Exhibit R-2, RDT&E Budget Item Justification: PB 2014 Army											DATE: April 2013	
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*					R-1 ITEM NOMENCLATURE PE 0602786A: *Warfighter Technology*							
COST ($ in Millions)	**All Prior Years**	**FY 2012**	**FY 2013#**	**FY 2014 Base**	**FY 2014 OCO ##**	**FY 2014 Total**	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**	**Cost To Complete**	**Total Cost**
Total Program Element	-	46.864	28.281	31.546	-	31.546	32.171	31.181	31.953	33.481	Continuing	Continuing
283: *Airdrop Adv Tech*	-	2.357	2.140	2.365	-	2.365	2.385	2.405	2.716	2.765	Continuing	Continuing
E01: *Warfighter Technology Initiatives (CA)*	-	16.474	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
H98: *Clothing & Equipm Tech*	-	19.234	18.892	21.801	-	21.801	22.256	21.084	21.500	22.840	Continuing	Continuing
H99: *Joint Service Combat Feeding Technology*	-	6.453	5.748	5.802	-	5.802	5.860	5.921	5.936	6.043	Continuing	Continuing
VT4: *Expeditionary Mobile Base Camp Technology*	-	2.346	1.501	1.578	-	1.578	1.670	1.771	1.801	1.833	Continuing	Continuing

FY 2013 Program is from the FY 2013 President's Budget, submitted February 2012

The FY 2014 OCO Request will be submitted at a later date

A. Mission Description and Budget Item Justification

This program element (PE) investigates and develops integrated technologies which improve Soldier and Small Combat Unit survivability, sustainability, mobility, combat effectiveness, field quality of life and assesses impact of each on Soldier performance. This PE supports the design, development, and improvement of components used for air delivery of personnel and cargo (project 283), combat clothing and personal equipment (including protective equipment such as personal armor, helmets and eye wear) (project H98) and combat rations and combat feeding equipment (project H99) and expeditionary base camps (VT4). This PE supports the investigation and advancement of critical knowledge and understanding of Soldier physical and cognitive performance. Project E01 funds congressional special interest items. The projects in this PE adhere to Tri-Service Agreements on clothing, textiles, and food with coordination provided through the Cross Service Warfighter Equipment Board, the Soldier and Squad Integrated Concepts Development Team, and the DoD Combat Feeding Research and Engineering Board.

Efforts in this program element support the Army science and technology Soldier portfolio.

Work in this PE is related to, and fully coordinated with, PE 0602105A (Materials Technology), PE 0602618A (Ballistics Technology), PE 0603001A (Warfighter Advanced Technology, PE 0602787A (Medical Technology Initiatives), 0602716A (Human Factors Engineering Technology) and PE 0602784A (Military Engineering Technology)

The cited work is consistent with the Director, Defense Research and Engineering Strategic Plan, the Army Modernization Strategy, and the Army Science and Technology Master Plan.

Work is led, performed, and/or managed by the Natick Soldier Research, Development, and Engineering Center (NSRDEC), Natick, MA.

Exhibit R-2, RDT&E Budget Item Justification: PB 2014 Army	DATE: April 2013
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	**R-1 ITEM NOMENCLATURE** PE 0602786A: *Warfighter Technology*

B. Program Change Summary ($ in Millions)	FY 2012	FY 2013	FY 2014 Base	FY 2014 OCO	FY 2014 Total
Previous President's Budget	46.261	28.281	29.146	-	29.146
Current President's Budget	46.864	28.281	31.546	-	31.546
Total Adjustments	0.603	0.000	2.400	-	2.400
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	1.122	-			
• SBIR/STTR Transfer	-0.519	-			
• Adjustments to Budget Years	-	-	2.400	-	2.400

Exhibit R-2A, RDT&E Project Justification: PB 2014 Army			DATE: April 2013
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602786A: *Warfighter Technology*	PROJECT 283: *Airdrop Adv Tech*	

