# ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

**February 2006**

| BUDGET ACTIVITY | PE NUMBER AND TITLE |
|---|---|
| **5 - System Development and Demonstration** | **0604645A - Armored Systems Modernization (ASM)-Eng. Dev.** |

| COST (In Thousands) | | FY 2005 Estimate | FY 2006 Estimate | FY 2007 Estimate | FY 2008 Estimate | FY 2009 Estimate | FY 2010 Estimate | FY 2011 Estimate | Cost to Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|
| Total Program Element (PE) Cost | | 2098130 | 2745716 | 3310477 | 3282408 | 3118477 | 3014482 | 2633249 | Continuing | Continuing |
| F52 | FCS- RECON PLATFORMS & SENSORS | 51034 | 52135 | 65555 | 68490 | 87574 | 131662 | 90626 | Continuing | 547076 |
| F53 | FCS- UNMANNED GROUND VEHICLES (UGV) | 65066 | 124988 | 107705 | 145693 | 146565 | 111391 | 97621 | Continuing | 799029 |
| F54 | UNATTENDED SENSORS | 15015 | 32131 | 17731 | 16515 | 12771 | 15913 | 1318 | Continuing | Continuing |
| F55 | SUSTAINMENT | 56613 | 143356 | 146106 | 164538 | 197448 | 169671 | 147496 | Continuing | 1025228 |
| F57 | MANNED GROUND VEHICLES | 313263 | 513896 | 570241 | 583483 | 821110 | 755918 | 411264 | Continuing | Continuing |
| F61 | S o S Engineering and Program Management | 1597139 | 1879210 | 2403139 | 2303689 | 1853009 | 1829927 | 1884924 | Continuing | Continuing |

**A. Mission Description and Budget Item Justification:** Future Combat Systems (FCS) will operate as a System of Systems (SoS) that will network existing systems, systems already under development, and new systems to be developed to meet the needs of the Unit of Action (UA). The network will enable improved intelligence, surveillance and reconnaissance, battle command, real time sensor-shooter linkages, and increased synergy between echelons and within small units. It will also enable the UA to connect to the Unit of Employment (UE) (UE is analogous to a division), joining capabilities, and national assets making these capabilities available.

FCS enables the networked UA to develop the situation in and out of contact, set conditions, maneuver to positions of advantage to close with and destroy the enemy through standoff attack and combat assault as articulated in the Future Force UA Operations and Organizational (O&O) plan.
Program Manager Future Combat Systems (FCS) Brigade Combat Team (BCT)will develop, procure and field capabilities to enable the full spectrum maneuver force the ability to conduct entry and campaign operations. The BCT deploys rapidly and conducts operations immediately on arrival to deter,contain, stabilize, or fight. The BCT will participate in Major Combat Operation (MCO) as a subordinate maneuver component within a Division/Corps in a variety of roles. The BCT will also participate in stability and support operations as an initial entry force or as a security force.
The FCS program is contained in three Program Elements (PEs): Non-Line of Sight - Launch System (NLOS-LS), Non-Line of Sight - Cannon (NLOS-C) and Armored Systems Modernization (ASM). The NLOS-LS PE develops the NLOS-LS family of missles including the Container Launch Unit (CL/U) and the Precision Attack Missle (PAM).

The NLOS-C PE provides sustained fires for close support and destructive fires for tactical standoff engagement. The system's primary purpose is to provide responsive fires in support of the FCS Combined Arms Battalions (CABs), and their subordinate units in concert with line-of-sight, Beyond-Line-of-Sight (BLOS), Non-Line-of-Sight (NLOS), external and Joint capabilities. The system provides flexible support through its ability to change effects round-by-round and mission-by-mission. These capabilities, combined with rapid response to calls for fire and rate of fire, provide a variety of effects on demand.

This program element contains the development effort for the balance of the Manned Ground Vehicle (MGV) common components, Unmanned Ground Vehicles (UGVs), Unmanned Air Vehicles (UAVs) and SoS development efforts including network, integration, software and test.

Army transformation is grounded in the operational framework of joint doctrine and concepts for future joint and combined operations. Transforming to the Future Force and developing the FCS is the Army's number one acquisition priority. The FCS family of systems (FoS) is being designed with the joint fight in mind.

FCS is comprised of a family of advanced, networked air and ground based maneuver, maneuver support, and sustainment systems that will include manned and unmanned platforms which are networked via a Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) architecture, including networked communications, network operations, sensors, battle command systems, and manned and unmanned reconnaissance and surveillance capabilities. This will enable FCS to achieve improved situational understanding and operations at a level of synchronization heretofore unachievable.

The FCS budget is based on the Work Breakout Structure (WBS). This will provide Congress the same program baseline data for budget justification that the Program Manager uses for program management. The three PEs and eight projects reflect the WBS reporting structure that will be provided to Congress quarterly. A full description of the projects can be found in the project level R2 forms. The following is a description of the projects:
F52 includes Class I , Class II, Class III, Class IVa Air Platforms.
F53 includes Armed Robotic Vehicles (ARV-R (Reconnaissance); ARV-A (Assault); ARV-A(L) (Assault(Light)), Small Unmanned Ground Vehicle (SUGV), Multi-function Utility/Logistics Equipment (MULE-T (Transport), MULE-CM (Countermine)) and the Autonomous Navigation System (ANS)
F54 includes Unattended Ground Sensors (UGS) development, engineering, prototype procurement, integration and assembly.
F55 includes SDD FCS-UA logistics and training development
F57 includes contractor efforts of all Manned Ground Vehicle (MGV) variants including Infantry Carrier Vehicle (ICV), Mounted Combat System (MCS), Non-Line of Sight Mortar (NLOS-M), Command and Control Vehicle (C2V), Reconnaissance and Surveillance Vehicle (RSV), Medical vehicle (MV), Family of Recovery and Maintenance Vehicle (FRMV).
and Common Mobility and Software
F61 includes the efforts associated with SoS Engineering Family of Systems (FoS) Analysis and Integration, Network Software, Systems Integration, Air Sensors, Program Management, SoS Test and Evaluation, Government Cost, and Other Contract Cost. This project includes support to other DOD agencies for Joint Programs, Multinational Programs and PM UA collaboration efforts.
IAW Section 214 of the FY2006 National Defense Authorization Act, this program element will be broken out into six unique program elements commencing with the FY2008 President's Budget submission to Congress.

# ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

**February 2006**

| BUDGET ACTIVITY | PE NUMBER AND TITLE |
|---|---|
| **5 - System Development and Demonstration** | **0604645A - Armored Systems Modernization (ASM)-Eng. Dev.** |

| **B. Program Change Summary** | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Previous President's Budget (FY 2006) | 2268236 | 3065629 | 3150136 |
| Current BES/President's Budget (FY 2007) | 2098130 | 2745716 | 3310477 |
| Total Adjustments | -170106 | -319913 | 160341 |
| Congressional Program Reductions | -33666 | -292195 | |
| Congressional Rescissions | -1731 | -27718 | |
| Congressional Increases | | | |
| Reprogrammings | -69660 | | |
| SBIR/STTR Transfer | -65049 | | |
| Adjustments to Budget Years | | | 160341 |

Change Summary Explanation: Funding - FY 05 funds realigned to new program elements for NLOS Cannon and NLOS Launcher as per Congressional direction.

| Termination Liability Funding For Major Defense Acquisition Programs, RDT&E Funding (R5) | | February 2006 |
|---|---|---|
| BUDGET ACTIVITY<br>**5 - System Development and Demonstration** | PE NUMBER AND TITLE<br>**0604645A - Armored Systems Modernization (ASM)-Eng. Dev.** | PROJECT<br>**0604645A** |

Funding in $000

| Program | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| Special Termination | | 413 | 428 | 428 | 416 | 388 | 353 |
| Other Termination | | 443 | 512 | 531 | 514 | 437 | 395 |
| | | | | | | | |
| **Total Termination Liability Funding:** | | 856 | 940 | 959 | 930 | 825 | 748 |

**Remarks:**

The SDD Contract contains FAR 52.232-22, Limitation of Funds, and FAR 52.249-6, Termination (Cost-Reimbursement) clauses to define allowable termination costs. The above costs are estimated to cover contract performance and termination liability incurred. Special termination is currently approved for the OTA and has been submitted for approval for the FAR. STC are not included in the program budget. Once approved, if the contract is terminated, the government will pay for the following costs:

- Severance Pay, as provided in FAR 31.205-6(g);
- Reasonable costs continuing after termination, as provided in FAR 31.205-42(b);
- Settlement of expenses, as provided in FAR 31.205-42(g);
- Costs of return of field service personnel from sites, as provided in FAR 31.205-35 and FAR 31.205-46(c); and
- costs in paragraphs (a) (1), (2), (3), and (4) of this clause to which subcontractors may be entitled in the event of termination.

Other termination is currently not covered by the Government. Therefore, due to the limitations of the funding clause in the FAR, the LSI must retain funding to cover the full cost in case of termination. Those costs include prime and subcontractor costs for:

- Allowable Fee
- Cost incurred, but not bllled to the OTA/FAR contract
- Non-cancelable commitments
- Unexpired leases
- Alteration/restorations required by leases
- Loss of useful value of capital property

Full termination liability is a combination of the above Special Termination Costs and Other Termination Costs.

# ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

**February 2006**

| BUDGET ACTIVITY | PE NUMBER AND TITLE | PROJECT |
|---|---|---|
| **5 - System Development and Demonstration** | **0604645A - Armored Systems Modernization (ASM)-Eng. Dev.** | **F52** |

| COST (In Thousands) | | FY 2005 Estimate | FY 2006 Estimate | FY 2007 Estimate | FY 2008 Estimate | FY 2009 Estimate | FY 2010 Estimate | FY 2011 Estimate | Cost to Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|
| F52 | FCS- RECON PLATFORMS & SENSORS | 51034 | 52135 | 65555 | 68490 | 87574 | 131662 | 90626 | Continuing | 547076 |

**A. Mission Description and Budget Item Justification:** This Future Combat System(FCS) project covers all air platforms (Class I, Class II, Class III, and Class IV) and includes contractor development, engineering, prototype procurement and integration, test, and assembly. The Class I Unmanned Aerial Vehicle (UAV) provides the dismounted soldier Reconnaissance, Surveillance, and Target Acquisition (RSTA). Weighing less than 15 pounds, the air vehicle operates in complex urban and rural terrains with a vertical take-off and landing capability. The Class II Unmanned Aerial Vehicle (UAV) will be a vehicle-carried system that provides Line-of-Sight (LOS), Non-Line of Sight (NLOS) and Beyond Line of Sight (BLOS) capabilities, including enhanced dedicated imagery. The distinguishing capability of this UAV is target designation in day, night, and adverse weather. The Class II Unmanned Aerial Vehicle (UAV) is carried on the MGV and capable of being lifted by two Soldiers, has a 16 km radius of action, and can remain aloft for two hours. The Class III Unmanned Aerial Vehicle (UAV) is a multifunction aerial system that has the range and endurance to support battalion level RSTA within the Unit of Action's (UA) battle space. It provides the capabilities of the Class I and Class II but at longer ranges and higher altitudes in addition to communications relay, mine detection, Chemical, Biological, Radiological and Nuclear detection, and meteorological survey. The Class IV Unmanned Aerial Vehicle (UAV) has a range and endurance appropriate for the brigade mission. It supports the FCS(BCT)Commander with communications relay, long endurance persistent stare, and wide area surveillance over a 75 km radius.

IAW Section 214 of the FY2006 National Defense Authorization Act, this project will be converted to a stand alone Program Element commencing with the FY2008 President's Budget submission to Congress.

| **Accomplishments/Planned Program** | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Class I FY06 Continue maturation to Technical Readiness Level -7 (w/25th ID). Build on the Micro Air Vehicle (MAV) program to mature item development specification (PIDS), system architecture and risk management. Complete systems engineering contract for the maturation of the MAV into Class I. After successful MAV tech demonstration, the LSI will continue, with Honeywell, maturing requirements, specifications, architecture, and begin the Software Build I effort. Complete Platform-Unique (SFR) to demonstrate system requirements and readiness to initiate the March 06 system design. After the SFR, initiate design efforts and requirements refinement to ensure a successful PDR in early FY07. Award SDD Contract in 3Q FY06 to begin FCS Class I UAVS design. Complete baseline system, software architectures and risk assessment. Document baseline software requirements. Complete initial Interface Control Documents (ICDs) for internal and external interfaces. FY07 - Conduct system PDR to confirms the requirements are defined and initial detailed prototype design is ready to be initiated. Begin prototype hardware procurement. Initiate delivery and integration of hardware sub-systems and avionics to Honeywell's production facility. Complete baseline hardware and software configuration item specifications. Complete system and software architectures and requirements. Complete initial validation and verification plan. Complete Experiment 1.1 and documented experiment results of operation of the MAV system utilizing a JTRS surrogate (SLICE) radio link and the SRW waveform. Deliver Class I simulation to SoSIL. | 5087 | 1279 | 1879 |
| Class II FY06 Continue with the three systems engineering contracts to begin technology analysis and assessment to show how the potential solutions meet the UAV requirements. These engineer efforts will be used to: demonstrate maturity of key technologies, identify technical gaps relative to FCS requirements, develop specifications, and finalize requirements. DARPA decision in 3Q FY06 to down-select to one OAV II supplier and LSI decision to award option for Phase 2 to the LSI supplier. This decision point will initiate the flight demonstration phase and the design and fabrication of two prototypes for FY07/08 demonstrations of flight characteristics, logistics and | 348 | 4154 | 6102 |

| | | | |
|---|---|---|---|
| training at Technical Readiness Level - 6 maturity level. Provide early simulation software for FCS SoS labs. FY07 Provide updated simulations for SoS labs and prepare for System and Integration Lab activities in FY08. Sub-tier suppliers will deliver air frame, navigation, communication and control equipment to the competing suppliers for integration prior to the Fy08 flight demonstration that will support the final source selections. Selected suppliers will contribute to the initial prime item development specs, systems architecture models, and interface definitions and develop risk management plans that demonstrate the suitability of their proposed design solutions. Development of prototype LSI & DARPA systems for flight demonstrations. Develop & release PIDS and RFP for the down selection in June 2008 to a single partner for SDD. | | | |
| Class III FY06 Continue the three LSI CL III, systems engineering contracts to begin technology analysis and assessment to show how their solutions meet the UAV requirements. These technologies, along with the knowledge gained from the DARPA technology from the DP-5 program will be used for the following activities. Demonstrate maturity of key technologies and identify technical gaps relative to FCS requirements; develop specifications; down select to two suppliers. This decision point will initiate the system assessment (flight demonstration) phase and begin the design and fabrication of two prototypes for FY07/08 demonstrations of flight characteristics, logistics and training at Technical Readiness Level - 6 maturity level. Provide simulations software for FCS SoS labs. FY 07 - Provide updated simulations for SoS labs and prepare for System and Integration Lab activities in FY08. Sub-tier suppliers will deliver air frame, navigation, communication and control equipment to the competing suppliers for integration prior to the FY08 flight demonstration that will support the final down selection. Selected suppliers will contribute to the prime item development specs, systems architecture models, and interface definitions and develop risk management plans that demonstrate the suitability of their proposed design solutions. Development of prototype systems for flight demonstrations and assessment. Develop & release PIDS and RFP for the down selection to a single partner for SDD. | 338 | 11595 | 17030 |
| CLASS IV FY06 Conduct SFR and PDR and begin design activities. Complete baseline system, software architectures and requirements. Complete ICDs, PDR and baseline hardware and software configuration item specifications. Complete system and software architectures and requirements. Complete initial validation and verification plan. Conduct Subsystem level testing of common hardware will be performed at Schweizer Aircraft prior to delivery to Northrop Grumman. Accept delivery of common Army/Navy airframes including airframe, rotors, engine, transmission, and three avionics items. Begin production of Army's first Class IV Air Vehicle, less FCS-unique suite of avionics/payloads. Perform demonstration flights. Complete Software Build I. FY07- Complete first Air Vehicle production less FCS-unique avionics/payloads. Continue Modeling and Simulation and software development and integration leading to a CDR. Complete detailed design for (CDR). Continued initial build software integration verification and validation testing. Begin build for second iteration of integrated software. Schweizer Aircraft will complete delivery of eight airframes with propulsion systems to Northrop Grumman. Northrop Grumman complete build of 8 MQ-8B airframes. Northrop Grumman to begin factory integration of systems and payloads. Perform testing, engage in simulations and emulations and participate in the FCS SoSil activities. | 27665 | 27607 | 40544 |
| GFX - Common Firescout Prototype - Government Support to the LSI - Airframe hardware purchased from the Navy to support Class IV development. Combine ASTAMIDS complementary program with RSTA sensor into one sensor. Purchased 8 Navy Fire Scout AV. | 12096 | 0 | 0 |
| ASTAMIDS GFX Sensors: In FY05, the following major actions were accomplished: Modified requirements for Army Airborne Standoff Minefield detection system (ASTAMIDS) Electro Optic/Infrared (EO/OR) sensor Complementary Program(CP) to include FCS Reconnaissance, Surveillance, and Target Acquisition (RSTA) capability. developed ICDs and monitored Synthetic Aperture Radar/Moving Target Indicator(SAR/MTI) payload (CP) design. Developed ICDs and monitored of Tactical signals Intelligence(SIGNET)Payload(CP)design. Defined approaches to survivability sensors for Class IV Unmanned Air Vehicle(UAV). Defined Class II and III UAV and sensor requirements. Developed and delivered Air Sensors simulations for IV0. As briefed to the Professional staff members, beginning in FY06, all sensor costs are included in the Network hardware development cost are included in | 5500 | 7500 | 0 |

| | | | |
|---|---|---|---|
| SoS engineering and Program Management project.FY06 - Deliver an updated sumulator sensor to be tested as part of Integration/Verification 1(IV1). | | | |
| Total | 51034 | 52135 | 65555 |

| **B. Other Program Funding Summary** | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | To Compl | Total Cost |
|---|---|---|---|---|---|---|---|---|---|
| 0604645 F52 UAV RECON & SENSORS | 51034 | 52135 | 65555 | 68490 | 87574 | 131662 | 90626 | 0 | 547076 |
| 0604645 F53 UGV | 65066 | 124988 | 107705 | 145693 | 146565 | 111391 | 97621 | 0 | 799029 |
| 0604645 F54 UGS | 15015 | 32131 | 17731 | 16515 | 12771 | 15913 | 1318 | 0 | 111394 |
| 0604645 F55 SUSTAINMENT | 56613 | 143356 | 146106 | 164538 | 197448 | 169671 | 147496 | 0 | 1025228 |
| 0604645 F57 MANNED GROUND VEHICLES | 313263 | 513896 | 570241 | 583483 | 821110 | 755918 | 411264 | 0 | 3969175 |
| 0604645 F61 SoS Engineering & Program Management | 1597139 | 1879210 | 2403139 | 2303689 | 1853009 | 1829927 | 1884924 | 0 | 13751037 |
| 0604646 F72 Non-LINE OF SIGHT LAUNCH SYSTEM (NLOS-LS) | 119767 | 231209 | 322880 | 274793 | 256283 | 89143 | 17759 | 0 | 1311834 |
| 0604647 F58 Non-LINE OF SIGHT CANNON (NLOS-C) | 286853 | 146271 | 112237 | 117605 | 90647 | 84160 | 44356 | 0 | 882129 |
| WTCV | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0604645 F59 Common Components | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 27500 |
| 0604645 F60 Family of Systems, Analysis & Integration | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 165302 |
| 0604645 F62 Mission Equipment Platforms | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 132537 |
| 0604645 F63 Network Software | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 111745 |
| 0604645 F64 Other Contract Costs | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 313536 |
| 0604645 F65 SoS Engineering & Prog Mgt | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 190331 |
| 0604645 F66 SoS Test and Evaluation | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 56347 |
| 0604645 F67 Supportability | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5252 |
| 0604645 F69 Training | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7756 |
| 0604645 F70 NLOS Launch System | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 49502 |

