operations into actionable products.<br>- Test and continue development on next generation capabilities for "real-time" reachback supporting radiological search and visualization.<br>- Continue modifications and capability improvements to vulnerability assessment software and integrated WMD toolsets to contribute to new CWMD cooperative technology efforts.<br>- Continue activities to implement Full Operational Capability for Mission Domain Information Technology architecture.<br>- Make improvements to the DTRA Integration, Test and Experimentation Center (DITEC).<br>- Continue to provide systems engineering contractor support to numerous DTRA Research and Development programs, projects, and activities, to include nuclear detection activities, innovative new technologies, modeling and simulation activities, and research and development strategic planning efforts. | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | Date: March 2014 |
|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 2 | **R-1 Program Element (Number/Name)**<br>PE 0602718BR / *WMD Defeat Technologies* | **Project (Number/Name)**<br>RA / *Information Science and Applications* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2013 | FY 2014 | FY 2015 |
|---|---|---|---|
| - Continue to upgrade and manage the research and development portfolio management software tool for use across all DTRA research and development programs, projects, and activities.<br>- Develop and modernize a Global Knowledge Management Capability (GKMC) software tool for OSD level and other users.<br>***FY 2015 Plans:***<br>- Create automated methods to operate DoD/DHS/DOE radiation particle transport code suite on the DoD high performance computational network.<br>- Integrate first principle blast and nuclear fallout codes into the DoD/DHS/DOE radiation particle transport code suite.<br>- Deploy the GKMC software tool for OSD level and other users, providing an integrated unclassified CWMD collaboration environment supporting U.S. and Allied capabilities and CWMD situational awareness.<br>- Develop and deploy enhanced geospatial and synthetic population services supporting more rapid Consequence of Execution and Consequence Management predictive modeling and Reachback support.<br>- Support the DTRA exploratory development and initial real-time collaborative CBRNE integrated deployment framework.<br>- Implement the FY 2014 developed design for a common information science and deployment environment, supporting training, operations, and mission support of CBRNE assessment for primary, secondary, and tertiary effects.<br>- Continue to conduct strategic analyses and assessments on emerging WMD threats using various strategic research methodologies.<br>- Continue to manage the Threat Reduction Advisory Committee (TRAC).<br>- Continue activities in support of leveraging cloud capabilities and demonstrate prototype capabilities.<br>- Demonstrate initial IT capabilities in support of achieving highly automated fusion and dissemination of comprehensive data necessary for the Agency's mission of providing global combating weapons of mass destruction situational awareness. | | | |
| **Accomplishments/Planned Programs Subtotals** | 24.872 | 26.284 | 29.079 |

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

| Line Item | FY 2013 | FY 2014 | FY 2015 Base | FY 2015 OCO | FY 2015 Total | FY 2016 | FY 2017 | FY 2018 | FY 2019 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • 30/0603160BR: *Proliferation, Prevention, and Defeat* | 3.006 | 2.431 | - | - | - | - | - | - | - | Continuing | Continuing |
| • 152/0605502BR: *Small Business Innovation Research* | 3.006 | 4.454 | - | - | - | - | - | - | - | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

Government and industrial performers are assessed and selected based upon a "best fit for task" criteria. DoD Service Laboratories and DoE National Laboratories are common government awardees.

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | Date: March 2014 |
|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 2 | **R-1 Program Element (Number/Name)**<br>PE 0602718BR / *WMD Defeat Technologies* | **Project (Number/Name)**<br>RA / *Information Science and Applications* |

**E. Performance Metrics**

Number of customer requests for data analysis compared to historical level.
Number of changes to investments based on systems engineering analyses.
Number of exercises and operations supported.
Number of Defense Acquisition Workforce Improvement Act certified systems engineers.
New capabilities delivered and transitioned to operational capabilities.
Mission Enclave RDT&E computing environment moves from development to Initial Operational Capability (IOC).
Mission Enclave moves from IOC to Full Operational Capability (FOC).
Segment architectures for the Mission Enclave and supported mission systems.
Integrated segment architectures into the DTRA Enterprise Architecture.
Development of network modeling and system-in-the-loop testing capabilities within the DTRA Integration, Test and Experimentation Center (DITEC).
Timely delivery of updated DTRA WMD force-on-force and radiation particle transport code to the development team and external customers
Number of project agreements/interactions with foreign partners and Allies.

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | | Date: March 2014 |
|---|---|---|---|
| Appropriation/Budget Activity<br>0400 / 2 | R-1 Program Element (Number/Name)<br>PE 0602718BR / *WMD Defeat Technologies* | Project (Number/Name)<br>RE / *Counter-Terrorism Technologies* | |

| COST ($ in Millions) | Prior Years | FY 2013 | FY 2014 | FY 2015 Base | FY 2015 OCO # | FY 2015 Total | FY 2016 | FY 2017 | FY 2018 | FY 2019 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RE: *Counter-Terrorism Technologies* | 2.409 | 2.607 | - | - | - | - | - | - | - | - | Continuing | Continuing |

# The FY 2015 OCO Request will be submitted at a later date.

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

The Counter-Terrorism Technologies project is an over-arching project that develops and transitions a full spectrum of new technologies to counter emergent Weapons of Mass Destruction (WMD) thus enabling warfighters to improve their ability to detect, disable, interdict, neutralize, and destroy chemical, biological, nuclear production, storage, and weaponization facilities. (See paragraph C for other program funding.)

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2013 | FY 2014 | FY 2015 |
|---|---|---|---|
| ***Title:*** RE: Counter-Terrorism Technologies | 2.607 | - | - |
| ***Description:*** Project RE provides research and development support to Joint United States Military Forces, specifically U.S. Special Operations Command (USSOCOM) in the areas of Explosive Ordnance Disposal (EOD) Device Defeat and counter-WMD technologies for warfighters.<br><br>***FY 2013 Accomplishments:***<br>- Continued planned development and transitioned new counterproliferation technologies for Joint U.S. Military Forces to counter WMD, enabling warfighters to improve their ability to detect, disable, interdict, neutralize, and destroy chemical, biological, and nuclear production, storage, and weaponization facilities. | | | |
| **Accomplishments/Planned Programs Subtotals** | 2.607 | - | - |

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

| Line Item | FY 2013 | FY 2014 | FY 2015 Base | FY 2015 OCO | FY 2015 Total | FY 2016 | FY 2017 | FY 2018 | FY 2019 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • 30/0603160BR: *Proliferation, Prevention, and Defeat* | 106.967 | 111.658 | 108.630 | - | 108.630 | 104.129 | 113.606 | 108.229 | 110.239 | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

N/A

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | Date: March 2014 |
|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 2 | **R-1 Program Element (Number/Name)**<br>PE 0602718BR / *WMD Defeat Technologies* | **Project (Number/Name)**<br>RE / *Counter-Terrorism Technologies* |

**E. Performance Metrics**

Number of technologies developed and delivered, and/or proof of concept, or successful Military Utility Assessments conducted that increase the potential mission success and reduces the number of current gaps in Special Operations Forces capabilities to counter weapons of mass destruction.

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | | Date: March 2014 |
|---|---|---|---|
| Appropriation/Budget Activity<br>0400 / 2 | R-1 Program Element (Number/Name)<br>PE 0602718BR / *WMD Defeat Technologies* | Project (Number/Name)<br>RF / *Detection and Forensics Technologies* | |

| COST ($ in Millions) | Prior Years | FY 2013 | FY 2014 | FY 2015 Base | FY 2015 OCO # | FY 2015 Total | FY 2016 | FY 2017 | FY 2018 | FY 2019 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RF: *Detection and Forensics Technologies* | 89.267 | 41.343 | 36.102 | 35.061 | - | 35.061 | 35.548 | 36.522 | 37.382 | 38.223 | Continuing | Continuing |

# The FY 2015 OCO Request will be submitted at a later date.

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

This project develops technologies, systems, and procedures to detect, identify, track, locate, monitor, and interdict strategic and improvised nuclear and radiological weapons, components, materials, or infrastructure in support of Department of Defense (DoD) requirements for combating terrorism, counterproliferation and nonproliferation, homeland defense, and international initiatives and agreements. This project researches, develops, demonstrates, and transitions advanced technologies to improve operational capabilities to detect and identify nuclear and radiological weapons. It supports the attribution process through development, demonstration, and transition of improved post-detonation National Technical Nuclear Forensics (NTNF) operational capabilities in the areas of materials collection, debris diagnostics and materials analysis, and prompt diagnostics and device reconstruction. Efforts under this project also support international peacekeeping and nonproliferation objectives, on-site and aerial inspections and monitoring, on-site sampling and sample transport, and on-site and off-site analysis to meet forensic, verification, monitoring and confidence-building requirements.

The decrease from FY 2013 to FY 2014 is predominately due to the redirection of the nuclear detection portfolio toward a more holistic Nuclear Threat Detection portfolio that integrates both passive and active radiation detection into a comprehensive Intelligence, Surveillance, and Reconnaissance (ISR) solution. This resulted in a decreased investment in advanced detector technology to fund increased investment in nuclear weapons effects in Project RI - Nuclear Survivability and system vulnerability and assessment capabilities in Project RL - Nuclear and Radiological Effects. The decrease from FY 2014 to FY 2015 is predominantly due to reduced investment in concept studies and prototype testing of CWMD defeat technologies.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2013 | FY 2014 | FY 2015 |
|---|---|---|---|
| ***Title:*** RF: Detection and Forensics Technologies | 41.343 | 36.102 | 35.061 |
| ***Description:*** Project RF develops technologies, systems and procedures for post detonation nuclear forensics and to detect, identify, track, tag, locate, monitor and interdict strategic and improvised nuclear and radiological weapons, components, materials, or infrastructure in support of DoD requirements for combating terrorism, counterproliferation and nonproliferation, homeland defense, and international initiatives and agreements. | | | |
| ***FY 2013 Accomplishments:***<br>- Completed design, development, and construction of a clean room for further development and low-cost manufacturability of a best-performing helium-3 replacement material.<br>- Completed research and development of new material capable of both gamma and neutron detection with high energy resolution and high discrimination for use in next generation prototype handheld and smaller radiation detectors.<br>- Improved the manufacturing readiness level by maturing technologies, designs, and production processes. | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | Date: March 2014 |
|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 2 | **R-1 Program Element (Number/Name)**<br>PE 0602718BR / *WMD Defeat Technologies* | **Project (Number/Name)**<br>RF / *Detection and Forensics Technologies* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2013 | FY 2014 | FY 2015 |
|---|---|---|---|
| - Completed multi-year testing and evaluation of over twenty large-area hand-held spectroscopic radioisotope identifiers to compare and select the best performing technology for further development and transition to user groups.<br>- Designed, tested, produced, and delivered modular precision radiation source localization tools.<br>- Completed design alternatives for a compact superconducting source in active interrogation systems, investigated the use of proton beams for standoff stimulation of fission in nuclear materials, and improved accelerator designs for enhanced capabilities with reduced weight and size.<br>- Continued to exploit known all-source nuclear threat signatures, characteristics, and corresponding detection modalities while continuing to identify new all-source nuclear threat signatures, characteristics, and corresponding detection modalities; identified the proper tipping, queuing, and data fusion techniques and algorithms to enable the rapid and effective accumulation of all-source intelligence on nuclear threat scenarios.<br>- Investigated alternative methods to detect fissions in nuclear materials from standoff ranges.<br>- Progressively advanced the laboratory physics demonstrations of target stimulation, signature detection, and validated modeling capability.<br>- Initiated research into advanced multi-modal detection algorithms.<br>- Began sensor integration into fielded situational awareness software systems.<br>- Started research into nanoscale radiation detection materials for small-scale high-resolution radiation detectors.<br>- Incorporated radiation transport algorithms into existing operational modeling tools.<br>- Developed, tested, and demonstrated prototype ground-based sensor capabilities for post-detonation prompt diagnostics (under DISCREET OCULUS).<br>- Developed and demonstrated prototype advanced airborne and ground debris sample collection and integrated nuclear yield determination capabilities as part of the extended National Technical Nuclear Forensics (NTNF) Joint Capability Technology Demonstration (JCTD).<br>- Developed and demonstrated upgraded technical capabilities for sample analysis, modeling to support nuclear device reconstruction, and forensics data to lower uncertainties/increase confidence in technical nuclear forensics (TNF) conclusions. | | | |
| ***FY 2014 Plans:***<br>- Develop, accelerate development where appropriate, demonstrate, and field (prototype) upgraded technical capabilities for prompt diagnostics (under DISCREET OCULUS and MINIKIN ECHO) and debris sample collection, sample analysis, modeling to support nuclear device reconstruction and forensics data to lower uncertainties/increase confidence and improve timeliness of technical nuclear forensics (TNF) conclusions. Includes development of new debris collection, field analysis concepts, improved in-laboratory timelines, new signature development, improved modeling and simulation capabilities, and other supporting technologies.<br>- Develop methods to rapidly determine post-event nuclear weapon yields and reaction history by investigating alternative prompt nuclear weapons effects, effects on the environment, and developing/fielding prototype capabilities. | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | Date: March 2014 |
|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 2 | **R-1 Program Element (Number/Name)**<br>PE 0602718BR / *WMD Defeat Technologies* | **Project (Number/Name)**<br>RF / *Detection and Forensics Technologies* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2013 | FY 2014 | FY 2015 |
|---|---|---|---|
| - Identify all-source nuclear threat signatures, characteristics, and corresponding detection modalities; identify the proper tipping, queuing, and data fusion techniques and algorithms to enable the rapid and effective accumulation of all-source intelligence on nuclear threat scenarios.<br>- Develop and improve an advanced algorithm to increase speed and reliability of isotope identification in fielded hand-held and portable detectors.<br>- Continue to collaborate with international partners to develop a photon Bremsstrahlung capability for active interrogation of Special Nuclear Material (SNM).<br>- Research and develop new detector materials intended to improve the capability to detect, locate, and identify threat materials.<br>- Improve the manufacturing readiness level by maturing technologies, designs, and production processes.<br>- Develop and demonstrate novel and advanced neutron detection technology as an alternative to helium-3 neutron detectors. | | | |
| ***FY 2015 Plans:***<br>- Complete initial development of two neutron detection materials as alternatives to helium-3 neutron detectors<br>- Complete development of room-temperature high-resolution gamma imaging detector electronics and semiconductor materials.<br>- Research and develop new detector materials to improve the capability to detect, locate, and identify special nuclear materials. Improve the manufacturing readiness level by maturing technologies, designs, and production processes.<br>- Execute robust and operationally relevant testing and evaluation of developmental radiation detection systems in order to determine and select the best performing technologies and techniques for further development and transition to user groups.<br>- Demonstrate and field methods to remotely monitor small and wide areas.<br>- Progress development of advanced 3D imaging technologies for high resolution source characterization and identification to provide new and improved capabilities to detect, locate, and identify threat materials.<br>- Research, develop, test, and evaluate software tools and capabilities to locate and identify the signatures of special nuclear materials on both existing and newly developed hardware platforms.<br>- Enhance algorithms to increase speed and reliability of isotope identification in fielded portable radiation detectors.<br>- Begin testing, evaluation, and selection of best-performing developed software tools and algorithms to improve user capabilities and extend capabilities of existing radiation detection technologies.<br>- Field an advanced detection algorithm to improve capabilities to detect, locate, and identify threat materials.<br>- Continue identifying comprehensive all-source nuclear threat signatures, characteristics, and corresponding detection modalities; continue the identification and development of the proper tipping, queuing, and data fusion techniques and algorithms to enable the rapid and effective accumulation of all-source intelligence on nuclear threat scenarios.<br>- Develop, accelerate development where appropriate, test, demonstrate, and field prototype ground-based sensor capabilities for post-detonation prompt diagnostics under DISCREET OCULUS. | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | Date: March 2014 |
|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 2 | **R-1 Program Element (Number/Name)**<br>PE 0602718BR / *WMD Defeat Technologies* | **Project (Number/Name)**<br>RF / *Detection and Forensics Technologies* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2013 | FY 2014 | FY 2015 |
|---|---|---|---|
| - Develop, test, demonstrate, and field (prototype) upgraded technical capabilities for prompt diagnostics, debris collection, sample analysis, modeling to support nuclear device reconstruction, and forensics data to decrease timeline, lower uncertainties, and increase confidence in technical nuclear forensics (TNF) conclusions. | | | |
| **Accomplishments/Planned Programs Subtotals** | 41.343 | 36.102 | 35.061 |

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

| Line Item | FY 2013 | FY 2014 | FY 2015 Base | FY 2015 OCO | FY 2015 Total | FY 2016 | FY 2017 | FY 2018 | FY 2019 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • 30/0603160BR: *Proliferation Prevention and Defeat* | 69.331 | 74.556 | 66.707 | - | 66.707 | 68.770 | 70.727 | 71.058 | 72.959 | Continuing | Continuing |
| • 121/0605000BR: *WMD Defeat Capabilities* | - | 6.906 | 6.887 | - | 6.887 | 7.156 | 7.397 | 7.497 | 7.625 | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

Government and industrial performers are assessed and selected based upon a "best fit for task" criteria. DoD Services, Laboratories, Department of Energy (DOE) National Laboratories are common government awardees.

**E. Performance Metrics**

Successful development and operational acceptance of transitional detection technologies.
Successful demonstration of the capability to exfiltrate data to a remote platform.
Delivery of technical equipment prototypes to reduce their current gaps in technology, to locate, characterize and provide advanced diagnostics to defeat Weapons of Mass Destruction devices in support of a classified Chairman of the Joint Chiefs of Staff plan.
Demonstrate high-resolution imaging, gamma spectroscopy, and gamma source location using room-temperature detector technology.
Successful completion of a neutron detection system utilizing multiple Helium-3 replacement technologies.
Delivery of a comprehensive report conclusively citing the successful utility of active interrogation techniques.
Successful demonstration of the effectiveness, optimization, and utility of advanced, cutting edge algorithms that are a significant improvement over currently fielded algorithms.
Successfully test, demonstrate, field, and/or transition prototype nuclear forensics technologies/capabilities to an operational customer.
Down-select of new signatures, surrogate urban debris production routes, and technology requirements for field analysis capabilities.
Successful demonstration of the capability to exfiltrate data to a remote platform.

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | | | | | | | | | | Date: March 2014 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>0400 / 2 | | | | | R-1 Program Element (Number/Name)<br>PE 0602718BR / *WMD Defeat Technologies* | | | | Project (Number/Name)<br>RG / *Defeat Technologies* | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2013** | **FY 2014** | **FY 2015 Base** | **FY 2015 OCO #** | **FY 2015 Total** | **FY 2016** | **FY 2017** | **FY 2018** | **FY 2019** | **Cost To Complete** | **Total Cost** |
| RG: *Defeat Technologies* | 34.313 | 13.544 | 15.059 | 10.982 | - | 10.982 | 11.769 | 11.492 | 11.804 | 12.072 | Continuing | Continuing |

# The FY 2015 OCO Request will be submitted at a later date.

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

The Defeat Technologies project develops, integrates, demonstrates and transitions innovative kinetic and non-kinetic weapon capabilities to expand traditional and asymmetric options available to Combatant Commanders (CCDRs) to deny, disrupt, and defeat adversarial use of Weapons of Mass Destruction (WMD) while minimizing collateral effects from incidentally released agents. Technology development focuses on the physical or functional defeat of (1) chemical, biological, radiological, and nuclear (CBRN) threat materials, (2) an adversary's ability to deliver the same, as well as (3) the physical and non-physical support networks enabling both. It does so through the systematic identification and maturation of advanced technologies capable of defeating WMD agents or agent based processes, then integrating them into weapons, delivery systems or rapid WMD elimination capabilities that are most relevant to the Combatant Commands (COCOMs) WMD Defeat Concept of Operations (CONOPS) and their Area of Responsibility (AOR). This program includes developing specific WMD agent/agent-based process simulants, test infrastructure, and sampling capability required for effective development, testing, and evaluation (DT&E) of next-generation capabilities to ensure optimum weapon solutions are achieved based on this technology. The program is addressing defeat of adversaries' offensive WMD programs through integration of current conventional weapons capabilities and next generation kinetic and non-kinetic solutions to provide full-spectrum asymmetric defeat options. The program addresses requirements delineated in the Quadrennial Defense Review and Strategic Planning Guidance as codified in the Joint Capabilities Integration and Development System (JCIDS), Service requirements documents, and COCOM and Agency Priority Lists for lethal and non-lethal Combating-WMD capability.

The program places a high priority on understanding, characterizing, and validating potential weapon effects within some mathematical confidence as it relates to the unintended release of hazardous threat materials. Our end-state is to provide COCOMs with accurate and timely WMD defeat expertise, tailored technologies, and customized solutions that provide offensive weapons and capabilities to combat WMD in any target while mitigating collateral contamination effects. Without these capabilities our nation cannot effectively hold at risk our adversaries' WMD capabilities thus giving them strategic advantage.

