

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY
RDTE, Defense Wide BA 03

PE NUMBER AND TITLE
0603781D8Z - Software Engineering Institute (SEI)

COST (\$ in Millions)	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
Total Program Element (PE) Cost	27.700	25.726	31.244	31.870	32.441	32.909	33.403
P781 Software Engineering Institute (SEI)	23.084	22.613	28.212	28.852	29.447	29.875	30.326
P782 Software Intensive Systems	2.602						
P783 Software Producibility Initiative	2.014	3.113	3.032	3.018	2.994	3.034	3.077

A. Mission Description and Budget Item Justification: Software is key to meeting DoD's increasing demand for high-quality, affordable, and timely national defense systems. There is a critical need to rapidly transition state-of-the-art technology and best practices to improve the acquisition, engineering, fielding, and evolution of software-intensive DoD systems.

Project 781 funds the technology development and transition activities of the Software Engineering Institute (SEI) at Carnegie Mellon University. The SEI is an R&D Laboratory Federally Funded Research and Development Center (FFRDC) sponsored by the Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics. It was established in 1984 as an integral part of the DoD's software initiative to identify, evaluate, and transition high-leverage software engineering technologies and practices. The SEI fosters disciplined software engineering practices by DoD acquisition and life-cycle support programs and by the industrial base where the bulk of defense software is produced. The Institute works across government, industry, and academia to: (1) improve current software engineering activities from acquisition, technical, and management perspectives; (2) facilitate rapid, value-added transition of software engineering technology into practice; and (3) evaluate and calibrate emerging software engineering technologies to determine their potential for improving the evolution of software-intensive DoD systems.

The SEI enables the exploitation of emerging software technology by bringing engineering discipline to software acquisition, development, and evolution. The SEI focuses on software technology areas judged to be of the highest payoff in meeting defense needs. FY 2005 focus areas are: Acquisition Practices for DoD Software-Intensive Systems (including pilot demonstrations of new technologies, dissemination of lessons learned, and provision of selected important services to the DoD acquisition community); Software Engineering Technical Practices (including survivable systems practices, software architecture technology, software component technology, performance-critical systems, and integration of software-intensive systems); and Software Engineering Management Practices [including personal and team software development processes, software engineering measurement and analysis, and Capability Maturity Model Integration (CMMI)].

This funding line includes the Software Intensive Systems (SIS) effort under project 782 for 2007 only. In FY 2008, the Software Intensive Systems funding line will be transferred from PE0603782D8Z to the Developmental Test and Evaluation line in Acquisition in Technology and will be renamed Software Engineering and System Assurance.

This funding line also includes the Software Produceability Initiative starting in FY 2006 as project 783. The role of software in major Defense acquisition programs has been steadily increasing. Much of the mission functionality demanded from programs such as F/A-22, JSF, Future Combat System, and many others is embodied in large, complex software systems. Shortcomings in software development often lead to schedule slippage, cost growth, and mission compromises. These shortcomings can frequently be traced to underpowered software development technologies not up to the task of developing the scale and complexity of software needed. Despite the large role of the commercial sector in advancing software technology, there are many key aspects of complex, distributed, robust systems crucial to DoD that are not being addressed directly by commercial technology efforts, as our experience over the past decade shows. The Software Produceability Initiative will focus on developing and transitioning more powerful and effective software development science, techniques, tools, and technologies to improve our ability to design, build, test and sustain software and software intensive systems.

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY
RDTE, Defense Wide BA 03

PE NUMBER AND TITLE
0603781D8Z - Software Engineering Institute (SEI)

<u>B. Program Change Summary</u>	FY 2007	FY 2008	FY 2009
Previous President's Budget (FY 2008)	28.380	29.851	31.305
Current BES/President's Budget (FY 2009)	27.700	25.726	31.244
Total Adjustments	-0.680	-4.125	-0.061
Congressional Program Reductions		-4.125	
Congressional Rescissions			
Congressional Increases			
Reprogrammings	-1.882		
SBIR/STTR Transfer	-0.771		
Other	1.973		-0.061