**C. Acquisition Strategy** During the FY06-11 POM process, the Army restructured the PM BCT Acquisition Program. The plan strengthened the FCS Program and simultaneously improved the Current Force through early delivery of selected FCS capabilities. The adjustments maintained the Army focus on FCS-equipped Brigade Combat Team (BCT) development and substantially reduced program risk. The adjustments to the FCS Program acquisition strategy fall into four primary categories:

- The development of system integration/verification phases to build FCS (BCT) capability iteratively over time, reducing overall technical risk by using a building block approach.
- The five previously deferred FCS core systems: 1) UAV Class II, 2) UAV III, 3) Armed Robotic Vehicle (ARV) -Assault, 4) ARV-Reconnaissance and 5) FCS Maintenance and Recovery Vehicle have been funded. These five systems will be fielded with the first FCS-equipped BCT allowing fielding of the complete 18 + 1 + 1 FCS core systems to the Army with delivery beginning in 2014.
- More robust experimentation and evaluation are included in the program to prove revolutionary concepts, mature the architecture and components, and assist in the spinout development.
- A series of Spinout packages will begin procurement in 2009 and continue approximately every two years through 2014 to insert FCS capability into Current Force Modular Brigade Combat Teams (M-BCTs) to include Heavy and Infantry.

The current OTA was initially modified on 6 Aug 2004 to cover the new Scope of Work (SOW) of the approved POM program. Final definitization of this modification occurred on 2 March 2005. Since FY05 funding was based on the original Milestone B approved program, two major reprogramming have occurred in order to align funding of the restructured program.

The Assistant Secretary of the Army (Acquisition, Logistics and Technology) in May 05 directed that the current FCS (BCT) OTA with the LSI be converted from an OTA to a Federal Acquisition Regulation-based contract. This transition was executed through the award of an Unpriced Contractual Action (UCA) in Sep 05.

The letter contract became effective 30 Sep 2005, and replaced the FCS SDD Other Transaction Agreement (OTA) DAAE07-03-9-F001 for most SDD effort performed beginning 20 Sep 2005 and thereafter. The LSI and the Government recognize that some effort remains to be completed under the OTA after 30 Sep 05, having to do with orderly OTA close-out and the like. Therefore, future funding profiles will be adjusted based on the definitization of UCA and subsequent adjusted Earned Value Management Baseline. The FAR based contract is scheduled to be definitized in March 2006.

IAW Section 214 of the FY2006 National Defense Authorization Act, this project will be converted to a stand alone Program Element commencing with the FY2008 President's Budget submission to Congress.

# ARMY RDT&E COST ANALYSIS (R3)

**February 2006**

BUDGET ACTIVITY
**5 - System Development and Demonstration**

PE NUMBER AND TITLE
**0604645A - Armored Systems Modernization (ASM)-Eng. Dev.**

PROJECT
**F52**

| I. Product Development | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2005 Cost | FY 2005 Award Date | FY 2006 Cost | FY 2006 Award Date | FY 2007 Cost | FY 2007 Award Date | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CLASS I | OTA/FAR | THE BOEING CO., SEATTLE,WA SEE REMARK 1 | 0 | 5087 | 1-3Q | 1279 | 3Q | 1879 | 1-3Q | 0 | 0 | 0 |
| CLASS II | OTA/FAR | THE BOEING CO., SEATTLE,WA SEE REMARK 4 | 0 | 348 | 4Q | 4154 | 1-3Q | 6102 | 1-3Q | 0 | 0 | 0 |
| CLASS III | OTA/FAR | THE BOEING CO., SEATTLE,WA SEE REMARK 4, 5, 6 | 0 | 338 | 4Q | 11595 | 1-3Q | 17030 | 1-3Q | 0 | 0 | 0 |
| CLASS IV | OTA/FAR | THE BOEING CO., SEATTLE,WA SEE REMARK 2 | 32690 | 27665 | 1-3Q | 27607 | 1-3Q | 40544 | 1Q | 0 | 0 | 0 |
| 0 | 0 | 0 | 8683 | 0 | | 0 | | 0 | | 0 | 0 | 0 |
| Subtotal: | | | 41373 | 33438 | | 44635 | | 65555 | | 0 | 0 | 0 |

Remarks: Remark 1: Subcontractor: Honeywell,- Albuquerque,New Mexico
Remark 2: Subcontractor: Northrop Grumman Systems Corp.- San Diego, CA
Remark 3: Subcontractor: Northrop Grumman, Electronics Systems Division, Linthieum, MD
Remark 4: Subcontractor: Piasecki Aircraft Corporation - Essington, PA
Remark 5: Subcontractor: Teledyne Brown Engineering - Huntsville, AL
Remark 6: Subcontractor: AAI Corporation - Hunt Valley, MD

| II. Support Costs | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2005 Cost | FY 2005 Award Date | FY 2006 Cost | FY 2006 Award Date | FY 2007 Cost | FY 2007 Award Date | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Government GFX ASTAIMIDS, RSTA Sensor, Firescout | Direct | PM FCS (BCT) , St. Louis, MO | 0 | 17596 | 1-3Q | 7500 | 1-3Q | 0 | | 0 | 0 | 0 |
| Government Statutory Reductions | Direct | PM FCS (BCT) , St. Louis, MO | 0 | 0 | | 0 | | 0 | | 0 | 0 | 0 |
| Subtotal: | | | 0 | 17596 | | 7500 | | 0 | | 0 | 0 | 0 |

Remarks: All support costs for this project are included in F61 SoS Engineering and Program Management project.

# ARMY RDT&E COST ANALYSIS (R3)

**February 2006**

BUDGET ACTIVITY
**5 - System Development and Demonstration**

PE NUMBER AND TITLE
**0604645A - Armored Systems Modernization (ASM)-Eng. Dev.**

PROJECT
**F52**

| III. Test And Evaluation | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2005 Cost | FY 2005 Award Date | FY 2006 Cost | FY 2006 Award Date | FY 2007 Cost | FY 2007 Award Date | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Subtotal: | | | 0 | | | | | | | | | |

Remarks: All Test and Evaluation costs for this project are included in F61 SoS Engineering and Program Management project.

| IV. Management Services | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2005 Cost | FY 2005 Award Date | FY 2006 Cost | FY 2006 Award Date | FY 2007 Cost | FY 2007 Award Date | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Subtotal: | | | 0 | | | | | | | | | |
| **Project Total Cost:** | | | **41373** | **51034** | | **52135** | | **65555** | | **0** | **0** | **0** |

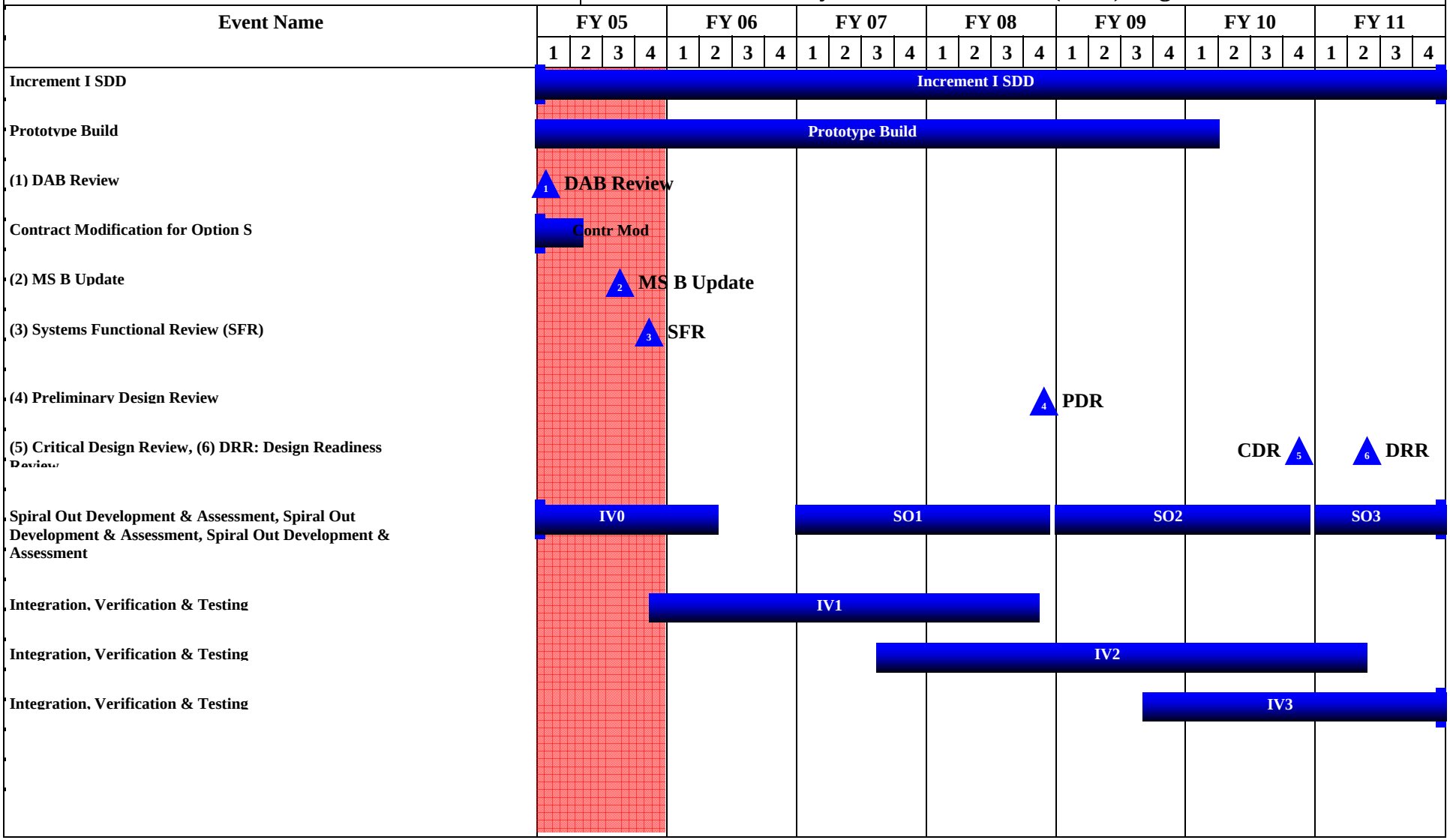
# Schedule Profile (R4 Exhibit)

**February 2006**

BUDGET ACTIVITY
**5 - System Development and Demonstration**

PE NUMBER AND TITLE
**0604645A - Armored Systems Modernization (ASM)-Eng. Dev.**

PROJECT
**F52**



# Schedule Detail (R4a Exhibit)

**February 2006**

| BUDGET ACTIVITY | PE NUMBER AND TITLE | PROJECT |
|---|---|---|
| **5 - System Development and Demonstration** | **0604645A - Armored Systems Modernization (ASM)-Eng. Dev.** | **F52** |

| Schedule Detail | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| ADM Required MS B Update | 3Q | | | | | | |
| Definitization of Contract modification for POM-adjusted Program | 2Q | | | | | | |
| SoS Functional Review (FR) | 4Q | | | | | | |
| SoS Preliminary Design Review (PDR) | | | | 4Q | | | |
| Phase 1 Integration at Test Completion | 4Q | | | | | | |
| Phase 2 Integration at Test Completion | | | 3Q | | | | |
| Phase 3 Integration at Test Completion | | | | 2Q | | | |
| SoS Critical Design Review (CDR) | | | | | | 4Q | |
| Design Ready Review | | | | | | | 2Q |

| COST (In Thousands) | | FY 2005 Estimate | FY 2006 Estimate | FY 2007 Estimate | FY 2008 Estimate | FY 2009 Estimate | FY 2010 Estimate | FY 2011 Estimate | Cost to Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|
| F53 | FCS- UNMANNED GROUND VEHICLES (UGV) | 65066 | 124988 | 107705 | 145693 | 146565 | 111391 | 97621 | Continuing | 799029 |

**A. Mission Description and Budget Item Justification:** This FCS project includes contractor efforts for developmental and engineering effort for requirement analysis, specification determination and justification, and detail design packages for integration of common and mission equipped Unmanned Ground Vehicles. The focus is on a producible, reliable, sustainable, maintainable, and affordable design. Also included are subsystem prototypes, models, and/or simulations to support development, tests, and demonstrations. Unmanned platforms include: Armed Robotic Vehicles-Reconnaissance (ARV-RSTA) and ARV-Assault (ARV-A), Small Unmanned Ground Vehicle (SUGV), Multi-function Utility/Logistics Equipment-Transport (MULE-T), MULE-Countermine (CM), and ARV-A Light (ARV-L). In addition to the UGV, this project includes the development of the hardware and software for the Autonomous Navigation System (ANS) required for operation of the UGVs and leader-follower capability for the Manned Ground Vehicles (MGV).

ARV
The ARV comes in two variants: the Assault (ARV-A) variant, and the Reconnaissance, Surveillance and Target Acquisition (ARV-RSTA) variant. The ARV-A and ARV-RSTA will have different mission payloads mounted on a common chassis capable of staying with MGVs. The ARV-A will be utilized to maneuver forward of the mounted and dismounted elements in the attack or within the defense. The ARV-A will provide direct fire and anti-tank (AT) weapons; occupy key terrain and provide over-watching fires and effects; provide Line-of-Sight (LOS) fires; provide Beyond-Line-of-Sight (BLOS) fires to destroy vehicles and fortified positions; employ non-lethal munitions; remotely provide limited reconnaissance capability; remotely deploy sensors; remotely assess battle damage; and act as a communications relay. The ARV-RSTA variant will provide Reconnaissance, Surveillance and Target Acquisition for the FCS (BCT). The ARV-RSTA accompanies mounted and reconnaissance units and fills the role of an additional "scout", gathering information forward of the MGVs. The ARV-RSTA consists of a common chassis platform with payloads that provide video capability, digital communications/audio relay modules (plug in/out), and advanced sensors/mission modules. The ARV-RSTA will provide reconnaissance capability in Urban Military Operations in Urban Terrain and other battlespace; deploy sensors, highlight targets (direct-fire weapons and special munitions into buildings, bunkers, and other urban features); locate or by-pass threat obstacles in buildings, bunkers, tunnels, and other urban feature,act as a communications relay and perform battle damage assessment.

MULE
The MULE Vehicle is a 2.5-ton UGV that will support dismounted operations. It consists of four major components:
• Mobility platform or common chassis.
• ANS. The ANS is the mission payload package that will be integrated on both the MULE vehicle and ARVs to provide a robotic semiautonomous capability and also on the family of MGVs to provide a leader-follower capability.
• Operator Control Unit (OCU).
• Three Mission equipment packages.
The MULE vehicle has three variants sharing a common chassis: transport(MULT-T), countermine (MULE-CM), and the ARV-A(L). The MULE-T will carry 1,900-2,400 pounds of equipment and rucksacks for dismounted infantry squads with the mobility needed to follow squads in complex terrain. The MULE-CM will provide the capability to

detect, mark and neutralize individual anti-tank mines by integrating a mine detection mission equipment package from the Ground Standoff Mine Detection System (GSTAMIDS) FCS program. The ARV-A(L)is a mobility platform with an integrated weapons and RSTA package to support the dismounted infantry's efforts to locate and destroy enemy platforms and positions. The centerpiece of the MULE Common Chassis's is superior mobility built around an articulated suspension system to negotiate obstacles and gaps that a dismounted squad might encounter.

SUGV
The SUGV is a small, lightweight, manportable UGV capable of conducting military operations in urban terrain tunnels, sewers, and caves. The SUGV enables the performance of manpower intensive or high-risk functions (i.e. urban Intelligence, Surveillance, and Reconnaissance (ISR) missions, chemical/Toxic Industrial Chemicals/Toxic Industrial Materials, reconnaissance, etc.) without exposing Soldiers directly to the hazard. The SUGV's modular design allows multiple payloads to be integrated in a plug-and-play fashion. Weighing less than 30 pounds, it is capable of carrying up to six pounds of payload weight.