COST ($ in Millions)	All Prior Years	FY 2012	FY 2013#	FY 2014 Base	FY 2014 OCO ##	FY 2014 Total	FY 2015	FY 2016	FY 2017	FY 2018	Cost To Complete	Total Cost
283: *Airdrop Adv Tech*	-	2.357	2.140	2.365	-	2.365	2.385	2.405	2.716	2.765	Continuing	Continuing

FY 2013 Program is from the FY 2013 President's Budget, submitted February 2012

The FY 2014 OCO Request will be submitted at a later date

A. Mission Description and Budget Item Justification

This project researches, investigates and evaluates component technologies to enhance cargo and personnel airdrop capabilities for global precision delivery, rapid deployment, and insertion for force projection into hostile regions. Areas of emphasis include parachute technologies, parachutist injury reduction, precision offset aerial delivery, soft landing technologies, and airdrop simulation.

Efforts in this program element support the Army science and technology Soldier portfolio.

The cited work is consistent with the Director, Defense Research and Engineering Strategic Plan, the Army Modernization Strategy, and the Army Science and Technology Master Plan.

Work in this project is led, performed and/or managed by the US Army Natick Soldier Research, Development and Engineering Center (NSRDEC), Natick, MA.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2012	FY 2013	FY 2014
Title: Airdrop/Aerial Delivery Research and Technology	2.357	2.140	2.365
Description: Beginning in FY13, this effort is renamed from Precision Aerial Delivery Enhancements to Airdrop/Aerial Delivery Research and Technology. The effort merges with the Enabling Airdrop Research and Technologies to provide complementary investigations of technologies for enhanced payload extraction and subsequent gliding capabilities, improves delivery accuracy of varying load weights, and investigates technologies for improved insertion safety and security for airborne personnel.			
FY 2012 Accomplishments: Explored aerial delivery concepts from rotary wing Army aircraft to provide a wider range of resupply capabilities to include automatic helicopter sling load (SL) hook up/drop-off, analyze human systems performance limits and injury mechanisms during SL and Military Free Fall (MFF) operations; completed assessment of oxygen requirements for extended range, high altitude MFF operations; developed a medium fidelity engineering model of the Army's new T11 parachute system steady state descent.			
FY 2013 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2014 Army		DATE: April 2013
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602786A: *Warfighter Technology*	PROJECT 283: *Airdrop Adv Tech*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2012	FY 2013	FY 2014
Evaluate decelerator design refinements and application of advanced sensors to decrease serious injuries and fatalities during mass tactical aerial insertion; conduct preliminary investigation of parafoil shape while in-flight to increase performance parameters. ***FY 2014 Plans:*** Will investigate navigation technologies in GPS denied areas to reduce Soldier borne equipment load by increasing resupply to austere operational environments; building on results from FY13, investigate the application of e-textiles and embedded miniature sensors in parachute systems to improve aerial decelerator performance characteristics, increase operator safety (increased control and glide enhancement), decrease system costs, and reduce load burden for Soldiers engaged in airborne operations by lowering the retrograde/retrieval weight and volume of current equipment.			
Accomplishments/Planned Programs Subtotals	2.357	2.140	2.365

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

Performance metrics used in the preparation of this justification material may be found in the FY 2010 Army Performance Budget Justification Book, dated May 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2014 Army			DATE: April 2013
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602786A: *Warfighter Technology*	PROJECT E01: *Warfighter Technology Initiatives (CA)*	

COST ($ in Millions)	All Prior Years	FY 2012	FY 2013#	FY 2014 Base	FY 2014 OCO ##	FY 2014 Total	FY 2015	FY 2016	FY 2017	FY 2018	Cost To Complete	Total Cost
E01: *Warfighter Technology Initiatives (CA)*	-	16.474	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

