

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)

February 2003

BUDGET ACTIVITY

6 - Management support

PE NUMBER AND TITLE

0605604A - Survivability/Lethality Analysis

COST (In Thousands)	FY 2002 Actual	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate
Total Program Element (PE) Cost	35060	35236	39138	41647	35452	42316	43007	44048
670 EMERGING TECH SYSTEMS	7239	0	0	0	0	0	0	0
671 AIR DEF/MSL DEF SYSTEM	5267	0	0	0	0	0	0	0
672 AVIATION SYSTEMS	2948	0	0	0	0	0	0	0
675 ARMY SURVIVABILITY ANALYSIS & EVALUATION SUPPORT	9476	35236	39138	41647	35452	42316	43007	44048
677 GROUND COMBAT SYSTEMS	4637	0	0	0	0	0	0	0
678 MUNITIONS SYSTEMS	5013	0	0	0	0	0	0	0
679 SOLDIER SYSTEMS	480	0	0	0	0	0	0	0

A. Mission Description and Budget Item Justification: Army increased funding in FY 2004 to support previous Congressional requests to increase funding for Information Operation Survivability Analysis.

This Program Element (PE) funds activities and functions to conduct objective and integrated survivability and lethality analyses (SLA) on systems of the Interim and Objective Forces of Army Transformation and other major and designated non-major Army systems as appropriate. The analyses quantify the effects of electronic warfare (EW) and ballistic battlefield threats and meteorological conditions on Army individual soldiers and systems. This PE also funds vulnerability assessments of digitized systems for Force XXI. The work is accomplished through threat research, theoretical and engineering analyses, signature measurements, modeling, simulations, laboratory experiments, and field investigations. Activities in progress include assessment of the effects of atmospheric, passive countermeasures, tactics, lasers, high-power microwave, electro-optical/radio frequency (EO/RF) jammers, electromagnetic environment effects (E3), information warfare (IW), decoys, and conventional ballistics on Army soldiers and systems. The PE work efforts provide U.S. Army decision makers, materiel and combat developers, system users, and independent evaluators critical soldier and system survivability analyses that quantify the soldier/system's survivability effectiveness in battlefield threat environments. Recommendations are provided to the materiel and combat developers on how to mitigate soldier/system deficiencies and enhance their survivability. This survivability/lethality engineering analyses is required to support the Army's vision to move to lighter more deployable systems while maintaining effectiveness. The analysis is required to properly down-select the appropriate mix of technologies for future platforms of the Transformed Forces. The proper mix of lethality and survivability provides the required force effectiveness for the Transformation Force. This PE funds civilian salaries, travel, development and maintenance of equipment and facilities, general management, administrative and contractor support required for program execution. The U.S. Army Research Laboratory (ARL) Survivability/Lethality Analysis Directorate (SLAD) conducts this effort.

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This PE provides support for all transition paths of the Transformation Campaign Plan (TCP).

<u>B. Program Change Summary</u>	FY 2002	FY 2003	FY 2004	FY 2005
Previous President's Budget (FY 2003)	34514	39200	42174	45324
Current Budget (FY 2004/2005 PB)	35060	35236	39138	41647
Total Adjustments	546	-3964	-3036	-3677
Congressional program reductions				
Congressional rescissions		-2849		
Congressional increases				
Reprogrammings	983	-202		
SBIR/STTR Transfer	-437	-913		
Adjustments to Budget Years			-3036	-3677

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BUDGET ACTIVITY 6 - Management support			PE NUMBER AND TITLE 0605604A - Survivability/Lethality Analysis				PROJECT 675			
COST (In Thousands)			FY 2002 Actual	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate
675	ARMY SURVIVABILITY ANALYSIS & EVALUATION SUPPORT		9476	35236	39138	41647	35452	42316	43007	44048
<p><u>A. Mission Description and Budget Item Justification:</u>Beginning in FY 2003 funding was transferred into this project from other projects internal to this PE in order to more efficiently fund holistic survivability analysis needed for the Army's Transformation Campaign Plan. This project funds the investigation of the survivability, lethality and vulnerability (SLV) of designated Army systems to all battlefield threats. It supports transforming the Army to a highly effective mobile force depending on symmetry between Survivability, Lethality, Mobility, MANPRINT, Deployability, and Sustainability. The challenge of the Army Transformation is to examine holistically the contribution of platforms to force effectiveness. This project provides lethality and survivability data of potential systems in the Interim and Objective Forces to achieve symmetric mix of force effectiveness. The analysis is integrated across all battlefield threats (i.e., conventional ballistic, electronic warfare, and directed energy). The results are used by each Project Manager (PM) and the Program Executive Officer (PEO) to direct weapon system development efforts and structure product improvement programs; by the Army Test and Evaluation Command's Army Evaluation Center (ATEC/AEC) when they provide system evaluations in support of milestone decisions; by the user to develop survivability/lethality requirements, doctrine and tactics; and by decision makers in formulating program/production decisions.</p> <p>Additionally this project supports survivability analysis, information warfare, and information operations of Army communications, electronic equipment and digitized forces against friendly and enemy threats. Provides field threat environment support for Electronic Warfare Vulnerability Analysis (EWVA). Analyzes vulnerabilities of foreign threat weapons and command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) and Intelligence Electronic Warfare (IEW) systems to U.S. Army EW systems. Provides threat weapon electronic design data to countermeasure developers and technical capability information to the intelligence community. Supports Army initiatives in vulnerability reduction of C4I/IEW systems against battlefield threats, including information warfare. Provides analysis for understanding potential vulnerabilities of Digitized Force developmental systems. Supports Army Warfighting Experiments and associated Information Operations Vulnerability Assessments for Digitized Force Architecture. Supports vulnerability analysis of situational awareness data of the Transformation Force.</p> <p>Analysis includes survivability and vulnerability analysis of ground systems of the Interim and Objective Force for Army Transformation and other Army ground combat systems; Army air defense and missile defense systems; Army aviation systems and Unmanned Aerial Vehicles (UAV); Army fire support weapons (smart and conventional); Horizontal Technology Integration systems, Advanced Technology Demonstration initiatives, and proposed survivability enhancements to weapon platforms.</p> <p>This PE provides support for all transition paths of the Transformation Campaign Plan (TCP).</p>										