C. Other Program Funding Summary Not applicable for this item.

D. Acquisition Strategy Not applicable for this item.

E. Performance Metrics:

FY	Strategic Goals Supported	Existing Baseline	Planned Performance Improvement / Requirement Goal	Actual Performance Improvement	Planned Performance Metric / Methods of Measurement	Actual Performance Metric / Methods of Measurement
08	Improve ability to acquire systems	Value to Customer	Average rating of 4 or higher		Customer Survey	
	Value to taxpayer	Contract Billings	All costs are allowable and allocable		Assessment by Admin Agent	
	Value to taxpayer	Performance and Cost review	Less than 5% of programs unsatisfied		DCAA conduct periodic review	

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY

RDTE, Defense Wide BA 03

PE NUMBER AND TITLE

0603781D8Z - Software Engineering Institute (SEI)

Comment: A&S Performance Measures for Products

Customer Supported

Activity

Performance Requirement

Performance Measure

Method of Measurement

SEI Admin Agent

Ensure value to PWS Customers

Average rating of 4 or higher

Level of overall performance

Paper or electronic survey of customers

SEI Admin Agent

Contract Billings

All costs are allowable and allocable

Contract costs

Approval by ACO

SEI Admin Agent

Performance and Cost Review

Less than 5% of solicited programs

Number of unsatisfactory ratings

DCAA conducts periodic review

For SIS: PM

Ensure valuable assistance to programs' success

Provide actionable and effective recommendations to PMs

Percentage of recommendations implemented

Customer Satisfaction Survey to PMs

Cost avoidance realized as result of implementing recommendations

Interview w/PM as follow-up to Survey

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY RDTE, Defense Wide BA 03		PE NUMBER AND TITLE 0603781D8Z - Software Engineering Institute (SEI)					PROJECT P781	
COST (\$ in Millions)	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	
P781 Software Engineering Institute (SEI)	23.084	22.613	28.212	28.852	29.447	29.875	30.326	

A. Mission Description and Budget Item Justification: Software Engineering Institute is key to meeting DoD's increasing demand for high-quality, affordable, and timely national defense systems. There is a critical need to rapidly transition state-of-the-art technology and best practices to improve the acquisition, engineering, fielding, and evolution of software-intensive DoD systems.

The SEI enables the exploitation of emerging software technology by bringing engineering discipline to software acquisition, development, and evolution. The SEI focuses on software technology areas judged to be of the highest payoff in meeting defense needs.

B. Accomplishments/Planned Program:

<u>Accomplishments/Planned Program Title:</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
Acquisition Practices for DoD Software Intensive Systems:	2.060	2.239	2.310

FY 2007 Accomplishments:

- Helped more than 50 key acquisition programs achieve their objectives by working directly with them to apply new technologies and conduct experiments with maturing SEI products and services in real-world acquirer contexts.
- Completed the Systems Engineering Effectiveness Study, in response to a request from OSD and in conjunction with the NDIA Systems Engineering Effectiveness Committee, which reveals how the use of effective performance of systems engineering best practices on a development program yields quantifiable improvements in the program execution (e.g., improved cost performance, schedule performance, technical performance).
- Established on-site presence in Los Angeles, CA to provide direct support to the USAF Space and Missile Systems Center.
- Established a delivery capability to meet the needs of strategic impact programs that are sponsored by service acquisition executives. Provided an on-site presence as needed to assist acquisition officials in the improvement of their software-intensive system-acquisition activities.
- Continued to provide liaison activity with external organizations and provided leadership roles within National Defense Industrial Association (NDIA), the International Council on Systems Engineering (INCOSE), the Program Managers Institute (PMI), Practical Systems and Software Measurement (PSSM), and the Office of the Secretary of Defense (OSD).
- Captured knowledge from engagements with acquisition organizations, integrated it with lessons learned from similar work, and helped to impart that knowledge to the acquisition community. Accomplished this through means such as conferences, workshops, courses, briefings, technical reports, articles, advocacy, and participation in acquisition communities of practice.

FY 2008 Plans:

- Continue to provide direct support to key acquisition programs.
- Pursue a balanced portfolio of program support and organizational support to aid in persistent organizational learning across multiple programs.
- Establish additional on-site presence in response to needs and requests from key acquisition programs and organizations.
- Explore the areas of mission assurance establishing a reasonable degree of confidence in mission success and enterprise information systems.