FY 2013 Program is from the FY 2013 President's Budget, submitted February 2012

The FY 2014 OCO Request will be submitted at a later date

A. Mission Description and Budget Item Justification

Congressional Interest Item funding for Warfighter Technology Applied Research.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2012	FY 2013	FY 2014
Title: Power Generation Research	16.474	0.000	0.000
Description: This is a Congressional Interest Item. ***FY 2012 Accomplishments:*** Researched state-of-the-art photovoltaic efficiency improvement concepts, fiber connection methods and novel energy harvesting; researched novel materials for efficiency improvements in photovoltaic cells, super capacitors, thermovoltaic cells, and batteries.			
Accomplishments/Planned Programs Subtotals	16.474	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

Performance metrics used in the preparation of this justification material may be found in the FY 2010 Army Performance Budget Justification Book, dated May 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2014 Army			DATE: April 2013
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602786A: *Warfighter Technology*	PROJECT H98: *Clothing & Equipm Tech*	

COST ($ in Millions)	All Prior Years	FY 2012	FY 2013#	FY 2014 Base	FY 2014 OCO ##	FY 2014 Total	FY 2015	FY 2016	FY 2017	FY 2018	Cost To Complete	Total Cost
H98: *Clothing & Equipm Tech*	-	19.234	18.892	21.801	-	21.801	22.256	21.084	21.500	22.840	Continuing	Continuing

FY 2013 Program is from the FY 2013 President's Budget, submitted February 2012

The FY 2014 OCO Request will be submitted at a later date

A. Mission Description and Budget Item Justification

This project investigates and evaluates components and materials that may enhance Soldier survivability from combat threats (flame and thermal threats, blast and ballistic threats, and lasers) and the field environment (e.g., cold, heat, wet) to increase operational effectiveness while decreasing the Soldier's cognitive and physical burden. Included are technologies and novel materials related to personnel armor, helmets, hearing protection, eyewear, and protective inserts for shelters. In addition, this project supports the development and refinement of essential analytic tools needed to predict and/or assess the combat effectiveness of next generation Soldier systems with a focus on human science investigation to identify and develop methods to assess human responses to sensory, physical, cognitive, and affective stimuli and stressors.

Efforts in this program element support the Army science and technology Soldier portfolio.

Work in this PE is fully coordinated with PE 0602105A (Materials Technology), PE 0602618A (Ballistics Technology), PE 0603001A (Warfighter Advanced Technology), PE 0602787A (Medical Technology Initiatives) and PE 0602716A (Human Factors Engineering Technology).

The cited work is consistent with the Assistant Secretary of Defense for Research and Engineering priority focus areas and the Army Modernization Strategy.

Work in this project is performed by the Natick Soldier Research, Development, and Engineering Center (NSRDEC), Natick, MA.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2012	FY 2013	FY 2014
Title: Soldier Blast and Ballistic Protection	7.000	6.533	4.884
Description: Beginning in FY13, this effort is renamed from Ballistic and Blast Protection for the Individual Soldier to Soldier Blast and Ballistic Protection. This effort focuses on material modeling, novel materials, and component designs to protect Soldiers against ballistic and blast threats. This effort utilizes a cross-disciplinary, human-centric approach to develop technologies which optimize tradeoffs in ballistic and blast protective component design. This effort is fully coordinated with PE 0602787/Project FH2, Project VB3, Project 874 (Medical Technology), PE 061618/H80, 62105/H84, and 62716/H70 (ARL) and PE 63001.J50. In FY13 and FY14, this effort supports Technology Enabled Capability Demonstration 1.b, Force Protection Soldier & Small Unit and Technology Enabled Capability Demonstration 2a, Overburden Physical Burden.			
FY 2012 Accomplishments:			

