

**UNCLASSIFIED**

**Exhibit R-2, RDT&E Budget Item Justification:** PB 2012 Office of Secretary Of Defense **DATE:** February 2011

**APPROPRIATION/BUDGET ACTIVITY**

0400: *Research, Development, Test & Evaluation, Defense-Wide*  
BA 6: *RDT&E Management Support*

**R-1 ITEM NOMENCLATURE**

PE 0605142D8Z: *Systems Engineering*

<b>COST (\$ in Millions)</b>	<b>FY 2010</b>	<b>FY 2011</b>	<b>FY 2012 Base</b>	<b>FY 2012 OCO</b>	<b>FY 2012 Total</b>	<b>FY 2013</b>	<b>FY 2014</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
Total Program Element	-	29.824	41.884	-	41.884	45.188	44.479	48.184	50.313	Continuing	Continuing
P142: <i>Systems Engineering</i>	-	24.939	37.130	-	37.130	40.218	39.140	42.402	43.773	Continuing	Continuing
P143: <i>Program Protection</i>	-	4.885	4.754	-	4.754	4.970	5.339	5.782	6.540	Continuing	Continuing

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

This Program Element (PE) establishes the dedicated funding line to carry out the duties, as described in Title 10 US Code, Section 139, the Weapons Systems Acquisition Reform Act of 2009. The Director, Systems Engineering (DSE) is the principal advisor to the Secretary of Defense, the Under Secretary of Defense for Acquisition, Technology and Logistics (USD(AT&L)) and the Director, Defense Research and Engineering (DDR&E) on systems engineering, development planning, and related technical fields in the Department of Defense. The DSE develops policies and guidance for (1) the use of systems engineering principles and best practices; (2) the use of systems and software engineering planning and contracting approaches to enhance reliability, availability, and maintainability on major defense acquisition programs (MDAPs); (3) the systems engineering plans (SEPs) for MDAPs including software, and systems engineering considerations in support of lifecycle management and sustainability; and (4) the inclusion of provisions relating to systems engineering and reliability in requests for proposals. The DSE reviews and approves the SEP for each MDAP and monitors and reviews the systems engineering and development planning activities of MDAPs and other defense acquisition programs as directed by the Secretary of Defense or the USD(AT&L). Based on the Director's continuous program engagement, the DSE advises and makes recommendations to the Secretary of Defense and the USD(AT&L) regarding systems engineering, development planning and the execution of these activities. As a member of the Defense Acquisition Board, the DSE provides independent assessments of defense acquisition program's systems engineering, development planning, technical execution, and risk. The DSE also provides input on the inclusion of systems engineering requirements as part of the Joint Requirements Oversight Council's process for joint military requirements, to include developing specific inputs relating to each capabilities development document.

The DSE issues guidance to, and consults with, the Services and Agencies with respect to systems engineering in the Department and provides advocacy, oversight, and guidance to elements of the acquisition workforce responsible for systems engineering, development planning, and lifecycle management and sustainability functions and developing policies and guidance for the integration of specialty engineering functions. The DSE integrates systems engineering with Mission Assurance in the acquisition system. The DSE periodically reviews the organizations and capabilities of the military departments with respect to systems engineering, development planning, and lifecycle management and sustainability, and identifies needed changes or improvements to such organizations and capabilities.

The DSE prepares and submits an annual report to Congress on systems engineering activities and effectiveness.

This PE includes effort by the office of the DSE in implementing the Department's Cyber initiatives. Specifically, the PE will develop and address the critical subdiscipline of systems engineering - system security engineering and Program Protection. This includes study and maturation of discipline fundamentals such as best practices, tools, guidance and policy, and will also pilot system security practices in defense acquisition as a fundamental element of systems engineering and technical reviews. Efforts in this area are directly driven by cyber and malicious supply chain threats that the Department faces, and therefore, will include implementing Department directives and regulations to protect critical program information.