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY
RDTE, Defense Wide BA 03

PE NUMBER AND TITLE
0603781D8Z - Software Engineering Institute (SEI)

PROJECT
P781

FY 2009 Plans:

- Continue to help Department of Defense and other government acquirers improve their ability to acquire, deploy, and sustain systems and capabilities.
- Partner with the acquisition community to identify common areas of concern across multiple programs.

Accomplishments/Planned Program Title:

FY 2007

FY 2008

FY 2009

Software Engineering Technical Practices

15.040

15.410

20.776

FY 2007 Accomplishments:

- Identified and established techniques and approaches needed to embed software and system assurance in all aspects of the system development life cycle. Created and matured a disciplined research and development process that produces theoretical foundations, engineering methods, and early prototype automation for solving security and software assurance challenge problems through Computational Engineering for Software and System Assurance and Software and System Assurance Technology and Knowledge Transfer.
- Worked to establish the routine use of disciplined approaches to improve the survivability and resiliency of the Department of Defense, federal civilian agencies, private sector organizations, and their networked systems by identifying and developing security management frameworks, evaluations, models, practices, and policy guidance that allow organizations to effectively and efficiently protect their mission-critical assets and systems; and focusing on the identification, analysis, and management of organizational, operational, and technical risks throughout the system development life cycle.
- Provided security practices and information assurance training and education to equip personnel in the Department of Defense, federal civilian agencies, and the private sector with the knowledge, skills, and abilities required to improve the survivability of networked systems and computer network defense.
- Improved the national cyber response and readiness capability and built international computer security information exchange and collaborative analysis capabilities. Developed and deployed tools to improve the effectiveness of response teams and investigator communities, such as malicious code cataloging and analysis tools
- Provided analysis and capabilities to the DoD, DHS, and the broad Internet community to enable situational awareness of Internet threats through novel engineering- and research-based approaches.
- Published the CERT Resiliency Engineering Framework, the first step in the development of a process improvement approach to operational resiliency management.
- Upgraded the SEI's security VTE (Virtual Training Environment), which has been viewed more than 9.9 million times since its launch in 1QFY07; 8,523 DoD personnel had accounts for VTE courses in FY07.
- Built CERT's Clustered Computing Analysis Platform, which is used by the US Secret Service.
- Transitioned CERT's forensic tool suite to all DoD computer forensic labs as part of the standard analysis platform.
- Addressed detection and analysis of malware using function extraction technology for computing software behavior.
- Built-out the DHS Build-Security-In Web site, with special emphasis on supporting the DHS Software Assurance Working Groups
- The Survivability in Information Assurance curriculum, available on the CERT web site for academic institutions and faculty, was downloaded 1,758 times worldwide, in 112 countries.
- Addressed method and tool support for improving deficient architectures by developing the second version of the architecture design expert (ArchE).
- Held an Army Software Architecture Workshop sponsored by the Army's Strategic Software Improvement Program (ASSIP) in which all 10 Army programs at the workshop agreed that ATAM architecture evaluations had significant positive effects resulting in reduced risk in schedule and cost, and a higher quality product for the warfighter.
- Published "System of Systems Governance: New Patterns of Thought," a report that addresses governance issues that result from working in a system of systems environment, particularly within one that is centered on a Service-Oriented Architecture approach.
- Transitioned AADL to the AVSI (Aerospace Vehicle Systems Institute), a consortium of American avionics companies (including Boeing, Lockheed Martin, Rockwell-Collins, and Smiths Industries), which has agreed to use AADL as their language for modeling and analyzing avionics systems designs.
- Developed Mission Success in Critical Environments (MSCE) methods which are based on a modular design, or toolkit approach, which allows for flexibility and tailoring when working with customers. Completed a prototype web-based toolkit interface and method repository.
- Updated SoS Navigator for systems of systems; the beta version is being employed in an engagement with Department of Interior (DOI).