The increase from FY 2013 to FY 2014 is predominately due to the net effect of Congressional reductions in FY 2013 and increased investment in Counter-WMD (CWMD) hard target defeat weapons development in FY 2014. The decrease from FY 2014 to FY 2015 is predominantly due to reduced investment in Next Generation CWMD Weapon Concept research and demonstration of Agent Defeat Penetrator technologies.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2013 | FY 2014 | FY 2015 |
|---|---|---|---|
| ***Title:*** RG: Defeat Technologies | 13.544 | 15.059 | 10.982 |
| ***Description:*** Project RG (Defeat Technologies) develops advanced technologies and weapon concepts and validates their applicability as counter WMD weapon systems. | | | |
| ***FY 2013 Accomplishments:*** | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | Date: March 2014 |
|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 2 | **R-1 Program Element (Number/Name)**<br>PE 0602718BR / *WMD Defeat Technologies* | **Project (Number/Name)**<br>RG / *Defeat Technologies* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2013 | FY 2014 | FY 2015 |
|---|---|---|---|
| - Initiated small-scale testing in support of BLU-121/B bomb development focusing on development of low lifecycle cost agent defeat payload fills.<br>- Continued advanced testing of non-energetic WMD Defeat sub-munitions.<br>- Continued testing and demonstrations of CWMD payloads.<br>- Continued to explore integration of kinetic and non-kinetic capabilities into single payload for counter-WMD testing.<br>- Continued testing and demonstrations of payloads capable of neutralizing large amounts of WMD agent.<br>- Continued determining and cataloging the accuracy and precision of bio-aerosol sampling equipment used in counter-WMD testing.<br>- Continued development of a capability to conduct full-scale agent defeat testing with acceptable accuracy and precision.<br>- Conducted large-scale target testing of functional and kinetic defeat technologies.<br>- Developed Next Generation AFX-757 Survivable Explosive Formulation for enhanced survivability against hard and deeply buried targets; transitioned effort to Air Force Research Laboratory/Munitions Office (AFRL/RW) Conventional Survivable Ordnance Package Program.<br>- Continued development of robust forensic tools for an automated analysis of susceptibility of electronics to electromagnetic fields.<br>- Demonstrated the capabilities of the Joint Direct Attack Munition (JDAM) tailkit Battle Damage Information (BDI) systems in ground testing to provide near-real-time munitions effectiveness estimates to the warfighter.<br>- Initiated development of access denial or denial-of-use technologies for WMD targets.<br>- Evaluated small new inventory weapons effectiveness against WMD threats. | | | |
| ***FY 2014 Plans:***<br>- Mature an automated system for the analysis of electronics susceptibility to electromagnetic fields.<br>- Continue classified components testing.<br>- Begin classified integration and component design.<br>- Continue testing in support of a WMD agent defeat penetrator bomb development focusing on development of low lifecycle cost payload fills.<br>- Continue development of potential WMD target access denial or denial-of-use technologies.<br>- Continue developing robust forensic tools for an automated analysis of susceptibility of electronics to electromagnetic fields.<br>- Continue advanced testing of non-energetic WMD Defeat sub-munitions.<br>- Continue small-scale testing of CWMD payloads.<br>- Continue to explore integration of kinetic and non-kinetic capabilities into single payload for CWMD testing.<br>- Continue testing and demonstrations of payloads capable of neutralizing large amounts of WMD agent.<br>- Continue to catalog the accuracy and precision of WMD sampling equipment used in CWMD testing.<br>- Continue development of a capability to conduct full-scale agent defeat testing with acceptable accuracy and precision. | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | Date: March 2014 |
|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 2 | **R-1 Program Element (Number/Name)**<br>PE 0602718BR / *WMD Defeat Technologies* | **Project (Number/Name)**<br>RG / *Defeat Technologies* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2013 | FY 2014 | FY 2015 |
|---|---|---|---|
| - Conduct large-scale target testing of functional and kinetic defeat technologies. | | | |
| ***FY 2015 Plans:***<br>- Mature classified component testing.<br>- Continue classified integration and component design.<br>- Continue development of access denial and denial-of-use technologies for WMD targets.<br>- Continue development and integration of concepts for exploiting susceptibility of electronics to electromagnetic fields. | | | |
| **Accomplishments/Planned Programs Subtotals** | 13.544 | 15.059 | 10.982 |

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

| Line Item | FY 2013 | FY 2014 | FY 2015 Base | FY 2015 OCO | FY 2015 Total | FY 2016 | FY 2017 | FY 2018 | FY 2019 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • 30/0603160BR: *Proliferation, Prevention, and Defeat* | 17.034 | 21.811 | 19.591 | - | 19.591 | 22.532 | 23.231 | 23.625 | 24.030 | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

Government and industrial performers are assessed and selected based upon a “best fit for task” criteria. DoD Service Laboratories, Department of Energy (DoE) National Laboratories, and specialized university laboratories are common government awardees.

**E. Performance Metrics**

Research and develop potential technologies and mature at least three new capabilities to counter WMD during the FYDP to Technology Readiness Level (TRL) 3/4.

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | | | | | | | | | | Date: March 2014 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>0400 / 2 | | | | | R-1 Program Element (Number/Name)<br>PE 0602718BR / *WMD Defeat Technologies* | | | | Project (Number/Name)<br>RI / *Nuclear Survivability* | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2013** | **FY 2014** | **FY 2015 Base** | **FY 2015 OCO #** | **FY 2015 Total** | **FY 2016** | **FY 2017** | **FY 2018** | **FY 2019** | **Cost To Complete** | **Total Cost** |
| RI: *Nuclear Survivability* | 38.131 | 19.133 | 19.649 | 19.416 | - | 19.416 | 19.319 | 19.405 | 19.807 | 20.424 | Continuing | Continuing |

# The FY 2015 OCO Request will be submitted at a later date.

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

The Nuclear Survivability project provides enabling technologies for Department of Defense (DoD) nuclear forces and their associated control and support systems and facilities in wartime to avoid, repel, endure, or withstand attack or other hostile action, to the extent that essential functions can continue or be resumed after the onset of hostile action. Emphasis is on ionizing radiation effects. The Nuclear Survivability project provides Radiation Hardened (RadHard) Microelectronics and Nuclear Weapons Effects (NWE) experimentation research. Funding in this project also supports the expanding role of the Nuclear Test Personnel Review (NTPR) program into Science & Technology development for human survivability.

Pulsed power and laser-driven NWE simulators are available to validate nuclear survivability requirements for DoD missile and space systems, conduct radiation effects research in materials and electronics, and validate computational models. The Nuclear Survivability Experimental Capabilities program is working with the National Nuclear Security Administration (NNSA) and the United Kingdom (UK) Atomic Weapons Establishment to jointly develop new, enabling technologies for improved NWE experimentation capabilities for x-rays, gamma rays, and neutrons.

The Nuclear Technology Analysis Support provides support for the Joint Atomic Information Exchange Group (JAIEG) and the international Weapon Effects Steering Committee (WESC) through the NWE Users' Group. The WESC establishes standards for United States. and UK nuclear weapons effects simulation codes and models as defined and prioritized by the nuclear community, and serves as a forum for sharing information on nuclear technologies, capability gaps, and plans.

The increase from FY 2013 to FY 2014 is predominately due to the relative net impact of Congressional reductions in FY 2013 and increased investment in nuclear weapons effects experimental capabilities. The decrease from FY 2014 to FY 2015 is predominantly due to reduced investment in nuclear effects simulation/ experimentation capability and radiation hardened nanoelectronics.

| **B. Accomplishments/Planned Programs ($ in Millions)** | **FY 2013** | **FY 2014** | **FY 2015** |
|---|---|---|---|
| ***Title:*** RI: Nuclear Survivability | 19.133 | 19.649 | 19.416 |
| ***Description:*** Project RI (Nuclear Survivability) provides the capability for DoD nuclear forces and their associated control and support systems and facilities in wartime to avoid, repel, endure, or withstand attack or other hostile action, to the extent that essential functions can continue or be resumed after the onset of hostile action. | | | |
| ***FY 2013 Accomplishments:***<br>- Demonstrated initial 45nm RadHard prototype circuits to develop RadHard by design methods.<br>- Developed Technology Computer-Aided Design modeling for 45nm circuit devices.<br>- Characterized and mitigated radiation effects in graphene devices. | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | Date: March 2014 |
|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 2 | **R-1 Program Element (Number/Name)**<br>PE 0602718BR / *WMD Defeat Technologies* | **Project (Number/Name)**<br>RI / *Nuclear Survivability* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2013 | FY 2014 | FY 2015 |
|---|---|---|---|
| - Implemented human radiation induced performance decrement model into operational code.<br>- Initiated an investigation of advanced concepts to generate >10X the existing warm x-ray test capability to support strategic system life extension programs in collaboration with the National Nuclear Security Administration (NNSA), Sandia National Laboratory (SNL), and the Navy Research Laboratory (NRL).<br>- Enhanced the test capabilities of the DTRA West Coast Facility.<br>- Conducted radiation tests of Air Force Intercontinental Ballistic Missile cables and Source Generated Electromagnetic Pulse research for SNL.<br>- Restored the electron-beam test capability to the Pithon Nuclear Weapons Effects (NWE) simulator.<br>- Funded joint ion beam material response tests with the Navy and UK.<br>- Successful use of Photonic Displacement Interferometer in joint US-UK experiments.<br>- Developed Marx generator to support Initial Operational Capability of the Short Pulse Gamma Simulator.<br>- Conducted solar cell vulnerability test with the Missile Defense Agency on the University of Rochester OMEGA laser. | | | |
| ***FY 2014 Plans:***<br>- RadHard-by-Design (RHBD) 45nm /32nm technology demonstration.<br>- Radiation effects on advanced technology testing and characterization.<br>- Product Demonstration Vehicle (PDV) architecture and circuit layout designs for 45nm/32nm RHBD project.<br>- Complete 45nm and 32nm Hardness Assurance Methods for Testing and Assurance Projects.<br>- Transition radiation effects modeling and simulation project from planar 45nm / 32nm Electronic Design Automation to 28nm / 22nm Fin-Shaped Field Effect Transistors (FinFets).<br>- Continue the sustainment of the test capabilities of the DTRA West Coast Facility.<br>- Establish the Short Pulsed Gamma prototype as a test capability within the West Coast Facility for hardening and validation of military systems.<br>- Demonstrate strategic level direct laser blow-off impulse test capability for two-dimensional configurations to support material modeling & simulation.<br>- Perform a full-scale space interceptor telescope survivability test on the National Ignition Facility (NIF) in collaboration with the MDA.<br>- Demonstrate new pulsed power driven source designs for enhanced warm (>10 keV) X-ray outputs.<br>- Implementation of combined radiation and burn, partial human body model in nuclear weapons effects code.<br>- Initiate update of MIL-STD-188-125-1 High-Altitude Electromagnetic Pulse (HEMP) Protection For Ground-Based C4I Facilities Performing Critical, Time-Urgent Missions Part 1 Fixed Facilities.<br>- Complete verification test of Modernization of Enterprise Terminals (MET) Hardened Transportable Terminal to MIL-STD-188-125-2.<br>- Complete Consolidated Afloat Network and Enterprise Services (CANES) Military Standard. | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | Date: March 2014 |
|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 2 | **R-1 Program Element (Number/Name)**<br>PE 0602718BR / *WMD Defeat Technologies* | **Project (Number/Name)**<br>RI / *Nuclear Survivability* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2013 | FY 2014 | FY 2015 |
|---|---|---|---|
| - Complete draft MIL-STD-4023 Maritime Electromagnetic Pulse (EMP) Standard for surface ships.<br>***FY 2015 Plans:***<br>- Conclude collaboration with the UK on EMP research on power grid transformers.<br>- Deliver new warm x-ray (10-50 keV) test capability on the Double-Eagle and ZR simulators, in collaboration with NRL and SNL.<br>- Upgrade the Short Pulse Gamma facility within the West Coast Facility for hardening and validation of satellite and stockpile subsystems and components.<br>- Explore and validate new pulsed-power neutron and dust test capabilities.<br>- Complete Program Manager's Handbook for Nuclear Survivability.<br>- Publish survivability standards in support of satellite systems, all air domain effects and source region EMP environment.<br>- Complete 32nm Product Demonstration Vehicle.<br>- Initiate a <22nm Rad Hard-by-Design (RHBD) program.<br>- Initiate development of Maskless e-beam lithography. | | | |
| **Accomplishments/Planned Programs Subtotals** | 19.133 | 19.649 | 19.416 |

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

| Line Item | FY 2013 | FY 2014 | FY 2015 Base | FY 2015 OCO | FY 2015 Total | FY 2016 | FY 2017 | FY 2018 | FY 2019 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • 30/0603160BR: *Proliferation Prevention and Defeat* | 5.551 | 6.016 | 5.570 | - | 5.570 | 6.055 | 6.302 | 6.513 | 6.257 | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

Government and industrial performers are assessed and selected based upon a "best fit for task" criteria. DoD Service Laboratories, Department of Energy (DOE) National Laboratories, and specialized university laboratories are common government awardees.

**E. Performance Metrics**

Enhance the NWE Simulator Program at the West Coast Facility (WCF) that provides capability for Department of Defense (DoD) programs to validate and verify survivability of military hardware against a nuclear threat.
Develop cold x-ray effects capabilities that meet or exceed the current capabilities.
Demonstrate advanced warm x-ray experimental and computational capabilities to meet emerging DoD system survivability requirements.
Successfully demonstrate Short Pulse Gamma simulator to support high temporal fidelity for validation of prompt gamma nuclear weapon effects on advanced electronics.
Successfully conduct nuclear weapon effects experimental campaigns to allow identification of x-ray effects phenomena.

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | | Date: March 2014 |
|---|---|---|---|
| Appropriation/Budget Activity<br>0400 / 2 | R-1 Program Element (Number/Name)<br>PE 0602718BR / *WMD Defeat Technologies* | Project (Number/Name)<br>RL / *Nuclear & Radiological Effects* | |

| COST ($ in Millions) | Prior Years | FY 2013 | FY 2014 | FY 2015 Base | FY 2015 OCO # | FY 2015 Total | FY 2016 | FY 2017 | FY 2018 | FY 2019 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RL: *Nuclear & Radiological Effects* | 41.674 | 25.395 | 31.398 | 32.352 | - | 32.352 | 33.322 | 34.250 | 34.555 | 35.104 | Continuing | Continuing |

# The FY 2015 OCO Request will be submitted at a later date.

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

The Nuclear and Radiological Effects project develops nuclear and radiological assessment modeling tools to support military operational planning, weapon effects predictions, and strategic system design decisions; consolidate validated Defense Threat Reduction Agency modeling tools into a net-centric environment for integrated functionality; predict system response to nuclear and radiological weapons producing electromagnetic, thermal, blast, shock and radiation environments - key systems include Nuclear Command and Control System, Global Information Grid, space assets, structures, humans and environment; provide detailed adversary nuclear infrastructure characterization to enhance counterforce operations and hazard effects; conduct analyses in support of nuclear and radiological Science and Technology and address the priority needs of the Combatant Commands and the Department of Defense (DoD); develop and provide electromagnetic pulse assessment capabilities to support national and military operational planning, weapon effects predictions, and national strategic systems designs; and develop foreign nuclear weapon outputs.

The increase from FY 2013 to FY 2014 is predominately due to the relative impact of Congressional reductions in FY 2013 and increased investment for nuclear weapons effects for survivability, targeting support, and consequence of execution in FY 2014. The increase from FY 2014 to FY 2015 is predominantly due to the net effect of the cancellation of the Experimental Situational Awareness Center and a shift in priorities from weapon effects modeling to Electromagnetic Pulse (EMP) survivability and increased investment in full effects modeling.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2013 | FY 2014 | FY 2015 |
|---|---|---|---|
| ***Title:*** RL: Nuclear & Radiological Effects | 25.395 | 31.398 | 32.352 |
| ***Description:*** Project RL (Nuclear & Radiological Effects) develops nuclear and radiological assessment modeling tools to support military operational planning, weapon effects predictions, and strategic system design decisions. | | | |
| ***FY 2013 Accomplishments:***<br>- Prototyped first principles urban effects model for nuclear detonations.<br>- Delivered improved High Altitude Nuclear Environments model for better modeling/predictions of nuclear effects from space detonations.<br>- Completed three dimensional models of nuclear fallout for better modeling/predictions of fallout from ground or low-altitude detonations.<br>- Started component level Electromagnetic Pulse (EMP) response model for better modeling/predictions of effects on electronic systems.<br>- Continued Effects Manual One (EM-1) development (4 chapters) to document the current state-of-the-art in Nuclear Weapons Effects (NWE) Research & Development. | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | Date: March 2014 |
|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 2 | **R-1 Program Element (Number/Name)**<br>PE 0602718BR / *WMD Defeat Technologies* | **Project (Number/Name)**<br>RL / *Nuclear & Radiological Effects* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2013 | FY 2014 | FY 2015 |
|---|---|---|---|
| -Continue publication of Joint Radiation Effects documentation.<br>- Continued to upgrade database of foreign nuclear weapon outputs for DoD and the Services.<br>- Began new effort in first principles modeling & simulation (M&S) of nuclear fires to support targeting and consequence of execution analyses.<br>- Began new effort in developing engineering level models of the response of airborne systems in nuclear dust clouds to support targeting and consequence of execution analyses.<br>- Started development of nuclear weapon environment on airborne strategic systems at low, medium, and high-altitudes to include non-steady, non-level flight to modernize M&S tools in airblast, thermal and fallout applicable areas.<br>- Conducted Maritime EMP Standard Ship Test to provide improved techniques for testing Navy vessels against EMP threats.<br>- Completed EMP survivability testing of the Defense Satellite Communications System (DSCS) satellite station at the Northwest Navy Satellite Communications Facility (NAVSATCOMMFAC), Chesapeake, VA.<br>- Certified the new Air Force Military Satellite Communications (MILSATCOM) Atmospheric Scintillation Simulator (MASS) through simulated modem testing in support of Advanced Extremely High Frequency (AEHF) Program.<br>- Supported Office of the Secretary of Defense-led table top exercises by providing subject matter expertise in support of Regional Deterrence.<br>- Established a DoD-wide EMP filter testbed to investigate technology shortfalls in industry EMP power filters used to protect United States facilities and systems.<br>- Conducted EMP Assessment on the National Military Command Center (NMCC).<br>- Conducted EMP Assessment on the Fylingdales, United Kingdom (UK) Satellite Station jointly with the UK developed roadmaps for R&D into nuclear denotation caused fires and EMP. | | | |
| ***FY 2014 Plans:***<br>- Start Atmospheric Nuclear Environment Military Standard.<br>- Start Communication in Disturbed Environment Military Standard.<br>- Complete Verification Test of Modernization of Enterprise Terminals (MET) Hardened Transportable Terminal to MIL-STD-188-125-2.<br>- Complete draft MIL-STD-4023, High Altitude Electro Magnetic Pulse (HEMP) protection for maritime assets.<br>- Via the Nuclear Weapon Effects Network (NWEN), model fire start to support United States Strategic Command (USSTRATCOM) interest in Consequences of Execution, fire start experiments, and tunnel defeat.<br>- Model Nuclear Infra-Red effects for global assessment of missile defense systems' capabilities.<br>- Expand to include modeling nuclear detonations at lower altitudes.<br>- Update radar and IR system models.<br>- Update Open cavity System Generated Electro-magnetic Pulse (SGEMP) model to support satellite systems design.<br>- Modify input requirements of engineering level codes to take advantage of Redbook and Bluebook output.<br>- Model the effects of urban nuclear detonations for underground tunnels (e.g., subways) in support of infrastructure assessments. | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | Date: March 2014 |
|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 2 | **R-1 Program Element (Number/Name)**<br>PE 0602718BR / *WMD Defeat Technologies* | **Project (Number/Name)**<br>RL / *Nuclear & Radiological Effects* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2013 | FY 2014 | FY 2015 |
|---|---|---|---|
| - Support Nuclear Weapons Effects Database System (NWEDS) functionality with expanded targets and damage calculations, enhanced reports, plot rendering, combined and multiple weapon effects and Nuclear Weapons Database.<br>- Provide model for analysis of the high altitude nuclear environments, the effects of EMP and non-ideal air-blast on defense systems for an integrated net-centric application.<br><br>***FY 2015 Plans:***<br>- Begin transition of improved airblast, fallout, fire and Source Region Electromagnetic Pulse (SREMP) models to the DTRA net-centric environment for USSTRATCOM (and other nuclear targeting/consequences of execution users).<br>- Improve weapon outputs, environment models and Effects Manual 1 (EM-1) chapters.<br>- Deliver upgraded database of foreign nuclear weapon outputs for DoD and the Services.<br>- Continue development of SGEMP simulation codes by adapting physics capabilities of the Maxwell's Equations Equivalent Circuit code (MEEC) and the Improved Concurrent Electromagnetic Particle-In-Cell (ICEPIC) high performance computing code.<br>- Further develop a database with selected nuclear weapon output and effects for use in validation of nuclear weapon effects codes.<br>- Continue component level EMP response model for better modeling/predictions of effects on electronic systems.<br>- Via the NWEN, continue modeling economic and social consequences of nuclear detonation effects, collateral building damage due to nuclear-induced airblast, assess nuclear dust/debris effects on airborne systems, and model nuclear fire initiation.<br>- Begin enhancement and fix current short falls of High Altitude Radiation Phenomenology (HARP) functionality for use on modern computer systems.<br>- Complete transfer of contracting vehicle for continued development of nuclear weapon environment on airborne strategic systems at low, medium, and high-altitudes to include non-steady, non-level flight to modernize modeling and simulation tools in airblast, thermal, and fallout applicable areas.<br>- Complete transfer of contracting vehicle for development of the Atmospheric Nuclear Environment Military Standard.<br>- Develop new magnetosphere experiments using microsatellites (CubeSats) for quantification of the artificial radiation belt formation and decay in order to define the source term for damage and degradation of space assets.<br>- Complete transfer of contracting vehicle for development of the Communication in Disturbed Environment Military Standard.<br>- Complete engineering level modeling of the response of airborne systems in nuclear dust clouds, and transition the capability to nuclear hardness databases.<br>- Begin implementation of first principle modeling tools for nuclear fire initiation and spread in urban and suburban environments.<br>- Publish MIL-STD-4023, HEMP Protection for Maritime Assets.<br>- Publish Comprehensive Atmospheric Nuclear Environment MIL-STD.<br>- Update MIL-STD-188-125-1/2, HEMP Protection for Fixed and Transportable Facilities and Systems.<br>- Perform an EMP assessment on a US Navy Warship.<br>- Update MIL-HDBK-423, HEMP Protection for Fixed facilities.<br>- Publish Aircraft EMP Protection Handbook. | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | Date: March 2014 |
|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 2 | **R-1 Program Element (Number/Name)**<br>PE 0602718BR / *WMD Defeat Technologies* | **Project (Number/Name)**<br>RL / *Nuclear & Radiological Effects* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2013 | FY 2014 | FY 2015 |
|---|---|---|---|
| - Add SREMP to the EMREP Toolkit.<br>- Conduct EMP Assessments on Defense Critical Infrastructure Power, specifically the power grid and telecommunications networks. | | | |
| **Accomplishments/Planned Programs Subtotals** | 25.395 | 31.398 | 32.352 |

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

| Line Item | FY 2013 | FY 2014 | FY 2015 Base | FY 2015 OCO | FY 2015 Total | FY 2016 | FY 2017 | FY 2018 | FY 2019 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • 121/0605000BR: *WMD Defeat Capabilities* | 5.173 | 5.995 | - | - | - | - | - | - | - | - | - |

**Remarks**

**D. Acquisition Strategy**

Government and industrial performers are assessed and selected based upon a “best fit for task” criteria. DoD Service Laboratories, Department of Energy (DOE) National Laboratories, and specialized university laboratories are common government awardees.