IAW Section 214 of the FY2006 National Defense Authorization Act, this project will be converted to a stand alone Program Element commencing with the FY2008 President's Budget submission to Congress.

| **Accomplishments/Planned Program** | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| ARV Systems Engineering and Program Management (SEPM) - FY06 will continue to refine the platform specifications for review at the ARV System Functional Review (SFR) in 4QFY06. This milestone review will verify that system level requirements are properly aligned with the SoS specification. FY07 will continue the maturation of the platform designs. This activity will be reviewed at the ARV Preliminary Design Review (PDR) which will verify that system designs are compliant with system level requirements as outlined in the ARV Prime Item Development Specifications (PIDS) documents. | 11098 | 15997 | 17351 |
| ARV Common - FY06 will continue to refine the platform specifications and develop Integrated UGV Platform Simulations for review at the ARV SFR, to verify that system level requirements are properly aligned with the SoS Specification and correctly flowed down to the Common Mobility Platform and common subsystems for the ARV-Assault (ARV-A) and ARV-RSTA variants. Common component level testing will be initiated to support efforts leading to the PDR in FY07. Develop initial ARV Automotive Test Rig (ATR) consisting of chasis,suspension,bandtrack, propulsion and vehicle management subsystems to mitigate mobility, RAM-T and ANS integration risks. Major components included in the ATR are Chassis, Engine, Steering, Transmission, Cooling System, Suspension System, Vehicle Management System Controller and Software. Initial ARV simulations (including Autonomous Navigation System simulations) will be prepared and tested in FY06. FY07 will continue the maturation of the ARV Common Mobility Platform and other common component designs leading to the ARV PDR. ARV PDR will verify that system preliminary designs are compliant with system level requirements as outlined in the ARV PIDS. Updated ARV simulations and emulations will be delivered to the SoSIL with support for testing for IV1. Conduct Technology and Integration Risk Reduction Activities. ARV ATR (including the ANS system) will complete final integration, system checkout and testing to demonstrate key semi-autonomous and tele-operated mobility modes. Complete fabrication, and install pre-prototype ANS. Initial integrated system checkout will begin in early FY07. Initiate ARV Automotive Test Rig (ATR) testing to verify mobility performance and component reliability to support the ARV PDR. Conduct Technology and Integration Risk Reduction Activities. Develop Integrated UGV platform software simulations and deliver to SOSIL. | 6226 | 17647 | 12797 |
| MULE Common Components - FY06 will continue to refine the platform specifications and develop Integrated UGV Platform Simulations for review at the MULE SFR, to verify that system level requirements are properly aligned with the SoS Specification and | 6945 | 7919 | 5856 |
| | | | |

| | | | |
|---|---|---|---|
| correctly flowed down to MULE common sub-systems. Common component level testing will be initiated to support efforts leading to the PDR. Conduct Technology and Integration Risk Reduction Activities. MULE Common Platform Engineering Evaluation Unit (EEU) completes preliminary design, fabrication and integration. Major components included in the EEU are Hub Motor,Gearbox,Starter/Generator, Cooling System, Engine,Hydraulic Suspension System, Chassis, Bi-Directional Controllers and Common Power Controllers. Initial integrated system checkout will also begin just prior to FY07. Updated MULE simulations (including Autonomous Navigation System updated simulations) will be prepared and tested. FY07 Mule PDR will verify that system preliminary designs are compliant with system level requirements as outlined in the MULE PIDS documents. The updated MULE simulations and emulations will be delivered to the SoSIL with support for testing for IV1. We will conduct Technology and Integration Risk Reduction Activities. MULE EEU (including the ANS system)will complete all integrated system checkout. | | | |
| MULE SEPM - FY06 will continue to refine the MULE platform specifications. This activity will be reviewed at the MULE SFR, which will be used to verify that system level requirements are properly aligned with the SoS Specification and correctly flowed down to MULE sub-systems. FY07 will continue the maturation of the MULE platform designs. This activity will be reviewed at the MULE PDR. This review will be used to verify that system designs are compliant with system level requirements as outlined in the MULE PIDS documents. Complete the MULE simulation and support testing at the SoSIL. Simulations and Emulations - FY07 - Updated digital system simulations will be delivered to the LSI SoS and C4ISR SILs to support IV1 activities. | 8294 | 25919 | 26610 |
| MULE-T- FY06 will continue to refine the MULE-T platform specifications. Procurement and fabrication of an EEU will be accomplished. Component level testing will be accomplished to support efforts leading to the Preliminary Design Review in FY07. Integrate the update ANS simulation and update the MULE-T simulation for delivery to the SoSIL. FY07 - Continue the maturation of the MULE platform designs,leading to the MULE PDR 4Q FY07 to show readiness to enter detailed design. Complete fabrication of the pre prototype MULE-T, to include installing pre-prototype ANS. Initiate MULE-T EEU testing to reduce risk in support the MULE PDR. Prototype and Hardware Deliveries - FY06 - 07 Pre-prototype EEU and component level fabrication, procurement, and testing.- Simulations and Emulations- Updated digital system simulations will be delivered to the LSI SoS and C4ISR SILs to support IV1 activities. | 5456 | 8508 | 8258 |
| ANS - FY06 will continue to refine the ANS specifications. This activity will be reviewed at the ANS SFR, which will be used to verify that system level requirements are properly aligned with the SoS Specification and the MGV and UGV platform PIDS, and correctly flowed down to ANS sub-systems. Will initiate fabrication of ANS pre-prototypes and install on legacy vehicles to conduct robotic operations. Update the ANS simulation for delivery and integration into the MULE, ARV, and MGV simulations. Procurement of the GPS/INS hardware for delivery to the NLOS-C prototypes. Complete System Functional Reviews (establishment of requirements baseline). Develop system specification and test approach for Robotic Convoy systems including design and build of HEMTT drive-by-wire capability, surrogate communication system, and operator control unit. Initiate the software design and development activities for required Robotic Convoy behaviors and initiate build of the ANS OCU, CPU, LIPM, and IPM breadboards. FY07 will continue the maturation of the ANS design, which will be reviewed at the ANS PDR. Complete fabrication of the ANS for legacy vehicles and initiate testing of robotic operations to support the PDR. Six surrogate vehicles to support ANS development. Fabricate ANS pre-prototypes for the MULE EEU and ARV EEU. ANS pre-prototypes for legacy platforms for robotic operations. Support integration of the ANS simulation into the MULE, ARV, and MGV simulations. Component level fabrication and testing Image Perception Module of the ANS. Conduct Robotic Convoy system integration and test of all hardware/software systems (LIPM, IPM, ANS computer, MMW, GPS/INS) on legacy vehicles (Stryker and HEMTT). Conduct increasingly more difficult experiments and demonstrations of Robotic Convoy capabilities, including teleoperation, leader/follower, move-on-route, wingman, and forward leading. | 18908 | 37513 | 28121 |
| SUGV- FY06 will continue to refine the specifications for review at the SUGV SFR, which will be used to verify that system level | 8139 | 11485 | 8712 |

| | | | |
|---|---|---|---|
| requirements are properly aligned with the SoS Specification and correctly flowed down to SUGV sub-systems. Rapid prototyping of pre-prototypes design concepts will be fabricated and tested to support the SUGV risk reduction in mobility performance, weight, and integration. SUGV simulation will be delivered for use in the SoSIL. Pre-prototype will include Chassis, brushless DC motor controller, Power board, Head Controller board, video board, and Neck Drive board. Conduct Technology and Integration Risk Reduction Activities beyond the pre-prototypes. Develop Integrated UGV Platform Simulations for delivery. Complete PDR for SUGV, to verify initial design meets requirements baseline prior to detail design initiation. FY07 will continue the maturation of the design for the SUGV CDR to verify that system design is compliant with system level requirements as outlined in the SUGV PIDS and ready for full prototype fabrication. Another pre-prototype will be fabricated and tested to support the minimal integrated risk levels needed at SUGV CDR. Simulation and support testing will be conducted using the SoSIL. Simulations and Emulations - Updated digital system simulations will be delivered to the LSI SoS and C4ISR SILs to support IV1 activities. Conduct Technology and Integration Risk Reduction Activities. Continue pre-prototype SUGV integration. Develop Integrated UGV Platform Simulations. | | | |
| Total | 65066 | 124988 | 107705 |

| **B. Other Program Funding Summary** | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | To Compl | Total Cost |
|---|---|---|---|---|---|---|---|---|---|
| 0604645 F52 Unmanned Areial Vehicles (UAV) | 51034 | 52135 | 65555 | 68490 | 87574 | 131662 | 90626 | 0 | 547076 |
| 6004645 F53 Unmanned Ground Vehicles (UGV) | 65066 | 124988 | 107705 | 145693 | 146565 | 111391 | 97621 | 0 | 799029 |
| 0604645 F54 (UGS) | 15015 | 32131 | 17731 | 16515 | 12771 | 15913 | 1318 | 0 | 111394 |
| 0604645 F55 Sustainment | 56613 | 143356 | 146106 | 164538 | 197448 | 169671 | 147496 | 0 | 1025228 |
| 6064645 F57 (MGV) | 313263 | 513896 | 570241 | 583483 | 821110 | 755918 | 411264 | 0 | 3969175 |
| 6064645 F61 SoS Engineering & Program Management | 1597139 | 1879210 | 2403139 | 2303689 | 1853009 | 1829927 | 1884924 | 0 | 13751037 |
| 0604646 F72 Non-Line of Sight Launch System (NLOS-LS) | 119767 | 231209 | 322880 | 274793 | 256283 | 89143 | 17759 | 0 | 1311834 |
| 0604647 F58 Non-Line of Sight Cannon (NLOS-C) | 286853 | 146271 | 112237 | 117605 | 90647 | 84160 | 44356 | 0 | 882129 |
| WTCV | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0604645 F59 Common Components | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 27500 |
| 0604645 F60 Family of Systems, Analysis & Integration | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 165302 |
| 0604645 F62 Mission Equipment Platforms | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 132537 |
| 0604645 F63 Network Software | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 111745 |
| 0604645 F64 Other Contracts Costs | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 313536 |
| 0604645 F65 SoS Engr & Prog Mgt | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 190331 |
| 0604645 F66 SoS Test and Evaluation | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 56347 |
| 0604645 F67 Supportability | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5252 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 0604645 F69 Training | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7756 |
| 0604645 F70 NLOS Launch System | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 49502 |

**C. Acquisition Strategy** During the FY06-11 POM process, the Army restructured the PM BCT Acquisition Program. The plan strengthened the FCS Program and simultaneously improved the Current Force through early delivery of selected FCS capabilities. The adjustments maintained the Army focus on FCS-equipped Brigade Combat Team (BCT) development and substantially reduced program risk. The adjustments to the FCS Program acquisition strategy fall into four primary categories:
- The development of system integration/verification phases to build FCS (BCT) capability iteratively over time, reducing overall technical risk by using a building block approach.
- The five previously deferred FCS core systems: 1) UAV Class II, 2) UAV III, 3) Armed Robotic Vehicle (ARV) -Assault, 4) ARV-Reconnaissance and 5) FCS Maintenance and Recovery Vehicle have been funded. These five systems will be fielded with the first FCS-equipped BCT allowing fielding of the complete 18 + 1 + 1 FCS core systems to the Army with delivery beginning in 2014.
- More robust experimentation and evaluation are included in the program to prove revolutionary concepts, mature the architecture and components, and assist in the spinout development.
- A series of Spinout packages will begin procurement in 2009 and continue approximately every two years through 2014 to insert FCS capability into Current Force Modular Brigade Combat Teams (M-BCTs) to include Heavy and Infantry.

The current OTA was initially modified on 6 Aug 2004 to cover the new Scope of Work (SOW) of the approved POM program. Final definitization of this modification occurred on 2 March 2005. Since FY05 funding was based on the original Milestone B approved program, two major reprogramming have occurred in order to align funding of the restructured program.
The Assistant Secretary of the Army (Acquisition, Logistics and Technology) in May 05 directed that the current FCS (BCT) OTA with the LSI be converted from an OTA to a Federal Acquisition Regulation-based contract. This transition was executed through the award of an Unpriced Contractual Action (UCA) in Sep 05.
The letter contract became effective 30 Sep 2005, and replaced the FCS SDD Other Transaction Agreement (OTA) DAAE07-03-9-F001 for most SDD effort performed beginning 20 Sep 2005 and thereafter. The LSI and the Government recognize that some effort remains to be completed under the OTA after 30 Sep 05, having to do with orderly OTA close-out and the like. Therefore, future funding profiles will be adjusted based on the definitization of UCA and subsequent adjusted Earned Value Management Baseline. The FAR based contract is scheduled to be definitized in March 2006.

IAW Section 214 of the FY2006 National Defense Authorization Act, this project will be converted to a stand alone Program Element commencing with the FY2008 President's Budget submission to Congress.

# ARMY RDT&E COST ANALYSIS (R3)

**February 2006**

BUDGET ACTIVITY
**5 - System Development and Demonstration**

PE NUMBER AND TITLE
**0604645A - Armored Systems Modernization (ASM)-Eng. Dev.**

PROJECT
**F53**

| I. Product Development | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2005 Cost | FY 2005 Award Date | FY 2006 Cost | FY 2006 Award Date | FY 2007 Cost | FY 2007 Award Date | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Armed Robotic Vehicle Assault (ARV- A) | OTA/FAR | The Boeing Company Seattle Washington see remark 2 | 4068 | 0 | 1-3Q | 0 | 1-3Q | 0 | 1-3Q | 0 | 0 | 0 |
| Armed Robotic Vehicle Reconaissance (ARV- R) | OTA/FAR | The Boeing Company Seattle Washington see remark 2 | 0 | 0 | 1-3Q | 0 | 1-3Q | 0 | 1-3Q | 0 | 0 | 0 |
| MULE Armed Robotic Vehicle Light (ARV- A(L)) | OTA/FAR | The Boeing Company Seattle Washington see remark 3 | 0 | 0 | 1-3Q | 0 | 1-3Q | 0 | 1-3Q | 0 | 0 | 0 |
| Small Unmanned Ground Vehicle (SUGV) | OTA/FAR | The Boeing Company Seattle Washington see remark 1 | 3471 | 8139 | 1-3Q | 11485 | 1-3Q | 8712 | 1-3Q | 0 | 0 | 0 |
| MULE T | OTA/FAR | The Boeing Company Seattle Washington see remark 3 | 12286 | 5456 | 1-3Q | 8508 | 1-3Q | 8258 | 1-3Q | 0 | 0 | 0 |
| Autonomous Navigation System - Software | OTA/FAR | The Boeing Company Seattle Washington see remark 4 | 10396 | 18908 | 1-3Q | 37513 | 1-3Q | 28121 | 1-3Q | 0 | 0 | 0 |
| MULE CM | OTA/FAR | The Boeing Company Seattle Washington see remark 3 | 0 | 0 | 1-3Q | 0 | 1-3Q | 0 | 1-3Q | 0 | 0 | 0 |
| ARV SEPM | OTA/FAR | The Boeing Company Seattle Washington see remark 2 | 0 | 11098 | 1-3Q | 15997 | 1-3Q | 17351 | 1-3Q | 0 | 0 | 0 |
| ARV COMMON | OTA/FAR | The Boeing Company Seattle Washington see remark 2 | 0 | 6226 | 1-3Q | 17647 | 1-3Q | 12797 | 2Q | 0 | 0 | 0 |
| MULE STE | OTA/FAR | The Boeing Company Seattle Washington see remark 3 | 0 | 0 | 1-3Q | 0 | 1-3Q | 0 | 1-3Q | 0 | 0 | 0 |
| MULE SEPM | OTA/FAR | The Boeing Company Seattle Washington see | 0 | 8294 | 1-3Q | 25919 | 1-3Q | 26610 | 1-3Q | 0 | 0 | 0 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | remark 3 | | | | | | | | | | |
| MULE Common | OTA/FAR | The Boeing Company Seattle Washington see remark 3 | 0 | 6945 | 1-3Q | 7919 | 1-3Q | 5856 | 1-3Q | 0 | 0 | 0 |
| Subtotal: | | | 30221 | 65066 | | 124988 | | 107705 | | 0 | 0 | 0 |

Remarks: Remark 1: Subcontractor: iRobot Corp. - Burlington, MA
Remark 2: Subcontractor: BAE - Ground Systems Division - Santa Clara, CA
Remark 3: Subcontractor: Lockheed Martin Missile and Fire Control - Grand Prairie, TX
Remark 4: Subcontractor: General Dynamics Robotic Systems - Westminister, MD

| II. Support Costs | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2005 Cost | FY 2005 Award Date | FY 2006 Cost | FY 2006 Award Date | FY 2007 Cost | FY 2007 Award Date | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Government Statutory Reductions | Direct | PM FCS (BCT), St. Louis, MO | 0 | 0 | | 0 | | 0 | | 0 | 0 | 0 |
| Subtotal: | | | 0 | 0 | | 0 | | 0 | | 0 | 0 | 0 |

Remarks: All support costs for this project are included in F61 SoS Engineering and Program Management project.

| III. Test And Evaluation | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2005 Cost | FY 2005 Award Date | FY 2006 Cost | FY 2006 Award Date | FY 2007 Cost | FY 2007 Award Date | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Subtotal: | | | 0 | | | | | | | | | |

Remarks: All Test and Evaluation costs for this project are included in F61 SoS Engineering and Program Management project.

| IV. Management Services | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2005 Cost | FY 2005 Award Date | FY 2006 Cost | FY 2006 Award Date | FY 2007 Cost | FY 2007 Award Date | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Subtotal: | | | 0 | | | | | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Total Cost:** | **30221** | **65066** | | **124988** | | **107705** | | **0** | **0** | **0** |

