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

**February 2003**

| BUDGET ACTIVITY | PE NUMBER AND TITLE |
|---|---|
| **2 - Applied Research** | **0602622A - Chemical, Smoke and Equipment Defeating Technology** |

| | 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 | 6079 | 15643 | 3540 | 3553 | 3713 | 3742 | 3830 | 3933 |
| 552 | SMOKE/NOVEL EFFECT MUN | 3190 | 3395 | 3540 | 3553 | 3713 | 3742 | 3830 | 3933 |
| BA1 | BIOTECHNOLOGY | 1931 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| BA3 | ADVANCED SENSORS AND OBSCURANTS | 0 | 1906 | 0 | 0 | 0 | 0 | 0 | 0 |
| BA4 | METALLIC PARTICLES IN DEFENSE APPLICATIONS ( MPDA) | 0 | 1431 | 0 | 0 | 0 | 0 | 0 | 0 |
| BA5 | SYSTEMS FOR SAMPLING AND DETECTING BIOAEROSOLS | 0 | 4335 | 0 | 0 | 0 | 0 | 0 | 0 |
| BA6 | VAPOROUS HYDROGEN PEROXIDE TECHNOLOGY | 0 | 4576 | 0 | 0 | 0 | 0 | 0 | 0 |
| CA1 | THERMOBARIC WARHEAD DEVELOPMENT | 958 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**A. Mission Description and Budget Item Justification:** The goal of this Program Element (PE) is to investigate and develop smoke and obscurant technologies to increase personnel and platform survivability. The PE funds applied research in materials science and dissemination technologies to counter enemy weapon target acquisition systems and to provide the ability to degrade enemy surveillance capability. The material and dissemination systems will be designed to be safe and environmentally acceptable. Work in this PE is consistent with the Army Science and Technology Master Plan (ASTMP), the Army Modernization Plan, and Project Reliance. This PE contains no duplication with any effort within the Military Departments. This work is performed by the U.S. Army Edgewood Chemical Biological Center, Aberdeen Proving Ground, MD. This work supports the Objective Force transition path of the Transformation Campaign Plan. No Defense Emergency Response Funds have been provided for this program.

| **B. Program Change Summary** | FY 2002 | FY 2003 | FY 2004 | FY 2005 |
|---|---|---|---|---|
| Previous President's Budget (FY 2003) | 6529 | 3675 | 3940 | 3904 |
| Current Budget (FY 2004/2005 PB) | 6079 | 15643 | 3540 | 3553 |
| Total Adjustments | -450 | 11968 | -400 | -351 |
| Congressional program reductions | | | | |
| Congressional rescissions | | -378 | | |
| Congressional increases | | 12850 | | |
| Reprogrammings | -303 | -89 | | |
| SBIR/STTR Transfer | -147 | -415 | | |
| Adjustments to Budget Years | | | -400 | -351 |

FY03 Congressional Adds:
Advanced Sensors and Obscurants, Project BA3 ($2000); Systems for Sampling and Detecting Bioaerosals, Project BA5, ($4550); Vaporous Hydrogen Peroxide Technology, Project BA6, ($4800); Metallic Particles in Defense Applications (MPDA) Obscurant Smokes, Project BA4 ($1500)

Projects with No R-2A:
- ($1906), Advanced Sensors and Obscurants, Project BA3, is the second year of a Congressional add placed in PE0602120A in FY02. The objective of this add is to research new techniques in sensors and obscurant materials. No additional funding is required to complete this project.
($1431), Metallic Particles in Defense Applications, Project BA4: The objective of this one year Congressional add is to research metallic materials for obscurant applications. No additional funding is needed to complete this project.
($4335), Systems for Sampling and Detecting Bioaerosols, Project BA5: The objective of this one year Congressional add is to develop new types of bioaerosol detection systems utilizing advancements in air sampling, biological and chemical speciation, and optics. No additional funding is required to complete this project.
($4576), Vaporous Hydrogen Peroxide Technology, Project BA6: The objective of this one year Congressional add is to research vaporous hydrogen peroxide technology for decontamination applications. No additional funding is required to complete this project.

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

**February 2003**

| BUDGET ACTIVITY | PE NUMBER AND TITLE | PROJECT |
|---|---|---|
| **2 - Applied Research** | **0602622A - Chemical, Smoke and Equipment Defeating Technology** | **552** |

| 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 |
|---|---|---|---|---|---|---|---|---|---|
| 552 | SMOKE/NOVEL EFFECT MUN | 3190 | 3395 | 3540 | 3553 | 3713 | 3742 | 3830 | 3933 |

**A. Mission Description and Budget Item Justification:** Project 552 researches and investigates smoke and obscurant technologies to increase personnel/platform survivability and to provide the ability to degrade enemy surveillance sensor capability. Improved multi-spectral smokes/obscurants are explored to enhance survivability by providing effective, affordable, and efficient screening of deployed forces from threat force surveillance sensors and effective defeat of target acquisition devices, missile guidance, and directed energy weapons. These systems will be designed to be safe and environmentally acceptable. Modeling and simulation (M&S) tools will be investigated to predict performance and analyze strategic use of obscurants on the battlefield. A major effort, Advanced Infrared (IR) Obscurants, is focused on increasing current IR obscurant performance by 4X (reducing logistics by >50%), for use in IR smoke pots, grenades and projected munitions. Other efforts within this project research obscurant enabling technology for Distant Smoke, Smoke Pot, and other obscurant capabilities. These efforts advance dissemination, delivery, M&S and vehicle protection technology to expand survivability options through increased standoff and threat protection. This program supports the Objective Force transition path of the Transformation Campaign Plan. No Defense Emergency Response Funds have been provided for this project.

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| BUDGET ACTIVITY | PE NUMBER AND TITLE | PROJECT |
|---|---|---|
| **2 - Applied Research** | **0602622A - Chemical, Smoke and Equipment Defeating Technology** | **552** |

| **Accomplishments/Planned Program** | FY 2002 | FY 2003 | FY 2004 | FY 2005 |
|---|---|---|---|---|
| Advanced IR Obscurants<br>In FY02, investigated and modeled IR sensor defeat mechanisms. Determined if commercial processes exist, or can be modified, to produce candidate countermeasure materials; investigated obscurant performance measurement technique addressing unique aspects of nano-particles; created test quantities of candidate materials for initial evaluation. In FY03, evaluate performance of candidate materials and develop laboratory method for evaluating its performance as an aerosol. In FY04, demonstrate a new IR obscurant screening material and laboratory method to evaluate performance as an aerosol; investigate the applications of this advanced obscurant material in simulations to determine the increase of survivability for the soldier. In FY05, identify dissemination techniques for new IR materials; develop concepts for prototype systems for use in grenades, artillery rounds, etc. and conduct trade-off analyses. | 2000 | 2248 | 2437 | 2350 |
| Obscurant Enabling Technology for Distant Smoke, Smoke Pot, and other obscurant capabilites<br>In FY02, researched Distant Smoke concepts using robotics for remote delivery; assessed performance of promising smoke pot dissemination technologies; upgraded modeling & simulation tools for vehicle protection. In FY03, investigate a remotely piloted smoke generator technology for Distant Smoke; conduct propellant dissemination experiments for self protection applications. In FY04-05, conduct modeling and simulation case studies to predict and analyze performance of Distant Smoke, Smoke Pot, and other obscurant applications; perform field experiments on obscuration/dissemination technologies to optimize vehicle protection. | 1190 | 1147 | 1103 | 1203 |
| Totals | 3190 | 3395 | 3540 | 3553 |