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<b>Exhibit R-2, RDT&amp;E Budget Item Justification:</b> FY 2018 Office of the Secretary Of Defense	<b>Date:</b> May 2017
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<b>Appropriation/Budget Activity</b>					<b>R-1 Program Element (Number/Name)</b>							
0400: <i>Research, Development, Test &amp; Evaluation, Defense-Wide I BA 5: System Development &amp; Demonstration (SDD)</i>					PE 0604161D8Z I <i>Nuclear and Conventional Physical Security/Countering Nuclear Threats</i>							
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018 Base</b>	<b>FY 2018 OCO</b>	<b>FY 2018 Total</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
Total Program Element	42.438	8.590	10.324	12.536	-	12.536	13.574	14.802	11.412	15.156	Continuing	Continuing
P163: <i>Nuclear and Conventional Physical Security</i>	37.519	5.007	6.903	7.900	-	7.900	6.890	7.009	7.132	7.280	Continuing	Continuing
P042: <i>CNT Prevention SDD</i>	4.919	3.583	3.421	4.636	-	4.636	6.684	7.793	4.280	7.876	Continuing	Continuing

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

This Program Element (PE) addresses the need to defend and deter against weapons of mass destruction (WMD) threats and to safeguard personnel; prevent unauthorized access to equipment, installations, material, and documents; and to safeguard the foregoing against espionage, sabotage, damage, and theft. This program oversees advanced engineering development throughout DoD for an integrated and systemic RDT&E approach for countering nuclear threats and nuclear and conventional physical security technology and systems. The funding has been centralized in this Defense-wide PE since the early 1990s and represents a substantial portion of all DoD physical security RDT&E funding. Priorities for this PE RDT&E efforts are driven by inputs from Quadrennial Defense Review guidance, Combatant Command and Service requirements, analysis reports such as "Protecting the Force: Lessons from Fort Hood," January 2010, the Integrated Unit, Base, and Installation Protection Cost Benefits Analysis, Multi-national Work Plans established through the Nuclear Security Summit process, and DoD Directive 5210.41, Security Policy for Protecting Nuclear Weapons-directed requirements and associated security deviation reports.

Under this integrated approach, funds are used to provide system development and demonstration for the Department in seven capability areas: (1) Detection and Assessment; (2) Access Controls; (3) Installation and Transport Security; (4) Storage and Safeguards; (5) Prevention; (6) Decision Support Systems; and (7) Analytical Support. The program will develop systems that are producible, supportable, and affordable and to demonstrate system integration, interoperability, and utility prior to full-rate production. The projects under the PE become technology insertions into existing programs or advance to being a certified Commercial/Government off-the-shelf product. The PE initiatives are coordinated by the Physical Security Enterprise and Analysis Group. This group is responsible for avoiding duplication of effort and when applicable ensure systems integration and promote interoperability and sustainability.

This PE can fund travel to support the requirements of this program.

This appropriation will finance work, including manpower, performed by a government agency or by private individuals or organizations under a contractual or grant arrangement with the government who conduct research (systematic study directed toward fuller scientific knowledge or understanding of the subject studied), development (systematic use of the knowledge and understanding gained from research, for the production of useful materials, devices, systems, or methods, including the design and development of prototypes and processes) and test and evaluation efforts.

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<b>Appropriation/Budget Activity</b> 0400: <i>Research, Development, Test &amp; Evaluation, Defense-Wide I BA 5: System Development &amp; Demonstration (SDD)</i>	<b>R-1 Program Element (Number/Name)</b> PE 0604161D8Z I <i>Nuclear and Conventional Physical Security/Countering Nuclear Threats</i>
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<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018 Base</b>	<b>FY 2018 OCO</b>	<b>FY 2018 Total</b>
Previous President's Budget	8.783	10.324	11.276	-	11.276
Current President's Budget	8.590	10.324	12.536	-	12.536
Total Adjustments	-0.193	0.000	1.260	-	1.260
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.193	-			
• Internal Realignment	-	-	1.354	-	1.354
• Internal Directed Reduction	-	-	-0.010	-	-0.010
• DTIC Offset	-	-	-0.084	-	-0.084

**Change Summary Explanation**

Internally realigned funding to this RDT&E Program Element to address additional advanced development for the Radiological Detection System

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Office of the Secretary Of Defense										Date: May 2017		
Appropriation/Budget Activity 0400 / 5					R-1 Program Element (Number/Name) PE 0604161D8Z / Nuclear and Conventional Physical Security/Countering Nuclear Threats				Project (Number/Name) P163 / Nuclear and Conventional Physical Security			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
P163: Nuclear and Conventional Physical Security	37.519	5.007	6.903	7.900	-	7.900	6.890	7.009	7.132	7.280	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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

This Program Element (PE) addresses the need to defend and deter against weapons of mass destruction (WMD) threats and to safeguard personnel; prevent unauthorized access to equipment, installations, material, and documents; and to safeguard the foregoing against espionage, sabotage, damage, and theft. This program oversees advanced engineering development throughout DoD for an integrated and systemic RDT&E approach for countering nuclear threats and nuclear and conventional physical security technology and systems. The funding has been centralized in this Defense-wide PE since the early 1990s and represents a substantial portion of all DoD physical security RDT&E funding. Priorities for this PE RDT&E efforts are driven by inputs from Quadrennial Defense Review guidance, Combatant Command and Service requirements, analysis reports such as "Protecting the Force: Lessons from Fort Hood," January 2010, the Integrated Unit, Base, and Installation Protection Cost Benefits Analysis, Multi-national Work Plans established through the Nuclear Security Summit process, and DoD Directive 5210.41, Security Policy for Protecting Nuclear Weapons-directed requirements and associated security deviation reports.