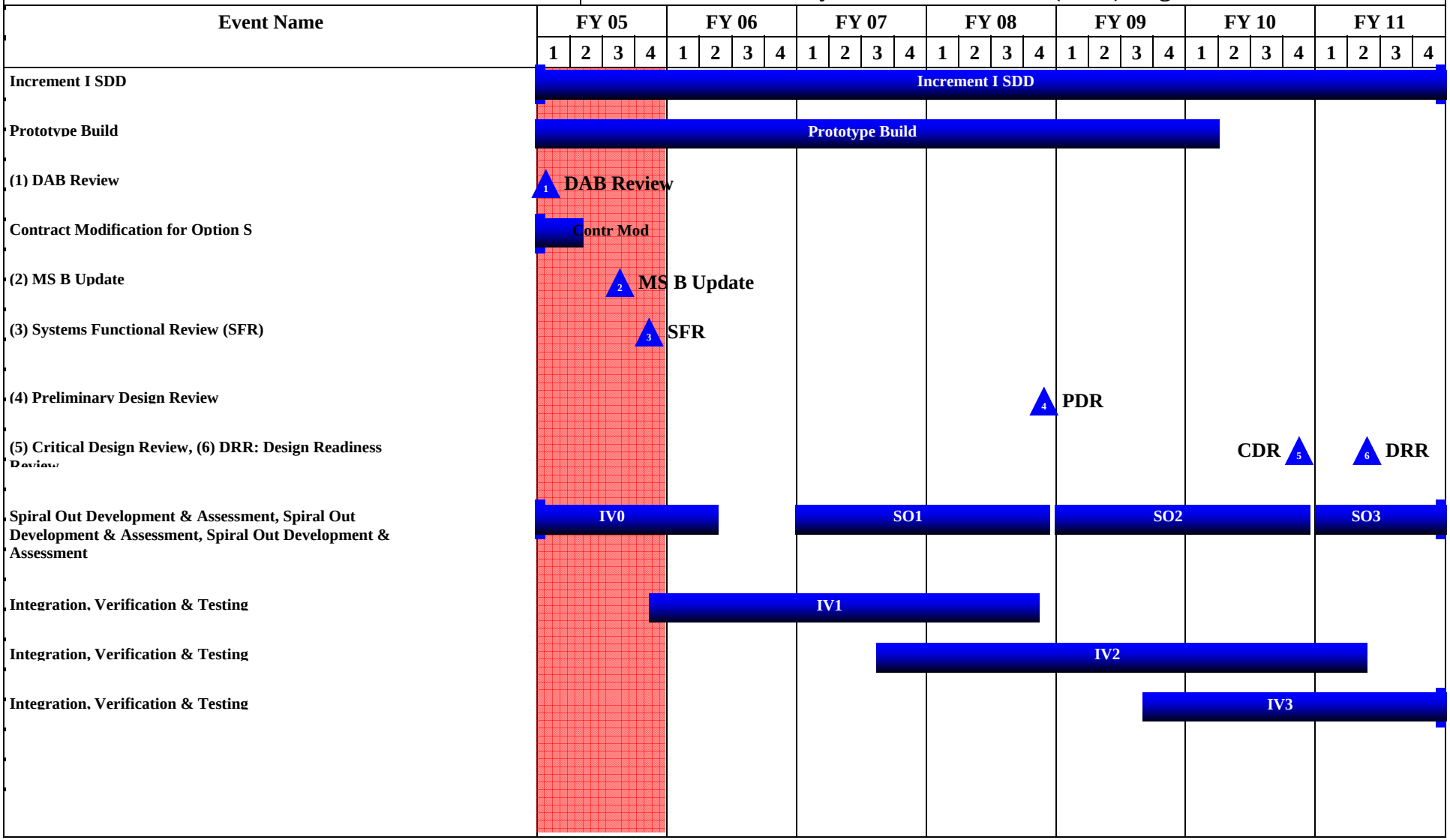
# Schedule Profile (R4 Exhibit)

**February 2006**

BUDGET ACTIVITY
**5 - System Development and Demonstration**

PE NUMBER AND TITLE
**0604645A - Armored Systems Modernization (ASM)-Eng. Dev.**

PROJECT
**F53**



# Schedule Detail (R4a Exhibit)

**February 2006**

| BUDGET ACTIVITY | PE NUMBER AND TITLE | PROJECT |
|---|---|---|
| **5 - System Development and Demonstration** | **0604645A - Armored Systems Modernization (ASM)-Eng. Dev.** | **F53** |

| Schedule Detail | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| ADM Required MS B Update | 3Q | | | | | | |
| Definitization of Contract Modification for POM-adjusted Program | 2Q | | | | | | |
| SoS Functional Review (FR) | 4Q | | | | | | |
| SoS Preliminary Design Review (PDR) | | | | 4Q | | | |
| Phase 1 Integration at Test Completion | 4Q | | | | | | |
| Phase 2 Integration at Test Completion | | | 3Q | | | | |
| SoS Critical Design Review (CDR) | | | | | | 4Q | |
| Phase 3 Integration at Test Completion | | | | 2Q | | | |
| Design Ready Review | | | | | | | 2Q |

# ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

**February 2006**

| BUDGET ACTIVITY | PE NUMBER AND TITLE | PROJECT |
|---|---|---|
| **5 - System Development and Demonstration** | **0604645A - Armored Systems Modernization (ASM)-Eng. Dev.** | **F54** |

| COST (In Thousands) | FY 2005 Estimate | FY 2006 Estimate | FY 2007 Estimate | FY 2008 Estimate | FY 2009 Estimate | FY 2010 Estimate | FY 2011 Estimate | Cost to Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|
| F54 UNATTENDED SENSORS | 15015 | 32131 | 17731 | 16515 | 12771 | 15913 | 1318 | Continuing | Continuing |

**A. Mission Description and Budget Item Justification:** This FCS project includes UGS development, engineering, prototype procurement and integration assembly.
The UGS systems is based on low risk, proven technologies that deliver critical capabilities. The modular design of these systems allow for integration of new capabilities within subsequent FCS Spin Outs.
The UGS program is an end-to-end, turnkey system of integrated acoustic and seismic sensors, multi-layer and multi-sensor fusion algorithms, networked and fielded hardware to provide warfighters with high confidence detection, classification and tracking of non-line of sight, mobile, time-critical targets in denied enemy areas. High confidence levels and precision will allow for indirect fire weapon targeting, remote scouting and augmentation/cueing of other C4ISR systems.

There are two configurations of UGS; Tactical and Urban. Tactical-UGS (T-UGS), which includes Intelligence, Surveillance and Reconnaissance (ISR)-UGS and Chemical, Biological, Radiological and Nuclear (CBRN)-UGS. The UGS (T-UGS) are designed for remote tactical operations in open spaces, at road choke points, avenues of approach, etc, and are designed to be emplaced by hand or by remote deployment methods. The T-UGS system consists of five configuration items (nodes), each containing a unique set of sensing capabilities, and sharing a common hardware form factor. The common form factor enables simplified scalability and upgrade paths for future technology insertion, while the distributed sensing capability enhances mission flexibility and system versatility. The T-UGS ISR node provides for vehicle and personnel detection capabilities via seismic, acoustic and magnetic sensors. The principal means of vehicle detection and tracking are the acoustic bearing sensors. Multiple sensors support precision location and simultaneous tracking of multiple targets. Seismic sensors are the primary means of personnel detection. When confirmed as a valid target of interest, Imaging nodes will autonomously capture multiple images of the target. The CBRN node provides for chemical, biological, radiological, and nuclear sensing and reporting capability. The Hazard/Clear Lane Marker (H/CLM) nodes are deployed to mark hazardous keep-out zones, or to define cleared lanes though hazardous areas such as minefields. The final component of the T-UGS system is the Long-Haul gateway node that provides radio communications and integration into the FCS network.

The Urban-UGS (U-UGS), also known as Urban Military Operations in Urban Terrain Advanced Sensor System. The Urban Unattended Ground Sensor (U-UGS) system is designed for use in confined spaces such as rooms, halls, attics, basements, sewers, caves, and alleyways. When a platoon or squad clears a building for example, U-UGS are left behind to perform surveillance that would otherwise require dedicated soldiers. The U UGS system provides a self-organizing wireless network that consists of three configuration items; personnel detect sensors, imaging sensors, and gateways. Personnel Detect Sensors provide dual mode, passive infrared and RF microwave motion sensing for "trip-wire" detection of intruders. Imaging Sensors provide electro-optical visual imaging with a near-infrared illuminator for operation in full darkness. Gateways organize and manage the sensor network, and communicate sensor data to FCS C2 systems and to the local dismounts.
IAW Section 214 of the FY2006 National Defense Authorization Act, this project will be converted to a stand alone Program Element commencing with the FY2008 President's Budget submission.

| **Accomplishments/Planned Program** | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| UNATTENDED GROUND SENSORS - FY06 - UGS program will utilize M&S to support concept definition, UGS design analysis and trades, and integration into the FCS (SoS) network-centric environment. UGS CIs/SCSIs will be released in early FY06 to support PDR Phases 1 and 2 and will begin the detailed design phase of the program. The Critical Design Review (CDR), Aug 2006, marks the design | 15015 | 32131 | 17731 |

| | | | |
|---|---|---|---|
| completion and initiates the fabrication and prototype build phase. In FY06, a IV phase 1 (IV1) is being performed to develop and exercise models consistent with the Spin Out 1 UGS configuration and FCS Environment Tests and Experiments. Tests include HALT Test, HAST Test, and Endurance test as well as the start of system integration testing. FY07 - Delivery of pre-qualification hardware to Boeing's C4ISR System Integration Lab (SIL) is scheduled in FY07 for integration testing with the C4ISR network elements. The delivery will augment other UGS Modeling & Simulation (M&S) efforts to conduct the Integration & Verification (IV) phase activities. A series of Integration & Verification (IV) phase activities are planned. Testing will be completed in FY07 to be followed by full system Integrated Qualification Test (IQT). Integration & Verification efforts and UA feedback will be utilized to refine the Spin Out 1 UGS system design and products, as well as provide input in subsequent Spin Outs. The UGS program is on track to deliver fully qualified UGS systems to the (SoS) SIL in FY 2007. | | | |
| Total | 15015 | 32131 | 17731 |

| **B. Other Program Funding Summary** | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | To Compl | Total Cost |
|---|---|---|---|---|---|---|---|---|---|
| 0604645 F52 UAV Recon Platform and Sensors | 51034 | 52135 | 65555 | 68490 | 87574 | 131662 | 90626 | 0 | 547076 |
| 0604645 F53 (UGV) | 65066 | 124988 | 107705 | 145693 | 146565 | 111391 | 97621 | 0 | 799029 |
| 0604645 F54 (UGS) | 15015 | 32131 | 17731 | 16515 | 12771 | 15913 | 1318 | 0 | 111394 |
| 0604645 F55 Sustainment | 56613 | 143356 | 146106 | 164538 | 197448 | 169671 | 147496 | 0 | 1025228 |
| 0604645 F57 Manned Ground Vehicles (MGV) | 313263 | 513896 | 570241 | 583483 | 821110 | 755918 | 411264 | 0 | 3969175 |
| 0604645 F61 SoS Engineering & Program Management | 1597139 | 1879210 | 2403139 | 2303689 | 1853009 | 1829927 | 1884924 | 0 | 13751037 |
| 0604646 F72 Non-Line of Sight Launch System (NLOS-LS) | 119767 | 231209 | 322880 | 274793 | 256283 | 89143 | 17759 | 0 | 1311834 |
| 0604647 F58 Non-Line of Sight - Cannon (NLOS-C) | 286853 | 146271 | 112237 | 117605 | 90647 | 84160 | 44356 | 0 | 882129 |
| WTCV | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0604645 F59 Common Components | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 27500 |
| 0604645 F60 Family of Systems,Anal & Int | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 165302 |
| 0604645 F62 Mission Equipment Platforms | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 132537 |
| 0604645 F63 Network Software | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 111745 |
| 0604645 F64 Other Contract Costs | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 313536 |
| 0604645 F65 S OF S Engr & Prog Mgt | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 190331 |
| 0604645 F66 S OF S Test and Evaluation | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 56347 |
| 0604645 F67 Supportability | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5252 |
| 0604645 F69 Training | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7756 |
| 0604645 F70 NLOS Launch Systems | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**C. Acquisition Strategy** During the FY06-11 POM process, the Army restructured the PM BCT Acquisition Program. The plan strengthened the FCS Program and simultaneously improved the Current Force through early delivery of selected FCS capabilities. The adjustments maintained the Army focus on FCS-equipped Brigade Combat Team (BCT) development and substantially reduced program risk. The adjustments to the FCS Program acquisition strategy fall into four primary categories:

- The development of system integration/verification phases to build FCS (BCT) capability iteratively over time, reducing overall technical risk by using a building block approach.
- The five previously deferred FCS core systems: 1) UAV Class II, 2) UAV III, 3) Armed Robotic Vehicle (ARV) -Assault, 4) ARV-Reconnaissance and 5) FCS Maintenance and Recovery Vehicle have been funded. These five systems will be fielded with the first FCS-equipped BCT allowing fielding of the complete 18 + 1 + 1 FCS core systems to the Army with delivery beginning in 2014.
- More robust experimentation and evaluation are included in the program to prove revolutionary concepts, mature the architecture and components, and assist in the spinout development.
- A series of Spinout packages will begin procurement in 2009 and continue approximately every two years through 2014 to insert FCS capability into Current Force Modular Brigade Combat Teams (M-BCTs) to include Heavy and Infantry.

The current OTA was initially modified on 6 Aug 2004 to cover the new Scope of Work (SOW) of the approved POM program. Final definitization of this modification occurred on 2 March 2005. Since FY05 funding was based on the original Milestone B approved program, two major reprogramming have occurred in order to align funding of the restructured program.

The Assistant Secretary of the Army (Acquisition, Logistics and Technology) in May 05 directed that the current FCS (BCT) OTA with the LSI be converted from an OTA to a Federal Acquisition Regulation-based contract. This transition was executed through the award of an Unpriced Contractual Action (UCA) in Sep 05.

The letter contract became effective 30 Sep 2005, and replaced the FCS SDD Other Transaction Agreement (OTA) DAAE07-03-9-F001 for most SDD effort performed beginning 20 Sep 2005 and thereafter. The LSI and the Government recognize that some effort remains to be completed under the OTA after 30 Sep 05, having to do with orderly OTA close-out and the like. Therefore, future funding profiles will be adjusted based on the definitization of UCA and subsequent adjusted Earned Value Management Baseline. The FAR based contract is scheduled to be definitized in March 2006.

IAW Section 214 of the FY2006 National Defense Authorization Act, this project will be converted to a stand alone Program Element commencing with the FY2008 President's Budget submission to Congress.

# ARMY RDT&E COST ANALYSIS (R3)

**February 2006**

BUDGET ACTIVITY
**5 - System Development and Demonstration**

PE NUMBER AND TITLE
**0604645A - Armored Systems Modernization (ASM)-Eng. Dev.**

PROJECT
**F54**

| I. Product Development | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2005 Cost | FY 2005 Award Date | FY 2006 Cost | FY 2006 Award Date | FY 2007 Cost | FY 2007 Award Date | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Unattended Ground Sensors (UGS) | OTA/FAR | The Boeing Company - Seattle, Wash., See Remark 1 | 6000 | 15015 | 1-3Q | 32131 | 1-3Q | 17731 | 1-3Q | 0 | 0 | 0 |
| Subtotal: | | | 6000 | 15015 | | 32131 | | 17731 | | 0 | 0 | 0 |

Remarks: Remarks 1: Subcontractor: Textron Systems,Intelligent Battlefield System Division - Willington, MA

| II. Support Costs | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2005 Cost | FY 2005 Award Date | FY 2006 Cost | FY 2006 Award Date | FY 2007 Cost | FY 2007 Award Date | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Subtotal: | | | 0 | | | | | | | | | |

Remarks: All support costs for this project are included in F61 SoS Engineering and Program Management project.

| III. Test And Evaluation | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2005 Cost | FY 2005 Award Date | FY 2006 Cost | FY 2006 Award Date | FY 2007 Cost | FY 2007 Award Date | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Subtotal: | | | 0 | | | | | | | | | |

Remarks: All Test and Evaluation costs for this project are included in F61 SoS Engineering and Program Management project.

| IV. Management Services | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2005 Cost | FY 2005 Award Date | FY 2006 Cost | FY 2006 Award Date | FY 2007 Cost | FY 2007 Award Date | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Subtotal: | | | 0 | | | | | | | | | |

| **Project Total Cost:** | | | **6000** | **15015** | | **32131** | | **17731** | | **0** | **0** | **0** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|

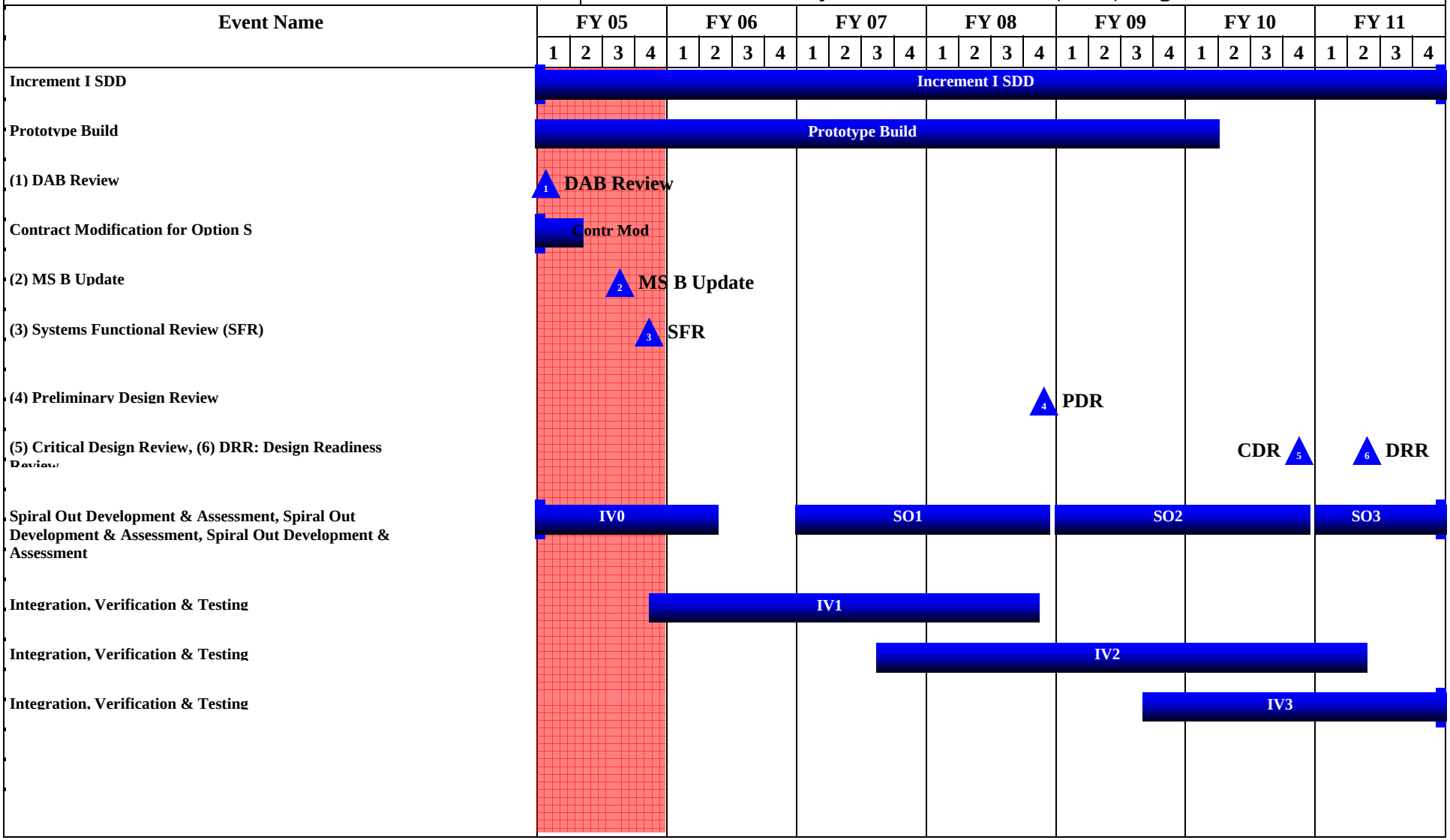
# Schedule Profile (R4 Exhibit)