**E. Performance Metrics**

Provide DoD the ability to predict the survival and mission impact of military critical systems exposed to nuclear weapon environments within acceptability criteria defined during the model accreditation process.

Provide performance-based, Interface MIL-STDs for nuclear weapon environments and effects for the new systems acquisition and survivability for the new triad and 21st century warfare.

Continuously improve USSTRATCOM official strategic targeting capability to determine the consequences of execution from nuclear weapons.

Weapon Effects Steering Committee: Coordinate and integrate nuclear weapon effects needs, capabilities and programs across the U.S. and UK defense communities.

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | | Date: March 2014 |
|---|---|---|---|
| Appropriation/Budget Activity<br>0400 / 2 | R-1 Program Element (Number/Name)<br>PE 0602718BR / *WMD Defeat Technologies* | Project (Number/Name)<br>RM / *WMD Counterforce Technologies* | |

| COST ($ in Millions) | Prior Years | FY 2013 | FY 2014 | FY 2015 Base | FY 2015 OCO # | FY 2015 Total | FY 2016 | FY 2017 | FY 2018 | FY 2019 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RM: *WMD Counterforce Technologies* | 34.344 | 18.026 | 14.444 | 13.787 | - | 13.787 | 13.583 | 13.807 | 14.133 | 14.607 | Continuing | Continuing |

# The FY 2015 OCO Request will be submitted at a later date.

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

The Weapons of Mass Destruction (WMD) Counterforce Technologies project provides applied research to support 1) full and sub-scale testing required to investigate countering WMD weapon effects and sensor performance, 2) weapon effects modeling algorithm development, and 3) development of visualization and situational awareness tools to support the next generation Technical Reachback analysis cell.

This project provides combatant commanders the prediction capability and the attack options to engage WMD targets, to include related Hard & Deeply Buried Targets (HDBTs) as the proliferation and hardness of this class of targets increases. The project conducts weapon effects phenomenology (WEP) tests, analyzes data, conducts high performance computer simulations, and creates/modifies software to more accurately model cratering effects, fragmentation (both primary & secondary), internal air blast, equipment/container damage, structural response, agent release, near miss lethality, and penetration. These efforts will lead to advanced modeling and simulation capability in the countering WMD planning tools, to include the Integrated Munitions Effects Assessment (IMEA) planning tool used for weaponeering and the Vulnerability Assessment and Protection Option (VAPO) planning tool used for force/structure protection. The Advanced Energetics Program develops new novel energetic materials and weapon design technology for rapid, directed and enhanced energy release, providing new capability to defeat difficult WMD/HDBTs. The Advanced Energetics Program develops new high energy systems well above current chemical energy levels to defeat WMD targets beyond the reach of traditional high explosive blast/frag warhead technology.

The decrease from FY 2013 to FY 2014 is predominately due to the relative impact of Congressional reductions in FY 2013 and reduced investment in DTRA wargaming. The decrease from FY 2014 to FY 2015 is predominantly due to reduced investment in small and medium-scale validation and parametric study experiments for advanced energetics.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2013 | FY 2014 | FY 2015 |
|---|---|---|---|
| ***Title:*** RM: WMD Counterforce Technologies | 18.026 | 14.444 | 13.787 |
| ***Description:*** Project RM (WMD Counterforce Technologies) provides (1) novel and enhanced weapons energetic materials and structures, full-scale testing of counter WMD weapons effects, weapons effects modeling, and weapon delivery optimization, (2) WMD sensor, surveillance and data processing technologies, and (3) the DTRA Experimentation Lab. | | | |
| ***FY 2013 Accomplishments:***<br>- Provided modeling support for the transfer of novel energetic concepts to selected weapon systems.<br>- Completed advanced energetic material formulation testing; performed in-depth fragmentation test and analysis with reactive liners in sub-scale lab tests. | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | Date: March 2014 |
|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 2 | **R-1 Program Element (Number/Name)**<br>PE 0602718BR / *WMD Defeat Technologies* | **Project (Number/Name)**<br>RM / *WMD Counterforce Technologies* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2013 | FY 2014 | FY 2015 |
|---|---|---|---|
| - Tested agent defeat concepts using hybrid enhanced blast explosives and novel weapon reactive case technologies.<br>- Began work to develop warhead energy release tailored to target environment and to develop directed blast energy release to enhance target damage.<br>- Released enhanced version of Second-order Hydrodynamic Automatic Mesh Refinement Code (SHAMRC) (blast analysis tool) that included improved post-detonation modeling of non-ideal explosives using multiple fuel types.<br>- Demonstrated ability to detonate hybrid enhanced blast explosives dynamically (in flight), and with simultaneous second internal detonation.<br>- Developed a new polymer for use in explosive formulations.<br>- Completed a study on defeat of Aluminum by non-kinetic means.<br>- Delivered optical taggant materials and testing kits.<br>- Completed synthesis and spectroscopic evaluations of 65 novel materials for explosive materials.<br>- Improved computational methods for prediction of progressive collapse.<br>- Completed blast through failing walls tests and developed new model for blast through failing walls in light structures.<br>- Completed testing for near miss lethality for two inventory weapons.<br>- Began validation of high fidelity models for air blast in complex tunnels.<br>- Started development of models for blast and fragmentation through failing blast doors.<br>- Delivered fast running threat and fragility models for equipment damage due to dynamic pressure in bunker rooms.<br>- Completed annual cycle of requirements collection, challenge proposals, resource allocation, and technical support through High Performance Computing (HPC).<br>- Submitted one DTRA Challenge Proposal for improved quality of service in time limit, allowed job size, and job throughput on DoD high performance computers.<br>- Submitted a proposal to the Department of Defense (DoD) HPC Modernization Program (HPCMP) and for a large dedicated HPC cluster for DTRA's Counter WMD Analysis Center.<br>- Supported senior Combatant Command (COCOM), Interagency, and International table top exercises to address key national/ international strategies for reducing/combating the WMD threat.<br>- Developed generalized Equipment Fragility Model.<br>- Developed Dynamic Pressure Model for bunkers.<br>- Delivered an initial blast and fragment propagation through failing blast doors and multi-blast doors model for integration in Integrated Munitions Effects Assessment (IMEA).<br>***FY 2014 Plans:***<br>- Develop Blast Propagation Through Failed Walls Model.<br>- Update Agent Release Model for container perforated translation/collision.<br>- Optimize Finite Element Flow Solver (FEFLO) for agent defeat calculations in complex tunnels.<br>- Complete General Near Miss Lethality Model. | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | Date: March 2014 |
|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 2 | **R-1 Program Element (Number/Name)**<br>PE 0602718BR / *WMD Defeat Technologies* | **Project (Number/Name)**<br>RM / *WMD Counterforce Technologies* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2013 | FY 2014 | FY 2015 |
|---|---|---|---|
| - Perform annual cycle of requirements collection, challenge proposals, resource allocation, and technical support through HPC.<br>- Enhance one HPC production code to better leverage capabilities of DoD high performance computers for improved modeling and simulation time to response.<br>- Continue model development for blast and fragment propagation through failing blast doors and multi-blast doors.<br>- Continue lab and scale testing for validation of high fidelity models for penetration mechanics through ultra-high strength materials.<br>- Develop test data for steel columns for near contact detonations to feed global response models for agent defeat planning and consequence of execution estimation.<br>- Continue global response testing and modeling for progressive collapse analyses for consequence of execution estimation.<br>- Start a new project agreement with Singapore for testing and modeling of mega columns.<br>- Complete a model for blast propagation through bunker walls for inventory weapons.<br>- Conduct a large scale test of hybrid enhanced blast explosives and reactive cases for defeat of biological agents using simulants.<br>- Scale up synthesis of novel explosives, prepare their metalized composites and conduct field tests.<br>- Develop real-time reachback requirements and gap solutions through wide area search Table Top Exercise. | | | |
| ***FY 2015 Plans:***<br>- Continue development of Hybrid Enhanced Blast Explosives (HEBX); demonstrate ability to embed detonator system and disperse along with the fuel, to initiate cloud reaction as designed.<br>- Conduct a large-scale test of hybrid enhanced blast explosives and reactive cases for defeat of biological agents using simulants.<br>- Continue modeling and testing support to optimize and improve reactive case technology for use in Joint Multi-Effects Warhead System (JMEWS), Tube-launched, Optically-tracked, Wireless-guided (TOW) bunker buster, and Hellfire warheads.<br>- Conduct field tests to support optimization and improve effectiveness of biocidal effect fuels used in explosive formulations, innovative common data methods supporting advanced WMD effects modeling, and simulation capabilities for consequence management.<br>- Conduct lab and field tests of two new high explosive formulations for use in Conventional Prompt Global Strike (CPGS) warheads; one optimized for blast/frag warheads, one optimized for high speed penetration warheads.<br>- Continue to improve hydrocodes to provide high fidelity capability to model post-detonation energy release from non-ideal detonation and other new advanced energetics systems.<br>- Integrate weapons effects model for blast propagation through bunker walls for inventory weapons into planning tools.<br>- Develop weapons effects debris model from bunker walls subjected to internal detonations with inventory weapons.<br>- Complete testing of response of dry-agent stimulant in container undergoing perforation, translation and collision from weapons induced loads. Deliver new Agent Release Model.<br>- Begin large-scale testing for validation of high fidelity models for penetration mechanics through ultra-high strength materials. | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | Date: March 2014 |
|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 2 | **R-1 Program Element (Number/Name)**<br>PE 0602718BR / *WMD Defeat Technologies* | **Project (Number/Name)**<br>RM / *WMD Counterforce Technologies* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2013 | FY 2014 | FY 2015 |
|---|---|---|---|
| - Complete testing and begin model development for response of massive columns to near-contract charges.<br>- Conduct testing to validate high fidelity computational methods for predicting progressive collapse analysis of steel buildings.<br>- Perform annual cycle of requirements collection, challenge proposals, resource allocation, and technical support through HPC.<br>- Submit proposal(s) to the DoD HPCMP to fund dedicated HPC hardware to meet unique DTRA requirements.<br>- Submit proposal(s) to the HPCMP to fund software development to meet unique DTRA requirements. | | | |
| **Accomplishments/Planned Programs Subtotals** | 18.026 | 14.444 | 13.787 |

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

| Line Item | FY 2013 | FY 2014 | FY 2015 Base | FY 2015 OCO | FY 2015 Total | FY 2016 | FY 2017 | FY 2018 | FY 2019 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • 30/0603160BR: *Proliferation, Prevention, and Defeat* | 21.514 | 29.420 | 29.346 | - | 29.346 | 31.404 | 31.012 | 31.231 | 33.152 | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

N/A

**E. Performance Metrics**

Scheduled tests completed.
Models being developed, completed or integrated.
Proposals submitted.
Time required to complete assessments.
The DTRA Experimentation Lab is occupied by planning or execution efforts 75% of the year.

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | | Date: March 2014 |
|---|---|---|---|
| Appropriation/Budget Activity<br>0400 / 2 | R-1 Program Element (Number/Name)<br>PE 0602718BR / *WMD Defeat Technologies* | Project (Number/Name)<br>RR / *Combating WMD Test and Evaluation* | |

| COST ($ in Millions) | Prior Years | FY 2013 | FY 2014 | FY 2015 Base | FY 2015 OCO # | FY 2015 Total | FY 2016 | FY 2017 | FY 2018 | FY 2019 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RR: *Combating WMD Test and Evaluation* | 30.150 | 10.425 | 12.659 | 11.060 | - | 11.060 | 11.182 | 11.809 | 12.091 | 12.426 | Continuing | Continuing |

# The FY 2015 OCO Request will be submitted at a later date.

**Note**

RR Project title change from Test Infrastructure starting in FY 2015

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

The Test Infrastructure project provides a unique national test bed capability for simulated Weapons of Mass Destruction (WMD) facility characterization, weapon-target interaction, and WMD facility defeat testing to respond to operational needs by developing and maintaining test beds used by the Department of Defense (DoD), the Services, the Combatant Commanders, and other federal agencies to evaluate the implications of WMD, conventional, and other special weapon use against United States military or civilian systems and targets. It leverages fifty years of testing expertise to investigate weapons effects and target response across the spectrum of hostile environments that could be created by proliferate nations or terrorist organizations with access to advanced conventional weapons or WMD (nuclear, biological and chemical). The project maintains testing infrastructure to support the testing requirements of warfighters, other government agencies, and friendly foreign countries on a cost reimbursable basis. It creates testing strategies and a WMD Test Bed infrastructure focusing on the structural response of buildings and Hard & Deeply Buried Targets that house nuclear, biological, and chemical facilities. It provides support for full and sub-scale tests that focus on weapon-target interaction with fixed soft and hardened facilities to include above ground facilities, cut-and-cover facilities, and deep underground tunnels. This capability does not exist anywhere else within the DoD and supports the counterproliferation pillar of the National Strategy to Combat WMD.

The increase from FY 2013 to FY 2014 is predominately due to the net impact of Congressional reductions in FY 2013 and the realignment of test bed facilities from RT-Target Assessment Technologies in Program Element (PE) 0603160BR to RR-Test Infrastructure in PE 0602718BR to better reflect the nature of those activities. The decrease from FY 2014 to FY 2015 is predominately due to decreased investment in test technology.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2013 | FY 2014 | FY 2015 |
|---|---|---|---|
| ***Title:*** RR: Combating WMD Test and Evaluation | 10.425 | 12.659 | 11.060 |
| ***Description:*** Project RR provides a unique national test bed capability for simulated WMD facility characterization, weapon-target interaction, and WMD facility defeat testing to respond to operational needs by developing and maintaining test beds used by the DoD, the Services, the Combatant Commanders and other federal agencies to evaluate the implications of WMD, conventional, and other special weapon use against U.S. military or civilian systems and targets. | | | |
| ***FY 2013 Accomplishments:***<br>- Continued Integrated Technology Demonstration (ITD) at Nevada National Security Site (NNSS) to defeat credible and threat-based scenarios; used demonstration data to transition into several related projects/planned events through FY 2017. | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | Date: March 2014 |
|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 2 | **R-1 Program Element (Number/Name)**<br>PE 0602718BR / *WMD Defeat Technologies* | **Project (Number/Name)**<br>RR / *Combating WMD Test and Evaluation* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2013 | FY 2014 | FY 2015 |
|---|---|---|---|
| - Continued technical and test development and demonstration of Transatlantic Collaboration Biological Resiliency Demo (TACBRD), a Department of Defense (DoD) capability to shape interagency approach to counter a wide area biological event impacting U.S. and partner nations' key civilian/military infrastructure.<br>- Completed initial phase of testing in support of "Speed of Sound" nuclear forensic program.<br>- Maintained existing test infrastructure in current configuration to support revitalized Weapons Effects Phenomenology Program supporting DTRA test programs; made improvements through funding provided by external program managers.<br>- Improved existing test infrastructure and test articles or constructed new test articles to support DTRA Detection Technology Program through funding provided by external program managers. Internal customer funding constructed two test beds for Weapons Effects Phenomenology testing; and USAF funding refurbished existing Capitol Peak Tunnel Complex and constructed additional phenomenology test beds for Massive Ordnance Penetrator (MOP) test program at SHIST, Alt SHIST, and Chestnut test beds.<br>- Completed Source Physics Experiment (SPE) 3 and continued SPE 4 testing in support of Treaty Verification Technologies Program and Source Physics Experiments to support Comprehensive Test Ban Treaty Initiatives, New START Warhead Verification, and detection and verification of Biological and Chemical Weapons.<br>- Continued support of WMD sensor testing at the Technical Evaluation Assessment and Monitor Site (TEAMS) to detect and prevent nuclear grade material from entering the U.S., U.S. territories, and Allied Nations through air, rail, ship, and ship ports.<br>- Completed Interagency Biological Restoration Demonstration (IBRD) testing in conjunction with DoD and the Department of Homeland Security (DHS) to reduce the time and resources necessary to recover and restore wide urban areas, military installations, and critical infrastructure, following a biological incident.<br>- Continued testing Chemical, Biological, Radiological, Nuclear, and High-yield Explosives (CBRNE) sensors, WMD countermeasures, remote geological sensing, and battle management systems designed for surveillance and tracking targets used for WMD activities.<br>- Continued support of inter-agency and inter-department nuclear detection and forensics testing to prevent weapons grade material/dirty bombs from entering the U.S., U.S. territories, and Allied Nations.<br>- Continued environmental remediation and compliance activities at the NNSS, White Sands Missile Range (WSMR), and Kirtland Air Force Base (KAFB) in accordance with Environmental Protection Agency (EPA) safety, and environmental guidelines.<br>- Completed Environmental remediation efforts at Dugway Proving Grounds, UT .<br>- Completed demolition of Component Test Structure 1 (CTS-1) and Large Test Structure 2 (LTS-2).<br>- Maintained current inventory of infrastructure and instrumentation, extending life-cycle of these items as long as possible to ensure test beds meet customers' advanced technology testing needs.<br>- Continued to document, prioritize, and support test infrastructure requirements.<br>- Turned over primary responsibility for day-to-day management of the Large Blast Thermal Simulator to WSMR.<br>- Continued to support the development of portable forensic assessment capabilities for the OCONUS environment.<br>- Completed the development of a suitable range on the NNSS and the first four phases of research in accelerator based detection systems. | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | Date: March 2014 |
|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 2 | **R-1 Program Element (Number/Name)**<br>PE 0602718BR / *WMD Defeat Technologies* | **Project (Number/Name)**<br>RR / *Combating WMD Test and Evaluation* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2013 | FY 2014 | FY 2015 |
|---|---|---|---|
| - Started evaluation and development of new test bed at NNSS to address emerging threats. Continued development, construction, and transition to specific scenarios planned through FY 2020. | | | |
| ***FY 2014 Plans:***<br>- Continue Combating WMD (CWMD) testing/demonstration at NNSS to defeat credible and threat-based scenarios; continue with transition into several related projects/planned events through FY 2017.<br>- Begin CWMD testing at WSMR prioritizing requirements to support reduced architectural and engineering design efforts and construction of future CWMD test beds.<br>- Support development and demonstration of TransAtlantic Collaboration Biological Resiliency Demo (TACBRD), a DoD capability to shape interagency approach to counter a wide area biological event impacting U.S. and partner nations' key civilian/military infrastructure.<br>- Continue research of Biological Re-aerosolization in conjunction with DoD/DHS/EPA to help develop precise measurement technologies for residual biological pathogens reentering air after settling.<br>- Continue intergovernmental Biological Agent Defeat test program between DTRA and Defence Research and Development Canada.<br>- Continue testing in support of "Speed of Sound" nuclear forensic program estimated to continue through FY 2015.<br>- Maintain existing test infrastructure in current configuration to support revitalized Weapons Effects Phenomenology Program supporting DTRA test programs. Improve existing test infrastructure and test articles.<br>- Conduct testing in support of Treaty Verification Technology Program and Source Physics Experiment (SPE) to support Comprehensive Test Ban Treaty (CTBT) Initiatives, New START Warhead Verification, and detection and verification of Biological and Chemical Weapons.<br>- Continue support of WMD sensor testing at the Technical Evaluation Assessment and Monitor Site (TEAMS) to detect and prevent nuclear grade material from entering the U.S., U.S. territories, and Allied Nations through air, rail, and ship ports.<br>- Continue testing CBRNE sensors, WMD countermeasures, remote geological sensing, and battle management systems designed for surveillance and tracking targets used for WMD activities.<br>- Continue nuclear detection and forensics testing to prevent weapons grade material/dirty bombs from entering the U.S., U.S. territories, and Allied Nations.<br>- Continue environmental remediation and compliance activities at the NNSS, DPG, WSMR, and KAFB in accordance with EPA, Safety, and Environmental guidelines. Defer major demolition and restoration efforts of major test articles while ensuring they are safely closed and sealed at minimal acceptable standards.<br>- Maintain current inventory of infrastructure and instrumentation, extending life-cycle of these items as long as possible to ensure test beds meet customers' advanced technology testing needs.<br>- Document, prioritize, and support test infrastructure requirements. | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | Date: March 2014 |
|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 2 | **R-1 Program Element (Number/Name)**<br>PE 0602718BR / *WMD Defeat Technologies* | **Project (Number/Name)**<br>RR / *Combating WMD Test and Evaluation* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2013 | FY 2014 | FY 2015 |
|---|---|---|---|
| - Evaluate and determine courses of action for current usefulness of remaining existing nuclear simulators within management control of Test Support Division.<br><br>***FY 2015 Plans:***<br>- Continue CWMD testing/demonstration at NNSS to defeat credible and threat-based scenarios; continue with transition into several related projects/planned events through FY 2017.<br>- Begin CWMD testing at WSMR prioritizing requirements to support reduced architectural and engineering design efforts and construction of future CWMD test beds.<br>- Continue technical and testing development and demonstration of TransAtlantic Collaboration Biological Resiliency Demo (TACBRD), a DoD capability to shape interagency approach to counter a wide area biological event impacting U.S. and partner nations' key civilian/military infrastructure.<br>- Continue testing in support of "Speed of Sound" nuclear forensic program estimated to continue through FY 2015.<br>- Maintain existing test infrastructure in current configuration to support revitalized Weapons Effects Phenomenology Program supporting DTRA test programs; make improvements through funding provided by external program managers.<br>- Continue testing in support of Treaty Verification Technology Program and Source Physics Experiment (SPE) to support Comprehensive Test Ban Treaty (CTBT) Initiatives, New START Warhead Verification, and detection and verification of Biological and Chemical Weapons.<br>- Continue support of WMD sensor testing at the TEAMS to detect and prevent nuclear grade material from entering the U.S., U.S. territories, and Allied Nations through air, rail, and ship ports.<br>- Continue testing CBRNE sensors, WMD countermeasures, remote geological sensing, and battle management systems designed for surveillance and tracking targets used for WMD activities.<br>- Continue nuclear detection and forensics testing to prevent weapons grade material/dirty bombs from entering the U.S., U.S. territories, and Allied Nations.<br>- Continue environmental remediation and compliance activities at the NNSS, WSMR, and KAFB in accordance with EPA, Safety, and Environmental guidelines. Defer major demolition and restoration efforts of major test articles while ensuring they are safely closed and sealed at minimal acceptable standards.<br>- Maintain current inventory of infrastructure and instrumentation, extending life-cycle of these items as long as possible to ensure test beds meet customers' advanced technology testing needs.<br>- Document, prioritize, and support test infrastructure requirements. | | | |
| **Accomplishments/Planned Programs Subtotals** | 10.425 | 12.659 | 11.060 |

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | Date: March 2014 |
|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 2 | **R-1 Program Element (Number/Name)**<br>PE 0602718BR / *WMD Defeat Technologies* | **Project (Number/Name)**<br>RR / *Combating WMD Test and Evaluation* |

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

| Line Item | FY 2013 | FY 2014 | FY 2015 Base | FY 2015 OCO | FY 2015 Total | FY 2016 | FY 2017 | FY 2018 | FY 2019 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • 30/0603160BR: *Proliferation, Prevention, and Defeat* | 0.020 | - | - | - | - | - | - | - | - | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

Government and industrial performers are assessed and selected based upon a “best fit for task” criteria. DoD Service Laboratories, Department of Energy (DOE) National Laboratories, and specialized university laboratories are common government awardees.