**UNCLASSIFIED**

**UNCLASSIFIED**

<b>Exhibit R-2, RDT&amp;E Budget Item Justification:</b> PB 2012 Office of Secretary Of Defense	<b>DATE:</b> February 2011
---	----------------------------

<b>APPROPRIATION/BUDGET ACTIVITY</b> 0400: <i>Research, Development, Test &amp; Evaluation, Defense-Wide</i> BA 6: <i>RDT&amp;E Management Support</i>	<b>R-1 ITEM NOMENCLATURE</b> PE 0605142D8Z: <i>Systems Engineering</i>
--	---

<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2010</b>	<b>FY 2011</b>	<b>FY 2012 Base</b>	<b>FY 2012 OCO</b>	<b>FY 2012 Total</b>
Previous President's Budget	-	29.824	26.983	-	26.983
Current President's Budget	-	29.824	41.884	-	41.884
Total Adjustments	-	-	14.901	-	14.901
• Congressional General Reductions		-			
• Congressional Directed Reductions		-			
• Congressional Rescissions	-	-			
• Congressional Adds		-			
• Congressional Directed Transfers		-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Baseline Review	-	-	18.900	-	18.900
• Defense Efficiency – Baseline Review	-	-	-0.413	-	-0.413
• Defense Efficiency - Reports, Studies, Boards, and Commissions	-	-	-1.152	-	-1.152
• Defense Efficiency – Civilian Staffing Reduction	-	-	-1.200	-	-1.200
• Defense Efficiency – Contractor Staff Support	-	-	-1.169	-	-1.169
• Economic Assumptions	-	-	-0.065	-	-0.065

**Change Summary Explanation**

Baseline Review: The Under Secretary of Defense (Acquisition, Technology & Logistics) initiated implementation of the Weapons Systems Acquisition Reform Act (WSARA) by establishing a new office of the Director, Systems Engineering and reallocating resources from the former Office of the Director, Systems and Software Engineering, which resided in PEs 0604875D8Z and PE 0605804D8Z. The FY12 adjustment supports this decision.

In FY 2011, identified funding from 0605804D8Z, was re-allocated to this Systems Engineering Program Element. The Base Year funding amount also includes a WSARA adjustment.

Defense Efficiency – Baseline Review. As part of the Department of Defense reform agenda, implements a zero-based review of the organization to align resources to the most critical priorities and eliminate lower priority functions.

Defense Efficiency – Report, Studies, Boards and Commissions. As part of the Department of Defense reform agenda, reflects a reduction in the number and cost of reports, studies, DoD Boards and DoD Commissions below the aggregate level reported in previous budget submission.

**UNCLASSIFIED**

**UNCLASSIFIED**

Exhibit R-2, RDT&E Budget Item Justification: PB 2012 Office of Secretary Of Defense		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 0400: Research, Development, Test & Evaluation, Defense-Wide BA 6: RDT&E Management Support	R-1 ITEM NOMENCLATURE PE 0605142D8Z: Systems Engineering	
<p>Defense Efficiency – Civilian Staffing Reduction. As part of the Department of Defense reform agenda, eliminates civilian full-time equivalent positions to maintain, with limited exceptions, civilian staffing at the FY 2010 level.</p> <p>Defense Efficiency – Contractor Staff Support. As part of the Department of Defense reform agenda, reduces funds below the aggregate level reported in the previous budget submission for contracts that augment staff functions.</p>		

**UNCLASSIFIED**

# UNCLASSIFIED

**Exhibit R-2A, RDT&E Project Justification:** PB 2012 Office of Secretary Of Defense **DATE:** February 2011

<b>APPROPRIATION/BUDGET ACTIVITY</b> 0400: <i>Research, Development, Test &amp; Evaluation, Defense-Wide</i> BA 6: <i>RDT&amp;E Management Support</i>	<b>R-1 ITEM NOMENCLATURE</b> PE 0605142D8Z: <i>Systems Engineering</i>	<b>PROJECT</b> P142: <i>Systems Engineering</i>
--	---	--

COST (\$ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
P142: <i>Systems Engineering</i>	-	24.939	37.130	-	37.130	40.218	39.140	42.402	43.773	Continuing	Continuing
Quantity of RDT&E Articles											

## A. Mission Description and Budget Item Justification

This (P142) program supports the execution of the missions of the Director, Systems Engineering (DSE) to: (1) provide flexible engineering policy, guidance, and workforce development requirements for the DoD acquisition workforce; (2) foster an acquisition environment of collaboration, teamwork, and joint ownership of program success through a proactive program oversight process, ensuring appropriate levels of systems engineering discipline are applied through all phases of the acquisition life cycle; and (3) engage all stakeholders across government, industry, and academia to collectively advance systems engineering practice and achieve acquisition excellence. The outcome of this effort is to ensure systems engineering principles and disciplines are fully accepted and assimilated into the DoD acquisition workforce positioning the DoD for acquisition excellence leading to a stronger national defense.