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This appropriation will finance work, including manpower, performed by a government agency or by private individuals or organizations under a contractual or grant arrangement with the government who conduct research (systematic study directed toward fuller scientific knowledge or understanding of the subject studied), development (systematic use of the knowledge and understanding gained from research, for the production of useful materials, devices, systems, or methods, including the design and development of prototypes and processes) and test and evaluation efforts.

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<b>Title:</b> Detection and Assessment	3.137	3.138	3.686

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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>
<p><b>Description:</b> The ability to detect an adversary and assess their intentions is a basic physical security tenant. This capability area will design equipment to identify and warn of unauthorized access to a specified area or installation as well as equipment related to the notification and identification of explosive threats or hazards.</p> <p><b>FY 2016 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>• Developed Millimeter Wave Asymmetric Threat Detection</li> <li>• Developed Sonar Propagation Acoustics Model Transition to Operational Initial Capability</li> <li>• Developed Hand-Held Explosive Detection Equipment for Maritime Operations</li> </ul> <p><b>FY 2017 Plans:</b></p> <ul style="list-style-type: none"> <li>• Conduct a Comparative Evaluation of Colorimetric Explosive Detection Systems</li> <li>• Develop Linear Sensor System Development for Multi-Threat Detection</li> <li>• Develop Automated tracking and classification of UUVs utilizing the AN/WQX-2</li> <li>• Develop Multi-Sensor Detection and Discrimination</li> </ul> <p><b>FY 2018 Plans:</b></p> <ul style="list-style-type: none"> <li>• Develop Linear Sensor System Development for Multi-Threat Detection</li> <li>• Develop PL1N/PL1 Portable Intrusion Detection System</li> </ul>			
<p><b>Title:</b> Access Controls</p> <p><b>Description:</b> Controlling access to safeguard personnel and their families and to prevent unauthorized access to critical infrastructure and materials is paramount. This capability area will focus on programs and processes related to the validity and verification of individuals entering or already within, a facility.</p> <p><b>FY 2016 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>• Developed an access control capability that leverages information housed in local law enforcement databases</li> </ul> <p><b>FY 2017 Plans:</b></p> <ul style="list-style-type: none"> <li>• Further the development of the Defense Installation Access Control</li> </ul> <p><b>FY 2018 Plans:</b></p> <ul style="list-style-type: none"> <li>• Continue the development of the Defense Installation Access Control capability</li> </ul>		0.890	1.010
<b>Title:</b> Installation and Transport Security		-	0.550
			1.794

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Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604161D8Z / Nuclear and Conventional Physical Security/Countering Nuclear Threats	Project (Number/Name) P163 / Nuclear and Conventional Physical Security		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<p><b>Description:</b> Robust installation and transport security are vital to preventing a weapon of mass destruction attack or the unauthorized access to key assets such as nuclear weapons and special nuclear material. This capability area will focus on programs and equipment intended to improve the physical security profile of fixed sites and facilities, as well as critical items while in-transit.</p> <p><b>FY 2017 Plans:</b></p> <ul style="list-style-type: none"><li>Integrate detection options and response capabilities previously identified, to include the full spectrum of non-lethal to lethal tactical weapon systems, to protect personnel and assets against the terrorist threat in an in transit maritime environment.</li></ul> <p><b>FY 2018 Plans:</b></p> <ul style="list-style-type: none"><li>Conduct a comprehensive concept demonstration in an operational environment with technologies and systems deployed and integrated across land, rail and waterside operating areas to address physical security detection gaps.</li></ul>				
<p><b>Title:</b> Prevention</p> <p><b>Description:</b> The security procedures taken to discourage an adversary from accessing weapons of mass destruction or gaining unauthorized access to critical assets are at the heart of prevention. This capability area will focus on broad spectrum, generic efforts which have the ability to influence multiple areas.</p> <p><b>FY 2017 Plans:</b></p> <ul style="list-style-type: none"><li>Develop capability to share and automate content across the defense security, biosurveillance, and countering weapons of mass destruction integration mission areas</li></ul>		-	0.660	-
<p><b>Title:</b> Storage and Safeguards</p> <p><b>Description:</b> Properly securing critical assets to prevent access by unauthorized persons and implementing control measures that ensure access is limited to authorized persons is the foundation of physical security. This capability area will focus on equipment (e.g., locks, doors, etc.) designed to delay or stop unauthorized entry/access to a specified/localized area.</p> <p><b>FY 2018 Plans:</b></p> <p>No efforts currently planned.</p>		-	-	0.000
<p><b>Title:</b> Decision Support Systems</p> <p><b>Description:</b> Decision support systems serve the management, operations, and planning levels of the DoD physical security enterprise to help to make decisions, which may be rapidly changing and not easily specified in advance. This capability area will</p>		0.980	0.880	0.279