**February 2006**

BUDGET ACTIVITY
**5 - System Development and Demonstration**

PE NUMBER AND TITLE
**0604645A - Armored Systems Modernization (ASM)-Eng. Dev.**

PROJECT
**F54**



# Schedule Detail (R4a Exhibit)

**February 2006**

| BUDGET ACTIVITY | PE NUMBER AND TITLE | PROJECT |
|---|---|---|
| **5 - System Development and Demonstration** | **0604645A - Armored Systems Modernization (ASM)-Eng. Dev.** | **F54** |

| Schedule Detail | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| ADM Required MS B Update | 3Q | | | | | | |
| Definitization of Contract Modification for POM-adjusted Program | 2Q | | | | | | |
| SoS Functional Review (FR) | 4Q | | | | | | |
| SoS Preliminary Design Review (PDR) | | | | 4Q | | | |
| Phase 1 Integration at Test Completion | 4Q | | | | | | |
| Phase 2 Integration at Test Completion | | | 3Q | | | | |
| SoS Critical Design Review (CDR) | | | | | | 4Q | |
| Phase 3 Integration at Test Completion | | | | 2Q | | | |
| Design Ready Review | | | | | | | 2Q |

# ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

**February 2006**

| BUDGET ACTIVITY | PE NUMBER AND TITLE | PROJECT |
|---|---|---|
| **5 - System Development and Demonstration** | **0604645A - Armored Systems Modernization (ASM)-Eng. Dev.** | **F55** |

| COST (In Thousands) | FY 2005 Estimate | FY 2006 Estimate | FY 2007 Estimate | FY 2008 Estimate | FY 2009 Estimate | FY 2010 Estimate | FY 2011 Estimate | Cost to Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|
| F55 SUSTAINMENT | 56613 | 143356 | 146106 | 164538 | 197448 | 169671 | 147496 | Continuing | 1025228 |

**A. Mission Description and Budget Item Justification:** This project contains funding for Logistics and Training Support System Development for the Future Combat Systems(FCS) Brigade Combat Team (BCT).

The logistics effort includes the development of the management, products, and services required to design, develop, assemble, integrate, and test the supportability processes and supporting automated applications within the FCS System of Systems (SoS). It also funds analysis to aid in life cycle product support decision making, to include developing and implementing metrics, performance standards, and warranty requirements. Definition of the Performance Based Logistics (PBL) business processes, performance metrics, standards, data management and analysis process, and the PBL concept for sustainment in accordance with the FCS supportability strategy is also included in this project.

This logistics portion of this project includes the following:
Test Support and Demonstration - Provisioning of test support for equipment testing and demonstration for SoS and Family of Systems (FoS) supportability performance verification. Validation of maneuver sustainment, PBL, and other applicable logistics support concepts during SoS Test and SoSIL simulations. Assurance that sensor collection of data for logistics decision support system software is adequate to support logistics modeling verification and validation efforts, as well as operational PBL.

Logistics Management Product Integration - Provides integration of supportability products into the SoS elements,including diagnostics and prognostics functions. Conduct logistics technical reviews at the system, vehicle, and component levels.

Fielding - Development of process for deploying vehicles to home base locations to include facilities analysis. Includes the use of integrated real and virtual test and evaluation to obtain and validate engineering data and design for the FCS equipped portion of the (BCT) and interfaces with the non-FCS equipped portion of FCS(BCT). Includes fielding analyses and recommendations of the best fielding methodology for FCS.

Training includes contractor analysis to support training for the System of Systems (SoS). This effort includes the design and development engineering, integration, embedded training, and testing of unique training devices, training systems engineering, training products, training support packages, and training integration.

Training also provides for the management, plans, products, verification and validation, and services required to ensure design, development, fabrication, integration, and test of a FCS (BCT) training program and FCS (BCT) training system capable of meeting Operational Requirements Document (ORD) objectives. Assure that the training system is designed as an integral part of the overall SoS design to meet Increment 1 requirements and provides for future increment upgrades. Identify, assess, and mitigate training risks as part of the SDD risk reduction effort and coordinate these risk reduction efforts with the SoS Engineering technical risk manager. Support the distributed network and platform development efforts required to implement embedded and stand alone training designs within (FoS) products necessary to ensure these designs meet ORD requirements. Includes training product design and interfaces as required to address U.S. Army training implementation beyond the SoS and/or FoS levels for consistency with the existing and planned U.S. Army training infrastructure. Apply a common systematic approach to identify, define, and assess training system technologies and training environments for potential application to FCS training requirements.

# ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

**February 2006**

| BUDGET ACTIVITY | PE NUMBER AND TITLE | PROJECT |
|---|---|---|
| **5 - System Development and Demonstration** | **0604645A - Armored Systems Modernization (ASM)-Eng. Dev.** | **F55** |

IAW Section 214 of the FY2006 National Defense Authorization Act, this project will be converted to a stand alone Program Element commencing with the FY2008 President's Budget submission to Congress.

| **Accomplishments/Planned Program** | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Training - FY06 Develop Embedded Training (ET) capability and products, including Spin Out #1; Training (Instructional) Support Packages (TSPs); Interactive Multi-media Instruction (IMI); Training Aids and Devices, Simulations and Simulators (TADSSs); ET software. Deliver first increment (CGF) of Training Common Components (TCCs) integrated with SOSCOE (ultimate reuse of 14.6 Million Government developed lines of code). Continue development of individual and collective Training Support Plans (1,500+ tasks). Deliver the second increment of the Single Operational Roles List (SORL) as part of the total FCS operational architecture description. The second increment of the Single Integrated Task List (SITL) (collective tasks that need to be performed by FCS units) will be delivered for use in the development of training packages for FCS training capabilities to be developed in Engineering Iteration #1. Develop TCCs Build 1 with OOS SAF/CGF and additional common components into SOSCOE 1.5 and test in the FCS Training Systems Integration Laboratory (SIL). Identify training requirements. Develop training support products in preparation for Integrated Mission Test 1 (IMT-1) and support for Experiment 1.1 in Training SIL. Develop and demonstrate Individual and Collective FCS TSPs as part of Experiment 1.1 and support testing of technology and products for Spin Out #1. FY07 - Continue to develop Embedded Training capability and products, Experiment 1.1 & Spin Out #1, (TSPs), Interactive Multi-media Instruction (IMI), Training Aids and Devices, Simulations and Simulators (TADSSs) and ET software. Develop (TCCs) Build 2 integrated with OOS and additional common components into SOSCOE 2.0 and tested in the FCS Training SIL. Deliver second increment of TCCs. Continue development of Training Support Plans (1,500+ tasks). Deliver the third increment of the (SORL) and the (SITL). Develop Leader and Battle Staff tasks for the FCS equipped units (500+ tasks). | 40722 | 99703 | 102933 |
| Logistics Systems Management - FY06 - A Supportability Design Assessment that looks across entire UA to determine how it will be supported during wartime and peacetime will be conducted. The Material Fielding Plan, PBL Implementation Plan and Supportability Strategy, Modeling and Simulating (M&S) activities will be updated. Logistics Analysis is supporting development of data sets and model software to insert logistics impacts as Operational Availability (Ao), Log Footprint and Life Cycle Costs into war fighter models (JANUS Simulation) and supportability assessments and trades. Provide logistics attributes and capabilities documents to support modeling and simulation activities in War games and major availability analyses. Logistics Products B1PC for SW Build 1 (EI1/IV1). IETM: Deliver D786-11067-1, IETM specification to DM (DP049). Deliver Water Generation Phase I Kit. CLA/SORA Data Product Update. Level of PBL requirement for FCS Prototypes E-BCT determined. Perform/Present UA Supportability Performance Assessment For IV0. KPP4 Assessment Completed (IV0). KPP5 Assessment Completed (IV0). FY07 Update the Material Fielding Plan, the PBL implementation plan, the Supportability Strategy, and the M&S models. Deliver the first phase of logistics products (Logistics Planning software) developed during the FCS Program's engineering iteration 1, to the C4ISR System Integration Lab (SIL) in February. Continue development of Log Data Management Systems (LDMS). SoS Specification Baselined. PIDS to CSCI Interfaces Documented. FCS (BCT) Integrated Architecture Development Baseline Documented. EI1 - Supportability Plan. IETM Specification and Requirements Development. So 1 Supportability Strategy Final Draft Released. SO1 PBL Implementation Plan approved. FCS Materiel Fielding Plan updated for EI1 RA. | 15891 | 42352 | 41820 |
| GFX - PEO STRI SME Training Support | 0 | 1301 | 1353 |
| Total | 56613 | 143356 | 146106 |

# ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

**February 2006**

| BUDGET ACTIVITY | PE NUMBER AND TITLE | PROJECT |
|---|---|---|
| **5 - System Development and Demonstration** | **0604645A - Armored Systems Modernization (ASM)-Eng. Dev.** | **F55** |

| **B. Other Program Funding Summary** | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | To Compl | Total Cost |
|---|---|---|---|---|---|---|---|---|---|
| 0604645 F52 UAV Recon Platforms and Sensors | 51034 | 52135 | 65555 | 68490 | 87574 | 131662 | 90626 | 0 | 547076 |
| 0604645 F53 (UGV) | 65066 | 124988 | 107705 | 145693 | 146565 | 111391 | 97621 | 0 | 799029 |
| 0604645 F54 (UGS) | 15015 | 32131 | 17731 | 16515 | 12771 | 15913 | 1318 | 0 | 111394 |
| 0604645 F55 Sustainment | 56613 | 143356 | 146106 | 164538 | 197448 | 169671 | 147496 | 0 | 1025228 |
| 0604645 F57 (MGV) | 313263 | 513896 | 570241 | 583483 | 821110 | 755918 | 411264 | 0 | 3969175 |
| 0604645 F61 SoS Engineering & Program Management | 1597139 | 1879210 | 2403139 | 2303689 | 1853009 | 1829927 | 1884924 | 0 | 13751037 |
| 0604646 F72 Non-Line of Sight Launch System (NLOS-LS) | 119767 | 231209 | 322880 | 274793 | 256283 | 89143 | 17759 | 0 | 1311834 |
| 0604647 F58 Non-Line of Sight Cannon (NLOS-C) | 286853 | 146271 | 112237 | 117605 | 90647 | 84160 | 44356 | 0 | 882129 |
| WTCV | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0604645 F59 Common Components | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 27500 |
| 0604645 F60 Family of Systems Analysis & Integration | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 165302 |
| 0604645 F62 Mission Equipment Platforms | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 132537 |
| 0604645 F63 Network Software | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 111745 |
| 0604645 F64 Other Contract Costs | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 313536 |
| 0604645 F65 SoS Engr & Prog Mgt | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 190331 |
| 0604645 F66 SoS Test and Evaluation | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 56347 |
| 0604645 F67 Supportability | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5252 |
| 0604645 F69 Training | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7756 |
| 0604645 F70 NLOS Launch System | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 49502 |

**C. Acquisition Strategy** During the FY06-11 POM process, the Army restructured the PM BCT Acquisition Program. The plan strengthened the FCS Program and simultaneously improved the Current Force through early delivery of selected FCS capabilities. The adjustments maintained the Army focus on FCS-equipped Brigade Combat Team (BCT) development and substantially reduced program risk. The adjustments to the FCS Program acquisition strategy fall into four primary categories:

- The development of system integration/verification phases to build FCS (BCT) capability iteratively over time, reducing overall technical risk by using a building block approach.
- The five previously deferred FCS core systems: 1) UAV Class II, 2) UAV III, 3) Armed Robotic Vehicle (ARV) -Assault, 4) ARV-Reconnaissance and 5) FCS Maintenance

and Recovery Vehicle have been funded. These five systems will be fielded with the first FCS-equipped BCT allowing fielding of the complete 18 + 1 + 1 FCS core systems to the Army with delivery beginning in 2014.
- More robust experimentation and evaluation are included in the program to prove revolutionary concepts, mature the architecture and components, and assist in the spinout development.
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IAW Section 214 of the FY2006 National Defense Authorization Act, this project will be converted to a stand alone Program Element commencing with the FY2008 President's Budget submission to Congress.

# ARMY RDT&E COST ANALYSIS (R3)

**February 2006**

BUDGET ACTIVITY
**5 - System Development and Demonstration**

PE NUMBER AND TITLE
**0604645A - Armored Systems Modernization (ASM)-Eng. Dev.**

PROJECT
**F55**

| I. Product Development | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2005 Cost | FY 2005 Award Date | FY 2006 Cost | FY 2006 Award Date | FY 2007 Cost | FY 2007 Award Date | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Training Specifications &Training Products | OTA/FAR | The Boeing Company - Seattle Washington - see remarks 1-3 | 31607 | 40722 | 1-3Q | 99703 | 1-3Q | 102933 | 1-3Q | 0 | 0 | 0 |
| Logistics Systems Management | OTA/FAR | The Boeing Company - Seattle Washington | 64732 | 15891 | 1-3Q | 42352 | 1-3Q | 41820 | 1-3Q | 0 | 0 | 0 |
| Subtotal: | | | 96339 | 56613 | | 142055 | | 144753 | | 0 | 0 | 0 |

Remarks: Remark 1: Subcontractor: Computer Science Corp. Federal Sector Defense Group - Hamptom, VA;
Remark 2: Subcontractor: Dynamics Research Corp. Systems Division - Andover, MD;
Remark 3: Subcontractor: Northrop Grumman, Information Tech, Defense Enterprise Solutions Div, - Mclean, VA

| II. Support Costs | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2005 Cost | FY 2005 Award Date | FY 2006 Cost | FY 2006 Award Date | FY 2007 Cost | FY 2007 Award Date | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GFX - PEO STRI SME Training Support | Direct | PM FCS (BCT), St. Louis, MO | 0 | 0 | | 1301 | 1-3Q | 1353 | 1-3Q | 0 | 0 | 0 |
| Subtotal: | | | 0 | 0 | | 1301 | | 1353 | | 0 | 0 | 0 |

Remarks: All support costs for this project are included in F61 SoS Engineering and Program Management project.

| III. Test And Evaluation | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2005 Cost | FY 2005 Award Date | FY 2006 Cost | FY 2006 Award Date | FY 2007 Cost | FY 2007 Award Date | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Subtotal: | | | 0 | | | | | | | | | |

Remarks: All Test and Evaluation costs for this project are included in F61 SoS Engineering and Program Management project.

| IV. Management Services | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2005 Cost | FY 2005 Award Date | FY 2006 Cost | FY 2006 Award Date | FY 2007 Cost | FY 2007 Award Date | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Subtotal: | | | 0 | | | | | | | | | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Project Total Cost:** | **96339** | **56613** | | **143356** | | **146106** | | **0** | **0** | **0** |

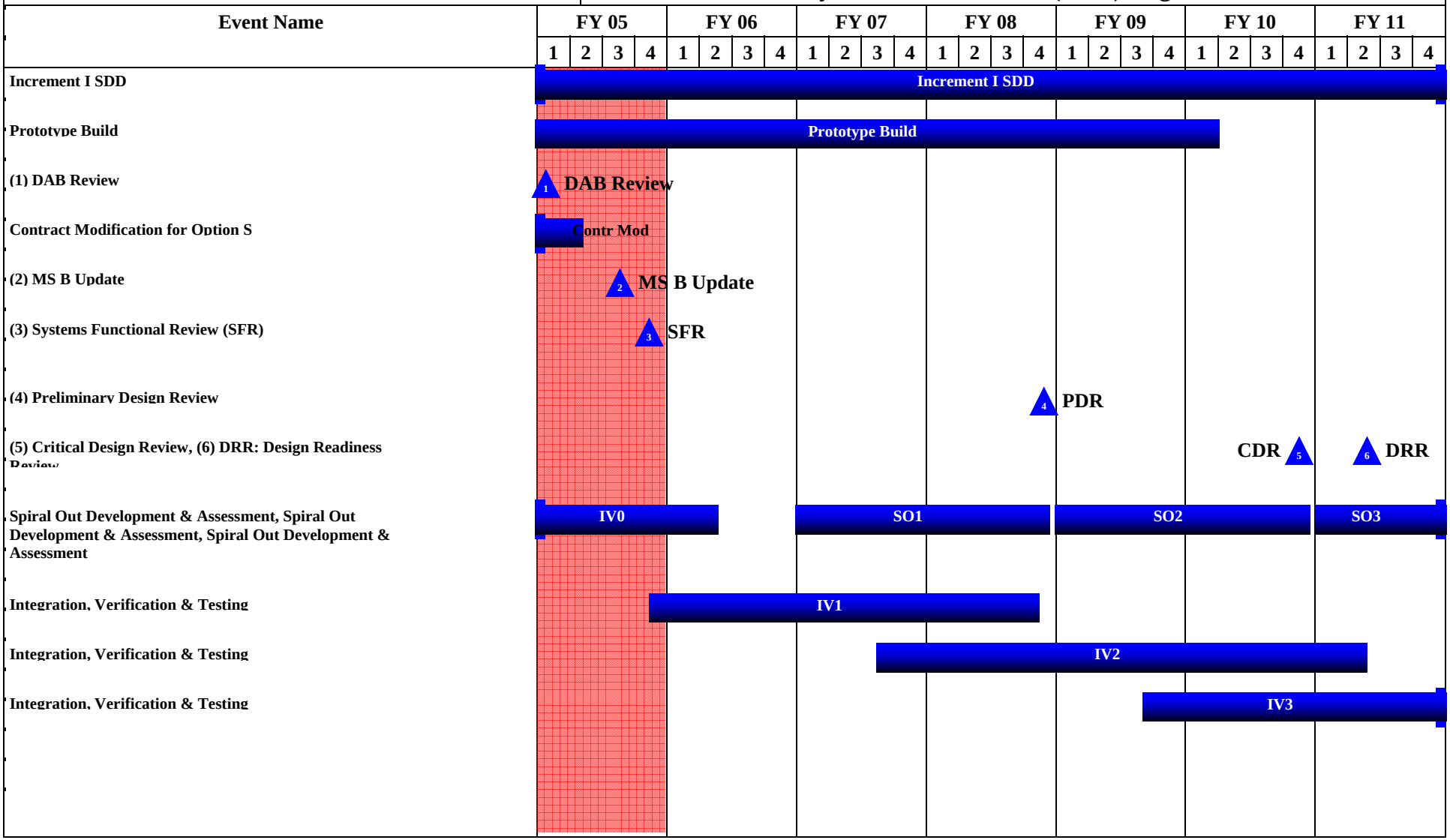
# Schedule Profile (R4 Exhibit)