Activities include the following--

### Program Support Functions:

- Working with program managers to prepare systems engineering plans (SEPs) to document the technical management approach.
- Conduct periodic visits in support of technical reviews to confirm programs are executed in accordance with the SEP.
- Review all aspects of the systems engineering process for major defense acquisition programs to ensure they are adequate to support fielding and the achievement of cost and performance goals including reliability, sustainment and other mission assurance considerations.
- Participate in Systems Engineering Integrated Project Teams (IPTs), Systems Engineering Working Integrated Project Teams (WIPTs) and Systems Engineering technical reviews, especially Preliminary Design Reviews and Critical Design Reviews.
- Work with DoD Service program managers, their staffs, and other organizations, technical authorities, and oversight organizations to develop and implement technical management programs for major defense acquisition program (MDAPS).
- Conceive plans and lead program support reviews and assessments of MDAP weapons systems and other programs (e.g., Major Automated Information Systems) to shape technical planning and management to ensure program success.
- Conduct other technical reviews as requested e.g. Nunn-McCurdy certification reviews, Non-Advocate Reviews, focused technical assessments and software readiness reviews to identify and mitigate program risk.

### Mission Assurance Functions:

- Establish Mission Assurance policy, guidance and workforce development to drive the development of fully capable and supportable weapons systems.
- Oversee Component implementation of Mission Assurance initiatives and conduct independent Mission Assurance assessments.
- Develop education and training materials for instructing, maintaining and enhancing the defense acquisition workforce. Activities include developing guidance to enhance Systems Planning, Research, Development and Engineering (SPRDE) and Production Quality and Manufacturing (PQM) acquisition career planning

UNCLASSIFIED

**UNCLASSIFIED**

Exhibit R-2A, RDT&E Project Justification: PB 2012 Office of Secretary Of Defense			DATE: February 2011		
APPROPRIATION/BUDGET ACTIVITY 0400: Research, Development, Test & Evaluation, Defense-Wide BA 6: RDT&E Management Support		R-1 ITEM NOMENCLATURE PE 0605142D8Z: Systems Engineering	PROJECT P142: Systems Engineering		
<p>and progression, monitoring and facilitating Defense Acquisition University (DAU) updates systems engineering, quality and software engineering course to ensure curriculum represents the education and training requirements necessary to be a viable team member in the acquisition process.</p> <p>- Drive an overall improvement in weapon system reliability through improved reliability engineering, reliability growth management, and reliability monitoring in program development contracting, execution and sustainment.</p> <p>- Prepare and submit annual reports to Congress on the Department’s capabilities and effectiveness in systems engineering and development planning.</p> <p>System Analysis Functions:</p> <p>- Execute the acquisition system elements of the National Cyber Security Strategy including cyber security, systems security and program protection planning.</p> <p>-Guide Service and other component organizations in the development planning process to ensure proposed MDAP programs are executable within acceptable levels of risk.</p> <p>- Resolve long-term major SE challenges such as systems of systems (SoS) systems engineering, SE Complexity Analysis and systems engineering based technical trade off analysis and pre-program formulation stages.</p> <p>- Provide necessary modeling and simulation policy and guidance, clarify the application of distributed simulation standards and work with the DoD modeling and simulation community to identify and prioritize required capabilities and competencies needed to support acquisition modeling and simulations.</p>					
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2010	FY 2011	FY 2012
<p><b>Title:</b> Systems Engineering Initiatives</p> <p><b>Description:</b> The Director, Systems Engineering (DSE) provides objective assessments of program risk to support knowledge-based decision making by Department of Defense (DoD) leaders regarding DoD Major Defense Acquisition Programs (MDAPs) and Major Automated Information Systems (MAIS).</p> <p><b>FY 2011 Plans:</b></p> <p>Strategic Thrust: Major Program Support</p> <ul style="list-style-type: none"><li>•Deep-dive systems engineering reviews of Major Acquisition Defense Acquisition Programs (MDAPs) and special interest programs.</li><li>•Expand conduct of SE and execution risk assessments.</li><li>•Initiate systems integration and development planning risk assessments.</li><li>•Expand monitoring programs, providing systems engineering oversight to include all MDAPs, MAIS and special interest programs.</li><li>•Conduct systemic analysis and process management.</li><li>•Expand root cause analysis conducted during and after Program Support Reviews (PSRs).</li><li>•Initiate detailed performance measurements and analysis.</li><li>•Participate in Overarching Integrated Product Teams (OIPTs) providing decision-quality information and recommendations to Defense Acquisition Boards (DABs), In-Process Reviews (IPRs), Defense Space Acquisition Boards (DSABs) and Information Technology Acquisition Boards (ITABs).</li></ul>			-	24.939	37.130

