Exhibit R-2, RDT&E Budget Item Justification: PB 2013 Army										DATE: February 2012	
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*				R-1 ITEM NOMENCLATURE PE 0602786A: *Warfighter Technology*							
COST ($ in Millions)	**FY 2011**	**FY 2012**	**FY 2013 Base**	**FY 2013 OCO**	**FY 2013 Total**	**FY 2014**	**FY 2015**	**FY 2016**	**FY 2017**	**Cost To Complete**	**Total Cost**
Total Program Element	26.972	46.261	28.281	-	28.281	29.146	27.809	28.000	28.681	Continuing	Continuing
283: *AIRDROP ADV TECH*	2.475	2.365	2.140	-	2.140	2.157	2.270	2.293	2.716	Continuing	Continuing
E01: *Warfighter Technology Initiatives (CA)*	-	16.474	-	-	-	-	-	-	-	Continuing	Continuing
H98: *CLOTHING & EQUIPM TECH*	19.033	19.571	18.892	-	18.892	19.609	18.009	18.015	18.228	Continuing	Continuing
H99: *JOINT SERVICE COMBAT FEEDING TECHNOLOGY*	5.464	5.505	5.748	-	5.748	5.802	5.860	5.921	5.936	Continuing	Continuing
VT4: *EXPEDITIONARY MOBILE BASE CAMP TECHNOLOGY*	-	2.346	1.501	-	1.501	1.578	1.670	1.771	1.801	Continuing	Continuing

Note

FY12 funding increase is a congressional add.

A. Mission Description and Budget Item Justification

This program element (PE) investigates and develops technologies which improve Soldier and Small Combat Unit survivability, sustainability, mobility, combat effectiveness, and field quality of life. 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). 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 as a System Integrated Concepts Development Team, and the DoD Combat Feeding Research and Engineering Board.

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 2013 Army		DATE: February 2012
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 2011	FY 2012	FY 2013 Base	FY 2013 OCO	FY 2013 Total
Previous President's Budget	27.746	29.835	28.180	-	28.180
Current President's Budget	26.972	46.261	28.281	-	28.281
Total Adjustments	-0.774	16.426	0.101	-	0.101
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	16.500			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.432	-			
• Adjustments to Budget Years	-	-	0.101	-	0.101
• Other Adjustments 1	-0.342	-0.074	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2013 Army			DATE: February 2012
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)	FY 2011	FY 2012	FY 2013 Base	FY 2013 OCO	FY 2013 Total	FY 2014	FY 2015	FY 2016	FY 2017	Cost To Complete	Total Cost
283: *AIRDROP ADV TECH*	2.475	2.365	2.140	-	2.140	2.157	2.270	2.293	2.716	Continuing	Continuing

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 2011	FY 2012	FY 2013
Title: Airdrop/Aerial Delivery Research and Technology	1.734	2.365	2.140
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 2011 Accomplishments: Researched and evaluated performance of adaptive Guidance Navigation and Control (GN&C) software and wind sensor technology to incorporate into on-board airborne guidance unit (AGU) enabling wind updates to be transmitted to the AGU for parafoil flight pattern adjustment.			
FY 2012 Plans: Explore 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 MFF operations; complete assessment of oxygen requirements for extended range, high altitude MFF operations; develop 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 2013 Army		DATE: February 2012
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 2011	FY 2012	FY 2013
Will evaluate decelerator design refinements and application of advanced sensors to decrease serious injuries and fatalities during mass tactical aerial insertion; will conduct preliminary investigation of parafoil shape while in-flight to increase performance parameters.			
Title: Enabling Airdrop Research and Technologies ***Description:*** Beginning in FY13, this effort will be captured in the Airdrop/Aerial Delivery Research and Technology effort. This effort investigates technologies for enhanced payload extraction and subsequent gliding capabilities. ***FY 2011 Accomplishments:*** Verified and validated both physics and engineering based aerial delivery models; investigated methods to increase the airfoil glide ratio, which allows the jumper/cargo to exit the aircraft further from the target. These methods include the optimization of parafoil canopy design, such as variations in canopy size, shape, materials, and suspension lines. In FY12 funding will transition to Precision Aerial Delivery Enhancements.	0.741	-	-
Accomplishments/Planned Programs Subtotals	2.475	2.365	2.140

C. Other Program Funding Summary ($ in Millions)

N/A

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 2013 Army			DATE: February 2012
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)	FY 2011	FY 2012	FY 2013 Base	FY 2013 OCO	FY 2013 Total	FY 2014	FY 2015	FY 2016	FY 2017	Cost To Complete	Total Cost
E01: *Warfighter Technology Initiatives (CA)*	-	16.474	-	-	-	-	-	-	-	Continuing	Continuing

A. Mission Description and Budget Item Justification

Congressional Interest Item funding for Warfighter Technology Applied Research.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2011	FY 2012	FY 2013
Title: Power Generation Research	-	16.474	-
Description: This is a Congressional Interest Item.			
FY 2012 Plans: Congressional add funding for Power Generation Research.			
Accomplishments/Planned Programs Subtotals	-	16.474	-