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY
RDTE, Defense Wide BA 03

PE NUMBER AND TITLE
0603781D8Z - Software Engineering Institute (SEI)

PROJECT
P781

FY2008 Plans:

- Develop a capability to support network and distributed systems forensics for the Department of Defense, federal agencies, law enforcement, and critical infrastructure operators.
- Encourage broad adoption of tools, techniques, and lessons learned from earlier work in vulnerability and malicious code analysis; situational awareness; process improvement for security management; insider threat studies; and computer network defense service provider metrics.
- Emphasize architecture-centric system evolution by developing theories and methods for determining inconsistencies between a system and its associated business goals, and strategies for evolving architectures to enable systems to continuously meet changing business and mission goals while minimizing risk.
- Develop methods, guidelines, and problem-specific interventions to improve individual and organization competence in using architecture-centric development approaches
- Expanded efforts to form a community that uses SEI architecture-centric methods by creating a partner network, accelerating the licensing of courses in the SEI Software Architecture Curriculum, and exploring other course delivery mechanisms
- Apply and mature research results with customers and emphasize integrating software and system architecture practices.
- Emphasize application of predictable assembly from certifiable components tools and techniques in real-world settings and facilitate adoption of predictable assembly in the Department of Defense, industry, and undergraduate and graduate academic.
- Mature and transition two emerging technologies for use in net-centric operations and systems of systems, and address the evolving research agenda in collaboration with a set of partners in the international research community.
- Formulate a comprehensive body of model-based engineering guidance, and the beginnings of dissemination to a wider community.
- Apply an assurance case approach to large-scale system development and in applications ranging from system-of-systems information assurance to the safety of plug-and-play medical devices.

FY 2009 Plans:

- Develop function-extraction tools for correctness verification and component composition.
- Develop training courses and workshops for the SEI Resiliency Engineering Framework and for software assurance.
- Develop a comprehensive architecture competence model.
- Write case studies, course materials, and book draft about architecture evolution.
- Demonstrate predictable assembly from certifiable components (PACC) in practice using test bed and case studies.
- Develop PACC workshops and course materials for academics and practitioners.
- Develop system-of-systems analytical framework and tools based on it.
- Mature practices and tools for engineering in a system-of-systems context.
- Develop training standards, curriculum material, and courses in model-based engineering
- Develop assurance case patterns for information assurance, safety, and large-scale system dependability

Accomplishments/Planned Program Title:

FY 2007

FY 2008

FY 2009

Software Engineering Management Practices

4,389

4,512

4,655

FY 2007 Accomplishments:

- Maintained the CMMI Product Suite by creating, maintaining, and appropriately updating or enhancing products, including guidance for small organizations and appraisal and process improvement courseware.
- Launched CMMI for Acquisition (CMMI-ACQ).
- Administered a certification program for High Maturity Lead Appraisers.
- Continued the transition of CMMI into practice, training (to date) 75,279 students in the Introduction to CMMI course; training 2,612 in the Intermediate CMMI course; authorizing 428

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY
RDTE, Defense Wide BA 03

PE NUMBER AND TITLE
0603781D8Z - Software Engineering Institute (SEI)

PROJECT
P781

Intro to CMMI V1.2 instructors; authorizing 452 SCAMPI V1.2 Lead Appraisers; and conducting more than 2,700 SCAMPI A appraisals

- Expanded the transition of the Personal Software Process by translating the developer exam into Japanese. Web pages related to CMMI v1.2 are also being translated.
- Published a book titled CMMI and Six Sigma: Partners in Process Improvement.
- Co-developed a special report titled A Survey of Systems Engineering Effectiveness, which was presented to the National Defense Industrial Association subcommittee.
- Replaced the system used to report SCAMPI appraisal results with a new system that allows more automated checking of appraisal reports as they are submitted. As a consequence, some quality audits will become automated, allowing SEI to more rapidly identify lead appraisers whose conduct should be carefully reviewed.
- Completed a technical report describing the results of our 2006 State of Measurement Practice Survey.
- Continued to provide support to OSD PA&E on systems of systems cost estimation and risk identification.
- Continued to deliver process improvement consulting services to a variety of U.S. government departments and agencies.
- Led the development and authoring of ISO/IEC 2520, which has now been approved for publication. This standard is part of a series that addresses the measurement of software product quality attributes.
- Conducted tutorial at Warner Robins Air Logistics Center (WRALC) to teach participants how to use the statistical visualization software SAS JMP. WRALC will use the software to keep the squadrons populated with statistical experts.
- Managed and administered transition programs (appraisal, training, SEI Partner Network, and communication programs) and services (delivering technical services and providing materials) to support the widespread, high-quality use of the CMMI Product Suite in government and industry.
- Extended and operated the Software Engineering Information Repository (SEIR) to provide data and information that software organizations use to learn about (a) the experiences of other organizations attempting to improve their software engineering processes and technology, (b) new software engineering technology that may improve their performance, and (c) issues, challenges, and policies related to the Department of Defense and its suppliers of software-intensive systems.
- Provided expertise and specific techniques for software and acquisition organizations to use for measuring and analyzing their performance and managing their projects and processes, and research new areas with promise for improving organizational measurement and analysis capability.