**UNCLASSIFIED**

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2012 Office of Secretary Of Defense		<b>DATE:</b> February 2011	
<b>APPROPRIATION/BUDGET ACTIVITY</b> 0400: <i>Research, Development, Test &amp; Evaluation, Defense-Wide</i> BA 6: <i>RDT&amp;E Management Support</i>	<b>R-1 ITEM NOMENCLATURE</b> PE 0605142D8Z: <i>Systems Engineering</i>	<b>PROJECT</b> P142: <i>Systems Engineering</i>	
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2010</b>	<b>FY 2011</b>
<ul style="list-style-type: none"> <li>•Review MDAP Request for Proposals for critical reliability requirements.</li> </ul> <p>Strategic Thrust: Department Systems Engineering Capabilities Assessment</p> <ul style="list-style-type: none"> <li>•Conduct analysis of Military Departments self-assessments; conduct analysis of DoD's systems engineering capability.</li> <li>•Author annual Congressional Report jointly with Development Test and Evaluation (DT&amp;E).</li> <li>•Work jointly with DT&amp;E to develop and track new measurable performance criteria.</li> <li>•Develop and strengthen component SE organization and capabilities.</li> </ul> <p>Strategic Thrust: Policy and Guidance</p> <ul style="list-style-type: none"> <li>•Develop and update core SE policy, guidance and standards; review all acquisition policy for SE implications.</li> <li>•Develop and update software engineering policy, guidance and standards.</li> <li>•Direct support and oversight to software intensive programs.</li> <li>•Develop and author specialty engineering policy, guidance and standards.</li> <li>•Workforce development: Functional Lead for System Planning, Research, Development and Engineering (SPRDE), Production, Quality, and Manufacturing (PQM) and assist software engineering.</li> <li>•Provide SE guidance to DoD earned value management (EVM).</li> <li>•Foster early integration of systems safety, reliability, maintainability and life cycle sustainment into pre-MDAPs, MDAPs and pre-material development decision (MDD) activities.</li> </ul> <p>Strategic Thrust: Early Systems Engineering and Development Planning</p> <ul style="list-style-type: none"> <li>•Develop policy and guidance for development planning and early systems engineering; oversee its establishment within Services.</li> <li>•Perform early acquisition risk assessment including pre-Milestone A engagement with Joint Requirements Oversight Council processes.</li> <li>•Support Services and Combatant Command (COCOMs) in pre-milestone (MS) A formulation.</li> <li>•Support requirements analyses and analysis of alternatives.</li> <li>•Support initial capabilities document definition and development.</li> <li>•Oversee and execute modeling, simulation and analysis for DoD.</li> <li>•Enhance modeling and simulation (M&amp;S) support to analysis of alternatives.</li> <li>•Lead SE research, systems of systems research and collaboration across Services to identify areas of improvement; develop and establish best practices.</li> <li>•Oversee SE Research University Affiliated Research Center (UARC) and conduct studies and analysis.</li> </ul> <p><b>FY 2012 Plans:</b></p>			

**UNCLASSIFIED**

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2012 Office of Secretary Of Defense		<b>DATE:</b> February 2011	
<b>APPROPRIATION/BUDGET ACTIVITY</b> 0400: <i>Research, Development, Test &amp; Evaluation, Defense-Wide</i> BA 6: <i>RDT&amp;E Management Support</i>	<b>R-1 ITEM NOMENCLATURE</b> PE 0605142D8Z: <i>Systems Engineering</i>	<b>PROJECT</b> P142: <i>Systems Engineering</i>	
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2010</b>	<b>FY 2011</b>
Continuation of FY 2011 Plans.			
<b>Accomplishments/Planned Programs Subtotals</b>		-	24.939
<b>C. Other Program Funding Summary (\$ in Millions)</b> N/A			
<b>D. Acquisition Strategy</b> Not applicable.			
<b>E. Performance Metrics</b> N/A			

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2012 Office of Secretary Of Defense	<b>DATE:</b> February 2011
--	----------------------------