**E. Performance Metrics**

Number of tests executed safely, i.e., no loss of life or limb, no unintentional significant damage of property.
FY 2012 – No safety issues/incidents during scheduled test events.
FY 2013 – No safety issues/incidents during scheduled test events.
Number of tests that are evaluated through the milestone review process.
100% of all tests completed in accordance with scheduled milestones.
Number of tests that undergo environmental assessment consistent with existing Environmental Impact Statements.
All test executed undergo environmental review consistent with existing Environmental Impact Statements.
FY 2013 - 89 Tests Completed
FY 2014 - 76-90 Tests (projected)

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | | Date: March 2014 |
|---|---|---|---|
| Appropriation/Budget Activity<br>0400 / 2 | R-1 Program Element (Number/Name)<br>PE 0602718BR / *WMD Defeat Technologies* | Project (Number/Name)<br>RU / *Fundamental Research for Combating WMD* | |

| COST ($ in Millions) | Prior Years | FY 2013 | FY 2014 | FY 2015 Base | FY 2015 OCO # | FY 2015 Total | FY 2016 | FY 2017 | FY 2018 | FY 2019 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RU: *Fundamental Research for Combating WMD* | 16.892 | 3.499 | 0.516 | - | - | - | - | - | - | - | - | - |

# The FY 2015 OCO Request will be submitted at a later date.

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

The Fundamental Research for Combating Weapons of Mass Destruction (CWMD) project conducts technology reviews of the Defense Threat Reduction Agency (DTRA) Basic Research Program to identify promising emerging science with potential to be matured into Counter Weapons of Mass Destruction technologies. The advancement of technology and science into applied technology development efforts focus upon increasing the stability and utility of mid-to-long term, moderate risk but high payoff science, and emerging technologies for transition to other DTRA applied technology programs. This effort serves as the bridge between the bench scientist and the applied technologist.

The decrease from FY 2013 to FY 2014 is predominately due to decreased investment in University Strategic Partnership (USP) activities. The decrease from FY 2014 to FY 2015 is predominately due to the completion of University Strategic Partnership activities.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2013 | FY 2014 | FY 2015 |
|---|---|---|---|
| ***Title:*** RU: Fundamental Research for Combating WMD | 3.499 | 0.516 | - |
| ***Description:*** Project RU (Fundamental Research for Combating WMD) provides (1) strategic studies to support DoD, (2) decision support tools and analysis to support combating WMD research and development investments, and (3) early applied research for technology development.<br><br>***FY 2013 Accomplishments:***<br>- Closed out the current University Strategic Partnership (USP) contract after 10 years of activities.<br>- Closed out the remainder of the eleven active research projects.<br>- Awarded five one year technology transition grants/contracts in nuclear detector technology, physical network protection from WMD, and high energy density material development.<br><br>***FY 2014 Plans:***<br>- Provide technical and programmatic support to DTRA's basic research program. | | | |
| **Accomplishments/Planned Programs Subtotals** | 3.499 | 0.516 | - |

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | Date: March 2014 |
|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 2 | **R-1 Program Element (Number/Name)**<br>PE 0602718BR / *WMD Defeat Technologies* | **Project (Number/Name)**<br>RU / *Fundamental Research for Combating WMD* |

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

| Line Item | FY 2013 | FY 2014 | FY 2015 Base | FY 2015 OCO | FY 2015 Total | FY 2016 | FY 2017 | FY 2018 | FY 2019 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • 1/0601000BR: *DTRA Basic Research Initiative* | 40.818 | 45.837 | 37.778 | - | 37.778 | 38.436 | 39.119 | 39.824 | 40.500 | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

Government and Industrial performers are assessed and selected based upon a "best fit for task" criteria. DoD Service Laboratories and Department of Energy (DOE) National Laboratories are common government awardees.

**E. Performance Metrics**

Project performance is measured via a combination of statistics including the number of publications generated, number of students trained in sciences and engineering supporting DoD's educational goals, number of research organizations participating, and percentage of participating universities on the US News & World Report "Best Colleges" list.

Publication of an annual basic research technical and external programmatic review report.

Each study/project will commence within 3 months of customer request and results delivered within 3 months of completion.

| Exhibit R-2, RDT&E Budget Item Justification: PB 2015 Defense Threat Reduction Agency | | | | | | | | | | | Date: March 2014 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 3: *Advanced Technology Development (ATD)* | | | | | R-1 Program Element (Number/Name)<br>PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention and Defeat* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2013** | **FY 2014** | **FY 2015 Base** | **FY 2015 OCO #** | **FY 2015 Total** | **FY 2016** | **FY 2017** | **FY 2018** | **FY 2019** | **Cost To Complete** | **Total Cost** |
| Total Program Element | 578.076 | 250.288 | 274.033 | 283.694 | - | 283.694 | 277.955 | 271.820 | 268.274 | 274.989 | Continuing | Continuing |
| RA: *Information Science and Applications* | 18.169 | 3.006 | 2.431 | - | - | - | - | - | - | - | Continuing | Continuing |
| RE: *Counter-Terrorism Technologies* | 229.573 | 106.967 | 111.658 | 108.630 | - | 108.630 | 104.129 | 113.606 | 108.229 | 110.239 | Continuing | Continuing |
| RF: *Detection and Forensics Technologies* | 150.452 | 69.331 | 74.556 | 66.707 | - | 66.707 | 68.770 | 70.727 | 71.058 | 72.959 | Continuing | Continuing |
| RG: *Defeat Technologies* | 32.879 | 17.034 | 21.811 | 19.591 | - | 19.591 | 22.532 | 23.231 | 23.625 | 24.030 | Continuing | Continuing |
| RI: *Nuclear Survivability* | 21.090 | 5.551 | 6.016 | 5.570 | - | 5.570 | 6.055 | 6.302 | 6.513 | 6.257 | Continuing | Continuing |
| RM: *WMD Counterforce Technologies* | 52.878 | 21.514 | 29.420 | 29.346 | - | 29.346 | 31.404 | 31.012 | 31.231 | 33.152 | Continuing | Continuing |
| RR: *Combating WMD Test and Evaluation* | 1.790 | 0.020 | - | - | - | - | - | - | - | - | Continuing | Continuing |
| RT: *Target Assessment Technologies* | 71.245 | 26.865 | 28.141 | 53.850 | - | 53.850 | 45.065 | 26.942 | 27.618 | 28.352 | Continuing | Continuing |

# The FY 2015 OCO Request will be submitted at a later date.

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

The Defense Threat Reduction Agency's (DTRA) mission is to safeguard the United States and our allies from global Weapons of Mass Destruction (WMD) threats by integrating, synchronizing, and providing responsive expertise, technologies, and capabilities unequalled by our adversaries. This mission directly reflects several national and Department of Defense level guidance/vision documents to include the National Security Strategy, Unified Command Plan, National Strategy to Combat WMD, Counterproliferation Interdiction, National Strategy for Combating Terrorism, National Military Strategy, Global Development of Forces, Global Employment of Forces, National Military Strategy for Combating WMD, National Military Strategic Plan for the War on Terrorism, Joint Strategic Capabilities Plan (including the Nuclear Annex), and Nuclear Posture Review. To achieve this mission, DTRA has identified principal objectives along with strategies and tasks to ensure the objectives are met. These objectives are:

1) Ensure a safe, secure, and effective nuclear deterrent;
2) Anticipate emerging WMD threats;
3) Provide Counter WMD (CWMD) situational awareness;
4) Assess infrastructure and personnel vulnerabilities;
5) Prevent proliferation and use of WMD;

| Exhibit R-2, RDT&E Budget Item Justification: PB 2015 Defense Threat Reduction Agency | Date: March 2014 |
|---|---|
| **Appropriation/Budget Activity**<br>0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 3: *Advanced Technology Development (ATD)* | **R-1 Program Element (Number/Name)**<br>PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention and Defeat* |

6) Defend against WMD threats;
7) Defeat WMD threats;
8) Recover from WMD consequences;
9) Synchronize countering WMD activities.

The Proliferation, Prevention, and Defeat program element reduces WMD proliferation and enhances WMD defeat capabilities through advanced technology development. To accomplish this objective, eight project areas were developed: RA-Information Science and Applications, RE-Counter-Terrorism Technologies, RF-Detection and Forensics Technologies, RG-Defeat Technologies, RI-Nuclear Survivability, RM-WMD Counterforce Technologies, RR-Combating WMD Test and Evaluation, and RT-Target Assessment Technologies. These projects support technology requirements in line with the Joint Functional Concepts (Chairman, Joint Chiefs of Staff Instruction 3170.01).

| B. Program Change Summary ($ in Millions) | FY 2013 | FY 2014 | FY 2015 Base | FY 2015 OCO | FY 2015 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 275.022 | 274.033 | 275.880 | - | 275.880 |
| Current President's Budget | 250.288 | 274.033 | 283.694 | - | 283.694 |
| Total Adjustments | -24.734 | - | 7.814 | - | 7.814 |
| • Congressional General Reductions | -0.363 | - | | | |
| • Congressional Directed Reductions | -21.783 | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | -2.588 | - | | | |
| • Realignments | - | - | 1.513 | - | 1.513 |
| • Other Reductions | - | - | -22.699 | - | -22.699 |
| • Programmatic - Increases | - | - | 29.000 | - | 29.000 |

**Change Summary Explanation**

The decrease in FY 2013 from the previous President's Budget submission is predominately due to Congressional reductions and the Small Business Innovation Research (SBIR) transfer. The increase in FY 2015 from the previous President's Budget Submission is a result of the net effect of decreased investments in nuclear detection, nuclear treaty technology, counter-terrorism/counterproliferation support and reachback tools and increased investment in the development and integration of high-priority find, characterize, and assess technologies in RT-Target Assessment Technologies. This project has the only identified solution capable of meeting a time sensitive, mission critical technology gap. Reduced investment impacted RA-Information Science and Applications, RE-Counter Terrorism Technologies, RF-Detection and Forensics Technologies, RG-Defeat Technologies, and RI-Nuclear Survivability.

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | | Date: March 2014 |
|---|---|---|---|
| Appropriation/Budget Activity<br>0400 / 3 | R-1 Program Element (Number/Name)<br>PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention and Defeat* | Project (Number/Name)<br>RA / *Information Science and Applications* | |

| COST ($ in Millions) | Prior Years | FY 2013 | FY 2014 | FY 2015 Base | FY 2015 OCO # | FY 2015 Total | FY 2016 | FY 2017 | FY 2018 | FY 2019 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RA: *Information Science and Applications* | 18.169 | 3.006 | 2.431 | - | - | - | - | - | - | - | Continuing | Continuing |

# The FY 2015 OCO Request will be submitted at a later date.

**Note**

*RA Project title change from Systems Engineering and Innovation starting in FY 2014

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

The Information Science and Applications project provides (1) Technical Reachback support to create decision advantage for the United States and our Allies through improved situational understanding across the complete Combating Weapons of Mass Destruction (CWMD) mission space and (2) research and development support for cooperative programs, technology demonstrations, and vulnerability assessments that enhance foreign partner ability to assess, prevent, and respond to threats and events involving weapons of mass destruction. The Technical Reachback effort provides 24 hour/7 days per week information and analyses on potential impacts of a WMD event to Warfighters and First Responders in consult with DTRA's Combating WMD Research and Development subject matter experts. This effort develops and integrates capabilities and processes to support WMD effects and consequences, to include secondary and tertiary effects. This project also provides support to international CWMD science and technology cooperation by developing modifications, improvements, or new technologies and information tools suitable for foreign release and cooperative efforts. Further, this project provides the Defense Threat Reduction Agency (DTRA) on-site support to North Atlantic Treaty Organization (NATO) and Supreme Headquarters Allied Powers, Europe (SHAPE) with a current primary focus on support to U.S. European Command (USEUCOM), NATO, and SHAPE in combating WMD and maintaining the NATO nuclear deterrent. A significant element of this project includes support to Command Elements and the warfighting Combatant Commands (COCOMs) on strategies for reducing/countering the WMD threat in the COCOMs Areas of Responsibility. This project also provides for the solution to the Secretary of Defense mandate for DTRA to account, maintain, report, and track the National Nuclear Weapons Stockpile & Nuclear Weapon-Related Materiel during peacetime, crisis, and wartime. In support of national requirements necessary to maintain a viable nuclear deterrent, the Defense Integration and Management of Nuclear Data Services provides a platform to ensure continued sustainability and viability of the nuclear weapons stockpile.

The decrease from FY 2013 to FY 2014 is predominately due to the consolidation of Reachback Support operations in Project RM - WMD Counterforce Technologies in Program Element (PE) 0603160BR and increased investment in research and development analysis support funded by a transfer from PE 0602718BR. The decrease from FY 2014 to FY 2015 is due to the completion of efforts in building partner capacity development activities.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2013 | FY 2014 | FY 2015 |
|---|---|---|---|
| ***Title:*** RA: Information Science and Applications | 3.006 | 2.431 | - |

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | Date: March 2014 |
|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 3 | **R-1 Program Element (Number/Name)**<br>PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention and Defeat* | **Project (Number/Name)**<br>RA / *Information Science and Applications* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2013 | FY 2014 | FY 2015 |
|---|---|---|---|
| ***Description:*** Project RA (Information Science and Applications) develops innovative technologies and modeling and simulation (M&S) capabilities and provides Technical Reachback support to create decision advantage for the U.S. and our Allies through improved situational understanding across the complete CWMD mission space.<br><br>***FY 2013 Accomplishments:***<br>- Completed initial development and integration phase of agent based modeling capabilities reducing computation time from hours to minutes for infectious disease modeling involving an area on the continental U.S.<br>- Conducted Near Real Time Reachback demonstration with a nuclear scenario; demonstrated capability to model selected secondary and tertiary effects (e.g. electric power and transportation).<br>- Demonstrated and validated software designed to assist our allies in understanding the effects of WMD.<br><br>***FY 2014 Plans:***<br>- Continue modifications and capability improvements to vulnerability assessment software and integrated WMD. | | | |
| **Accomplishments/Planned Programs Subtotals** | 3.006 | 2.431 | - |

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

| Line Item | FY 2013 | FY 2014 | FY 2015 Base | FY 2015 OCO | FY 2015 Total | FY 2016 | FY 2017 | FY 2018 | FY 2019 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • 23/0602718BR: *WMD Defeat Technologies* | 24.872 | 26.284 | 29.079 | - | 29.079 | 29.814 | 30.033 | 30.443 | 30.827 | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

N/A

**E. Performance Metrics**

Support the Office of Secretary of Defense, Joint Staff, COCOMs, Services, Nuclear Weapon Custodial Units, and Department of Energy.
Number of new capabilities delivered to COCOMs.
Number of requests for information/analysis submitted to Technical Reachback and returned to respective customers.
Meet NIMBLE ELDER threshold detection requirements for: vehicle-mounted area search, man-portable point search, stationary long-dwell detection for buildings, and stationary portal detection for roads.
Achieve measurable increases in force protection by developing detectors with low-visibility characteristics while maintaining or improving current detection stand-off capabilities.

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | Date: March 2014 |
|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 3 | **R-1 Program Element (Number/Name)**<br>PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention and Defeat* | **Project (Number/Name)**<br>RA / *Information Science and Applications* |

Achieve measurable increases in mission effectiveness by expanding the speed and range of reconnaissance operations, improving tasking and tracking of reconnaissance capabilities, and narrow the selection of threat counter-reconnaissance alternatives.
Achieve measurable increases in timeliness and accuracy of target identification by improving data accuracy and delivery, speeding up data fusion and analysis, and/or boosting confidence levels for decision makers.

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | | Date: March 2014 |
|---|---|---|---|
| Appropriation/Budget Activity<br>0400 / 3 | R-1 Program Element (Number/Name)<br>PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention and Defeat* | Project (Number/Name)<br>RE / *Counter-Terrorism Technologies* | |

| COST ($ in Millions) | Prior Years | FY 2013 | FY 2014 | FY 2015 Base | FY 2015 OCO # | FY 2015 Total | FY 2016 | FY 2017 | FY 2018 | FY 2019 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RE: *Counter-Terrorism Technologies* | 229.573 | 106.967 | 111.658 | 108.630 | - | 108.630 | 104.129 | 113.606 | 108.229 | 110.239 | Continuing | Continuing |

# The FY 2015 OCO Request will be submitted at a later date.

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

The Counter-Terrorism Technologies project is an over-arching project that develops and transitions a full spectrum of new technologies to counter emergent Weapons of Mass Destruction (WMD) thus enabling warfighters to improve their ability to detect, disable, interdict, neutralize, and destroy chemical, biological, nuclear production, storage, and weaponization facilities. This project supports Joint U.S. Military Forces, and in particular, the U.S. Special Operations Command (USSOCOM). This research and development support directly enhances USSOCOM, the highest priority mission areas in the National Security Strategy, the National Strategy to Combat WMD, the National Military Strategy to Combat WMD, the Quadrennial Defense Review, and the Guidance on the Employment of the Force, and is therefore a high priority for the Defense Threat Reduction Agency (DTRA). The following efforts are included in this project:

The Counter WMD-Terrorism (CWMD-T) Counterproliferation (CP) research and development program is a collaborative effort with USSOCOM where the DTRA manages and sub-allocates funding directly to USSOCOM to develop warfighter-unique technologies in support of USSOCOM's Counterterrorism and Counterproliferation (CT/CP) mission. New CT/CP technologies are developed under USSOCOM management that provides warfighters with the operational capability to counter WMD threats.

The Counter WMD-Terrorism (CWMD-T) technologies program builds upon collaborative efforts with the warfighter. This program develops proofs of concept and subsequent advancements in research, development, testing, and evaluation (RDT&E) and provides multi-mission capabilities that may be applied throughout the entire spectrum of warfare while significantly eliminating collateral damage. The CWMD-T technologies program develops technologies to enable the warfighter to locate, identify, characterize, and access Chemical, Biological, Radiological, and Nuclear (CBRN) WMDs, their production and storage facilities, and associated enablers along multiple nodes concurrently or simultaneously within the terrorist pathway to disrupt, delay, degrade, destroy, or deny WMDs while minimizing risk to U.S. forces in support of CT/CP offensive operations.

The USSOCOM Combating Weapons of Mass Destruction – Terrorism Support Program (SCSP) addresses Commander USSOCOM responsibilities under the Chairman, Joint Chiefs of Staff (CJCS) Unified Command Plan (UCP) for integrating and synchronizing operations and activities to prevent terrorists from developing, acquiring, proliferating, or using WMD.

The increase from FY 2013 to FY 2014 is predominately due to increased investment in CWMD-T support to USSOCOM in FY 2014 for planned high fidelity CWMD test article development and testing and increased capabilities to address CWMD information gaps. The decrease from FY 2014 to FY 2015 is predominantly due to reduced investment in CWMD-T support to USSOCOM due to planned efficiencies in tool and application developments to counter WMD upstream defeat efforts.