Exhibit R-2A, RDT&E Project Justification: PB 2014 Army		DATE: April 2013
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602786A: *Warfighter Technology*	PROJECT H98: *Clothing & Equipm Tech*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2012	FY 2013	FY 2014
Developed methodology to characterize multidirectional bending/ flexing behavior of multi-layer armor material systems, applied human flexure findings to digital human models and investigated advanced armor material and configurations to accommodate body flexure; developed reduced weight material concepts for head and face protection and researched emerging ballistic and blast protective materials for application to shelter systems; conducted research to increase fundamental understanding of blast effects on humans, Personal Protective Equipment design factors effecting exposure limits, scope of future threats and the potential impact to Ground Soldiers. ***FY 2013 Plans:*** Investigate and assess specific material parameters as well as novel assembling approaches for lightweight shelter and personal protective system applications; further design methodologies, processes, tests methods, and analytical tools that optimize ballistic and blast protective equipment for human performance (mobility and comfort) and survivability; investigate improved methods of assessing behind-armor blunt trauma. ***FY 2014 Plans:*** Will develop and evaluate ballistic and blast component concepts that fully delineate weight, performance, and mobility trade space using modeling and casualty assessment tools as well as ergonomic and ballistic test methods; investigate new ballistic fiber and composite material to increase strength and toughness while decreasing component weight; develop relevant criteria and advance concepts for assessing behind armor blunt trauma; investigate and apply advanced techniques for multiscale analysis of factors that affect ballistic performance (yarn deniers, surface treatments, material configuration, fiber properties) to develop predictive model(s) for assessing armor systems; develop methods for assessing environmental stability and durability of high performance fibers and composites that enhance Soldier protection in various operational environments.			
Title: Soldier Vision Protection and Enhancement ***Description:*** This effort focuses on technologies which provide eye protection from battlefield threats. In FY13 and FY14, this effort supports Technology Enabled Capability Demonstration 1.b, Force Protection Soldier & Small Unit and Technology Enabled Capability Demonstration 2a, Overburden Physical Burden. ***FY 2012 Accomplishments:*** Began integration of eye protection and variable transmission technologies into a single lens design with multiple levels of light transmission control. ***FY 2013 Plans:*** Mature agile laser eye protection components for variable transmission and anti-fog capabilities as well as determine feasibility of adding these capabilities into a ballistic fragmentation protective lens design for improved Soldier vision protection. ***FY 2014 Plans:***	2.500	2.611	3.395

Exhibit R-2A, RDT&E Project Justification: PB 2014 Army		DATE: April 2013
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602786A: *Warfighter Technology*	PROJECT H98: *Clothing & Equipm Tech*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2012	FY 2013	FY 2014
Will investigate and design a vision enhancement lens concept that manipulates the visible electromagnetic spectrum to improve dismounted Soldiers ability to identify combatants and increases the multi-protective capability (e.g. ballistic, laser, environmental) of the baseline eyewear; conduct human research studies to explore how vision protection technologies enhance or detract from Soldier situational awareness.			
Title: Soldier and Small Unit Modeling and Analysis ***Description:*** Beginning in FY13, this effort will be captured in the Measurement, Prediction and Improvement of Soldier Performance technology effort. This effort will focus on Small Unit (SU) modeling and analysis to provide critical data and the rationale necessary for making technology decisions for the Soldier and Small Units. This effort is fully coordinated with PE 0602716A/Project H70 (Human Factors Engineering Technology) and PE 0602784A/Project H71 (Military Engineering Technology.) ***FY 2012 Accomplishments:*** Analyzed the utility of tailorable/modular/scalable body armor and recommended optimal configurations to ensure the proper balance of protection and Soldier load for any given missions and scenario; continued to conduct analyses to support Expeditionary Mobile Base Camps as Combat Outposts (COPs) that will allow SCUs to sustain themselves in austere environments.	1.384	0.000	0.000
Title: Measurement, Prediction and Improvement of Soldier Performance ***Description:*** Beginning in FY13, Soldier and Small Unit Modeling and Analysis efforts are combined with this effort to provide a more comprehensive focus on human science methods (psychological, anthropometric, and psychophysical) and biomechanical models to assess human responses to sensory, physical, cognitive and affective stimuli and stressors to support human systems design concepts for Soldier equipment and to enhance Soldier and Small Unit physical and cognitive performance. This work is collaborative with the Army Research Laboratory PE 0602716A/H70 and the Medical Research and Materiel Command PE 0602787. In FY13 and FY14, this effort supports Technology Enabled Capability Demonstration 1.b, Force Protection Soldier & Small Unit and Technology Enabled Capability Demonstration 2a, Overburden Physical Burden. ***FY 2012 Accomplishments:*** Matured and validated cognitive metrics for quantifying and evaluating Soldier performance affected by contextual variables; conducted human research to identify mitigation strategies for performance decrements; provided anthropometric specifications for 3D digital human models representing body size/proportional variations for males and females and link individual Soldier physical task simulations to better predict and model the effect of equipment loads on Soldier performance. ***FY 2013 Plans:***	2.900	4.212	5.585