**February 2006**

BUDGET ACTIVITY
**5 - System Development and Demonstration**

PE NUMBER AND TITLE
**0604645A - Armored Systems Modernization (ASM)-Eng. Dev.**

PROJECT
**F55**



# Schedule Detail (R4a Exhibit)

**February 2006**

| BUDGET ACTIVITY | PE NUMBER AND TITLE | PROJECT |
|---|---|---|
| **5 - System Development and Demonstration** | **0604645A - Armored Systems Modernization (ASM)-Eng. Dev.** | **F55** |

| Schedule Detail | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| ADM Required MS B Update | 3Q | | | | | | |
| Definitization of Contract Modification for POM-adjusted Program | 2Q | | | | | | |
| SoS Functional Review (FR) | 4Q | | | | | | |
| SoS Preliminary Design Review (PDR) | | | | 4Q | | | |
| Phase 1 Integration at Test Completion | 4Q | | | | | | |
| Phase 2 Integration at Test Completion | | | 3Q | | | | |
| SoS Critical Design Review (CDR) | | | | | | 4Q | |
| Phase 3 Integration at Test Completion | | | | 2Q | | | |
| Design Ready Review | | | | | | | 2Q |

# ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

**February 2006**

| BUDGET ACTIVITY | PE NUMBER AND TITLE | PROJECT |
|---|---|---|
| **5 - System Development and Demonstration** | **0604645A - Armored Systems Modernization (ASM)-Eng. Dev.** | **F57** |

| COST (In Thousands) | | FY 2005 Estimate | FY 2006 Estimate | FY 2007 Estimate | FY 2008 Estimate | FY 2009 Estimate | FY 2010 Estimate | FY 2011 Estimate | Cost to Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|
| F57 | MANNED GROUND VEHICLES | 313263 | 513896 | 570241 | 583483 | 821110 | 755918 | 411264 | Continuing | Continuing |

**A. Mission Description and Budget Item Justification:** This FCS project includes contractor efforts for Manned Ground Vehicles (MGVs) (other than Non-Line of Sight - Cannon NLOS-C) and includes the contractor development, engineering, sub-component and prototype fabrication, integration and assembly of all variants including development of unique mission equipment (such as main armament and fire control). Platforms include: Infantry Carrier Vehicle (ICV), Mounted Combat System (MCS), Non-Line of Sight Mortar (NLOS-M), Command and Control Vehicle (C2V), Recon and Surveillance Vehicle (RSV), FCS Recovery and Maintenance Vehicle (FMRV), Medical Vehicle (MV). This project also includes development of Common subsystem components for all MGV variants, including NLOS-C, (mobility, power, communication, command and control, vehicle utility, survivability, structure, and vetronics sub-systems).

The ICV consists of four platform versions: a Company Commander; a Platoon Leader; a Rifle Squad; and a Weapon Squad. The ICV will effectively employ weapon systems and rapidly maneuver during blackout, day and night operations, inclement weather, and limited visibility periods. The ICV will deliver the dismounted force to the close battle and support the squad by providing self-defense and supporting fires. The ICV can move, shoot, communicate, detect threats, and protect crew and critical components under most land-surface environments.

The MCS provides direct and Beyond-Line-of-Sight (BLOS) offensive firepower allowing FCS Brigade Combat Teams (BCTs) to close with and destroy enemy forces. The MCS delivers precision rapid fires to destroy multiple targets at standoff ranges. This complements the fires of other systems in the FCS(BCT). It is highly mobile and maneuvers out of contact to positions of advantage. It is capable of providing direct support to the dismounted infantry in an assault, defeating bunkers and breaching walls during the attack. The MCS also provides BLOS fires enabled by the horizontal integration and battle command provided by our integrated sensor and communications network. The MCS will consist of the common MGV chassis, the ammunition handling system and primary weapons assembly.

The NLOS-M is the U.S. Army's first semi-automated breach loaded mortar system. The NLOS-M incorporates vastly, improved ammunition handling, loading, and firing systems which will enable it to provide unparalleled responsiveness and lethality to the FCS BCT commander. The NLOS-M features transformational technologies that will be common to all FCS Manned Ground Vehicles, including hybrid-electric drive and drive-by-wire capabilities that enable the system to move rapidly, stop quickly and deliver lethal first round effects in record time. The mortar will provide supportive, destructive and special purpose fires in close support of tactical maneuvers. It provides highly responsive, reliable, timely, accurate and sustained rates of fire and rates of kill with 24/7 availability in all weather and terrain conditions at extended ranges. The NLOS-M will have a multiple round simultaneous impact (MRSI) capability as well as the capability to fire the Precision Guided Mortar Munitions (PGMM) and deliver lethal fires to destroy high payoff and most dangerous targets.

The C2V platform provides the information management of the integrated network of communications and sensor capability within the BCT and provides the tools for commanders to synchronize their knowledge of combat power with the human dimension of leadership.

RSVs feature a suite of advanced sensors to detect, locate, track, classify and automatically identify targets from increased standoff ranges under all climatic conditions, day or night. RSVs also feature the onboard capability to conduct automatic target detection, aided target recognition and level one sensor fusion.

The FRMV is the recovery and maintenance system for the BCT and contributes to sustaining and generating combat power to the BCT. Included in this suite are a mast-mounted, long-range electro-optic infrared sensor, an emitter mapping sensor for radio frequency (RF) intercept and direction finding, remote chemical detection, and a multifunction RF sensor. Each BCT will have a small number of 2-3 man Combat Repair Teams within the organic Forward Support Battalion (FSB) to perform; field maintenance requirements beyond the capabilities of the crew chief/crew, more in-depth Battle Damage Assessment Repair (BDAR) and limited recovery operations. The FRMV is designed to hold a crew of three with space allotted for three additional recovered crew. The FRMV has a Close Combat Support Weapon (CCSW) .

The MV is designed to provide advanced trauma life support within 1 hour to critically injured soldiers. These MVs serve as the primary medical system within the BCT and will have two mission modules, Evacuation and Treatment. The time-sensitive nature of treating critically injured soldiers requires an immediately responsive force health protection system with an expedient field evacuation system. The FCS MV-Evacuation vehicle allows trauma specialists, maneuvering with combat forces, to be closer to the casualty's point-of-injury and is used for casualty evacuation. The MV-Treatment vehicle enhances the ability to provide Advanced Trauma Management (ATM)/Advanced Trauma Life Support (ATLS) treatments and procedures forward for more rapid casualty interventions and clearance of the battle space. Both FCS MV mission modules will be capable of conducting medical procedures and treatments using installed networked telemedicine interfaces, Medical Communications for Combat Casualty Care and the Theater Medical Information Program (TMIP).

The Common Subsystems are defined as end-items that are produced for inclusion into multiple vehicle platforms. In FY05 common subsystem were partially funded in the NLOS-C and the MGV products. For FY06 and out all MGV, NLOS-C common components will be totally accounted for in the MGV line. This project includes developmental and engineering effort for requirement analysis, specifications, detailed design packages, and the integration of common components and sub-systems into the complete platform and weapon systems. The focus is on a producible, reliable, sustainable, maintainable, and affordable design. Also included are subsystem prototypes, models, and simulations as necessary to support development as well as tests and demonstrations.

Active Protection System (APS) Consists of Government Support Subject Matter Experts (SMEs) to assist LSI in development of APS. APS is comprised of systems that sense incoming threats and employ countermeasures to physically intercept and defeat them. A generic APS consists of sensor subsystem, a countermeasure subsystem and data processing. Data processing uses the tracking data to determine the appropriate countermeasure, calculate the firing solution and deploy the countermeasure. Includes APS Spiral, APS sensors and processors and Countermeasures: APS includes Common Radar Integration Architecture and analysis for use with Hit Avoidance Countermeasures. Countermeasure deployment and gimbal brass board test, evaluation and analysis.

| **Accomplishments/Planned Program** | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Contractor Infantry Carrier Vehicle (ICV) FY06 Initiate preliminary design and integration activities. Update Subsystem CIDS. Conduct Subsystem Best Technical Approach (BTA). Update Subsystem Interface Control Documents (ICDs). Develop specification, SOW and release RFP for ICV multimedia slip ring. Develop ammo feed system demonstrator.FY07 Conduct Manned Ground Vehicles (MGV) Interim Preliminary Design Review (PDR). Update Architecture products and ICDs. Initiate design activities, Software builds, SigMan tests. Complete Human Factors Engineering(HFE)testing. Integrate C4ISR Emulators into SIL and Rig. Start brass board ammunition feed system fabrication to evaluate reliability versus affordability trade. Perform specialty engineering analysis (reliability, maintainability, logistics, HFE, and system survivability). | 4202 | 8054 | 16913 |
| Contractor Mounted Combat Systems (MCS) FY06 the MCS team will execute the System Functional Review (SFR), design and test | 27600 | 55103 | 54882 |
| | | | |

| | | | |
|---|---|---|---|
| sympathetic detonation barrier coupons, fabricate three cannons for testing, compete contracts for major sub-systems, and begin long lead procurement for and initial assembly for the static firing fixture. and begin long lead procurements for the mobile firing test rig.FY 07- Contractor Mounted Combat System (MCS) Complete the majority of the preliminary design efforts on the Mounted Combat System (MCS) Armament consisting of the turret structure, ammunition handling system, and primary weapons assembly and initiate firing fixture testing in preparation for the MGV preliminary design review in the 3rd quarter of fiscal year 2008. Complete phase two of the static firing fixture testing and eevelop initial fire control software for the firing fixture testing and begin development of software for mobile testing. Start initial integration assembly of the software and communications on the mobile firing test rig. | | | |
| Non-Line of Sight Mortar (NLOS-M) FY06 NLOS-M will complete its system functional review in coordination with the rest of the FCS and MGV systems allocating system requirements and baselining a concept. The tube and breech vendor will be selected and preliminary design will begin on the integrated vehicle. Component Maturation will continue with round retention ammunition handling and slip ring technology development and integration. The reliability investment program will continue. Development and construction of an NLOS-M firing platform will begin. FY07 NLOS-M Preliminary Design Efforts Continue. NLOS Mortar Firing Platform is delivered and NLOS-M Firing Platform First Shot Down Range. Component maturation and integration continues on round retention, ammunition handling, and slip ring. Reliability Investment Program continues. | 6286 | 16498 | 17560 |
| Contractor Command & Control Vehicle (C2V) -FY06 C2V - Conduct Manned Ground Vehicles (MGV) System Functional Review (SFR) and transition into design activities. Continue C2V habitability study and Soldier-centric evaluations. Update subsystem critical item development specifications and interface control documents. Begin C2V installed performance and roof-top communications equipment de-confliction analysis. FY07 C2V - Continue preliminary design activities for C2V mission work station and integrated platform. Integrate mission module and development efforts with C4ISR emulators into the system integration lab. Conduct software build efforts including common software integration. Update subsystem critical item development specifications and interface control documents. Continue human factors engineering analysis and testing. Conduct C2V installed performance component maturation testing. | 18556 | 20651 | 8243 |
| Contractor Reconnaissance & Surveillance Vehicle (RSV) - FY06 Functional Review (SFR) and transition into design activities. Update subsystem critical item development specifications and interface control documents. Complete RSV mock-up build. Begin RSV installed performance and roof-top sensor de-confliction studies. FY07 RSV - Continue preliminary design activities for RSV mission work station and integrated platform. Update subsystem critical item specifications and interface control documents. Conduct software build efforts including common software integration. Continue human factors engineering analysis and testing. Integrate mission module and common development efforts with C4ISR Emulators into the system integration lab. Conduct RSV installed performance component maturation testing. | 16460 | 20123 | 19075 |
| Contractor FCS Recovery & Maintenance Vehicle (FRMV) FY06 - Initiate preliminary design and integration activities. Update Subsystem CIDS. Conduct Subsystem BTA. Update Subsystem Interface Control Documents (ICDs). Develop FRMV Integrated System Model to evaluate alternate crane designs. Perform platform stability analysis for Tactical Crane System. Fabrication of Tactical Crane System FY07 FRMV - Update Architecture products. Update ICDs. Initiate detailed design activities. Concept maturation and fabrication of FRMV towing system. Create full scale wooden FRMV mock-up, and evaluate MANPRINT issues. | 6602 | 8977 | 20334 |
| Contractor Medical Vehicle (MV) - FY06 - Initiate preliminary design and integration activities. Update Subsystem CIDS. Conduct Subsystem BTA. Update Subsystem Interface Control Documents (ICDs). Update full scale wooden mock-up and integrate litter lift system. Perform integration of MC-4 Software. FY07 MV - Update Architecture products. Update ICDs. Initiate detailed design activities. Initiate development of treatment table. Complete system and subsystem level trade studies. | 4225 | 6162 | 8134 |
| Common SubsystemsFY06 - Specify, design, procure and begin testing of Increment 0 Threshold Common subsystems; Software Build 1 | 228860 | 332700 | 383634 |
| | | | |

| | | | |
|---|---|---|---|
| Life Cycle Objective (LCO) Review. Complete MGV SFR. Begin Preliminary Design. Baselined SW Build 1 Design Initiated. Complete system, functional and software architecture for MGV. Complete ATR Design. Order LLI. Subsystem size, weight, power, cooling, reliability and cost allocations completed. Complete best technical approach. Complete initial Interface Control Documents (ICDs) for internal and external interfaces. Document risks and associated mitigation plans. System Integration Plans Initiated. Initiate solid based model design. Perform interim requirements compliance assessments for the Common. Initiate Procurement of Inc 1 Subsystems. Band Track Component Maturation. Procurement and Integration of ATR. Procure Servo Motor Controller and Track Tensioner. Develop flex bus and connector concepts. Procurement and Integration of ATR . Procurement of Servo Motor Controller, Remote Interface Units. Develop and baseline a Thermal Architecture. Procure Environmental Control System, Vapor Control System, Water Distribution System and Air Handling Unit. Develop a 24 Ton Modular-Scalable BTA IAW new ECC/FCC. Develop Station Architecture. Procure Propulsion Generator, Air Induction System and Final Drive. FY07 - Provide emulators and stimulators to SILS for Integration/Testing. Automotive Test Rig (ATR) Fabrication and testing. Complete Common Software Build One Suspension Systems into Labs for Testing. Vetronics - Continue Integration/Test in the ATR. Systems into Labs for Integration/Testing. Integration of ICS and VMS/INS onto ATR/MGV NBC/ECS. Procure Nuclear Biological Chemical System. Develop A&B Armor and Mine Resistant Structure CMMP Common Crew Station. Station Architecture Systems into Labs. | | | |
| Government GFX XM307 FY06 - Development prototypes. Testing to be provided as GFX to the LSI. - A light weight portable Advanced Crew Served Weapon utilizing 25mm air burst ammunition. XM-307 has a full solution fire control system that includes a laser range finder and a day /night sight. It is highly portable within small soldier units and provides overwhelming lethality compared to existing systems. General Dynamics Ordnance and Tactical Systems is developing ammo. Kaman Dayron is developing the fuze and Raytheon is developing the full solution fire control.FY06 - Develop requirements/specifications and ICDs for the XM307 weapon to be used on UGV or MGV variants. FY07 Continue the development build prototype of the XM307 for verifying, validating and proving the concept. | 0 | 44075 | 39200 |
| Government GFX MK-44 AMMO Development FY07 Begin requirement/specification and ICDs for MK-44 Ammo. | 0 | 0 | 1266 |
| Government GFX Active Protection System (APS) - FY06 Active Protection Systems - APS Developer Base Program Award and Preliminary Design Review/Critical Design Review. Finalize APS Testing Strategy.FY07 Active Protection Systems - Begin APS SIL Integration. Initial Developmental Testing. APS FY07 expected contract awards include; Laser Warning Receiver award, Multi-function countermeasures award, and a Survivability Coordinator Software award.FY06 Hit Avoidance - Initiate EMA concepts for integration on MGV, Update BTA to reflect EMA. | 472 | 1553 | 1000 |
| Total | 313263 | 513896 | 570241 |

| **B. Other Program Funding Summary** | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | To Compl | Total Cost |
|---|---|---|---|---|---|---|---|---|---|
| 0604645 F52 UAV Recon Platforms and Sensors | 51034 | 52135 | 65555 | 68490 | 87574 | 131662 | 90626 | 0 | 547076 |
| 0604645 F53 (UGV) | 65066 | 124988 | 107705 | 145693 | 146565 | 111391 | 97621 | 0 | 799029 |
| 0604645 F54 (UGS) | 15015 | 32131 | 17731 | 16515 | 12771 | 15913 | 1318 | 0 | 111394 |
| 0604645 F55 Sustainment | 56613 | 143356 | 146106 | 164538 | 197448 | 169671 | 147496 | 0 | 1025228 |
| 0604645 F57 (MGV) | 313263 | 513896 | 570241 | 583483 | 821110 | 755918 | 411264 | 0 | 3969175 |
| 0604645 F61 SoS Engineering & Program Management | 1597139 | 1879210 | 2403139 | 2303689 | 1853009 | 1829927 | 1884924 | 0 | 13751037 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 0604646 F72 Non-Line of Sight Launch System (NLOS-LS) | 119767 | 231209 | 322880 | 274793 | 256283 | 89143 | 17759 | 0 | 1311834 |
| 0604647 F58 Non-Line of Sight Cannon (NLOS-C) | 286853 | 146271 | 112237 | 117605 | 90647 | 84160 | 44356 | 0 | 882129 |
| WTCV | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0604645 F59 Common Components | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 27500 |
| 0604645 F62 Mission Equipment Platforms | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 132537 |
| 0604645 F63 Network Softwaret | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 111745 |
| 0604645 F64 Other Contract Costs | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 313536 |
| 0604645 F65 S of S Engr & Prog Mgt | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 190331 |
| 0604645 F66 S of S Test and Evaluation | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 56347 |
| 0604645 F67 Supportability | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5252 |
| 0604645 F69 Training | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7756 |
| 0604645 F70 NLOS Launch Systemt | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 49502 |

**C. Acquisition Strategy** During the FY06-11 POM process, the Army restructured the PM BCT Acquisition Program. The plan strengthened the FCS Program and simultaneously improved the Current Force through early delivery of selected FCS capabilities. The adjustments maintained the Army focus on FCS-equipped Brigade Combat Team (BCT) development and substantially reduced program risk. The adjustments to the FCS Program acquisition strategy fall into four primary categories:

- The development of system integration/verification phases to build FCS (BCT) capability iteratively over time, reducing overall technical risk by using a building block approach.
- The five previously deferred FCS core systems: 1) UAV Class II, 2) UAV III, 3) Armed Robotic Vehicle (ARV) -Assault, 4) ARV-Reconnaissance and 5) FCS Maintenance and Recovery Vehicle have been funded. These five systems will be fielded with the first FCS-equipped BCT allowing fielding of the complete 18 + 1 + 1 FCS core systems to the Army with delivery beginning in 2014.
- More robust experimentation and evaluation are included in the program to prove revolutionary concepts, mature the architecture and components, and assist in the spinout development.
- A series of Spinout packages will begin procurement in 2009 and continue approximately every two years through 2014 to insert FCS capability into Current Force Modular Brigade Combat Teams (M-BCTs) to include Heavy and Infantry.