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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>
<p>focus on command and control equipment and projects related to the creation and enhancement of common operating pictures, and the establishment of common architectures / interface standards.</p> <p><b>FY 2016 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>• Developed a Defense Security Enterprise Environment that would link/harmonize disparate and sub-optimal capabilities utilizing existing and emerging Component capabilities to better close known physical security gaps</li> </ul> <p><b>FY 2017 Plans:</b></p> <ul style="list-style-type: none"> <li>• Continue to develop Response Force Command, Control &amp; Communications</li> <li>• Continue to develop C2 Enhanced Capability Suite</li> </ul> <p><b>FY 2018 Plans:</b></p> <ul style="list-style-type: none"> <li>• Continue to develop Response Force Command, Control &amp; Communications</li> <li>• Continue to develop C2 Enhanced Capability Suite</li> </ul>			
<p><b>Title:</b> Analytical Support</p> <p><b>Description:</b> This capability area will focus on studies related to physical security topics and operational and management efforts related to day-to-day activities of the DoD Physical Security Enterprise RDT&amp;E Program.</p> <p><b>FY 2017 Plans:</b></p> <ul style="list-style-type: none"> <li>• Conduct physical security test and evaluation efforts</li> <li>• Provide DOD and industry the means to achieve PSE interoperability</li> </ul> <p><b>FY 2018 Plans:</b></p> <ul style="list-style-type: none"> <li>• Conduct physical security test and evaluation efforts</li> <li>• Provide DOD and industry the means to achieve PSE interoperability</li> </ul>		-	0.665
<b>Accomplishments/Planned Programs Subtotals</b>		5.007	7.900
<b>C. Other Program Funding Summary (\$ in Millions)</b>			
N/A			
<b>Remarks</b>			
<b>D. Acquisition Strategy</b>			
N/A			

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**E. Performance Metrics**

The program performance metrics are established/approved through the Office of the Deputy Assistant Secretary of Defense for Nuclear, Chemical, and Biological Defense Programs / Nuclear Matters. The cost, schedule and technical progress of each project is reviewed at quarterly PSEAG. Performance variances are addressed and corrective action is implemented as necessary.

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Appropriation/Budget Activity 0400 / 5					R-1 Program Element (Number/Name) PE 0604161D8Z / Nuclear and Conventional Physical Security/Countering Nuclear Threats				Project (Number/Name) P042 / CNT Prevention SDD			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
P042: CNT Prevention SDD	4.919	3.583	3.421	4.636	-	4.636	6.684	7.793	4.280	7.876	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
Establish a Defense-wide Countering Nuclear Threats (CNT) Materiel Development Program focused on prevention. Addresses capability gaps identified by Services, Combatant Commands, and Joint Staff. The CNT acquisition strategy directly applies to Joint requirements for CNT materiel development and addresses the materiel and sustainment gaps for general purpose Joint Forces including the US Army 20th Support Command / Navy Visit, Board, Search, and Seizure / Technical Support Groups (NIMBLE ELDER and the US Special Operations Command).												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2016	FY 2017	FY 2018	
Title: CNT Rad/Nuc Passive Defense									3.583	3.421	4.636	
Description: Advanced Development of Joint Radiological and Nuclear passive defense systems (i.e. Radiological Detection System and the Joint Personal Dosimeter).												
The Radiological Detection System will provide a ruggedized Radiation Detection, Indication, and Computation for real time gamma radiation monitoring and low energy x-ray, beta, alpha, and neutron detection.												
The Joint Personal Dosimeter will provide a joint solution to increase capability and reduce life-cycle costs.												
Both systems will address Operation TOMODACHI (response to Japan's Fukushima Daiichi nuclear power plant incident) lessons learned for common, interoperable equipment with adequate sensitivity and common units of measure.												
FY 2016 Accomplishments: Continued the development of Joint Radiological and Nuclear passive defense systems (i.e. Radiological Detection System and the Joint Personal Dosimeter)												
FY 2017 Plans: Continue the development of Joint Radiological and Nuclear passive defense systems (i.e. Radiological Detection System and the Joint Personal Dosimeter)												
FY 2018 Plans:												



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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>
Complete the development of Joint Radiological and Nuclear passive defense systems (i.e. Radiological Detection System and the Joint Personal Dosimeter)			
<b>Accomplishments/Planned Programs Subtotals</b>		3.583	4.636
<b>C. Other Program Funding Summary (\$ in Millions)</b> N/A			
<b>Remarks</b>			
<b>D. Acquisition Strategy</b> N/A			
<b>E. Performance Metrics</b> The program performance metrics are established/approved through the Countering Nuclear Threats Program Manager. The cost, schedule and technical progress is reviewed on a quarterly basis. Performance variances are addressed and corrective action(s) is(are) implemented as necessary.			