Exhibit R-2A, RDT&E Project Justification: PB 2014 Army		DATE: April 2013
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602786A: *Warfighter Technology*	PROJECT H98: *Clothing & Equipm Tech*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2012	FY 2013	FY 2014
Evaluate mitigation techniques that support spatial memory and navigation such as adaptive display technologies, resilience training, and nutritional intervention; investigate the interactive effects of individual differences (e.g., spatial cognitive performance and working memory capacity) and mission context on Soldier cognitive processes; conduct operational human performance effectiveness modeling and simulation analyses for optimal body armor/load configurations for individual Soldiers and Small Units. ***FY 2014 Plans:*** Will validate mitigation techniques for enhancing human spatial memory and navigation using adaptive display technologies and nutritional intervention; investigate new mitigation techniques such as enhanced vision technologies and biomechanical, physiological, as well as neurophysiological markers of physical and cognitive fatigue; incorporate data on the effects of individual differences on the effectiveness of cognitive state monitoring technologies and mitigation techniques (e.g. measure stress and panic responses through eye movements, inner ear temperature, etc.); will integrate human performance data into performance models to enhance mission performance assessment and analysis for the Small Unit; will design and validate statistical human two dimensional and three dimensional models using updated Soldier anthropometric data to optimize the design, fit and sizing of Soldier clothing and individual equipment; will advance methods for assessing encumbered anthropometry to enable improved design of manned platforms. Investigate concepts for improved biofidelic human models.			
Title: Advancements in Fibers, Textiles and Materials for Soldier Protection ***Description:*** Beginning in FY13, this effort is renamed from Multifunctional Fibers, Textiles and Material for the Soldier to Advancements in Fibers, Textiles and Materials for Soldier Protection. This effort focuses on technologies that aid in the design and evaluation of multifunctional protective materials and concealment concepts for Soldier clothing, equipment and shelters. In FY13 and FY14, this effort supports Technology Enabled Capability Demonstration 1.b, Force Protection Soldier & Small Unit and Technology Enabled Capability Demonstration 2a, Overburden Physical Burden. ***FY 2012 Accomplishments:*** Assessed multifunctional fiber technologies for key flame and thermal protection capabilities, cut and abrasion resistance, concealment and electronic/electrical properties as well as fiber composite toughness enhancement improvement for multiple Soldier items; integrated selected novel FR protective materials into fibers and researched new FR characterization methodologies and modeling of layered FR materials to determine the physical properties controlling FR performance; determined the effect of enhanced process control on electrospun materials, and evaluated performance for a wide range of operational conditions; and investigated textile properties effecting signature reduction and performance evaluation techniques for a wide range of operational conditions and sensors. ***FY 2013 Plans:*** Evaluate properties of novel bi- and tri-component fibers for Electro Magnetic Imaging (EMI) shielding, friend/foe identification and signature management; investigate environmentally benign coatings, surface treatments and other novel deposition techniques	5.450	5.536	7.937