FY 2008 Plans:

- Transition CMMI for Acquisition, launched in FY 2007, to increase critical government adoption.
- Pursue development of CMMI for Services (sponsored by Northrop Grumman).
- Maximize the interoperability of multiple CMMI constellations CMMI for Development and CMMI for Acquisition.
- Support a series of user workshops to define the requirements for a CMMI Version 2.0.
- Bring together industry and vendors with sizable repositories of performance data together to address the need for high-quality project-performance benchmarks.
- Merge techniques from CMMI appraisals, measurement system evaluation, and customer satisfaction analysis to improve data and information quality for managing projects.

FY 2009 Plans:

- Manage a joint industry, government, and SEI effort to extend coverage of the CMMI Framework to the acquisition of products and services.
- Explore whether and how to add Information Security to CMMI.
- Provide empirical analyses of CMMI costs and benefits.
- Continue stewardship functions for CMMI
- Create specific how to methodology or implementation guidance for Six Sigma tools, business case analyses, various computations of expected benefits or returns (e.g., ROI), and other techniques and tools.
- Adapt statistical and quantitative analysis techniques for acquisition, systems engineering, and software engineering practitioners.

<u>Accomplishments/Planned Program Title:</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)		February 2008		
APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT		
RDTE, Defense Wide BA 03	0603781D8Z - Software Engineering Institute (SEI)	P781		
Administrative Agent		0.322	0.452	0.471
Funding send to Electronic Systems Command annually for contractual and financial administration of the SEI				
<u>Accomplishments/Planned Program Title:</u>		<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
Other		1.273		
TBD				
<u>C. Other Program Funding Summary</u> Not applicable for this item.				
<u>D. Acquisition Strategy</u> Not applicable for this item.				
<u>E. Major Performers</u> Not applicable for this item.				

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY RDTE, Defense Wide BA 03		PE NUMBER AND TITLE 0603781D8Z - Software Engineering Institute (SEI)					PROJECT P782	
COST (\$ in Millions)	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	
P782 Software Intensive Systems	2.602							

A. Mission Description and Budget Item Justification: The Systems and Software Engineering (SSE) Directorate manages the Software Intensive Systems (SIS) mission to improve DoD SIS acquisition and sustainment. The SSE Directorate is the focal point for DoD initiatives that reduce software risk. The SSE Directorate is organized into elements that ensure coverage of the breadth of responsibilities necessary to achieve the mission of improving SIS acquisition performance, and to act as the DoD software community focal point. These elements focus on Policy and Guidance, Education, Best Practices, Software Engineering Technology, and Collaboration. The SSE Directorate conducts its SIS efforts by understanding DoD needs, issues and solutions; and acting on/transitioning improvements to DoD enterprise, program and practitioner levels.

In FY 2008, the Software Intensive Systems funding line will be transferred from PE0603782D8Z to the Developmental Test and Evaluation line in Acquisition in Technology and will be renamed Software Engineering and System Assurance.

B. Accomplishments/Planned Program:

<u>Accomplishments/Planned Program Title:</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
Software Intensive Systems:	2.602		

FY 2007 Accomplishments: Conducted assessments on acquisition programs as part of formal acquisition oversight reviews and in support of Nunn-McCurdy certification requirements for acquisition programs exceeding legally established thresholds for cost and schedule growth.