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | Date: March 2014 |
|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 3 | **R-1 Program Element (Number/Name)**<br>PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention and Defeat* | **Project (Number/Name)**<br>RE / *Counter-Terrorism Technologies* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2013 | FY 2014 | FY 2015 |
|---|---|---|---|
| ***Title:*** RE: Counter-Terrorism Technologies | 106.967 | 111.658 | 108.630 |

***Description:*** Project RE provides research and development support to Joint U.S. Military Forces, specifically U.S. Special Operations Command (USSOCOM), in the areas of Explosive Ordnance Disposal (EOD) Device Defeat; counter-WMD technologies for warfighters; the USSOCOM Combating Weapons of Mass Destruction – Terrorism Support Program (SCSP); and oversight of counterproliferation (CP) research and development resources sent directly to USSOCOM for warfighter-unique CP technologies.

***FY 2013 Accomplishments:***
- Continued other planned development and transitioned new CP technologies for Joint U.S. Military Forces to counter WMD, enabling warfighters to improve their ability to detect, disable, interdict, neutralize, and destroy chemical, biological, and nuclear production, storage, and weaponization facilities.
- Continued work on successive multi-year efforts to develop high fidelity test articles for EOD Device Defeat program.
- Built EOD Device Defeat test objects for characterization and testing.
- Continued work on Knowledge Management Objectives begun in FY 2010; continued to test the effects of Radio Frequency (RF) signals on test objects and initiate a study of the effects of RF signals on explosives.
- Accelerated SCSP applications release cycle from six to four-month cycle in order to better support COCOMs. More responsive release schedule and application improvements have provided increased capability to COCOMs in the CWMD-T mission space.
- Released SCSP v1.1, 1.2 and 1.3 that included improved data management/search, integrated "machine reading" algorithms/ filters for Natural Language Processing (NLP) extraction, mapping/layering capabilities and an improved graphical user interface (GUI).

***FY 2014 Plans:***
- Continue other planned development and transition new CP technologies for Joint U.S. Military Forces to counter WMD, enabling warfighters to improve their ability to detect, disable, interdict, neutralize, and destroy chemical, biological, and nuclear production, storage, and weaponization facilities.
- Continue work on successive multi-year efforts to develop high fidelity test articles and enhanced electronic test objects for the EOD Device Defeat program.
- Develop impeded tools for Improvised Explosive Device (IED) triggers.
- Continue to support COCOM planning efforts related to CWMD-T.
- Continue multi-year efforts to develop and transition innovative CWMD tools designed to locate, identify, characterize, assess, and attack WMD production and storage facilities with minimal-to-no collateral damage or loss of life.
- Build precision shaped charges using a proven manufacturing process through the use or modification of an existing shaped charge design.

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | Date: March 2014 |
|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 3 | **R-1 Program Element (Number/Name)**<br>PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention and Defeat* | **Project (Number/Name)**<br>RE / *Counter-Terrorism Technologies* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2013 | FY 2014 | FY 2015 |
|---|---|---|---|
| - Transition next generation imaging facilities to allow EOD forces advanced diagnostic capabilities.<br>- Continue to improve and further enhance the usability and capability of CWMD-T global dynamic picture of the operating environment for use by the Department of Defense and United States Government Community of Interest.<br>- Continue to improve upon COCOM planning efforts related to CWMD-T to include the scheduled release of automated planning and analyst support tools for large-scale data management and information extraction.<br>- Continue modeling efforts to include application and integration of models into SCSP's high performance computing architecture.<br>***FY 2015 Plans:***<br>- Continue other planned development and transition of new CP technologies for Joint U.S. Military Forces to counter WMD, enabling warfighters to improve their ability to detect, disable, interdict, neutralize, and destroy chemical, biological, and nuclear production, storage, and weaponization facilities.<br>- Continue work on successive multi-year efforts to develop high fidelity test articles and enhanced electronic test objects for the EOD Device Defeat program.<br>- Develop impeded tools for IED triggers.<br>- Continue to support COCOM planning efforts related to CWMD-T.<br>- Continue multi-year efforts to develop and transition innovative CWMD tools designed to locate, identify, characterize, assess, and attack WMD production and storage facilities with minimal-to-no collateral damage or loss of life.<br>- Build precision shaped charges using a proven manufacturing process through the use or modification of an existing shaped charge design.<br>- Transition next generation imaging facilities to allow EOD forces advanced diagnostic capabilities.<br>- Integrate Natural Language Processing (NLP) and Machine Reading capabilities into knowledge discovery and data/information pipeline for COCOM CWMD-T WMD analysis and planning.<br>- Begin application of NLP to audio, photographic, and videographic data. | | | |
| **Accomplishments/Planned Programs Subtotals** | 106.967 | 111.658 | 108.630 |

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

| Line Item | FY 2013 | FY 2014 | FY 2015 Base | FY 2015 OCO | FY 2015 Total | FY 2016 | FY 2017 | FY 2018 | FY 2019 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • 23/0602718BR: *WMD Defeat Technologies* | 2.607 | - | - | - | - | - | - | - | - | Continuing | Continuing |

**Remarks**

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | Date: March 2014 |
|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 3 | **R-1 Program Element (Number/Name)**<br>PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention and Defeat* | **Project (Number/Name)**<br>RE / *Counter-Terrorism Technologies* |

**D. Acquisition Strategy**

-Government and industrial performers are assessed and selected based upon a "best fit for task" criteria. DoD Services, Laboratories, Department of Energy (DOE) National Laboratories, and specialized university laboratories are common government awardees.
-SCSP-Evolutionary Acquisition profile leveraging ongoing DARPA and National Lab research programs in Natural Language Processing, Machine Reading, visual analytics directly linked to SOCOM WMD Enterprise and supporting all COCOM WMD-T plans.

**E. Performance Metrics**

Number of technologies developed, delivered, proof of concept demonstrations, and successful Military Utility Assessments. A high priority focus of these metrics is increasing potential mission success and reducing the number of current gaps in Special Operations Forces capabilities to counter WMD.
SCSP-Utility of SCSP applications and analytics to COCOM WMD-T planners and analysts as measured by number of application releases, users and COCOM feedback.

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | | Date: March 2014 |
|---|---|---|---|
| Appropriation/Budget Activity<br>0400 / 3 | R-1 Program Element (Number/Name)<br>PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention and Defeat* | Project (Number/Name)<br>RF / *Detection and Forensics Technologies* | |

| COST ($ in Millions) | Prior Years | FY 2013 | FY 2014 | FY 2015 Base | FY 2015 OCO # | FY 2015 Total | FY 2016 | FY 2017 | FY 2018 | FY 2019 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RF: *Detection and Forensics Technologies* | 150.452 | 69.331 | 74.556 | 66.707 | - | 66.707 | 68.770 | 70.727 | 71.058 | 72.959 | Continuing | Continuing |

# The FY 2015 OCO Request will be submitted at a later date.

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

The Detection and Forensics Technologies project under Counterproliferation Intiiatives - Proliferation, Prevention and Defeat emphasizes the advanced technology development and engineering portion of the overall effort.

This project develops technologies, systems and procedures to detect, identify, track, locate, monitor and interdict strategic and improvised nuclear and radiological weapons, components, or materials in support of Department of Defense (DoD) requirements for combating terrorism, counterproliferation and nonproliferation, homeland defense, and international initiatives and agreements. This project researches, develops, demonstrates, and transitions advanced technologies to improve operational capabilities to detect and identify nuclear and radiological weapons. It supports the attribution process through development, demonstration, and transition of improved post-detonation National Technical Nuclear Forensics (NTNF) capabilities in the areas of materials collection, debris diagnostics and materials analysis, and prompt diagnostics and device reconstruction. Efforts under this project also support international peacekeeping and nonproliferation objectives, on-site and aerial inspections and monitoring, on-site sampling and sample transport, and on- and off-site analysis to meet forensic, verification, monitoring, and confidence-building requirements.

The increase from FY 2013 to FY 2014 is predominately due to the relative effect of Congressional reductions in FY 2013 causing decreased investment in radiation detection. The decrease from FY 2014 to FY 2015 is predominantly due to reduced investment in novel advanced nuclear/radiological detection technologies and emerging requirements in support of nuclear treaties implementation.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2013 | FY 2014 | FY 2015 |
|---|---|---|---|
| ***Title:*** RF: Detection and Forensics Technologies | 69.331 | 74.556 | 66.707 |
| ***Description:*** Project RF (Detection and Forensics Technologies) develops technologies, systems and procedures for post-detonation nuclear forensics, to detect, identify, track, tag, locate, monitor, and interdict strategic and improvised nuclear and radiological weapons, components, or materials in support of Department of Defense (DoD) requirements for combating terrorism, counterproliferation and nonproliferation, homeland defense, and international initiatives and agreements. | | | |
| ***FY 2013 Accomplishments:***<br>- Exploited all-source nuclear threat signatures and characteristics to improve probability of nuclear threat detection and reduce the occurrence of false alarms. | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | Date: March 2014 |
|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 3 | **R-1 Program Element (Number/Name)**<br>PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention and Defeat* | **Project (Number/Name)**<br>RF / *Detection and Forensics Technologies* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2013 | FY 2014 | FY 2015 |
|---|---|---|---|
| - Completed initial development of three neutron detection materials to serve as alternatives to helium-3 for neutron detectors.<br>- Completed operational testing of eleven prototype neutron detectors utilizing the best performing helium-3 replacement materials as determined by advanced and operational testing campaigns.<br>- Completed fielding of four advanced, non-helium-3 neutron detection technologies as an alternative to helium-3 neutron detectors.<br>- Initiated further development of the best performing helium-3 alternative neutron detection technologies.<br>- Continued to develop the best performing neutron detection technologies as an alternative to helium-3 neutron detectors as determined by rigorous internal and advanced testing campaigns.<br>- Completed design, development, fabrication, and testing of prototype passive detection systems for determining the location and signature of nuclear material; tested and characterized developmental prototype passive detection systems.<br>- Completed development of a prototype room temperature high-resolution gamma imaging spectrometer.<br>- Continued development of the Radiation Sensor Tagging, Tracking and Locating project, scheduled to transition in FY 2015.<br>- Continued transitioning multiple near term technologies to generate prototypes and design packages to assist operational users.<br>- Completed and field-tested two prototype systems that are scheduled to transition in FY 2014.<br>- Completed design, development, and delivery of radiation detector system.<br>- Continued to improve performance of new detector materials, imaging and spectroscopy systems, and signals analysis methods through rigorous laboratory and field testing.<br>- Continued to perform field demonstrations of new detector technologies for handheld detectors, distributed sensors, and vehicle mountable detector systems, to improve the ability of fielded forces to detect, locate, and identify nuclear materials in the battle space.<br>- Completed operational testing of eleven prototype neutron detectors utilizing the best performing helium-3 replacement materials as determined by advanced and operational testing campaigns.<br>- Continued to develop the best performing neutron detection technologies as an alternative to helium-3 neutron detectors as determined by rigorous internal and advanced testing campaigns.<br>- Completed and fielded extended use self-powered transport cases for high-resolution identification and characterization.<br>- Continued testing, verification, and validation, of the Joint Semi-Automated Forces (JSAF) tool intended to provide nuclear detection simulation capability into the JSAF environment, an integrated, accurate, environment where the Concept of Operations (CONOPS) and physics of nuclear detection can be studied in tandem.<br>- Continued development of a large standoff, directionally oriented, monoenergetic gamma (e.g. laser Wakefield/inverse Compton scattering accelerator) source for integration with an active interrogation system.<br>- Researched and tested on-track to provide a final determination of military utility of bremsstrahlung-based active interrogation and standoff detection of nuclear threats by end of FY 2014.<br>- Completed 85% of operational characterization of the emerging radiological active detection prototypes. | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | Date: March 2014 |
|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 3 | **R-1 Program Element (Number/Name)**<br>PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention and Defeat* | **Project (Number/Name)**<br>RF / *Detection and Forensics Technologies* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2013 | FY 2014 | FY 2015 |
|---|---|---|---|
| - Developed, tested, demonstrated, and fielded prototype ground-based sensor capabilities for post-detonation prompt diagnostics (under DISCREET OCULUS).<br>- Began installation of prompt diagnostics systems in first United States (U.S.) city.<br>- Continued to develop and demonstrated advanced airborne and ground debris sample collection and integrated nuclear yield determination capabilities as part of the extended National Technical Nuclear Forensics (NTNF) Joint Capability Technology Demonstration (JCTD).<br>- Continued to develop, demonstrate, and field (prototype) upgraded technical capabilities for sample analysis, modeling to support nuclear device reconstruction, and forensics data to lower uncertainties/increase confidence in technical nuclear forensics (TNF) conclusions.<br>- Demonstrated Spiral 3 of the Arms Control Enterprise System (ACES) that addresses prototypes, new equipment, demos, telemetry.<br>- Completed the software operations manual for ACES to enable transition to a new O&M maintenance contract.<br>- Developed a prototype for a future generation ACES system based on the analysis of alternatives.<br>- Conducted a warhead imaging experiment at a National Nuclear Security Administration (NNSA) nuclear facility.<br>- Conducted a field demonstration of production signatures for the Fissile Material Cutoff Treaty.<br>- Developed experiments and models to demonstrate the ability to simulate Underground Test (UGT) Electromagnetic Pulse (EMP) signatures in a field experiment in partnership with NNSA.<br>- Continued the development of low-visibility improvements for NIMBLE ELDER detection equipment.<br>- Developed and assessed algorithm improvements to current Radiological/Nuclear (R/N) detector technologies.<br>- Investigated and demonstrated alternative neutron and gamma detection technologies for replacement of lower performing crystals and helium-3.<br>- Developed enhancements to Combating Weapons of Mass Destruction (CWMD) network technologies, to include Unmanned Aerial Systems (UAS) retransmission platforms, to improve network reliability and range.<br>- Conducted NIMBLE ELDER evaluation exercises assessing radiological/nuclear (R/N) detection technology at the TRL 3, 4, 5, & 6 level of development against the approved NIMBLE ELDER capability gaps.<br>- Continued development of NIMBLE ELDER maritime detection capabilities.<br>- Accelerated the development of non-radiological detection Science & Technology (S&T) projects.<br>- Completed a JASON Advisory Group Summer Study on Cooperative Aerial Monitoring in support of the Treaty on Open Skies.<br>- Completed Fidelity and Scalability of Nonnuclear Decoupling Experiments Study.<br>- Completed 3D Seismic Moment-Tensor Inversion Report on methods to distinguish earthquakes from explosions in support of nuclear test monitoring.<br>- Constructed electromagnetic pulser coil for EMP phenomenology experiments. | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | Date: March 2014 |
|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 3 | **R-1 Program Element (Number/Name)**<br>PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention and Defeat* | **Project (Number/Name)**<br>RF / *Detection and Forensics Technologies* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2013 | FY 2014 | FY 2015 |
|---|---|---|---|
| - Developed soil buffers to detect nuclear fission products at trace levels using the Gradient Elution Moving Boundary Electrophoresis (GEMBE) prototype.<br>- Conducted over 40 laser decoupling experiments at the Naval Research Laboratory's Nike laser test facility in support of NNSA computational models.<br>- Conducted two small scale cavity decoupling tests and calibrated high fidelity computer models for near source response.<br>- Completed historical airborne filter material testing and reported results.<br>- Completed preliminary survey of materials capable of satisfying airborne Nuclear Debris Collection and Analysis (NDC&A) requirements.<br>- Initiated efforts to expand NIMBLE ELDER capability to include Chemical and Biological threats; activities included threat characterization, technology survey, limited equipment procurement, pilot team training, CONOPs development, and user evaluation. | | | |
| ***FY 2014 Plans:***<br>- Continue near-source strong motion-small scale tests and high fidelity analysis for detection and identification of low yield and evasive testing.<br>- Conduct additional laboratory experiments with lasers to assess shock/seismic and electromagnetic signatures from underground nuclear tests including the first decoupling experiments with the National Ignition Facility.<br>- Conduct warhead imaging experiments and demonstrations for warheads deployed on strategic launch and delivery systems that could lead to adoption of this technology for verification of future START treaties.<br>- Down-select to the most promising warhead characterization approach for application to future START treaties.<br>- Test and transition a prototype version of the Knowledge Management Strategic Information System software for future START and other treaty database and notification needs.<br>- Field a prototype for an on-site inspection system and virtual training tool for nuclear materials production monitoring in support of the Fissile Material Cutoff Treaty and the Army nuclear disablement mission.<br>- Develop and demonstrate advanced materials for particulate and gaseous radionuclides to detect underground nuclear testing in support of Air Force and international treaty monitoring requirements.<br>- Conduct international partnership high explosive tests to calibrate seismic and infrasound international monitoring stations.<br>- Continue preparations for R/N detector program of record decisions.<br>- Expand the level of non-radiological sensor support for R/N search operations.<br>- Continue to develop, accelerate development where appropriate, demonstrate, and field (prototype) upgraded technical capabilities for prompt diagnostics (under DISCREET OCULUS and MINIKIN ECHO) and debris sample collection, sample analysis, modeling to support nuclear device reconstruction, and forensics data to lower uncertainties/increase confidence and improve timeliness of TNF conclusions. Includes development of new debris collection, field analysis concepts, in-laboratory | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | Date: March 2014 |
|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 3 | **R-1 Program Element (Number/Name)**<br>PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention and Defeat* | **Project (Number/Name)**<br>RF / *Detection and Forensics Technologies* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2013 | FY 2014 | FY 2015 |
|---|---|---|---|
| timeline improvements, new signature development, improved modeling and simulation capabilities, and other supporting technologies.<br>- Continue development of methods to rapidly determine post-event nuclear weapon yields and reaction history by investigating alternative prompt nuclear weapons effects, effects on the environment, and developing/fielding prototype capabilities.<br>- Continue exploiting all-source nuclear threat signatures, characteristics, and corresponding detection modalities; develop the proper tipping, queuing, and data fusion techniques and algorithms to enable the rapid and effective accumulation of all-source intelligence on nuclear threat scenarios.<br>- Continue design and fabrication of prototype passive detection systems for determining the location and signature of nuclear material; test and characterize developmental prototype passive detection systems.<br>- Continue to develop and demonstrate alternative neutron detection technologies for replacement of helium-3 neutron detectors.<br>- Complete the development of a modular based detection system using near term technologies to generate prototypes and design packages to assist operational users.<br>- Complete development of room temperature high-resolution spectrometers to determine signature of nuclear material.<br>- Continue to develop CWMD network technologies.<br>- Continue the development of force protection modifications to R/N detector technologies.<br>- Develop and assess software improvements to current R/N detector technologies.<br>- Expand the development of CWMD/Technical Support Group training technologies for R/N search equipment. | | | |
| ***FY 2015 Plans:***<br>- Continue identifying all-source nuclear threat signatures, characteristics, and corresponding detection modalities; continue the identification and development of the proper tipping, queuing, and data fusion techniques and algorithms to enable the rapid and effective accumulation of all-source intelligence on nuclear threat scenarios.<br>- Design and fabricate of prototype passive detection systems for determining the location and signature of nuclear material; test and characterize developmental prototype passive detection systems.<br>- Improve performance of new detector materials, imaging and spectroscopy systems, and signals analysis methods through rigorous laboratory and field testing.<br>- Begin to integrate recent advances in materials science into lightweight, high-resolution radiation spectrometers for use in field operations.<br>- Develop, demonstrate, and field methods to remotely monitor small and wide areas which may contain nuclear threats.<br>- Research and develop advanced 3D imaging technologies for high resolution source characterization and identification to provide new and improved capabilities to detect, locate, identify, and characterize threat materials.<br>- Begin transitioning multiple near term technologies to generate prototypes and design packages to assist operational users.<br>- Conduct advanced and operational testing and evaluation of radiation detection systems. | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | Date: March 2014 |
|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 3 | **R-1 Program Element (Number/Name)**<br>PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention and Defeat* | **Project (Number/Name)**<br>RF / *Detection and Forensics Technologies* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2013 | FY 2014 | FY 2015 |
|---|---|---|---|
| - Begin design, development, and fabrication of new radiological test objects.<br>- Improve performance of new detector materials, imaging and spectroscopy systems, and signals analysis methods through rigorous laboratory and field testing.<br>- Begin transitioning multiple near term technologies to generate prototypes and design packages to assist operational users.<br>- Research, develop, test, evaluate, and deliver software tools and capabilities to locate and identify the signatures of special nuclear materials on both existing and newly developed hardware platforms.<br>- Conduct advanced and operational testing and evaluation of radiation detection systems.<br>- Continue development, accelerate development where appropriate, demonstrate, and field methods to remotely monitor small and wide areas which may contain nuclear threats.<br>- Begin to research and develop 3D imaging technologies for high resolution source characterization and identification to provide new and improved capabilities to detect, locate, and identify threat materials.<br>-Begin design, development, and fabrication of new radiological test objects.<br>- Develop, accelerate development where appropriate, test, demonstrate, and field prototype ground-based sensor capabilities for post-detonation prompt diagnostics under DISCREET OCULUS.<br>- Complete installation of prompt diagnostics systems in second U.S. city.<br>- Continue to develop, test, demonstrate, and field (prototype) upgraded technical capabilities for prompt diagnostics, debris collection, sample analysis, modeling to support nuclear device reconstruction, and forensics data to decrease timeline, lower uncertainties, and increase confidence in technical nuclear forensics (TNF) conclusions.<br>- Continue near-source strong motion small scale tests and high fidelity analyses for detection and identification of low yield and evasive testing.<br>- Develop modular prototype using advanced materials for particulate and gaseous radionuclides detection of evasive testing in support of U.S. and international treaty monitoring requirements.<br>- Provide S&T development to support onsite inspections.<br>- Begin implementing R/N detector Program of Record decisions.<br>- Transition wide area search modular prototypes into an operational configuration to replace the current systems<br>- Transition software improvements to current R/N detector technologies.<br>- Transition selected ship search capabilities into an operational configuration for fielding to the TSGs.<br>- Continue to enhance CWMD network technologies by exploiting the operational advantages of DoD's cellular communications program.<br>- Continue to expand non-radiological sensor support for R/N search operations.<br>- Expand the development of CWMD/TSG training technologies for R/N search equipment. | | | |
| **Accomplishments/Planned Programs Subtotals** | 69.331 | 74.556 | 66.707 |

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | Date: March 2014 |
|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 3 | **R-1 Program Element (Number/Name)**<br>PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention and Defeat* | **Project (Number/Name)**<br>RF / *Detection and Forensics Technologies* |

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

| Line Item | FY 2013 | FY 2014 | FY 2015 Base | FY 2015 OCO | FY 2015 Total | FY 2016 | FY 2017 | FY 2018 | FY 2019 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • 23/0602718BR: *WMD Defeat Technologies* | 41.343 | 36.102 | 35.061 | - | 35.061 | 35.548 | 36.522 | 37.382 | 38.223 | Continuing | Continuing |
| • 121/0605000BR: *System Development and Demonstration* | - | 6.906 | 6.887 | - | 6.887 | 7.156 | 7.397 | 7.497 | 7.625 | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

Continue to implement the approved CWMD SEARCH Modernization Strategy for the transition of Science & Technology projects to DoD programs of record at the Milestone A decision for rapid capability fielding.