Exhibit R-2A, RDT&E Project Justification: PB 2014 Army		DATE: April 2013
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602786A: *Warfighter Technology*	PROJECT H98: *Clothing & Equipm Tech*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2012	FY 2013	FY 2014
for flame and thermal protection; investigate the performance of non-traditional textiles to protect against temperature extremes, microbes, and insects threats to increase protection capabilities of Soldier clothing, individual equipment and shelters. ***FY 2014 Plans:*** Will investigate cost effective textile-embedded power generation for integration of sensors/detectors into Soldier clothing to reduce power needs and Soldier carried weight; investigate metrics, methods, and treatments for multifunctional materials to enhance Soldier survivability and mission effectiveness by reducing probability of detection by battlefield sensors; validate novel flame resistant (FR) test methodologies for FR materials that more accurately measure thermal material properties and provide trade-off data for developing Soldier clothing; conduct experiments on multi-functional protective textiles and membranes to determine response to environmental extremes and microbial/insect threats to develop increased protection capabilities for emerging pathogenic threats to Soldiers and Small Units.			
Accomplishments/Planned Programs Subtotals	19.234	18.892	21.801

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

Performance metrics used in the preparation of this justification material may be found in the FY 2010 Army Performance Budget Justification Book, dated May 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2014 Army			DATE: April 2013
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602786A: *Warfighter Technology*	PROJECT H99: *Joint Service Combat Feeding Technology*	

COST ($ in Millions)	All Prior Years	FY 2012	FY 2013#	FY 2014 Base	FY 2014 OCO ##	FY 2014 Total	FY 2015	FY 2016	FY 2017	FY 2018	Cost To Complete	Total Cost
H99: *Joint Service Combat Feeding Technology*	-	6.453	5.748	5.802	-	5.802	5.860	5.921	5.936	6.043	Continuing	Continuing

FY 2013 Program is from the FY 2013 President's Budget, submitted February 2012

The FY 2014 OCO Request will be submitted at a later date

A. Mission Description and Budget Item Justification

This project investigates, develops and evaluates novel ration packaging, combat feeding equipment/systems and advanced food processing technologies to prolong shelf-life. This project also investigates technologies that detect food safety hazards on the battlefield and enhances quality, nutritional content and the variety of food items in military rations. Efforts funded in this project support all Military Services, the Special Operations Command, and the Defense Logistics Agency. The Army serves as Executive Agent for this Department of Defense (DoD) program, with oversight and coordination provided by the DoD Combat Feeding Research and Engineering Board. Technologies developed within this effort transition to PE 0603001A/project C07 for maturation.

Efforts in this program element support the Army science and technology Soldier portfolio.

Work in this PE is fully coordinated with PE 0602787 (Medical Technology) Project 869.

The cited work is consistent with the Assistant Secretary of Defense for Research and Engineering priority focus areas and the Army Modernization Strategy.

Work in this project is led, performed, and/or managed by the US Army Natick Soldier Research, Development and Engineering Center (NSRDEC), Natick, MA, and this project has collaborative efforts with the US Army Research Institute for Environmental Medicine.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2012	FY 2013	FY 2014
Title: Joint Combat Feeding Equipment Technologies	2.610	2.321	2.343
Description: Beginning in FY13, this effort is renamed from Combat Feeding Equipment Technologies to Joint Combat Feeding Equipment Technologies. This effort investigates equipment and energy technologies to enhance effectiveness and reduce logistics footprint of Joint Services field feeding operations in a wide range of environmental and operational contexts. In FY12, 13 and 14, this effort supports Technology Enabled Capability Demonstration 4a, Sustainability and Logistics-Basing.			
FY 2012 Accomplishments: Investigated innovative mission-specific, man portable feeding technologies; evaluated high efficiency thermoelectric powered appliances to reduce reliance on JP8 and other power sources to operate kitchen appliances; investigated novel			