APPROPRIATION/BUDGET ACTIVITY				R-1 ITEM NOMENCLATURE				PROJECT			
0400: <i>Research, Development, Test &amp; Evaluation, Defense-Wide</i> BA 6: <i>RDT&amp;E Management Support</i>				PE 0605142D8Z: <i>Systems Engineering</i>				P143: <i>Program Protection</i>			
COST (\$ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
P143: <i>Program Protection</i>	-	4.885	4.754	-	4.754	4.970	5.339	5.782	6.540	Continuing	Continuing
Quantity of RDT&E Articles											

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

The Department of Defense (DoD) must address cyber security and supply chain risks to DoD networks, weapons systems and information stored and processed on both DoD and Defense Industrial Base (DIB) unclassified networks that support DoD programs. Increased reliance on the internet as a vehicle for sharing information, globalization of the supply chain, and advanced persistent threats (APTs) that can evade commercially available security tools and defeat generic security best practices, drive the need for better and smarter program protection planning and execution. The President's Cyber Initiative has moved to counter these threats and mitigate the risks. The Acquisition Cyber Security Initiative links high level policies and practical expertise to specific acquisition practices, systems engineering activities, and risk reduction activities. Through this initiative the Department will pilot activities with the DIB to reduce risks in sharing and storing critical program information, better understand and mitigate supply chain risks, improve program protection planning, and improve and streamline program protection engineering. The Department has developed a Trusted Systems strategy which integrates Protection Planning for the development of capabilities, the use of proven mitigation techniques and tools, and the ongoing refinement of risk management processes, and creation of needed technology.

**B. Accomplishments/Planned Programs (\$ in Millions)**

	FY 2010	FY 2011	FY 2012
<b>Title:</b> Program Protection  <b>FY 2011 Plans:</b> - Publish Program Protection Plan Guidebook. Implement Program Protection Plan procedures with programs on an ongoing engagement basis with verification as they approach major milestone reviews. Conduct support reviews for up to 15 Major Defense Acquisition Programs (MDAPs) and develop guidance for criticality analysis with Services to augment current research technology protection focused activity with procedures to ensure protection of critical components.  -Develop acquisition guidance for supply chain risk management, incorporating lessons learned from vulnerability assessments conducted. Support programs in effective implementation of needed supply chain risk management. Assess sustainment issues for protection of critical components and program information.  - Collaborate in the development of the Defense Acquisition Regulations System (DFARS) and Federal Acquisition Regulation (FAR) language to implement information security on DoD contracts for protection of defense program information to include Prime and subcontractors. Develop and implement process for adjudicating public comments. Provide acquisition support to DIB Cyber Security program.	-	4.885	4.754

**UNCLASSIFIED**



**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2012 Office of Secretary Of Defense		<b>DATE:</b> February 2011	
<b>APPROPRIATION/BUDGET ACTIVITY</b> 0400: <i>Research, Development, Test &amp; Evaluation, Defense-Wide</i> BA 6: <i>RDT&amp;E Management Support</i>	<b>R-1 ITEM NOMENCLATURE</b> PE 0605142D8Z: <i>Systems Engineering</i>	<b>PROJECT</b> P143: <i>Program Protection</i>	
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2010</b>	<b>FY 2011</b>
<p>- Oversee and manage the acquisition security database, track implementation by the components. Develop horizontal protection requirements. Develop a strategy for oversight and implementation of horizontal protection.</p> <p><b><i>FY 2012 Plans:</i></b></p> <p>- Provide support to Acquisition Category (ACAT) I programs to conduct broad program protection planning. Conduct criticality analyses. Develop Program Protection Plans, and track progress to verify protection of critical program capabilities. Review ACAT I Program Protection Plans and provide recommendations for their approval to USD(AT&amp;L).</p> <p>- Conduct outreach to further the implementation and understanding of system security engineering requirements and practices (courseware, guidance dissemination, mentoring of Service teams, training, and outreach).</p> <p>- Collaborate in developing DFARS or FAR language to implement information security on DoD contracts for protection of defense program information. Develop and implement process for adjudicating public comments. Provide acquisition support to Defense Industrial Base (DIB) Cyber Security (CS) program.</p> <p>- Oversee and manage the acquisition security database and track implementation by the components. Implement horizontal protection adjudication process. Evolve the Horizontal Protection processes to meet changing threats.</p>			
<b>Accomplishments/Planned Programs Subtotals</b>		-	4.885
<b>C. Other Program Funding Summary (\$ in Millions)</b> N/A			
<b>D. Acquisition Strategy</b> N/A			
<b>E. Performance Metrics</b> N/A			

**UNCLASSIFIED**