**E. Performance Metrics**

Successful operational development and operational acceptance of transitional technologies.
Successful completion of the Intelligent Personal Radiation Locator (IPRL) program.
Successful completion of the radiation sensor with tagging, tracking, and locating project.
Successful completion and transition of the modular radiation detector system.
Successful completion and transition of the Man-Portable Detection System.
Successful testing of the first prototype hand-held high-resolution detector.
Successful completion of imaging and characterization test to down-select threat device characterization system.
Conduct/support end-to-end National Technical Nuclear Forensics capabilities exercises and supporting demonstration(s).
Installation of ground-based prompt diagnostics systems in first and second U.S. cities by the end of FY 2015.
Successfully test, demonstrate, field, and/or transition nuclear forensics technologies/capabilities to an operational customer.
Down-select of new signatures, surrogate urban debris production routes, and technology requirements for field analysis capabilities.
Support development of National Technical Nuclear Forensics (NTNF) capabilities through development of technologies/prototypes addressing gaps and shortfalls in Department of Defense (DoD) NTNF capabilities, and through participation in the interagency process. Note: More specific metrics associated with NTNF gaps and shortfalls are classified.

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | | Date: March 2014 |
|---|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 3 | **R-1 Program Element (Number/Name)**<br>PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention and Defeat* | **Project (Number/Name)**<br>RG / *Defeat Technologies* | |

| COST ($ in Millions) | Prior Years | FY 2013 | FY 2014 | FY 2015 Base | FY 2015 OCO # | FY 2015 Total | FY 2016 | FY 2017 | FY 2018 | FY 2019 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RG: *Defeat Technologies* | 32.879 | 17.034 | 21.811 | 19.591 | - | 19.591 | 22.532 | 23.231 | 23.625 | 24.030 | Continuing | Continuing |

# The FY 2015 OCO Request will be submitted at a later date.

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

The Defeat Technologies project develops, integrates, demonstrates and transitions innovative kinetic and non-kinetic weapon capabilities to expand traditional and asymmetric options available to Combatant Commanders (CCDRs) to deny, disrupt, and defeat adversarial use of Weapons of Mass Destruction (WMD) while minimizing collateral effects from incidentally released agents. Technology development focuses on the physical or functional defeat of (1) chemical, biological, radiological, and nuclear (CBRN) threat materials, (2) an adversary's ability to deliver the same, as well as (3) the physical and non-physical support networks enabling both. It does so through the systematic identification and maturation of advanced technologies capable of defeating WMD agents or agent based processes, then integrating them into weapons, delivery systems or rapid WMD elimination capabilities that are most relevant to the Combatant Commands (COCOMs) WMD Defeat Concept of Operations (CONOPS) and their Area of Responsibility (AOR). This program includes developing specific WMD agent/agent-based process simulants, test infrastructure, and sampling capability required for effective development, testing, and evaluation (DT&E) of next-generation capabilities to ensure optimum weapon solutions are achieved based on this technology. The program is addressing defeat of adversaries' offensive WMD programs through integration of current conventional weapons capabilities and next generation kinetic and non-kinetic solutions to provide full-spectrum asymmetric defeat options. The program addresses requirements delineated in the Quadrennial Defense Review and Strategic Planning Guidance as codified in the Joint Capabilities Integration and Development System (JCIDS), Service requirements documents, and COCOM and Agency Priority Lists for lethal and non-lethal Counter-WMD (C-WMD) capability.

The increase from FY 2013 to FY 2014 is predominately due to increased investment in C-WMD Hard Target Defeat (HTD) Weapons Technologies efforts in FY 2014. The decrease from FY 2014 to FY 2015 is predominantly due to reduced investment in Next Generation C-WMD Weapon Concept research and demonstration of select technologies.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2013 | FY 2014 | FY 2015 |
|---|---|---|---|
| ***Title:*** RG: Defeat Technologies | 17.034 | 21.811 | 19.591 |
| ***Description:*** Project RG (Defeat Technologies) develops advanced technologies and weapon concepts and validates their applicability to C-WMD. | | | |
| ***FY 2013 Accomplishments:***<br>- Continued improvements for defeat of WMD in soft targets.<br>- Continued maturing diagnostic capability to meet emerging needs and field improved capabilities for agent defeat.<br>- Completed initial Heated And Mobile Munitions Employing Rockets (HAMMER) technology demonstration weapon design, critical component testing, and payload subscale bio defeat tests. | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | Date: March 2014 |
|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 3 | **R-1 Program Element (Number/Name)**<br>PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention and Defeat* | **Project (Number/Name)**<br>RG / *Defeat Technologies* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2013 | FY 2014 | FY 2015 |
|---|---|---|---|
| - Conducted Modular Autonomous Counter-WMD System (MACS) proof-of-principle demonstration.<br>- Completed Integrated Precision Ordnance Delivery System (IPODS) Phase II Preliminary Design.<br>- Issued MACS Phase III First Generation System Concept Request for Proposal.<br>- Initiated design of a functional defeat testbed.<br>***FY 2014 Plans:***<br>- Continue improvements for defeat of WMD in soft targets.<br>- Continue maturing diagnostic capability to meet emerging needs and field improved capabilities for agent defeat.<br>- Complete HAMMER system integration testing.<br>- Complete HAMMER Advanced Technology Development (ATD) weapon design, critical component testing, and payload subscale bio defeat tests.<br>- Complete HAMMER full-scale test.<br>- Complete Modular Autonomous Countering WMD System (MACS) component integration.<br>- Design MACS Family of Systems (FOS) architecture.<br>***FY 2015 Plans:***<br>- Continue development of access denial or denial-of-use technologies for WMD targets.<br>- Complete Next Generation C-WMD weapon design.<br>- Initiate full-scale lethality tests for Next Gen Agent Defeat weapon.<br>- Complete functional defeat testbed and initial test events. | | | |
| **Accomplishments/Planned Programs Subtotals** | 17.034 | 21.811 | 19.591 |

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

| Line Item | FY 2013 | FY 2014 | FY 2015 Base | FY 2015 OCO | FY 2015 Total | FY 2016 | FY 2017 | FY 2018 | FY 2019 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • 23/0602718BR: *WMD Defeat Technologies* | 13.544 | 15.059 | 10.982 | - | 10.982 | 11.769 | 11.492 | 11.804 | 12.072 | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

Government and industrial performers are assessed and selected based upon a “best fit for task” criteria. DoD Services Laboratories, Department of Energy DOE National Laboratories, and specialized university laboratories are common government awardees.

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | Date: March 2014 |
|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 3 | **R-1 Program Element (Number/Name)**<br>PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention and Defeat* | **Project (Number/Name)**<br>RG / *Defeat Technologies* |

**E. Performance Metrics**

Evaluate weapon system component technologies required for development of at least one new capability to counter WMD during the FYDP to Technology Readiness Level (TRL) 4/5.

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | | Date: March 2014 |
|---|---|---|---|
| Appropriation/Budget Activity<br>0400 / 3 | R-1 Program Element (Number/Name)<br>PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention and Defeat* | Project (Number/Name)<br>RI / *Nuclear Survivability* | |

| COST ($ in Millions) | Prior Years | FY 2013 | FY 2014 | FY 2015 Base | FY 2015 OCO # | FY 2015 Total | FY 2016 | FY 2017 | FY 2018 | FY 2019 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RI: *Nuclear Survivability* | 21.090 | 5.551 | 6.016 | 5.570 | - | 5.570 | 6.055 | 6.302 | 6.513 | 6.257 | Continuing | Continuing |

# The FY 2015 OCO Request will be submitted at a later date.

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

The Nuclear Survivability project develops and demonstrates Radiation Hardened Microelectronics (RHM) for nuclear hardening and survivability of Department of Defense's (DoD) systems and provides for the execution of force-on-force evaluations and nuclear weapons surety efforts to enhance the protection of nuclear resources.

The RHM program responds to DoD space and missile system requirements for RHM and photonics technology to support mission needs. This program develops and demonstrates radiation-hardened, high performance prototype microelectronics to support the availability of RHM and photonics for DoD missions from both private sector and government organizations.

Mighty Guardian Force-on-Force Tests aid in satisfying requirements for the Services by providing denial of access to nuclear resources in all environments: operational, storage and in transit. The results of the evaluations identify security vulnerabilities to weapons systems that are then addressed through targeted application of research and development projects requested by the resource owners. These projects are designed to demonstrate, test, and evaluate security enhancement systems prior to service procurement.

Nuclear Weapons Surety, as tasked by the DoD Nuclear Weapon System Safety Program, provides Combatant Commands (COCOMs), Services, and Joint Chiefs of Staff with technical analyses, studies, research, and experimental data necessary to identify and quantify risks of plutonium dispersal and Loss of Assured Safety due to accidents, fires, or natural causes during peacetime operations of the nation's nuclear weapon systems. Additionally, this will provide studies necessary to quantify the probability of success against targeted terrorist attacks on DoD facilities, while leveraging these risk assessment advances. It also provides new and innovative technologies for the protection of nuclear resources in support of COCOMs and Services.

The increase from FY 2013 to FY 2014 is predominately due to the relative impact of Congressional reductions to nuclear surety in FY 2013. The decrease from FY 2014 to FY 2015 is predominately due to the net impact of increased investment in stockpile logistics and decreased investment in nuclear surety in FY 2015.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2013 | FY 2014 | FY 2015 |
|---|---|---|---|
| ***Title:*** RI: Nuclear Survivability | 5.551 | 6.016 | 5.570 |
| ***Description:*** Project RI (Nuclear Survivability) provides the capability for DoD nuclear forces and their associated control and support systems and facilities in wartime to avoid, repel, or withstand attack or other hostile action, to the extent that essential functions can continue or be resumed after the onset of hostile action. | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | Date: March 2014 |
|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 3 | **R-1 Program Element (Number/Name)**<br>PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention and Defeat* | **Project (Number/Name)**<br>RI / *Nuclear Survivability* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2013 | FY 2014 | FY 2015 |
|---|---|---|---|
| ***FY 2013 Accomplishments:***<br>- Transitioned 90nm Application Specific Integrated Circuit (ASIC) Qualified Manufacturer List radiation hardened microelectronics activity to user community.<br>- Transitioned 90nm radiation hardened 64Mb Static Random Access Memory (SRAM) to user community.<br>- Conducted engineering studies in support of planned Mighty Guardian XVI Force-on-Force test to evaluate nuclear security policy for Prime Nuclear Airlift Forces (PNAF) and On-Base Convoys at 377th Air Base Wing Headquarters, Albuquerque, NM.<br>- Conducted research, development, test, and evaluation on physical security technologies designed to enhance protection of the nuclear stockpile as determined by the Services.<br>- Conducted Mighty Guardian XV Force on Force test & evaluation of nuclear security policy at Naval Base Kingsbay, GA.<br>- Conducted Mighty Guardian Out of Cycle Test (OOCT) Discrete Xena III (DXIII) during a Launch Facility (LF) Maintenance engineering study at F.E. Warren AFB, WY.<br>***FY 2014 Plans:***<br>- Test and characterize radiation effects on advanced technology testing and characterization.<br>- Conduct engineering studies in support of and plan for Mighty Guardian XVII Force-on-Force test to evaluate nuclear security policy for Navy Limited Areas at Strategic Weapons Facility Pacific, Naval Base Kitsap, and Washington.<br>- Conduct research, development, test, and evaluation on physical security technologies designed to enhance protection of the nuclear stockpile as determined by the Services.<br>***FY 2015 Plans:***<br>- Develop Satellite Protection Standard.<br>- Conduct research, development, test, and evaluation on physical security technologies designed to enhance protection of the nuclear stockpile as determined by the Services.<br>- Develop next generation of Defense Integration and Management of Nuclear Data Services (DIAMONDS) network and infrastructure design, leverage IT improvements, and modernize DIAMONDS software code; conduct preliminary design review and meet with users.<br>- Conduct engineering studies in support of and plan for Mighty Guardian XVII Force-on-Force test to evaluate nuclear security policy for Navy Limited Areas at Strategic Weapons Facility Pacific, Naval Base Kitsap, and Washington. | | | |
| **Accomplishments/Planned Programs Subtotals** | 5.551 | 6.016 | 5.570 |

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | Date: March 2014 |
|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 3 | **R-1 Program Element (Number/Name)**<br>PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention and Defeat* | **Project (Number/Name)**<br>RI / *Nuclear Survivability* |

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

| Line Item | FY 2013 | FY 2014 | FY 2015 Base | FY 2015 OCO | FY 2015 Total | FY 2016 | FY 2017 | FY 2018 | FY 2019 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • 23/0602718BR: *WMD Defeat Technologies* | 19.133 | 19.649 | 19.416 | - | 19.416 | 19.319 | 19.405 | 19.807 | 20.424 | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

N/A

**E. Performance Metrics**

Achieve Radiation Hardened and Radiation Hardened by Design (RHBD) 90nm ASIC design flow capability.
Successful completion of Mighty Guardian exercises is measured by completing all necessary planning and logistics steps, troops arriving when required, training completed, execution of the exercise, redeployment of forces, and publishing a final report within 90 days of completion.
Successful completion of research, development, test, and evaluation for physical security technologies is determined by performers completing the project on-time and within budget, all stated tasks in the statement of work/objectives being met, proper reporting and coordination of decision areas, receipt of final reports closing out the project, and transitioning the project to the requesting Service.

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | | Date: March 2014 |
|---|---|---|---|
| Appropriation/Budget Activity<br>0400 / 3 | R-1 Program Element (Number/Name)<br>PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention and Defeat* | Project (Number/Name)<br>RM / *WMD Counterforce Technologies* | |

| COST ($ in Millions) | Prior Years | FY 2013 | FY 2014 | FY 2015 Base | FY 2015 OCO # | FY 2015 Total | FY 2016 | FY 2017 | FY 2018 | FY 2019 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RM: *WMD Counterforce Technologies* | 52.878 | 21.514 | 29.420 | 29.346 | - | 29.346 | 31.404 | 31.012 | 31.231 | 33.152 | Continuing | Continuing |

# The FY 2015 OCO Request will be submitted at a later date.

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

The Weapons of Mass Destruction (WMD) Counterforce Technologies project develops, integrates, demonstrates and transitions emerging/innovative technologies to support the counter WMD Mission. This activity specifically focuses on three critical components in countering the WMD threat: (1) end-to-end planning capabilities; (2) emerging/innovative technologies; and (3) Technical Reachback support.

Developing end-to-end planning capabilities includes: weaponeering tools to aid the Combatant Command's (COCOM) targeting and weapons officers in choosing the proper weapon, fuze, and employment parameters to optimize the defeat of WMD and related hard targets delivering modernized, validated and fast running attack planning tools, and integrating software. Leveraging attack planning tools to support force protection planners and vulnerability assessment teams.

Emerging/innovative technologies are developed, integrated, demonstrated and transitioned to provide the warfighter with an enhanced near real-time combat and battle damage assessment capability. Capability is achieved through the development of Unmanned Aerial Systems (UAS) and weapon-based sensors, platforms, taggants, seekers and other innovative technologies to: remotely sense, identify, track and target WMD-related threats; perform battle damage assessment/indication of strikes against these threats; and locate, track, collect, detect, selectively identify, and characterize Chemical Weapon and Biological Weapon aerosol agents released during these WMD counterforce strikes.

The Technical Reachback support provides 24 hour/7 days per week information and analyses on potential impacts of a WMD event to Warfighters and First Responders in consult with DTRA's Combating WMD Research and Development subject matter experts. This effort develops and integrates capabilities and processes to support WMD effects and consequences, to include secondary and tertiary effects.