C. Other Program Funding Summary Not applicable for this item.

D. Acquisition Strategy Not applicable for this item.

E. Major Performers Not applicable for this item.

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY RDTE, Defense Wide BA# 3		PE NUMBER AND TITLE 0603781D8Z - Software Engineering Institute (SEI)					PROJECT P783	
COST (\$ in Millions)	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	
P783 Software Producibility Initiative	2.014	3.113	3.032	3.018	2.994	3.034	3.077	

A. Mission Description and Budget Item Justification: The role of the Software Producibility in major Defense acquisition programs has been steadily increasing. Much of the mission functionality demanded from programs such as F/A-22, JSF, Future Combat System, and many others is embodied in large, complex software systems. Shortcomings in software development often lead to schedule slippage, cost growth, and mission compromises. These shortcomings can frequently be traced to underpowered software development technologies not up to the task of developing the scale and complexity of software needed. Despite the large role of the commercial sector in advancing software technology, there are many key aspects of complex, distributed, robust systems crucial to DoD that are not being addressed directly by commercial technology efforts, as our experience over the past decade shows.

This initiative will conduct integrated program of research from basic through dem-val that advances the state-of-the art in producibility of software for DoD systems, particularly those systems characterized by high complexity, need for robustness, information assurance, real-time performance, and physical distribution. Research and transition efforts will pursue technical goals to (1) meet and ensure mission-critical requirements; (2) control complexities; (3) enable system evolution; (4) ensure seamless interoperability; and (5) model behavior and performance.

Invest in promising software technologies involving (1) specification of complex requirements; (2) correct-by-construction software development; (3) composable and customizable frameworks; (4) high-confidence system software and middleware; (5) system architectures for network-centric environments; (6) technologies for testing, verification, and validation, and (7) modeling and metrics. Establish cost avoidance goals of 10% - requirements phase, 60% - design phase, 80% - code/unit test phase and 40% - integration and test phase in the software development lifecycle. Based on these goals, annuals cost avoidance is estimated at \$10.6 billion. Additionally, these software experts would directly advise ongoing acquisition programs.

B. Accomplishments/Planned Program:

<u>Accomplishments/Planned Program Title:</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
Software Producibility	2.014	3.113	3.032

FY 2007 Accomplishments: Completed competition to host the Software and Systems Test Track. Awarded three contracts to provide software development tools for promoting systems of systems interoperability. Initiated development of a business plan for options to foster government and industry co-investment in focused research centers for improving software producibility. Engaged with industry and government to mature options. Initiated development of a SIS Producibility Technology Roadmap to prioritize research investments and identify measures that allow the development community to judge progress. Continued progress on National Academy of Sciences study on Advancing Software-Intensive Systems Producibility

FY 2008 Plan: Award the Software and Systems Test Track implementation contract in Jan 2008 per the completed competition. Continue research efforts in developing technologies for interoperable systems of systems. Mature business plan for gov/industry co-investment in research, select an implementation approach, initiate the necessary agreements. Mature the SIS Producibility Technology Roadmap, get community consensus on priorities and measures. Start initial effort in using the Systems and Software Test Track to provide a place (possibly virtual and

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY

RDTE, Defense Wide BA# 3

PE NUMBER AND TITLE

0603781D8Z - Software Engineering Institute (SEI)

PROJECT

P783

not a single physical location) for experimental verification of Software-Intensive Systems Producibility technologies due to their novelty and the potential complexity of the underlying theories. The experimental platforms will incorporate software technology to instrument, monitor and test large-scale applications. The experimental platform research included subtasks to conduct large-scale coordination experiments, and developed methods and tools for evaluating aggregate performance of applications. This environment provided a full range of collaborative technology challenges, run-time platforms and applications, experiments, evaluations, and demonstrations. A Common infrastructure will enable control and data flow between both kinds of application components for a distributed environment. The open experimentation environment provided the fundamental reference architecture and underpinnings helping researchers to develop and test their designs as well as facilitates transition of promising technologies into production use. Initiated a research topic in interoperability to address software techniques to improve system of system interoperability. Review previously awarded contracts to develop and transition new methodologies, tools, technologies and techniques that improve DoDs ability to acquire software for large, net-centric warfighting systems of systems. Release a BAA with subsequent award for community based technology efforts such as reuseable SW library or populating existing toolsets with domain-specific knowledge for application to a DoD-specific need such as military avionics, communications, or platform control.

FY 2009 Plan: Complete efforts in SW Technologies for Interoperable SoS, initiate new topic based on mature technology roadmap. Sustain experimentation on the Software and Systems Test Track. Continue DoD-specific community based technology effort awarded in 2008.

C. Other Program Funding Summary Not applicable for this item.

D. Acquisition Strategy Not applicable for this item.

E. Major Performers Not applicable for this item.