The current OTA was initially modified on 6 Aug 2004 to cover the new Scope of Work (SOW) of the approved POM program. Final definitization of this modification occurred on 2 March 2005. Since FY05 funding was based on the original Milestone B approved program, two major reprogramming have occurred in order to align funding of the restructured program.

The Assistant Secretary of the Army (Acquisition, Logistics and Technology) in May 05 directed that the current FCS (BCT) OTA with the LSI be converted from an OTA to a Federal Acquisition Regulation-based contract. This transition was executed through the award of an Unpriced Contractual Action (UCA) in Sep 05.
The letter contract became effective 30 Sep 2005, and replaced the FCS SDD Other Transaction Agreement (OTA) DAAE07-03-9-F001 for most SDD effort performed beginning 20 Sep 2005 and thereafter. The LSI and the Government recognize that some effort remains to be completed under the OTA after 30 Sep 05, having to do with orderly OTA close-out and the like. Therefore, future funding profiles will be adjusted based on the definitization of UCA and subsequent adjusted Earned Value Management Baseline. The FAR based contract is scheduled to be definitized in March 2006.

IAW Section 214 of the FY2006 National Defense Authorization Act, this project will be converted to a stand alone Program Element commencing with the FY2008 President's Budget submission to Congress.

# ARMY RDT&E COST ANALYSIS (R3)

**February 2006**

BUDGET ACTIVITY
**5 - System Development and Demonstration**

PE NUMBER AND TITLE
**0604645A - Armored Systems Modernization (ASM)-Eng. Dev.**

PROJECT
**F57**

| I. Product Development | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2005 Cost | FY 2005 Award Date | FY 2006 Cost | FY 2006 Award Date | FY 2007 Cost | FY 2007 Award Date | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| INFANTRY CARRIER VEHICLE (ICV) | OTA/FAR | THE BOEING COMPANY - SEATTLE WASHINGTON, see remark 2 | 35245 | 4202 | 1-3Q | 8054 | 1-3Q | 16913 | 1-3Q | 0 | 0 | 0 |
| MOUNTED COMBAT SYSTEMS (MCS) | OTA/FAR | THE BOEING COMPANY - SEATTLE WASHINGTON, see remark 1 | 80637 | 27600 | 1-3Q | 55103 | 1-3Q | 54882 | 1-3Q | 0 | 0 | 0 |
| NON-LINE OF SIGHT MORTAR (NLOS-M) | OTA/FAR | THE BOEING COMPANY - SEATTLE WASHINGTON, see remark 3 | 17519 | 6286 | 1-3Q | 16498 | 4Q | 17560 | 1-3Q | 0 | 0 | 0 |
| Contractor Common Component Vehicle Subs | OTA/FAR | THE BOEING COMPANY - SEATTLE WASHINGTON, see remark 1,2,3,4,5 | 0 | 228860 | 1-3Q | 332700 | 1-3Q | 383634 | 1-3Q | 0 | 0 | 0 |
| COMMAND & CONTROL VEHICLE (C2V) | OTA/FAR | THE BOEING COMPANY - SEATTLE WASHINGTON, see remark 1 | 20870 | 18556 | 1-3Q | 20651 | 1-3Q | 8243 | 1-3Q | 0 | 0 | 0 |
| RECONNAISSANCE & SURVEILLANCE VEHICLE (RSV) | OTA/FAR | THE BOEING COMPANY - SEATTLE WASHINGTON, see remark 1 | 23368 | 16460 | 1-3Q | 20123 | 1-3Q | 19075 | 1-3Q | 0 | 0 | 0 |
| Medical Vehicle (MV) | OTA/FAR | THE BOEING COMPANY - SEATTLE WASHINGTON, see | 0 | 4225 | 1-3Q | 6162 | 1-3Q | 8134 | 1-3Q | 0 | 0 | 0 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | remark 2 | | | | | | | | | | |
| FCS RECOVERY & MAINT VEH (FRMV) | OTA/FAR | THE BOEING COMPANY - SEATTLE WASHINGTON, see remark 2 | 0 | 6602 | 1-3Q | 8977 | 1-3Q | 20334 | 1-3Q | 0 | 0 | 0 |
| GFX XM307 Prototypes | Direct | General Dynamics Arm. & Tech. Products, Charlotte, NC | 0 | 0 | 1-3Q | 44075 | 2-3Q | 39200 | 1-3Q | 0 | 0 | 0 |
| GFX MK44 AMMO | Direct | General Dynamics Arm. & Tech. Products, Charlotte, NC | 0 | 0 | | 0 | | 1266 | 1-3Q | 0 | 0 | 0 |
| GFX APS | Direct | PM FCS (BCT) St.Louis,MO | 0 | 472 | 1-3Q | 1553 | 1-3Q | 1000 | 1-3Q | 0 | 0 | 0 |
| Subtotal: | | | 177639 | 313263 | | 513896 | | 570241 | | 0 | 0 | 0 |

Remarks: Remark 1: Subcontractor: General Dynamics - Sterling Heights, MI
Remark 2: Subcontractor: BAE - Ground Systems Division - Santa Clara, CA
Remark 3: Subcontractor: BAE - Armament Systems Division - Minnepolis,MN
Remark 4: Subcontractor: Raytheon Network Centric Systems - Plano, TX
Remark 5: Subcontractors: General Dynamics Armament & Technical Products - Charlotte, NC

| II. Support Costs | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2005 Cost | FY 2005 Award Date | FY 2006 Cost | FY 2006 Award Date | FY 2007 Cost | FY 2007 Award Date | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Subtotal: | | | 0 | | | | | | | | | |

Remarks: GFX Support provides Subject Matter Experts for the Active Protection Systems (APS).
All other support costs for this project are included in F61 SoS Engineering and Program Management project.

| III. Test And Evaluation | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2005 Cost | FY 2005 Award Date | FY 2006 Cost | FY 2006 Award Date | FY 2007 Cost | FY 2007 Award Date | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Subtotal: | | | 0 | | | | | | | | | |

Remarks: All Test and Evaluation costs for this project are included in F61 SoS Engineering and Program Management project.

# ARMY RDT&E COST ANALYSIS (R3)

**February 2006**

BUDGET ACTIVITY
**5 - System Development and Demonstration**

PE NUMBER AND TITLE
**0604645A - Armored Systems Modernization (ASM)-Eng. Dev.**

PROJECT
**F57**

| IV. Management Services | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2005 Cost | FY 2005 Award Date | FY 2006 Cost | FY 2006 Award Date | FY 2007 Cost | FY 2007 Award Date | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Subtotal: | | | 0 | | | | | | | | | |

Remarks: FY05 estimates do not reflect the latest two reprogrammings taht were approved in June and August 2005. Actuals ratioed to reflect this adjustment.

FY06 estimates do not reflect the current Earned Value Management Baseline; they reflect the FY06 President's Budget. The FY06 President's Budget submit occurred prior to contract definitization and baselining. Once the FY06 Budget is approved, a reprogramming action will be submitted to realing the Budget with the EVM Baseline. For purpose of this estimate, the FY06 Baseline numbers were adjusted to fit within the President's Budget allocation.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Total Cost:** | | | **177639** | **313263** | | **513896** | | **570241** | | **0** | **0** | **0** |

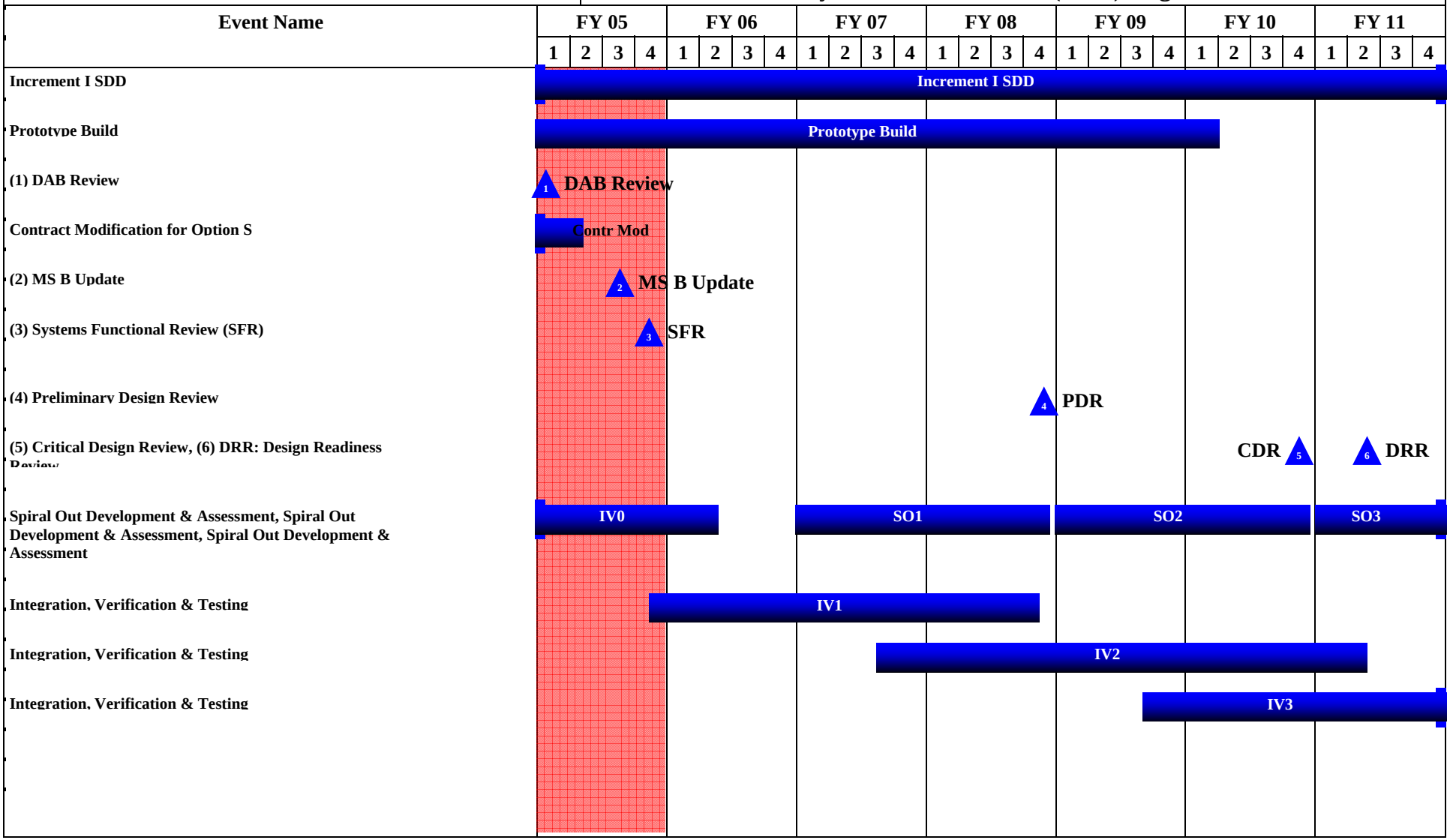
# Schedule Profile (R4 Exhibit)

**February 2006**

BUDGET ACTIVITY
**5 - System Development and Demonstration**

PE NUMBER AND TITLE
**0604645A - Armored Systems Modernization (ASM)-Eng. Dev.**

PROJECT
**F57**



# Schedule Detail (R4a Exhibit)

**February 2006**

| BUDGET ACTIVITY | PE NUMBER AND TITLE | PROJECT |
|---|---|---|
| **5 - System Development and Demonstration** | **0604645A - Armored Systems Modernization (ASM)-Eng. Dev.** | **F57** |

| Schedule Detail | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| ADM Required MS B Update | 3Q | | | | | | |
| Definitization of Contract Modification for POM-adjusted Program | 2Q | | | | | | |
| SoS Functional Review (FR) | 4Q | | | | | | |
| SoS Preliminary Design Review (PDR) | | | | 4Q | | | |
| Phase 1 Integration at Test Completion | 4Q | | | | | | |
| Phase 2 Integration at Test Completion | | | 3Q | | | | |
| SoS Critical Design Review (CDR) | | | | | | 4Q | |
| Phase 3 Integration at Test Completion | | | | 2Q | | | |
| Design Ready Review | | | | | | | 2Q |

# ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

**February 2006**

| BUDGET ACTIVITY | PE NUMBER AND TITLE | PROJECT |
|---|---|---|
| **5 - System Development and Demonstration** | **0604645A - Armored Systems Modernization (ASM)-Eng. Dev.** | **F61** |

| COST (In Thousands) | | FY 2005 Estimate | FY 2006 Estimate | FY 2007 Estimate | FY 2008 Estimate | FY 2009 Estimate | FY 2010 Estimate | FY 2011 Estimate | Cost to Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|
| F61 | S o S Engineering and Program Management | 1597139 | 1879210 | 2403139 | 2303689 | 1853009 | 1829927 | 1884924 | Continuing | Continuing |

**A. Mission Description and Budget Item Justification:** This PE includes government and System Development and Demonstration (SDD) contractor efforts associated with System of Systems (SoS) engineering Family of Systems (FoS) analysis and integration, Network Software and Hardware, Government SoS test and evaluation, Contractor SoS Test and evaluation, and contractor and government program management. This project includes support to other DOD agencies for joint programs and collaboration efforts with Future Combat System (FCS).

Major program milestones include the FCS Maturity Reviews and FCS Design Reviews. FCS Maturity Reviews provide program-level System of Systems (SoS) synchronization through the review of critical elements of the development program. These reviews, held approximately once per year, provide status of the phased Engineering, Integration and Verification progress. FCS Design Reviews monitor the design maturity of the FCS system leading to the FY12 MS-C decision. To address the overall FCS design impact of FCS System acceleration associated with the Spin-out strategy, an incremental design review approach based on DoD 5000 principles for Spin Out development has been adopted. The Incremental SoS level Design Reviews provide an early design assessment of the accelerated FCS Systems and focus on the FCS design impacts associated with these systems. The Incremental SoS level Design Reviews are included in the FCS Maturity Review process. The following is a summarized list of these key program reviews:

The SoSFR was conducted in Aug 2005. This will be followed by the System level SFRs for each platform, that will review the resulting SoSFR requirements to determine if all the requirements can be met by the individual platform. The role up of these System level Functional Reviews will occur at the Engineering Maturity Review (Jun 07), where the SoS requirements will be once again reviewed for completeness. After the requirements have reviewed again, the system level PDRs will take place, culminating in the SoSPDR scheduled for Aug 08.

The following summarizes what is included within the SOS Engineering and Program Management Project:

SoS Engineering - Conduct SoS reviews, top level trade studies, and architectural design of the SoS including requirements decomposition, requirements flow down, development of specifications, interface definitions, configuration management oversight, specialty engineering, and the analysis and verification of integrated force effectiveness.

Program management - The development of processes,tools,meetings, EVM, Risk, software, etc used to manage the total program ( to include subcontractors/Partners) to achieve the SoS program goals within the available dollars and schedules.

Network Software - Provides the SoS engineering effort to transform the FCS Operational Requirement Document (ORD) into a networked SoS architecture. Develop and Build/Test software codes for the FCS. Provides the SoS engineering effort to transform the FCS Operational Requirement Document (ORD) into a networked SoS architecture. It includes the conduct of system reviews, trade studies, and architectural design of the SoS network including requirements flow down, configuration management, SoS software requirements, functional & operational architecture, and design reviews to ensure network integration across all of the BCT Battlefield Functional Areas to meet FCS requirements and SoS integration. Network software management traces, cost, schedule, and performance throughout the program. Network Software Analysis and Integration links definition, design, procurement, construction, integration, experimentation, and testing of the elements of the distributed network system across the FoS in accordance with the Software Development Plan (SDP), SoS specification, C4ISR, Spin Out, and applicable segment and subsystem specifications.

Common Network Hardware - Includes design, development and prototype procurement of common hardware required for implementation of the data network. This includes sensors, communications hardware and computer processing capabilities.

SoS Test and Evaluation - Includes contractor and Government test and analysis to ensure SoS and FoS performance is effectively and efficiently achieved to specific criteria. The results of the SoS test is validation/verification that the resulting specifications meet the ORD and O&O requirements

Government Support Costs - Includes funding for government personnel to include labor, travel, training, supplies, and other support costs (support contractors, Automated Data Processing (ADP), communications, supplies, and equipment). Supports other services for Joint Programs, Multinational Project Arrangements, and collaborative efforts. Includes the procurement of Government Furnished Equipment/Items/Data (GFX) for the LSI. GFX is used when procurement through the government is less expensive than through the LSI.