The increase from FY 2013 to FY 2014 is predominately due to increased investment in WMD Intelligence, Surveillance, and Reconnaissance activities and the consolidation of Reachback support operations from Project RA-Information Science and Applications.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2013 | FY 2014 | FY 2015 |
|---|---|---|---|
| ***Title:*** RM: WMD Counterforce Technologies | 21.514 | 29.420 | 29.346 |
| ***Description:*** Project RM (WMD Counterforce Technologies) provides (1) novel and enhanced weapons energetic materials and structures, full-scale testing of counter-WMD (C-WMD) weapons effects, weapons effects modeling, and weapon delivery optimization, (2) WMD sensor, surveillance, and data processing technologies, and (3) Technical Reachback support. | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | Date: March 2014 |
|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 3 | **R-1 Program Element (Number/Name)**<br>PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention and Defeat* | **Project (Number/Name)**<br>RM / *WMD Counterforce Technologies* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2013 | FY 2014 | FY 2015 |
|---|---|---|---|
| ***FY 2013 Accomplishments:***<br>- Conducted Phase 1 development of highly specialized chemical/biological sensors for tracking WMD.<br>- Demonstrated an integrated counter-WMD sensor proof of concept within a mission-based experiment at a major United States Special Operations Command (USSOCOM) exercise.<br>- Conducted a proof of concept evaluation of Chemical, Biological, Radiological, Nuclear (CBRN)-responsive transformational materials compatible with optical detection.<br>- Developed a prototype Counter-WMD (CWMD) Tag, Track and Locate (TTL) device and conducted proof of concept demonstration at the Trident Spectre 13 (TS-13) exercise.<br>- Conducted successful proof of concept testing of porous Silicon (pSi) material for detection of WMD production byproducts.<br>- Completed Technology Transition Agreement (TTA) with Army Project Manager, Unmanned Aircraft Systems (UAS) for WMD Aerial Collection System (WACS)-Shadow UAS integration.<br>- Supported Army with WACS pod component optimization and ruggedization required for integration/certification on the Shadow UAS.<br>- Completed integration of a satellite communications (SATCOM)-based beyond line of sight (BLOS) capability for the WACS payload.<br>- Completed a U.S. Army Training and Doctrine fielding suitability evaluation of the WACS Operational Needs Statement (ONS).<br>- Participated in Ulchi Freedom Guardian 2013 (UFG-13) exercise in Korea and validated United States Forces Korea (USFK) WACS Concept of Operations (CONOPS) and the U.S. Army's 2nd Infantry Division's UAV Standard Operating Procedures.<br>- Completed a comprehensive Analysis of Alternatives study for a CBRN Air-droppable Remotely Deployed Sensor System (CARDS) and identified air vehicle requirements for sensor deployment.<br>- Completed prototype CARDS airframe design, integrated the autopilot flight control system, and conducted local flight testing to characterize mission profile flight characteristics.<br>- Completed an analysis and reported on the use of hyperspectral imaging for the detection of chemical precursors present during the production of chemical warfare agents.<br>- Completed and documented a threat analysis for the Biological (Bio) Intelligence, Surveillance, and Reconnaissance (ISR) project.<br>- Completed a Bio-ISR Table Top Exercise with representatives from USSOCOM and the Intelligence Community to identify requirements and capability gaps for bio-search missions.<br>- Completed an Analysis of Technologies Report to guide investments for Bio-ISR program.<br>- Delivered the Vulnerability Assessment and Protection Option (VAPO) planning tool with improved progressive collapse modeling capabilities. | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | Date: March 2014 |
|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 3 | **R-1 Program Element (Number/Name)**<br>PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention and Defeat* | **Project (Number/Name)**<br>RM / *WMD Counterforce Technologies* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2013 | FY 2014 | FY 2015 |
|---|---|---|---|
| - Delivered Integrated Munitions Effects Assessment (IMEA) planning tool improvements/corrections to include weapon cratering methodology, bomb fragment environment predictions and nuclear weapons effects and planning (IMEA 2010.0.3).<br>- Integrated IMEA 2010.0.3 into Air Force's fielded suite of targeting applications (Targeting Application Workstation (TAW) program of record, Spiral 12).<br>- Led AF-sponsored development efforts to improve IMEA Large Caliber Penetrator weapons effects predictions and supported planning tool integration (IMEA 11.1).<br>- Performed verification and validation supporting Modeling and Simulation (M&S) accreditation of IMEA 11.0 conventional and nuclear planning capabilities.<br>- Provided Targeting/Weaponeering academics and targeting recommendation packages supporting Combatant Command (COCOM) requirements.<br>- Provided over 1300 products supporting requests for information on WMD effects and consequences.<br>- Completed initial development and integration phase of agent based modeling capabilities reducing computational time from hours to minutes for infectious disease modeling involving major population areas in the continental U.S.<br>- Began initial planning effort for the National CWMD Technical Reachback Enterprise (NCTRE), providing DoD with a singularly focused Technical Operations Hub to link DoD, Interagency, and other national/international CBRN subject matter experts (SMEs) into a collaborative, net-centric information environment. | | | |
| ***FY 2014 Plans:***<br>- Continue to support the COCOMS with the further refinement and development of operation center critical technologies that will enhance the capability of rapid response in relation to next generational reachback capabilities.<br>- Complete the effort to integrate first principle nuclear fallout modeling codes into Graphical User Interface (GUI)-based hazard prediction models.<br>- Continue development of capability to model secondary and tertiary effects supporting optimal course of action and tactical decisions for WMD operations, including power and communication infrastructure.<br>- Begin development of technologies and methods for comprehensive WMD consequence assessment to potentially include PMESII (Political, Military, Economic, Social, Infrastructure, and Information) implications – will support United States Strategic Command's (USSTRATCOM) consequence of execution analyses.<br>- Deliver IMEA 11.1 (Near Miss Lethality/Multi-Hit/Ultra-High Performance Concrete (UHPC) Penetration/LCP Enhancements).<br>- Deliver VAPO 6.1 (Improved Blast Model/Glass Curtain Wall Model).<br>- Deliver Targeted Weaponeering Assistance Cell (TWAC) academic sessions and targeting recommendation pages supporting COCOM requirements.<br>- Demonstrate Silent Scout Chemical/Rad Sensor Delivery – Other Government Agency (OGA).<br>- Demonstrate Nano-scale Transformational Rad Tag. | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | Date: March 2014 |
|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 3 | **R-1 Program Element (Number/Name)**<br>PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention and Defeat* | **Project (Number/Name)**<br>RM / *WMD Counterforce Technologies* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2013 | FY 2014 | FY 2015 |
|---|---|---|---|
| - Continue WACS and Army Shadow UAS integration efforts and Air Worthiness Certification.<br>- Develop WMD ISR system architecture.<br>- Conduct WMD ISR signature characterization and phenomenology research.<br>- Continue development and integration of agent based modeling capabilities, including secondary and tertiary effects linked with social behavior resulting from WMD insult.<br>- Develop parallel version of transport and dispersion code to allow faster and more complex data analysis execution on high performance computing resources.<br>- Support requests for information providing technical advisory reachback support on WMD effects and consequences – expected workload of over 1,600 requests for information. | | | |
| ***FY 2015 Plans:***<br>- Develop parallel version of transport and dispersion code to allow faster analysis execution on high performance computing resources. Coupled with FY 2014 enhancements, provide upgraded capability to run faster, finer and larger analyses.<br>- Continue development and integration of agent.<br>- Demonstrate a novel chemical/biological sensor for a CWMD TTL application.<br>- Demonstrate a multi-modal chemical sensor integrated in a TTL device.<br>- Conduct a demonstration of scintillating transformational material for CWMD application within an operational architecture.<br>- Support PM UAS in completing WACS transition activities, fielding, and procurement.<br>- Design, integrate, and demonstrate CARDS payload captive carry system for CBRN sensor packages.<br>- Conduct a CARDS system demonstration of precision emplacement using representative CBRN sensor packages.<br>- Conduct Phase I demonstration of enhanced near-term bio-search/detection sensors for Department of Defense and Intelligence Community customers.<br>- Conduct down-select of multi-mode sensor systems for bio-terrorism threat detection.<br>- Initiate Phase II development of select sensor systems for use in detecting small-scale biological labs.<br>- Deliver the VAPO planning tool with improved infrastructure modeling capabilities, including secondary effects from improved vehicle borne improvised explosive device models, and tertiary effects linked with social behavior resulting from WMD insult.<br>- Develop coarse, worldwide population and activity database to enable rapid emergent refined, country level synthetic infrastructures for agent-based improved urban site modeling operational capabilities.<br>- Deliver capabilities developed in FY 2014 (IMEA 11.1).<br>- Demonstrate High Performance Computing integration using improved software infrastructure developed in FY 2014.<br>- Develop Enhanced Tunnel/ Hard and Deeply Buried Targets (HDBT) defeat modeling capabilities in the areas of High Strength Concrete weapon penetration and Steep Slope cratering/rubble model.<br>- Start development to support non-kinetic weapons effects and full-spectrum defeat capability. | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | Date: March 2014 |
|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 3 | **R-1 Program Element (Number/Name)**<br>PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention and Defeat* | **Project (Number/Name)**<br>RM / *WMD Counterforce Technologies* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2013 | FY 2014 | FY 2015 |
|---|---|---|---|
| - Develop improved Agent Defeat modeling capabilities for WMD target attack planning.<br>- Deliver Targeting/Weaponeering academics and targeting recommendation packages supporting COCOM requirements. | | | |
| **Accomplishments/Planned Programs Subtotals** | 21.514 | 29.420 | 29.346 |

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

| Line Item | FY 2013 | FY 2014 | FY 2015 Base | FY 2015 OCO | FY 2015 Total | FY 2016 | FY 2017 | FY 2018 | FY 2019 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • 23/0602718BR: *WMD Defeat Technologies* | 18.026 | 14.444 | 13.787 | - | 13.787 | 13.583 | 13.807 | 14.133 | 14.607 | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

Government and industrial performers are assessed and selected based upon a “best fit for task” criteria. DoD Services, Laboratories, DoE National Laboratories, and specialized university laboratories are common government awardees.

**E. Performance Metrics**

Standoff detection range of WMD reconnaissance system.
Number of technology demonstrations completed.
Number of new capabilities delivered to COCOMs.
Number of Targeting/Weaponeering academics and target recommendation packages and weaponeering solutions delivered to COCOMs.
Increase automation of the analytic process used by Defense Threat Reduction Agency (DTRA) Technical Reachback, DTRA Joint Operations Center and the U.S. Strategic Command Center for Combating WMD.
Number of requests for information/analysis submitted to Technical Reachback and returned to respective customers.

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | | Date: March 2014 |
|---|---|---|---|
| Appropriation/Budget Activity<br>0400 / 3 | R-1 Program Element (Number/Name)<br>PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention and Defeat* | Project (Number/Name)<br>RR / *Combating WMD Test and Evaluation* | |

| COST ($ in Millions) | Prior Years | FY 2013 | FY 2014 | FY 2015 Base | FY 2015 OCO # | FY 2015 Total | FY 2016 | FY 2017 | FY 2018 | FY 2019 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RR: *Combating WMD Test and Evaluation* | 1.790 | 0.020 | - | - | - | - | - | - | - | - | Continuing | Continuing |

# The FY 2015 OCO Request will be submitted at a later date.

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

Project RR provides a unique national test bed capability for simulated WMD facility characterization, weapon-target interaction, and WMD facility defeat testing to respond to operational needs by developing and maintaining test beds used by the DoD, the Services, the Combatant Commanders and other federal agencies to evaluate the implications of WMD, conventional, and other special weapon use against U.S. military or civilian systems and targets.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2013 | FY 2014 | FY 2015 |
|---|---|---|---|
| ***Title:*** RR: Combating WMD Test and Evaluation | 0.020 | - | - |
| ***FY 2013 Accomplishments:***<br>- Supported the setup and execution of the Integrated Standoff Inspection System (ISIS) Experiment test campaign | | | |
| **Accomplishments/Planned Programs Subtotals** | 0.020 | - | - |

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

| Line Item | FY 2013 | FY 2014 | FY 2015 Base | FY 2015 OCO | FY 2015 Total | FY 2016 | FY 2017 | FY 2018 | FY 2019 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • 23/0602718BR: *WMD Defeat Technologies* | 10.425 | 12.659 | 11.060 | - | 11.060 | 11.182 | 11.809 | 12.091 | 12.426 | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

Government and industrial performers are assessed and selected based upon a "best fit for task" criteria. DoD Services Laboratories, Department of Energy (DOE) National Laboratories, and specialized university laboratories are common government awardees.

**E. Performance Metrics**

N/A

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | | Date: March 2014 |
|---|---|---|---|
| Appropriation/Budget Activity<br>0400 / 3 | R-1 Program Element (Number/Name)<br>PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention and Defeat* | Project (Number/Name)<br>RT / *Target Assessment Technologies* | |

| COST ($ in Millions) | Prior Years | FY 2013 | FY 2014 | FY 2015 Base | FY 2015 OCO # | FY 2015 Total | FY 2016 | FY 2017 | FY 2018 | FY 2019 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RT: *Target Assessment Technologies* | 71.245 | 26.865 | 28.141 | 53.850 | - | 53.850 | 45.065 | 26.942 | 27.618 | 28.352 | Continuing | Continuing |

# The FY 2015 OCO Request will be submitted at a later date.

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

For some Weapons of Mass Destruction (WMD) targets and hard and deeply buried targets (HDBTs), physical destruction may not be possible, practical, or desirable with current conventional weapons and employment techniques. It may be possible or preferable, to achieve operational objectives by denying or disrupting the mission or function of the target facility. Functional defeat, however, requires extensive and highly detailed analysis of the target. The functional defeat process includes finding and identifying a facility, characterizing its function and physical layout, determining its vulnerabilities to available defeat mechanisms, planning and executing an attack, assessing damage, and if necessary, suppressing reconstitution efforts and re-attacking the facility. Target Assessment Technologies develops for the Combatant Commands (COCOMs) and the Intelligence Community (IC), the analytical tools and processes required to find and characterize WMD targets and HDBTs and then, in near-real-time, assess the results of attacks against those targets. Overall objectives are to develop new methodologies, processes and technologies for detecting, locating, identifying, physically and functionally characterizing, modeling, and assessing new and existing hard and deeply buried targets to support physical or functional defeat. Applying these processes to WMD time-dependent target characterization and threat analysis presents a further technical challenge. The Target Assessment Technologies project is meeting this challenge through three subordinate and related activities: (1) Targeting and Intelligence Community Technologies Development; (2) Find, Characterize, Assess Technologies Development; and (3) Counter-WMD Analysis Cell (C-WAC) Technologies Development.

This program supports the National Strategy for Countering Biological Threat priority/focus areas 3) Capability Expansion and 4) Leveraging Science. The Counter WMD Analysis Cell (C-WAC) Technologies Development program has cooperative Research and Development projects with the United Kingdom and Commonwealth nations. The C-WAC project is also developing the Bio Dual-Use Analytical Tool as an aid in discriminating the employment of dual use technologies in the disguised development of bio warfare capabilities.

The increase from FY 2013 to FY 2014 is predominately due to the relative impact of Congressional reductions in FY 2013 impacting the Counter-WMD Analysis Cell (C-WAC). The increase from FY 2014 to FY2015 is due to increased investment in the development and integration of high-priority find, characterize and assess sensor technologies and supporting algorithms and software. This project has the only identified solution capable of meeting a time sensitive mission critical technology gap.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2013 | FY 2014 | FY 2015 |
|---|---|---|---|
| ***Title:*** RT: Target Assessment Technologies | 26.865 | 28.141 | 53.850 |
| ***Description:*** Project RT (Target Assessment Technologies) provides the COCOMs and the IC with technologies and processes to find and characterize WMD targets and HDBTs and then assess the results of attacks against those targets. | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | Date: March 2014 |
|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 3 | **R-1 Program Element (Number/Name)**<br>PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention and Defeat* | **Project (Number/Name)**<br>RT / *Target Assessment Technologies* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2013 | FY 2014 | FY 2015 |
|---|---|---|---|
| ***FY 2013 Accomplishments:***<br>- Demonstrated Integrated Sensor System (ISS) software suite in realistic field conditions in two mission profiles.<br>- Validated C-WAC Nuclear Fuel Cycle model for support of COCOM and IC counter-WMD analysis.<br>- Demonstrated an intermediate analytical tool for the characterization of dual-use technologies related to the possible development of biological weapons (BW) by potential adversaries.<br>- Demonstrated Underground Targeting and Analysis System (UTAS) modeling capability for support of IC and COCOM WMD process analysis and characterization.<br>- Continued target characterization technical training for the Underground Facility (UGF) and WMD target defeat communities.<br>***FY 2014 Plans:***<br>- Demonstrate Denied Area Persistent Sensor System (DAPSS) enhanced yield detection/discrimination capability.<br>- Develop a chemical/biological virtual laboratory model for support of foreign weapons program analysis.<br>- Collect data and then develop an evaporative cooling analytical validation and verification model for support of the UTAS thermal analysis capability.<br>- Demonstrate an initial thermal process model interface for UTAS.<br>- Provide target characterization training for the UGF and WMD target defeat communities.<br>***FY 2015 Plans:***<br>- Deliver Find Characterize and Assess (FCA) detection and characterization on-node data fusion algorithm improvements in support of near-real time target update capabilities.<br>- Deliver FCA/UTAS tool suite interface improvement for near real time support of IC target characterization and assessment.<br>- Develop Adversarial Route Analysis Tool (ARAT) with Global Expansion for support of counter-WMD intelligence analysis.<br>- Develop Full Operational Capability for UTAS thermal process modeling capability in support of IC target analysis.<br>- Develop FCA detection and characterization hardware and software to support near-real time target update capabilities. | | | |
| **Accomplishments/Planned Programs Subtotals** | 26.865 | 28.141 | 53.850 |

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

N/A

**Remarks**

**D. Acquisition Strategy**

Government and industrial performers are assessed and selected based upon a “best fit for task” criteria. DoD Services Laboratories, DoE National Laboratories, and specialized university laboratories are common government awardees.

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | Date: March 2014 |
|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 3 | **R-1 Program Element (Number/Name)**<br>PE 0603160BR / *Counterproliferation Initiatives - Proliferation, Prevention and Defeat* | **Project (Number/Name)**<br>RT / *Target Assessment Technologies* |

**E. Performance Metrics**

By the end of FY 2014, increase WMD target characterization capability through successful incorporation of WMD systems and process characterization modeling and assessment capabilities into the UTAS functionality.
By the end of FY 2014, demonstrate improvements to UTAS by incorporating functionality to handle a broader range of WMD-related equipment.
By the end of FY 2014, demonstrate improved sensor-on-node data fusion capability.
By the end of FY 2014, improve DoD's ability to analyze adversary WMD development capability through C-WAC modeling and analysis.
By the end of FY 2015, deliver a thermal predictive process model interface.
for underground facility forced and evaporative air cooled systems.
By the end of FY 2015, demonstrate improved compact, low power integrated.
sensor-on-node seismic & acoustic system with an operating prototype
By the end of FY 2015, deliver a virtual laboratory chemical, biological,
and radiological models to analyze adversary WMD capabilities.

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| Exhibit R-2, RDT&E Budget Item Justification: PB 2015 Defense Threat Reduction Agency | | | | | | | | | | | Date: March 2014 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 5: *System Development & Demonstration (SDD)* | | | | | R-1 Program Element (Number/Name)<br>PE 0605000BR / *WMD Defeat Capabilities* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2013** | **FY 2014** | **FY 2015 Base** | **FY 2015 OCO #** | **FY 2015 Total** | **FY 2016** | **FY 2017** | **FY 2018** | **FY 2019** | **Cost To Complete** | **Total Cost** |
| Total Program Element | 13.576 | 5.173 | 12.901 | 6.887 | - | 6.887 | 7.156 | 7.397 | 7.497 | 7.625 | Continuing | Continuing |
| RF: *Detection and Forensics Technologies* | 0.000 | - | 6.906 | 6.887 | - | 6.887 | 7.156 | 7.397 | 7.497 | 7.625 | Continuing | Continuing |
| RL: *Nuclear & Radiological Effects* | 13.576 | 5.173 | 5.995 | - | - | - | - | - | - | - | - | - |

# The FY 2015 OCO Request will be submitted at a later date.

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

This program element supports the development of system capabilities for the Countering Weapons of Mass Destruction (CWMD) mission. This funding specifically supports (1) the development of collaborative CWMD analysis capabilities between DoD and key interagency and international partners through a globally accessible net-centric framework in the form of the Integrated Weapons of Mass Destruction Toolset (IWMDT) and (2) technologies to meet national International Monitoring System (IMS) technology requirements in support of nuclear arms control activities under the Nuclear Arms Control Technology (NACT) program.

Project RF-Detection and Forensics Technologies supports the NACT Program, conducting Research, Development, Testing, and Evaluation (RDT&E) to meet IMS technology requirements in support of implementation, compliance, monitoring, and inspection for existing and emerging nuclear arms control activities.

Project RL-Nuclear & Radiological Effects develops and provides a real-time globally accessible net-centric framework which migrates the Defense Threat Reduction Agency (DTRA) chemical, biological, radiological, nuclear, and high explosive (CBRNE) modeling and simulation codes to provide an integrated suite of Combating WMD decision support capabilities.

| B. Program Change Summary ($ in Millions) | FY 2013 | FY 2014 | FY 2015 Base | FY 2015 OCO | FY 2015 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 5.749 | 12.901 | 12.967 | - | 12.967 |
| Current President's Budget | 5.173 | 12.901 | 6.887 | - | 6.887 |
| Total Adjustments | -0.576 | - | -6.080 | - | -6.080 |
| • Congressional General Reductions | -0.008 | - | | | |
| • Congressional Directed Reductions | -0.464 | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | -0.104 | - | | | |
| • Realignments | - | - | -3.951 | - | -3.951 |

| Exhibit R-2, RDT&E Budget Item Justification: PB 2015 Defense Threat Reduction Agency | | | | | Date: March 2014 |
|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 5: *System Development & Demonstration (SDD)* | | | R-1 Program Element (Number/Name)<br>PE 0605000BR / *WMD Defeat Capabilities* | | |
| • Other Reductions | - | - | -2.129 | - | -2.129 |

**Change Summary Explanation**

The decrease in FY 2013 from the previous President's Budget submission is predominately due to Congressional reductions and the Small Business Innovation Research (SBIR) transfer. The decrease in FY 2015 from the previous President's Budget Submission is predominately due to decreased investment in net-centric architecture.

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | | Date: March 2014 |
|---|---|---|---|
| Appropriation/Budget Activity<br>0400 / 5 | R-1 Program Element (Number/Name)<br>PE 0605000BR / *WMD Defeat Capabilities* | Project (Number/Name)<br>RF / *Detection and Forensics Technologies* | |

| COST ($ in Millions) | Prior Years | FY 2013 | FY 2014 | FY 2015 Base | FY 2015 OCO # | FY 2015 Total | FY 2016 | FY 2017 | FY 2018 | FY 2019 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RF: *Detection and Forensics Technologies* | - | - | 6.906 | 6.887 | - | 6.887 | 7.156 | 7.397 | 7.497 | 7.625 | Continuing | Continuing |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

# The FY 2015 OCO Request will be submitted at a later date.

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

The Nuclear Arms Control Technology (NACT) Program provides Research, Development, Testing, and Evaluation (RDTE) to meet International Monitoring System (IMS) technology requirements in support of Comprehensive Nuclear Test Ban Treaty (CTBT) implementation, compliance, monitoring, and inspection, and other existing and emerging nuclear arms control activities. The project directly provides for the United States contribution to the IMS and addresses Weapons of Mass Destruction (WMD) monitoring requirements validated by the Office of the Under Secretary of Defense, Acquisition, Technology, and Logistics (OUSD AT&L). This project conforms to the administration's research and development priorities as related to WMD arms control and disablement. Technical assessments are made to provide the basis for sound project development, evaluate existing programs and provide the data required to inform compliance assessments, and support US monitoring policy- and decision-makers and negotiation teams. Technology developments and system improvements are conducted to ensure the availability of these CTBT monitoring capabilities.

Primary program emphasis is on improving sensors sustainability, operational availability, and detection capabilities against a wide range of nuclear test phenomena and associated threat origins. The program includes development, fielding, and sustainment of specialized monitoring and analysis equipment and capabilities, procedures, persistent monitoring and associated monitoring data in direct support to the IMS and CTBT requirements. NACT also directly supports US and allied warfighter and national technical monitoring requirements and provides vital monitoring data that are extensively used by warfighter planners, Department of Defense (DoD) and other U.S. government agencies, and international agencies. This project directly supports the warfighting capability area of combatting WMD.