C. Other Program Funding Summary ($ in Millions)

N/A

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 2013 Army			DATE: February 2012
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)	FY 2011	FY 2012	FY 2013 Base	FY 2013 OCO	FY 2013 Total	FY 2014	FY 2015	FY 2016	FY 2017	Cost To Complete	Total Cost
H98: *CLOTHING & EQUIPM TECH*	19.033	19.571	18.892	-	18.892	19.609	18.009	18.015	18.228	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project investigates and evaluates components and materials that have potential to 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 network centric warfare technologies and human science investigation to identify and develop methods to assess human cognitive 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 2011	FY 2012	FY 2013
Title: Soldier Blast and Balistic Protection	5.428	7.196	6.533
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.			
FY 2011 Accomplishments: Investigated and conducted trade analysis of parameters which could lead to lighter weight ballistic and blast protective systems for individuals and shelters; constructed and evaluated initial soft armor and composite armor components using emerging materials (from PE 0602105A/project H84 or others) and geometry data from the Integrated Casualty Estimation Method modeling			

Exhibit R-2A, RDT&E Project Justification: PB 2013 Army		DATE: February 2012
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 2011	FY 2012	FY 2013
tool; transitioned enhanced survivability analysis and modeling tools to materiel developers and Product Managers to aid in future requirements, design, and acquisition decisions. ***FY 2012 Plans:*** Develop methodology to characterize multidirectional bending/ flexing behavior of multi-layer armor material systems, apply human flexure findings to digital human models and investigate advanced armor material and configurations to accommodate body flexure; develop reduced weight material concepts for head and face protection and research emerging ballistic and blast protective materials for application to shelter systems. Conduct 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:*** Will 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.			
Title: Soldier Vision Protection and Enhancement ***Description:*** This effort focuses on technologies which provide eye protection from battlefield threats. ***FY 2011 Accomplishments:*** Developed and evaluated against the baseline variable transmission eyewear technologies, material properties and methods to integrate glare, laser flash and dazzle protection into eyewear. ***FY 2012 Plans:*** Begin integration of eye protection and variable transmission technologies into a single lens design with multiple levels of light transmission control. ***FY 2013 Plans:*** Will 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.	2.416	2.543	2.611
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	2.260	1.437	-

Exhibit R-2A, RDT&E Project Justification: PB 2013 Army		DATE: February 2012
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 2011	FY 2012	FY 2013
PE 0602716A/Project H70 (Human Factors Engineering Technology) and PE 0602784A/Project H71 (Military Engineering Technology.) ***FY 2011 Accomplishments:*** Linked models and simulations and provided data analysis to examine the issue of Soldier load; developed counterinsurgency scenarios for Soldier and SCUs; analyzed SCUs logistics supply chain and capability to sustain themselves in austere environments; modeled SCUs combat effectiveness utilizing notional capabilities compared to the current capabilities of Force Provider systems; analyzed fuel and water systems, cost/benefits of unmanned sensors for stand-off recognition and intelligence gathering. ***FY 2012 Plans:*** Analyze the utility of tailorable/modular/scalable body armor and recommend optimal configurations to ensure the proper balance of protection and Soldier load for any given missions and scenario. Continue to conduct analyses to support Expeditionary Mobile Base Camps as Combat Outposts (COPs) that will allow SCUs to sustain themselves in austere environments.			
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. ***FY 2011 Accomplishments:*** Developed an initial set of standard cognitive metrics for quantifying and evaluating Soldier performance under stressed and non-stressed task situations based on cognitive task analysis and human experimental studies; conducted human research to quantify the influence of contextual variables (e.g., physical fatigue) on cognitive processes involved in performing squad-level infantry tasks. ***FY 2012 Plans:*** Mature and validate cognitive metrics for quantifying and evaluating Soldier performance affected by contextual variables; conduct human research to identify mitigation strategies for performance decrements; provide 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:***	3.484	2.950	4.212

Exhibit R-2A, RDT&E Project Justification: PB 2013 Army		DATE: February 2012
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 2011	FY 2012	FY 2013
Will 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; and conduct operational human performance effectiveness modeling and simulation analyses for optimal body armor/load configurations for individual Soldiers and Small Units.			
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. ***FY 2011 Accomplishments:*** Investigated modeling and control of low cost electrospinning processes to produce micro/ nanostructure fibrous materials; applied analytical methods to design and fabricate multifunctional fibers for advanced flame, thermal and concealment/signature protective textiles and composite concepts. ***FY 2012 Plans:*** Assess 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; integrate selected novel FR protective materials into fibers and research new FR characterization methodologies and modeling of layered FR materials to determine the physical properties controlling FR performance; determine the effect of enhanced process control on electrospun materials, and evaluate performance for a wide range of operational conditions; and investigate textile properties effecting signature reduction and performance evaluation techniques for a wide range of operational conditions and sensors. ***FY 2013 Plans:*** Will 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 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.	5.445	5.445	5.536
Accomplishments/Planned Programs Subtotals	19.033	19.571	18.892

C. Other Program Funding Summary ($ in Millions)

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2013 Army		DATE: February 2012
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*

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 2013 Army			DATE: February 2012
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)	FY 2011	FY 2012	FY 2013 Base	FY 2013 OCO	FY 2013 Total	FY 2014	FY 2015	FY 2016	FY 2017	Cost To Complete	Total Cost
H99: *JOINT SERVICE COMBAT FEEDING TECHNOLOGY*	5.464	5.505	5.748	-	5.748	5.802	5.860	5.921	5.936	Continuing	Continuing

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 performed by the US Army Natick Soldier Research, Development and Engineering Center (NSRDEC), Natick, MA.