Exhibit R-2A, RDT&E Project Justification: PB 2014 Army		DATE: April 2013
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602786A: *Warfighter Technology*	PROJECT H99: *Joint Service Combat Feeding Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2012	FY 2013	FY 2014
heating technologies that will allow the Warfighter to self heat a wider range of rations, including group rations, in a variety of environmental conditions without kitchen equipment. ***FY 2013 Plans:*** Explore alternative energy solutions to reduce fuel, water, and logistics requirements of current field feeding systems to support a single scalable kitchen platform for the Joint Forces that uses common integrated kitchen components. ***FY 2014 Plans:*** Will investigate greywater recycling and repurposing technologies within field feeding operations to reduce the contingency basing footprint and cost; investigate logistical support and costs of novel JP8 fueled burner technologies within containerized field kitchen platforms to improve fuel efficiency and reduce troop to task ratio within contingency basing field feeding operations; identify technology gaps in kitchen platforms across Joint Forces to increase use of common kitchen components to improve mean-time between failure while increasing interoperability across Joint systems.			
Title: Ration Stabilization, Packaging, Novel Nutrient Delivery, and Food Safety Technologies ***Description:*** Beginning in FY13, this effort is renamed from Ration Stabilization and Novel Nutrient Delivery Technologies and combines with Ration Packaging and Food Safety Technologies to form Ration Stabilization, Packaging, Novel Nutrient Delivery and Food Safety Technologies to provide investigation of complementary food technologies. This effort identifies and develops nutrient compositions to maximize Soldier cognitive and physical performance on the battlefield and minimizes nutritional degradation to protect the Warfighter from food borne illnesses. In FY12, 13 and 14, this effort supports Technology Enabled Capability Demonstration 2a, Overburdened - Physical Burden. ***FY 2012 Accomplishments:*** Explored the integration of antioxidants into various ration components to improve the overall health of the Warfighter; developed new baked food items that will increase the variety of baked goods available in military rations; developed ration components that increase the Warfighter appetite satisfaction rate relative to ration size to support Soldier mental and physical performance. ***FY 2013 Plans:*** Explore novel drying process to produce shelf stable, nutritionally dense carriers for performance optimizing ingredients; explore efficient food sample preparation/clean-up methods to improve accuracy of biosensor detection technologies for preventing food borne illnesses; investigate simulated digestion model to measure human absorption of bio-active nutrients. ***FY 2014 Plans:*** Will investigate dehydration technologies to produce lighter weight, condensed, shelf-stable rations that reduce refrigeration requirements in field environments; explore methods of stabilizing amino acids within rations to ensure optimal nutritional absorption by the Warfighter based on results from the FY13 investigation of the simulated digestion model; evaluate performance	1.910	3.427	3.459

Exhibit R-2A, RDT&E Project Justification: PB 2014 Army		DATE: April 2013
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602786A: *Warfighter Technology*	PROJECT H99: *Joint Service Combat Feeding Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2012	FY 2013	FY 2014
of new bio-based packaging solutions within ration platforms to meet shelf-stability requirements extending ration life-cycle and reducing cost.			
Title: Ration Packaging and Food Safety Technologies ***Description:*** Beginning in FY13, this effort merged into Ration Stabilization, Packaging, Novel Nutrient Delivery and Food Safety Technologies. This effort investigates biosensors models and designs for food products and novel ration packaging technologies to minimize nutritional degradation and protect the Warfighter from food borne illnesses. ***FY 2012 Accomplishments:*** Conducted exploratory research on bioactive packaging materials which can detect and kill pathogens present in a food product to protect the Warfighter's health; evaluated ration packaging microencapsulation technologies that enhance barrier protection and packaging integrity resulting in higher ration quality and reduced waste.	1.933	0.000	0.000
Accomplishments/Planned Programs Subtotals	6.453	5.748	5.802

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

Performance metrics used in the preparation of this justification material may be found in the FY 2010 Army Performance Budget Justification Book, dated May 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2014 Army			DATE: April 2013
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602786A: *Warfighter Technology*	PROJECT VT4: *Expeditionary Mobile Base Camp Technology*	