The increase from FY 2013 to FY 2014 is due to the transfer of the NACT program to the Defense Threat Reduction Agency (DTRA). The NACT program transferred from the United States Army Space Missile Development Command (SMDC) to DTRA in FY 2014.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2013 | FY 2014 | FY 2015 |
|---|---|---|---|
| ***Title:*** RF - Detection and Forensics Technologies | - | 6.906 | 6.887 |
| ***Description:*** Project RF-Detection and Forensics Technologies supports the Nuclear Arms Control Technologies (NACT) Program, conducting RDT&E to meet International Monitoring System (IMS) technology requirements in support of Comprehensive Nuclear Test Ban Treaty implementation, compliance, monitoring, and inspection and other emerging nuclear arms control activities. | | | |
| ***FY 2013 Accomplishments:*** | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | Date: March 2014 |
|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 5 | **R-1 Program Element (Number/Name)**<br>PE 0605000BR / *WMD Defeat Capabilities* | **Project (Number/Name)**<br>RF / *Detection and Forensics Technologies* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2013 | FY 2014 | FY 2015 |
|---|---|---|---|
| N/A | | | |
| ***FY 2014 Plans:***<br>-Continue support of Office of the Secretary of Defense (OSD) treaty management objectives and continue participating in joint US-International Comprehensive Test Ban Office Provisional Technical Secretariat (PTS) sponsored technology development exchanges and developmental exercises in support of technology development and IMS operations and maintenance objectives.<br>- Continue prototype sensor development, station calibration, and metrology planning.<br>- Continue development of monitoring station array element calibration with focus on developing in-situ array calibration and performance monitoring capabilities. Conduct signal capture and identification studies to reduce signal clutter, false alarms, and improve noise rejection methods and algorithms.<br>- Continue planning to evaluate options for performing experiments or demonstrations to evaluate system performance to monitor a planned underground or underwater detonation. The detonation will be non-nuclear in nature but configured to simulate the release of suitable surrogate nuclear testing signatures. All associated signatures will be acceptable to environmental and health regulations and of a nature suitable to challenge IMS monitoring technologies.<br>- Continue radio-xenon gas detection system development and research. Study and evaluate atmospheric and subsurface xenon backgrounds and transport phenomenon.<br>- Continue a study of baseline noble gas detection schemes and select the pathway for future radio-xenon detection options providing enhanced detection and operational capabilities and reliability. This study is paying close attention to timeline and feasibility of implementation alternatives.<br>- Continue infrasound information system enhancements and development of infrasound propagation models to improve detection, identification, and discrimination of sources and signatures of interest.<br>- Continue field experiments to collect data required to constrain and validate models. Models will include fine-scale atmospheric conditions, topography, 3-D winds and effects of non-linear propagation.<br>- Continue to develop a portable/rapid deployable infrasound array and standard sound source for calibrating infrasound stations/ arrays.<br>- Continue on-location infrasound event calibration and metrology research at established engineering and development test centers (EDTC), continue development of EDTCs to support research, testing, and evaluation relevant to station shutdowns, configuration changes, and invasive procedures, and use EDTCs to perform primary evaluations of prototype monitoring arrays and related new technologies and all associated field testing.<br>- Continue R&D on support system to collect and prioritize station operator requirements to inform required design-build-test activities across the monitoring system. Focus areas continue to be improvements to radionuclide detector cooling and functionality, filtration medium and sample head, and electronic controls.<br>- Continue U.S. IMS sensor event signal identification technique research and development of the transportable xenon laboratory (TXL) and associated xenon detection system and prepare for international deployment exercises and demonstrations. Operations and maintenance performed in advance of the TXL foreign deployment will establish an operations baseline for | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | Date: March 2014 |
|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 5 | **R-1 Program Element (Number/Name)**<br>PE 0605000BR / *WMD Defeat Capabilities* | **Project (Number/Name)**<br>RF / *Detection and Forensics Technologies* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2013 | FY 2014 | FY 2015 |
|---|---|---|---|
| this xenon monitoring capability and provide unique opportunities to diagnose and resolve remaining operational and technical concerns and issues, including investigating the "memory effect" recently encountered in these systems as a result of the unintended radio-xenon releases from the Fukushima reactors. Also planned is a continuation of infrasound event clutter and false alarm reduction, and noise mitigation analyses.<br>- Continue to drive improvements in radionuclide detection and measurement, including xenon gas collection/analysis systems research. Evaluate detection limits, and yields. The PTS technical requirements dictate that the US radionuclide laboratory (RL-16) gas system requires additional capability to meet required detection thresholds. Develop test methods to increase xenon gas yields, improve detection efficiencies, and decrease dead volume. To ensure RL-16 is making a high precision measurement, analysis samples will be peer reviewed and calibrated at certified laboratories.<br>- Continue to develop a robust, high-precision method to calibrate nuclear detectors and calibration methods to obtain the absolute calibration of the system's nuclear detector.<br>***FY 2015 Plans:***<br>- Continue to operate and maintain the 36 US IMS stations.<br>- Complete PTS certification of US IMS IS monitoring station on Wake Island and AS monitoring station on Shemya Island AK.<br>- Continue to improve US IMS operations efficiency, capabilities, and quality of monitoring data, and decrease false alarms.<br>- Continue support of OSD treaty management objectives.<br>- Continue participating in International Comprehensive Test Ban Office Provisional Technical Secretariat (PTS) sponsored technology development exchanges and field exercises.<br>- Continue R&D to inform required design-build-test activities across the monitoring system.<br>- Continue IMS prototype sensor and station calibration capabilities development.<br>- Continue development of monitoring station in-situ calibration and performance monitoring capabilities.<br>- Continue performing experiments or field demonstrations to evaluate monitoring system performance.<br>- Continue to enhance baseline radionuclide particulate and noble gas detection capabilities, efficiency and reliability.<br>- Continue development and calibration of infrasound and seismic propagation models.<br>- Continue field experiments to collect data required to calibrate and constrain and validate IMS relevant propagation models.<br>- Continue US IMS sensor event signal identification technique research and development of the transportable xenon laboratory. | | | |
| **Accomplishments/Planned Programs Subtotals** | - | 6.906 | 6.887 |

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

| Line Item | FY 2013 | FY 2014 | FY 2015 Base | FY 2015 OCO | FY 2015 Total | FY 2016 | FY 2017 | FY 2018 | FY 2019 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • 23/0602718BR: *WMD Defeat Technologies* | 41.343 | 36.102 | 35.061 | - | 35.061 | 35.548 | 36.522 | 37.382 | 38.223 | Continuing | Continuing |

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | Date: March 2014 |
|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 5 | **R-1 Program Element (Number/Name)**<br>PE 0605000BR / *WMD Defeat Capabilities* | **Project (Number/Name)**<br>RF / *Detection and Forensics Technologies* |

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

| Line Item | FY 2013 | FY 2014 | FY 2015 Base | FY 2015 OCO | FY 2015 Total | FY 2016 | FY 2017 | FY 2018 | FY 2019 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • 30/0603160BR: *Proliferation Prevention and Defeat* | 69.331 | 74.556 | 66.707 | - | 66.707 | 68.770 | 70.727 | 71.058 | 72.959 | Continuing | Continuing |

**Remarks**

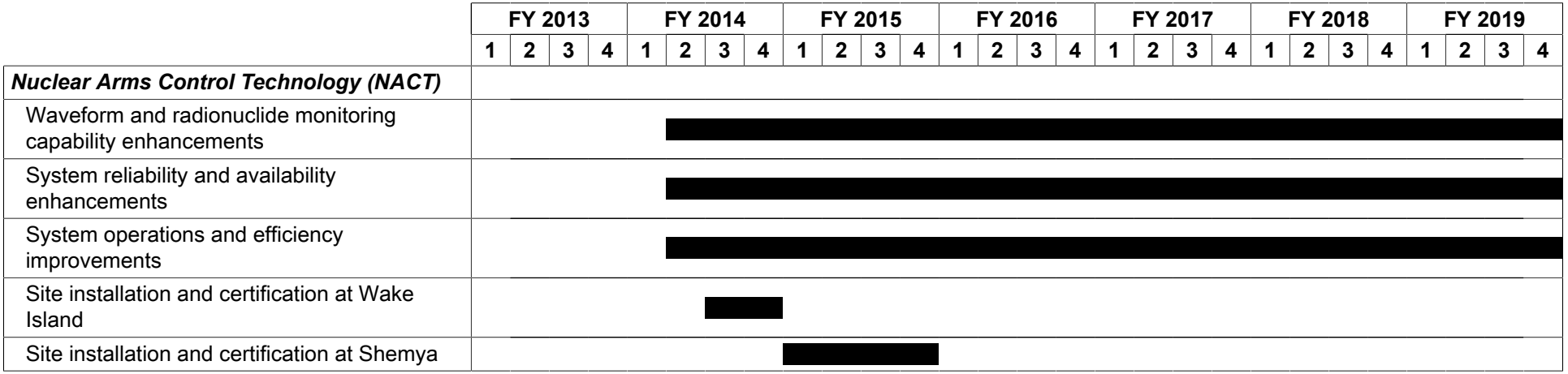
**D. Acquisition Strategy**

Government and industrial performers are assessed and selected based upon a "best fit for task" criteria. DoD Service Laboratories and DoE National Laboratories are common government awardees.

**E. Performance Metrics**

Operate, maintain, and sustain the PTS certified waveform and radionuclide CTBT monitoring stations in accordance with the CTBT verification monitoring performance requirements and the CTBT Radionuclide and Waveform Operations Manuals. Meet the associated CTBT IMS data availability/timeliness performance specifications/ requirements–98% for IMS waveform and 95% for IMS radionuclide systems.

| Exhibit R-4, RDT&E Schedule Profile: PB 2015 Defense Threat Reduction Agency | | Date: March 2014 |
|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 5 | **R-1 Program Element (Number/Name)**<br>PE 0605000BR / *WMD Defeat Capabilities* | **Project (Number/Name)**<br>RF / *Detection and Forensics Technologies* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2015 Defense Threat Reduction Agency | | Date: March 2014 |
|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 5 | **R-1 Program Element (Number/Name)**<br>PE 0605000BR / *WMD Defeat Capabilities* | **Project (Number/Name)**<br>RF / *Detection and Forensics Technologies* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***Nuclear Arms Control Technology (NACT)*** | | | | |
| Waveform and radionuclide monitoring capability enhancements | 2 | 2014 | 4 | 2019 |
| System reliability and availability enhancements | 2 | 2014 | 4 | 2019 |
| System operations and efficiency improvements | 2 | 2014 | 4 | 2019 |
| Site installation and certification at Wake Island | 3 | 2014 | 4 | 2014 |
| Site installation and certification at Shemya | 1 | 2015 | 4 | 2015 |

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | | Date: March 2014 |
|---|---|---|---|
| Appropriation/Budget Activity<br>0400 / 5 | R-1 Program Element (Number/Name)<br>PE 0605000BR / *WMD Defeat Capabilities* | Project (Number/Name)<br>RL / *Nuclear & Radiological Effects* | |

| COST ($ in Millions) | Prior Years | FY 2013 | FY 2014 | FY 2015 Base | FY 2015 OCO # | FY 2015 Total | FY 2016 | FY 2017 | FY 2018 | FY 2019 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RL: *Nuclear & Radiological Effects* | 13.576 | 5.173 | 5.995 | - | - | - | - | - | - | - | - | - |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

# The FY 2015 OCO Request will be submitted at a later date.

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

This project supports the National Strategy for Countering Biological Threat priority/focus areas 3) Capability Expansion and 4) Leveraging Science. Under Project RL, the Net-Centric Architecture program integrates legacy capabilities and facilitates data sharing through a net-centric framework. It provides near-real time collaborative analysis capabilities between Department of Defense (DoD) and key interagency and international partners through a globally accessible net-centric framework known as the Integrated Weapons of Mass Destruction Toolset (IWMDT). The IWMDT migrates Defense Threat Reduction Agency (DTRA) chemical, biological, radiological, nuclear, and high explosive (CBRNE) modeling and simulation codes to provide an integrated suite of Countering WMD decision support capabilities. The framework is the only operational CBRNE framework in the world which provides capabilities through web applications, net-centric web services, and stand-alone mobile deployments which are validated and accredited for operational use by International, National, State, and local authorities.

The Net-Centric Architecture program includes three functional areas: 1) IWMDT, 2) IWMDT Codes, and 3) Software Assurance, Certification, and Accreditation. The IWMDT functional area develops the architecture, defines and implements the standards to consolidate validated DTRA tools, and through this architecture, enables rapid access for planning, emergency response, and assessment capabilities. These capabilities are used by a wide range of planners, managers, and operational and technical personnel facing the full spectrum of CBRNE threats. The IWMDT Codes functional area develops analysis and simulation codes, and then integrates the codes into the IWMDT architecture. These activities are unique to this effort across the DoD. They directly support analysis capabilities in the Office of the Secretary of Defense (OSD) Studies and Analysis Group, and Cost Assessment and Program Evaluation (OSD CAPE), US Pacific Command and United States Forces Korea (USFK) offices, Republic of Korea (ROK) Ministry of Defense, Ministry of Defense Taiwan, as well as providing unique simulation capabilities to the Air Force Distributed Mission Operation Center. The Software Assurance, Certification and Accreditation functional area supports all aspects of DTRA software development and fielding. This sub-project extends research and development to system development and demonstration.

The increase from FY 2013 to FY 2014 is due to increased investment for fielding of IWMDT in FY 2014. The decrease in FY 2015 is due to the completion of IWMDT investments based on Agency priorities.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2013 | FY 2014 | FY 2015 |
|---|---|---|---|
| ***Title:*** RL: Nuclear & Radiological Effects | 5.173 | 5.995 | - |
| ***Description:*** Project RL-Nuclear & Radiological Effects develops and provides a real-time globally accessible net-centric framework which migrates the DTRA CBRNE modeling and simulation codes to provide an integrated suite of Combating WMD decision support capabilities. | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | Date: March 2014 |
|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 5 | **R-1 Program Element (Number/Name)**<br>PE 0605000BR / *WMD Defeat Capabilities* | **Project (Number/Name)**<br>RL / *Nuclear & Radiological Effects* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2013 | FY 2014 | FY 2015 |
|---|---|---|---|
| ***FY 2013 Accomplishments:***<br>- Leveraged the 4th Quarter FY 2011 and FY 2012 successes across U.S. Strategic Command (USSTRATCOM), the UK and Supreme Headquarters Allied Powers Europe (SHAPE), enabling IWMDT to become the single integrated assessment CBRNE capability for nuclear targeting across, STRATCOM, UK, SHAPE (Nuclear Operations) and the U.S. Army Nuclear and Combating WMD Agency (USANCA).<br>- Deployed IWMDT Version 3.3.<br>***FY 2014 Plans:***<br>- Install IWMDT version 3.4 (server based) at USFK for collaboration between US forces and the ROK forces.<br>- Field IWMDT version 3.4 to USSTRATCOM, United Kingdom, SHAPE, OSD, U.S. Army Nuclear and Combating WMD Agency (USANCA), and DTRA Reachback.<br>- Broad deployment of IWMDT version 3.4 to Department of Homeland Security. | | | |
| **Accomplishments/Planned Programs Subtotals** | 5.173 | 5.995 | - |

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

| Line Item | FY 2013 | FY 2014 | FY 2015 Base | FY 2015 OCO | FY 2015 Total | FY 2016 | FY 2017 | FY 2018 | FY 2019 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • 23/0602718BR: *WMD Defeat Technologies* | 25.395 | 31.398 | 32.352 | - | 32.352 | 33.322 | 34.250 | 34.555 | 35.104 | Continuing | Continuing |

**Remarks**

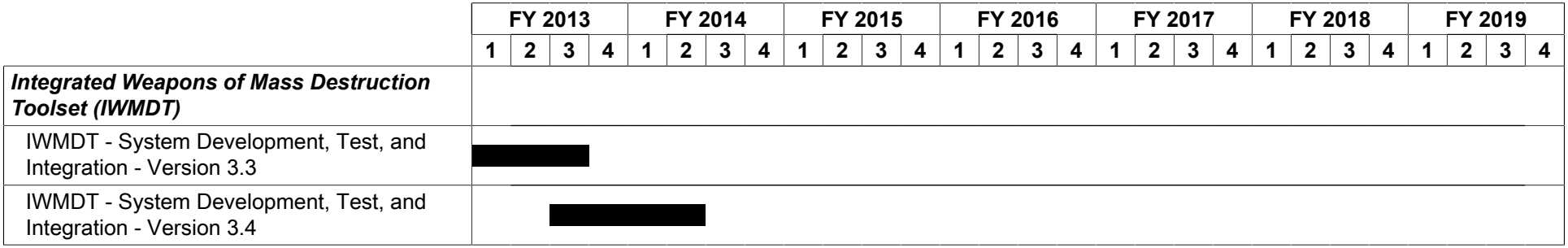
**D. Acquisition Strategy**

The program for IWMDT is executed through a competed Cost Plus Fixed-Fee contract. This contract is a 3-year effort for software development, test, and integration. Follow-on contracts will be competed for award to continue any out-year activities.

**E. Performance Metrics**

Demonstrate and provide over 80% of the customer-required CBRNE modeling and simulation capabilities over networks, e.g. Department of Defense Global Information Grid. Integrate mission-required legacy DTRA CBRNE codes into a net-centric architecture through a process-controlled Verification, Validation, and Accreditation standards-based method necessary to promote the National Strategy for Countering Biological Threats.

| Exhibit R-4, RDT&E Schedule Profile: PB 2015 Defense Threat Reduction Agency | | Date: March 2014 |
|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 5 | **R-1 Program Element (Number/Name)**<br>PE 0605000BR / *WMD Defeat Capabilities* | **Project (Number/Name)**<br>RL / *Nuclear & Radiological Effects* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2015 Defense Threat Reduction Agency | | Date: March 2014 |
|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 5 | **R-1 Program Element (Number/Name)**<br>PE 0605000BR / *WMD Defeat Capabilities* | **Project (Number/Name)**<br>RL / *Nuclear & Radiological Effects* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***Integrated Weapons of Mass Destruction Toolset (IWMDT)*** | | | | |
| IWMDT - System Development, Test, and Integration - Version 3.3 | 1 | 2013 | 3 | 2013 |
| IWMDT - System Development, Test, and Integration - Version 3.4 | 3 | 2013 | 2 | 2014 |

| Exhibit R-2, RDT&E Budget Item Justification: PB 2015 Defense Threat Reduction Agency | Date: March 2014 |
|---|---|
| **Appropriation/Budget Activity**<br>0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 6: *RDT&E Management Support* | **R-1 Program Element (Number/Name)**<br>PE 0605502BR / *Small Business Innovation Research* |

| COST ($ in Millions) | Prior Years | FY 2013 | FY 2014 | FY 2015 Base | FY 2015 OCO # | FY 2015 Total | FY 2016 | FY 2017 | FY 2018 | FY 2019 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Program Element | 14.852 | 4.454 | - | - | - | - | - | - | - | - | Continuing | Continuing |
| RA: *Information Science and Applications* | 14.852 | 4.454 | - | - | - | - | - | - | - | - | Continuing | Continuing |

# The FY 2015 OCO Request will be submitted at a later date.

**Note**

*Funding is not allocated until the year of execution. Program Element 0605502BR "Small Business Innovative Research (SBIR)" is used in reporting year-end actual expenses only.

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

The Small Business Innovative Research (SBIR) program provides the means for stimulating technological innovation in the private sector, strengthens the role of small business in meeting the Department of Defense (DoD) research and development needs; fosters and encourages participation of minority and disadvantaged businesses in technological innovation; and increases the commercial application of the DoD supported research and development results. These efforts are responsive to Public Law 106-554.

| B. Program Change Summary ($ in Millions) | FY 2013 | FY 2014 | FY 2015 Base | FY 2015 OCO | FY 2015 Total |
|---|---|---|---|---|---|
| Previous President's Budget | - | - | - | - | - |
| Current President's Budget | 4.454 | - | - | - | - |
| Total Adjustments | 4.454 | - | - | - | - |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | 4.454 | - | | | |

**Change Summary Explanation**

Funding for the SBIR Program is consolidated in this program element during the year of execution.

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | | Date: March 2014 |
|---|---|---|---|
| Appropriation/Budget Activity<br>0400 / 6 | R-1 Program Element (Number/Name)<br>PE 0605502BR / *Small Business Innovation Research* | Project (Number/Name)<br>RA / *Information Science and Applications* | |

| COST ($ in Millions) | Prior Years | FY 2013 | FY 2014 | FY 2015 Base | FY 2015 OCO # | FY 2015 Total | FY 2016 | FY 2017 | FY 2018 | FY 2019 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RA: *Information Science and Applications* | 14.852 | 4.454 | - | - | - | - | - | - | - | - | Continuing | Continuing |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

# The FY 2015 OCO Request will be submitted at a later date.

**Note**

* Funding is not allocated until the year of execution. Program Element 0605502BR "Small Business Innovative Research (SBIR)" is used in reporting year-end actual expenses only.

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

This project provides the means for stimulating technological innovation in the private sector, strengthens the role of small business in meeting the Department of Defense (DoD) research and development needs; fosters and encourages participation of minority and disadvantaged businesses in technological innovation; and increases the commercial application of the DoD supported research and development results. These efforts are responsive to Public Law 106-554.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2013 | FY 2014 | FY 2015 |
|---|---|---|---|
| ***Title:*** RA: Information Science and Applications | 4.454 | - | - |
| ***Description:*** This project provides the means for stimulating technological innovation in the private sector, strengthens the role of small business in meeting the DoD research and development needs; fosters and encourages participation of minority and disadvantaged businesses in technological innovation; and increases the commercial application of the DoD supported research and development results. These efforts are responsive to Public Law 106-554.<br><br>***FY 2013 Accomplishments:***<br>Phase I contract awards from qualified proposals and availability of funds:<br>- SBIR 12.2 Solicitation: 12 Phase I contracts were awarded<br>- SBIR 12.3 Solicitation: 2 Phase I contracts were awarded<br><br>Phase II awards resulting from Phase I efforts and availability of funds:<br>- SBIR 11.1 Solicitation: 1 Phase II contract was awarded<br>- SBIR 11.2 Solicitation: 1 Phase II contract was awarded | | | |
| **Accomplishments/Planned Programs Subtotals** | 4.454 | - | - |

| Exhibit R-2A, RDT&E Project Justification: PB 2015 Defense Threat Reduction Agency | | Date: March 2014 |
|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 6 | **R-1 Program Element (Number/Name)**<br>PE 0605502BR / *Small Business Innovation Research* | **Project (Number/Name)**<br>RA / *Information Science and Applications* |

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

| Line Item | FY 2013 | FY 2014 | FY 2015 Base | FY 2015 OCO | FY 2015 Total | FY 2016 | FY 2017 | FY 2018 | FY 2019 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • 23/0602718BR: *WMD Defeat Technologies* | 24.872 | 26.284 | 29.079 | - | 29.079 | 29.814 | 30.033 | 30.443 | 30.827 | Continuing | Continuing |
| • 30/0603160BR: *Proliferation, Prevention, and Defeat* | 3.006 | 2.431 | - | - | - | - | - | - | - | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

N/A

**E. Performance Metrics**

N/A

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