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 this project has collaborative efforts with the US Army Research Institute for Environmental Medicine.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2011	FY 2012	FY 2013
Title: Joint Combat Feeding Equipment Technologies	2.273	1.617	2.321
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.			
FY 2011 Accomplishments:			

Exhibit R-2A, RDT&E Project Justification: PB 2013 Army		DATE: February 2012
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 2011	FY 2012	FY 2013
Developed recycling technology concepts for greywater (non-industrial wastewater) generated from field food sanitation systems for the Food Sanitation Center; and completed concept development of self-powered appliances with next generation high efficiency thermoelectric modules to reduce reliance on JP8. ***FY 2012 Plans:*** Investigate innovative mission-specific, man portable feeding technologies; evaluate high efficiency thermoelectric powered appliances to reduce reliance on JP8 and other power sources to operate kitchen appliances; investigate novel heating technologies that will allow the Warfighter to self heat a wider range or rations, including group rations, in a variety of environmental conditions without kitchen equipment. ***FY 2013 Plans:*** Will 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.			
Title: Ration Stabilization, Packaging, Novel Nutrient Delivery, and Food Safety Technologies ***Description:*** Beginning in FY13, this effort is renamed from Ration Stabililation 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. ***FY 2011 Accomplishments:*** Explored shelf-stable pocket bread formulas and production parameters; evaluated the efficacy of carbon dioxide treatment of fresh fruits and vegetables and antimicrobial effects on ration components; and demonstrated nanotechnology-based carriers (ration component) for enhancing micronutrient stability in food items of military rations. ***FY 2012 Plans:*** Explore the integration of antioxidants into various ration components to improve the overall health of the Warfighter; develop new baked food items that will increase the variety of baked goods available in military rations; develop ration components that increase the Warfighter appetite satisfaction rate relative to ration size to support Soldier mental and physical performance. ***FY 2013 Plans:*** Will 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.	1.656	1.930	3.427
Title: Ration Packaging and Food Safety Technologies	1.535	1.958	-

Exhibit R-2A, RDT&E Project Justification: PB 2013 Army		DATE: February 2012
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 2011	FY 2012	FY 2013
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 2011 Accomplishments:*** Investigated compatibility and integration issues with printed electronic display applications on packaging structures for ration condition assessment; evaluated electrochemical measurements generated by an antibody-antigen reaction with conductive membranes for more rapid and reliable detection of pathogens in foods. ***FY 2012 Plans:*** Conduct exploratory research on bioactive packaging materials which can detect and kill pathogens present in a food product to protect the Warfighter's health; and evaluate ration packaging microencapsulation technologies that enhance barrier protection and packaging integrity resulting in higher ration quality and reduced waste.			
Accomplishments/Planned Programs Subtotals	5.464	5.505	5.748

C. Other Program Funding Summary ($ in Millions)

N/A

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 2013 Army			DATE: February 2012
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)	FY 2011	FY 2012	FY 2013 Base	FY 2013 OCO	FY 2013 Total	FY 2014	FY 2015	FY 2016	FY 2017	Cost To Complete	Total Cost
VT4: *EXPEDITIONARY MOBILE BASE CAMP TECHNOLOGY*	-	2.346	1.501	-	1.501	1.578	1.670	1.771	1.801	Continuing	Continuing

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 2011	FY 2012	FY 2013
Title: Expeditionary Base Camp Component Technologies	-	2.346	1.501
Description: Identify and improve component interoperability and mature and scale component technologies for an integrated holistic base camp concept.			
FY 2012 Plans: Develop a database of physical measurements (size, weight, volume); human metrics (manpower, cognitive load); and interfaces (power, network) and assess technical performance and maturity of technologies (i.e., level of ballistic, environmental and/or chem-bio protection); capture key data regarding mission planning from deploying units and component limitations from returning			

Exhibit R-2A, RDT&E Project Justification: PB 2013 Army		DATE: February 2012
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 2011	FY 2012	FY 2013
Soldiers; investigate data and prioritize critical new or improved capabilities through simulations and war-gaming, develop test protocols for technology assessment, and define design and technical performance criteria for achievable capability sets. ***FY 2013 Plans:*** Will 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.			
Accomplishments/Planned Programs Subtotals	-	2.346	1.501

C. Other Program Funding Summary ($ in Millions)

N/A

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.