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<u>Accomplishments/Planned Program</u>		FY 2002	FY 2003	FY 2004	FY 2005	
Developed preliminary set of analytical tools, techniques and methodologies to over come shortcomings of current Information Operations Vulnerability Survivability Assessments (IOVSA). Developed initial format and logic content for the decision-making processes for each of the following: C2 node, DF weapons node, sensor node, and red tank node. Additionally, defined, developed, and tested a set of vulnerability metrics that measure vulnerabilities and susceptibilities for given C2 strategies and scenarios.		4000	0	0	0	
Conducted integrated electronic and information operations survivability analysis for U.S. Army communications systems: Warfighter Integrated Network- Terrestrial, the Near Term Digital Radio, Joint Tactical Radio System, and SINCGARS ASIP, EPLR-VHSIC, MIDS, and TACLANE		1498	0	0	0	
Conducted integrated electronic and ballistic effects survivability analysis for U.S. Army IEW systems: ICIDS, Profiler, Prophet and GPS. Conducted information operations vulnerability analysis on these systems.		579	0	0	0	
Continued information warfare vulnerability assessment program to further determine exploitable weakness in the Digitized Forces to include Stryker and FCS and to recommend mitigating solutions. Focused on components of the BCT, FDD, FDC and determined the limitations of system performance in information warfare (IW) threat environment. Updated the information warfare vulnerability database, and performed vulnerability analyses of selected Tactical Internet components to radio frequency directed energy weapons (RFDEW).		946	0	0	0	
Conducted limited integrated electronic and information operations effects survivability analysis for U.S. Army command and control systems. Conducted information operations vulnerability analysis of the following systems: FBCB2, Advanced Field Artillery Tactical Data System, Maneuver Control System, FAAD-C2I, All Source Analysis System, the Information System Controller, Advanced Missile Defense Warning System and ABCS Foundation Products development.		2453	0	0	0	
Conduct integrated survivability, lethality, and vulnerability analyses on Army Transformation systems. Continue to support Stryker Live Fire Test and Evaluation (LFT&E) for the second set of variants/configurations (perform damage assessments, post-shot analyses and input to Independent Evaluation). Complete non-ballistic survivability/lethality analysis for the second group of Stryker variants/configurations. Initiate LFT&E support for the third group of Stryker variants/configurations (perform shot predictions, damage assessments, post-shot analyses and input to Independent Evaluation). Initiate survivability analyses for the third group of Stryker variants/configurations. Initiate analysis of the Pre-Planned Product Improvements (P3I) of the Stryker.		0	5404	5195	4216	

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PROJECT

675

FY 2005

10774

7347

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<u>Accomplishments/Planned Program (continued)</u>		<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	
Conduct integrated electronic and information warfare effects survivability analysis on command and control systems, and various Army weapon platforms as they integrate C4ISR components with internal information/computer processors controlling automotive, flight, fire control and sensor functions. This effort supports the full set of Army Battle Command Systems: FBCB2, Advanced Field Artillery Tactical Data System, Maneuver Control System, FAAD-C2I, All Source Analysis System, Combat Service Support Control System, and Advanced Missile Defense Warning System. Continue to expand information warfare vulnerability assessment program to determine exploitable weakness in the Digitized Forces (including FCS) and recommend mitigating solutions. Focus on processor components of the FDC and STRYKER to determine the limitations of system performance in information warfare (IW) threat environment. Conduct integrated electronic and information operations survivability analysis for U.S. Army communications systems such as Warfighter Integrated Network-Terrestrial, the Near Term Digital Radio, Joint Tactical Radio System, and SINCGARS ASIP, EPLR-VHSIC. Includes update of information warfare vulnerability database, and vulnerability analyses of Tactical Internet components to radio frequency directed energy weapons (RFDEW).		0	10123	11642	12012	
Conduct integrated survivability, lethality, vulnerability analyses for developmental air defense and missile defense systems, pre-planned product improvements of current systems, and recently fielded systems. Systems to be addressed include Ground-based Missile Defense (GMD), Theater High Altitude Air Defense (THAAD), Patriot, Medium Extended Air Defense System (MEADS) and SHORAD. Provide interim survivability reports. Recommend survivability enhancements. Project also funds Anti-Radiation Missile (ARM) Counter-Arm efforts that assess threat technologies against THAAD and GMD, Patriot, MEADS, and Forward Area Air Defense-C21 (FAAD-C21) ground based sensors. Includes work on Focal Plane Array Countermeasures (FPACM) (Partner: United Kingdom): Continue characterization and assessment of advanced focal plane array missile seekers and develop electronic countermeasures (ECM) to defeat them through simulation, modeling and lab testing. Continue development of models and simulations to analyze missile system performance in countermeasure environments. Conduct lab and field investigations to refine countermeasure techniques. Support development of GMD Evaluation Test Bed. Provide survivability analysis for THAAD Block 04 Activities.		0	5248	6157	7298	
Totals		9476	35236	39138	41647	