COST ($ in Millions)	All Prior Years	FY 2012	FY 2013#	FY 2014 Base	FY 2014 OCO ##	FY 2014 Total	FY 2015	FY 2016	FY 2017	FY 2018	Cost To Complete	Total Cost
VT4: *Expeditionary Mobile Base Camp Technology*	-	2.346	1.501	1.578	-	1.578	1.670	1.771	1.801	1.833	Continuing	Continuing

FY 2013 Program is from the FY 2013 President's Budget, submitted February 2012

The FY 2014 OCO Request will be submitted at a later date

A. Mission Description and Budget Item Justification

This project matures and demonstrates fully integrated holistic expeditionary base camp (EBC) capabilities with mission-specific plug and play components, subsystems and modules designed to optimized manpower requirements, improve situational awareness, increase survivability, optimize habitation, reduce logistics footprint, enhance supportability and reduce cost. Expeditionary Base Camp (EBC) systems provide an operational capability for Small Combat Units (battalion and below) and Soldiers in varying environments which are rapidly deployable and re-locatable and require no Military Construction and limited materiel handing support. This project integrates mature technologies to create mission specific lab demonstrators and evaluates the performance capabilities using metrics and methodologies developed under PE 0602786//Project VT4.

Efforts in this program element support the Army science and technology Soldier portfolio.

The cited work is consistent with the Director, Defense Research and Engineering Strategic Plan, the Army Modernization Strategy, and the Army Science and Technology Master Plan.

Work in this project is led, performed and/or managed by the US Army Natick Soldier Research, Development and Engineering Center (NSRDEC), Natick, MA and fully coordinated with PE 0602786A (Warfighter Technology), PE 0602784A and 0603734A (Military Engineering) PE 0603004A (Weapons and Munitions Advanced Technology), PE 0603005A (Combat Vehicle and Automotive Advanced Technology), PE 0603125A (Combating Terrorism Technology Development) and PE 0603772A (Advanced Tactical Computer Science and Sensor Technology).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2012	FY 2013	FY 2014
Title: Expeditionary Base Camp Component Technologies	2.346	1.501	1.578
Description: Identify and improve component interoperability and mature and scale component technologies for an integrated holistic base camp concept. In FY13 and FY14, this effort supports Technology Enabled Capability Demonstration 4a, Basing Sustainment and Logistics.			
FY 2012 Accomplishments: Developed a database of physical measurements (size, weight, volume), human metrics (manpower, cognitive load), interfaces (power, network), and assess technical performance and maturity of technologies (i.e., level of ballistic, environmental and/or			

Exhibit R-2A, RDT&E Project Justification: PB 2014 Army		DATE: April 2013
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602786A: *Warfighter Technology*	PROJECT VT4: *Expeditionary Mobile Base Camp Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2012	FY 2013	FY 2014
chem-bio protection); captured key data regarding mission planning from deploying units and component limitations from returning Soldiers; investigated data and prioritize critical new or improved capabilities through simulations and war-gaming, developed test protocols for technology assessment, and defined design and technical performance criteria for achievable capability sets. ***FY 2013 Plans:*** Evaluate technology approaches to address the performance criteria and capability sets identified in FY12; investigate technologies which can increase capabilities to project the force, sustain the force and/or protect the base without increasing manpower requirements; conduct experiments to measure protection, power and other sustainment technologies performance using test protocols developed in FY12. ***FY 2014 Plans:*** Will investigate self-sustaining living module concepts for experiments with technologies investigated in FY13 that reduce dependence on resupply at Contingency Bases by providing protection, water, energy efficiency and power capabilities; validate protection, power and other sustainment performance parameters measured in FY13.			
Accomplishments/Planned Programs Subtotals	2.346	1.501	1.578

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

Performance metrics used in the preparation of this justification material may be found in the FY 2010 Army Performance Budget Justification Book, dated May 2010.