IAW Section 214 of the FY2006 National Defense Authorization Act, this project will be converted to a stand alone Program Element commencing with the FY2008 President's Budget submission to Congress.

| **Accomplishments/Planned Program** | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| GOVERNMENT - SYSTEM ENGINEERING & PROGRAM MANAGEMENT (SEPM) SoS Engineering - Participate and ensure the government's best interest/value are considered in the following: SoS reviews, trade studies, architectural management, requirements decomposition, requirements flow down, development of specifications, interface definitions, configuration management oversight, specialty engineering, and the analysis and verification of integrated force effectiveness, Software Management, Risk Management, Modeling and Simulation Management, Performance Assurance Management, Integration & Verification Management, Technology Management, Experimentation, and FCS Spin Out Development. PM - Provide integrated program management (i.e. planning, directing, tools and controlling functions, for all development activities, including data and supplier management, program control, procurement and contracts management, operations management, Congressional title 10 oversight, cost analysis and management, Budget development and justification, Earned Value Management, integrated master schedule development and management, Complementary Program management and operations management associated with the LSI overarching management of the OTA/FAR. | 115991 | 144817 | 149098 |
| GOVERNMENT - System Test & Evaluation (STE) Defense Research Engineering Network (DREN) Connectivity: Funding for connectivity (point-of-service fees and hardware purchases) of SoSIL nodes to the (DREN). Ammunition: Procurements includes ammunition to support firing fixture testing and integration testing, along with NLOS-C, ARV-A, and ARV-RSTA testing. ATEC Test Integration Network (ATIN): Development of the ATIN providing intra-range and inter-range connectivity between all ATEC test centers and the SoSIL distributed network. Threat Systems/Simulators and Test Targets: Funds PM-ITTS to develop and procure threat systems and simulators and test targets in support of FCS test. Infrastructure: Development of the SoSIL nodes at the White Sands Missile Range and at the APG for local integration efforts of FCS variants. Modeling and Simulation for Test: The development of test tools to analyze results from Force-on-Force simulations, integrated spectral terrains for FCS applications, Digital Collection, Analysis and Review (DCARS), Test Conduct and Reporting System (TCARS), and Role Player Work Station (RPWS). FCS Unique Instrumentation: The development and implementation of FCS unique instrumentation (Advanced Passive Armor Test Capabilities, Precision Engagement Instrumentation, enhancements to meet E3 specification, and telemetry expansions) which will bridge critical instrumentation shortfalls at | 68072 | 117010 | 166301 |

| | | | |
|---|---|---|---|
| ATEC ranges. Test Range Support (Test Execution at Army Test Ranges): Specialty testing to include initial nuclear radiation (INR) survivability testing of MGV components and CBRN coupon material testing, MCS gun qualification and AHS compatibility testing, NLOS-C and NLOS-M compartmentation testing, NLOS-C cannon pre-fatigue testing, cannon breech cooling testing, and laser ignition testing, co-site and sensor performance testing, UGV ANS testing, co-site, and sensor performance, and NLOS-C and MCS lethality testing will be conducted. | | | |
| GOVERNMENT - Modeling and Simulation (M&S ) Funds are provided for enhancement of ATEC, RDECOM and TRADOC M&S capabilities essential to implement the FCS M&S strategy. This strategy is dependent on linking FCS based M&S requirements with existing Army M&S capabilities with a focus on minimum 'built from scratch' program M&S and maximum reusable integration of Army M&S capabilities. PM FCS (BCT) will work with 3 Commands to create persistent, leave behind capabilities for the Army in the area of SoS M&S. 3CE will develop enhanced, more interoperable M&S tools, capabilities and processes that will increase the overall capabilities of M&S These improved capabilities will reduce the overall costs to the LSI in integration, lifecycle applicability and reduce cycle time from requirements to integration with FCS simulation environment, particularly in IP1 and beyond. Application will be developing reference implementations that move M&S from cold war capabilities to those of NW-centric M&S. 3CE will also provide a larger library of tools available for consideration, incorporation and breakdown of the funding based on integrated 3CE ongoing planning, M&S technical program management and integration with FCS program. M&S persistent network nodes that link all 3CE commands together and to the SoSIL network. M&S requirements, architecture and gap analysis for 3CE and integration with the same from FCS LSI. M&S capability identification and development of emerging technologies. Capability Integration and interoperability support. FCS IV&V support will continue throughout the program. IV&V Strategy and Master Plan. Multi Cell & Dismounted Command and Control (M&DC2). M&DC2 is being recommended by TRADOC for use by the Army and for a replacement for the MC2 Device at UAMBL (their current BC surrogate). M&DC2 needs to convert from OTB to OOs as its principal battle environment. | 21355 | 11000 | 21000 |
| GOVERNMENT SPIN OUT 1 - This effort includes procurement of prototype hardware (brackets, wiring harnesses) to be used in the EBCT to integrate the ICS (as an appliqué) onto the Abrams (MIA2SEP), or Bradley (M2A3) and HMMWV (M1151) vehicle systems. IAW Section 214 of the FY2006 National Defense Authorization Act, this project will be assigned a unique SpinOut program element commmencing with the FY2008 President's Budget submission to Congress. | 0 | 6400 | 27900 |
| GOVERNMENT - OTHER and GFX - GFX supports the LSI contract. Dollars to fund GFX efforts came off the LSI contract as part of the definitization of the transition contract award. GFX requirements include the following: Government support to JEFX Experimentation, Multinational Interoperability support, C4ISR hardware to support Experiments 1 and 2, C4ISR End to End Network, hardware required to support Spin Out 1 assessment, TRADOC support including (TDY), Modeling and Simulation software updates, Mobility Shaker Support rent, support to NV labs. Government Other costs include ACE site licenses funding, SE/PM government labor, other non labor government costs and STEs from the base contract and transition. | 34958 | 160530 | 190995 |
| GOVERNMENT - Statutory Reductions - (4% allotment against the ASM PE for SBIR/STTR and other OSD statutory reductions) | 0 | 49882 | 135793 |
| CONTRACTOR - Program Management SoS PM - Develop the processess, models, tools and management structure to integrate all subcontractor partners into one team, to meet cost, schedules,and technical performance requirements in the contract. This includes program overview, demonstration, Earned Value Management, briefings, Demos, reports, meetings to support Program, risk Management, subcontract Management, Small and Minority Business Integration, data management, operation Management, contract Management, CDRL Management, Procurement, Acquisition Management, SDD Affordability/CAIV/ Life Cycle Management, Development of program baseline and Integrated Master Schedule Development | 165440 | 144670 | 159779 |
| CONTRACTOR - FEE This includes both the LSI fixed and incentive fee. | 276401 | 288909 | 350709 |
| | | | |

| | | | |
|---|---|---|---|
| Contractor Network Systems - FCS (BCT) Network program performance for C4ISR is on track. SOSCOE V1.5 was successfully tested and released to FCS OTPs to support EI1 software development. SOSCOE V1.8 will be released in FY07 to provide the software infrastructure to support IP1 software development. The PM FCS (BCT) continues to perform System of Systems (SoS) JIM interoperability and systems engineering work in support of the System of Systems Engineering and Integration (SSEI) effort. Joint Tactical Radio System (JTRS) Cluster 1, 5 and AMF are expected to receive official DAB approval to proceed with their Option 3, providing an FCS coordinated forward path for the FCS Transport Layer. Several Simulator Updates will be delivered in FY06 and will be tested as part of Integration/Verification 1 (IV1). In FY07 1 ASTAMIDS prototype will be delivered and 4 TSP prototypes are expected. The LSI will deliver 10 Tactical UGS prototypes in FY07 and 6 U-UGS prototypes that will be used for Spin Out 1. Additional sensors and updates will be delivered in the outyears. The first delivery of the prototypes will be in FY07. In FY07 1 ASTAMIDS prototype will be delivered and 4 TSP prototypes are expected. Subcontractors supporting JEFX are: Boeing, SAIC, Raytheon, Overwatch Systems, General Dynamics, Lockheed Martin, Northrup Grumman, Sparta and Textron. We have purchased 46 SuperMicro computers for JEFX most of which will be used in Experiment 1.1. | 414005 | 527146 | 705098 |
| Contractor System Requirements & Integration - SoS Engineering - Conduct architectural design, requirements decomposition and flow down, development of specifications, interface definitions, configuration management oversight, specialty engineering, and the analysis and verification of integrated force effectiveness. This includes: completing baseline system and software architectures, complete initial Interface Control Documents (ICDs) for internal and external interfaces, complete the baseline Prime Item Development Specifications (PIDS)-(1200 requirements). The Integrated concepts and requirements refinement for operational Systems engineering include; conducting FD/FA, develop and design the Design Reference Mission Profiles to insure FCS equipment meets Army requirements, conduct Force Trade assessment, O & O Refinement, and Operational Views for Architecture. Participate in Experiment 1.1, Produce Software Description documents, develop PIDs and CIDs for Spin Out 1, Develop ICD with Current force equipment, design, procure, and assemble B Kits for Spin Out 1. Develop/Plan/ and execute IV1, to include architecture development, and defining interfaces for systems entering preliminary design. Support JFEX Experimentation with A/B kit design and fabrication. Support Experiment 1.1 by modifying vehicles surrogates to integrate the JTRS cluster 1/Cluster 5 and WIN-T radios, FBCB2, AFATDS, DCGS-A. Develop Experiment detailed test procedures. Assembly of Test Consoles for Battle Command Suite Test and Integration, Integration of MGV, UGV, UAV electronic compartment Mock-ups, Initial Test of Laboratory Test equipment software, Initiate Network system Communication test event, Develop IV1 simulation requirements documentation, Develop IV1 simulation Test procedures, Integration and test of Ground and Air Sensor Simulations from " One Team Partners", Integrate SoSCOE into an integrated C4ISR software suite. | 471713 | 394083 | 454134 |
| Contractor SoS Test - FY06 - Integration Phase 0 - Establish foundational ties between requirements, architecture, and interface products & the time-phased SoS-level H/W & S/W Capability/Functionality buildup planning products. Develop and execute test plans for the Integration Phase 0 Integrated Mission Test to include: stand-up SoS Integration and Verification, and Test Capabilities and Processes; FCS to perform the Networked Fires and Provide Force Health Protection Integrated Processes; initial interoperability with the AFATDS, FBCB2, and GCCS-A complementary programs; maturation of the test articles, environment, and infrastructure. Participate in JEFX 06 This experiment is a multi-service focused on network centric operations and ISR fusion as well as advanced command and control systems. FY07- Demonstrate initial capability to establish and control the UA Network, manage selected sensors, display initial BCT level Common Operating Picture interface with selected external M-BCT assets, demonstrate selected Distributed Systems functions and provide test data to support Spin Out 1. Execute Experiment 1.1 with the following objectives: effect of quality of service implementations on network performance; assess maturity of distributed fusion management; assess interoperability and IA between selected assets; assess maturity of JTRS CL 1 and the WNW waveform, and CL 5 and the SRW waveform; demonstrate progress and maturity of selected FCS technologies; support selected KPP analysis and risk mitigation. | 29204 | 34763 | 42332 |

| Total | 1597139 | 1879210 | 2403139 |
|---|---|---|---|

| **B. Other Program Funding Summary** | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | To Compl | Total Cost |
|---|---|---|---|---|---|---|---|---|---|
| 0604645 F52 UAV Recon Platforms and Sensors | 51034 | 52135 | 65555 | 68490 | 87574 | 131662 | 90626 | 0 | 547076 |
| 0604645 F53 (UGV) Unmanned Ground Vehicles | 65066 | 124988 | 107705 | 145693 | 146565 | 111391 | 97621 | 0 | 799029 |
| 0604645 F54 (UGS) Unattended Ground Sensors | 15015 | 32131 | 17731 | 16515 | 12771 | 15913 | 1318 | 0 | 111394 |
| 0604645 F55 Sustainment | 56613 | 143356 | 146106 | 164538 | 197448 | 169671 | 147496 | 0 | 1025228 |
| 0604645 F57 (MGV) Manned Ground Vehicles | 313263 | 513896 | 570241 | 583483 | 821110 | 755918 | 411264 | 0 | 3969175 |
| 0604645 F61 SoS Engineering & Program Management | 1597139 | 1879210 | 2403139 | 2303689 | 1853009 | 1829927 | 1884924 | 0 | 13751037 |
| 0604646 F72 Non-Line of Sight Launch System (NLOS-LS) | 119767 | 231209 | 322880 | 274793 | 256283 | 89143 | 17759 | 0 | 1311834 |
| 0604647 F58 Non-Line of Sight Cannon (NLOS-C) | 286853 | 146271 | 112237 | 117605 | 90647 | 84160 | 44356 | 0 | 882129 |
| WTCV Weapons and Tracked Combat Vehicles | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0604645 F59 Common Components | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 27500 |
| 0604645 F60 Family of System, Anal & Int | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 165302 |
| 0604645 F62 Mission Equipment Platforms | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 132537 |
| 0604645 F63 Network Software | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 111745 |
| 0604645 F64 Other Contract Costs | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 313536 |
| 0604645 F65 S of S Engr & Prog Mgt | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 190331 |
| 0604645 F66 S of S Test and Evaluation | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 56347 |
| 0604645 F67 Supportability | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5252 |
| 0604645 F69 Training | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7756 |
| 0604645 F70 NLOS Launch System | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 49502 |

**C. Acquisition Strategy** During the FY06-11 POM process, the Army restructured the PM BCT Acquisition Program. The plan strengthened the FCS Program and simultaneously improved the Current Force through early delivery of selected FCS capabilities. The adjustments maintained the Army focus on FCS-equipped Brigade Combat Team (BCT) development and substantially reduced program risk. The adjustments to the FCS Program acquisition strategy fall into four primary categories:

- The development priority, in descending order, is; the 1) Network, 2) Unattended Munitions, 3) Unmanned systems, and finally 4) Manned Ground Vehicles (MGV). Consequently, the MGV development duration may be extended. However, Non Line of-Sight-Cannon (NLOS-C) leads MGV development and delivers prototype NLOS-C systems in 2008 and delivers Block 0 NLOS-C prototypes in 2010.
- The five previously deferred FCS core systems: 1) UAV Class II, 2) UAV III , 3) Armed Robotic Vehicle (ARV) -Assault, 4) ARV-Reconnaissance and 5) FCS Maintenance and Recovery Vehicle have been funded. These five systems will be fielded with the first FCS-equipped BCT allowing fielding of the complete 18 + 1 FCS core systems to the Army with delivery beginning in 2014.
- More robust experimentation and evaluation are included in the program to prove revolutionary concepts, mature the architecture and components, and assist in the spinout development.
- A series of Spinout packages will begin procurement in 2009 and continue approximately every two years through 2014 to insert FCS capability into Current Force Modular Brigade Combat Teams (M-BCTs) to include Heavy and Infantry.

The current OTA was initially modified on 6 Aug 2004 to cover the new Scope of Work (SOW) of the approved POM program. Final definitization of this modification occurred on 2 March 2005. Since FY05 funding was based on the original Milestone B approved program, two major reprogrammings have occurred in order to align funding of the restructured program. Similarly, the FY06 funding request was submitted prior to definitization and prior to completion of the contract/program budget baseline. Therefore, future funding profiles will be adjusted based on the definitized program Earned Value Management Baseline. IAW Section 214 of the FY2006 National Defense Authorization Act, this project will be converted to a stand alone Program Element commencing with the FY2008 President's Budget submission to Congress.

# ARMY RDT&E COST ANALYSIS (R3)

**February 2006**

BUDGET ACTIVITY
**5 - System Development and Demonstration**

PE NUMBER AND TITLE
**0604645A - Armored Systems Modernization (ASM)-Eng. Dev.**

PROJECT
**F61**

| I. Product Development | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2005 Cost | FY 2005 Award Date | FY 2006 Cost | FY 2006 Award Date | FY 2007 Cost | FY 2007 Award Date | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CONTRACTOR- PROG MGT | OTA/FAR | The Boeing Company - Seattle, WA | 313348 | 165440 | 1-3Q | 144670 | 1-3Q | 159779 | 1-3Q | 0 | 0 | 0 |
| CONTRACT FEE | OTA/FAR | The Boeing Company - Seattle, WA | 0 | 276401 | 2-3Q | 288909 | 1-3Q | 350709 | 1-3Q | 0 | 0 | 0 |
| CONTRACTOR NETWORK SYSTEMS | OTA/FAR | The Boeing Company - Seattle, WA see remarks 1 - 7 | 0 | 414005 | 1-3Q | 527146 | 1-3Q | 705098 | 1-3Q | 0 | 0 | 0 |
| CONTRACTOR SYSTEM REQUIREMENTS AND INTEGRATION | OTA/FAR | The Boeing Company - Seattle, WA | 0 | 471713 | 1-3Q | 394083 | 1-3Q | 454134 | 1-3Q | 0 | 0 | 0 |
| Subtotal: | | | 313348 | 1327559 | | 1354808 | | 1669720 | | 0 | 0 | 0 |

Remarks: Remark 1: Subcontractor: Textron, wilmington, MA
2: Subcontractor: SAIC, Huntington Beach, CA
3: Subcontractor: SPARTA, Hungtington Beach, CA
4: Subcontractor: Northrop Grumman, Carson, CA
5: Subcontractor: Raytheon, Fort Wayne, IN
6: Subcontractor: Overwatch Systems, Austin, TX
7: Subcontractor: General Dynamics, Scottsdale, AZ

| II. Support Costs | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2005 Cost | FY 2005 Award Date | FY 2006 Cost | FY 2006 Award Date | FY 2007 Cost | FY 2007 Award Date | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GOVERNMENT SYS ENG PROGRAM MGT | DIRECT | PM FCS UA - ST. Louis, MO | 0 | 115991 | 1-4Q | 144817 | 1-4Q | 149098 | 1-4Q | 0 | 0 | 0 |
| GOVERNMENT OTHER | DIRECT | PM FCS UA - ST. Louis, MO | 0 | 34958 | 1-3Q | 160530 | 1-3Q | 190995 | 1-3Q | 0 | 0 | 0 |
| GOVERNMENT-STATUTORY REDUCTIONS | DIRECT | PM FCS UA - ST. Louis, MO | 0 | 0 | | 49882 | 1Q | 135793 | 1Q | 0 | 0 | 0 |
| SPIN OUT | Direct | PM FCS UA - ST. Louis, MO | 0 | 0 | | 6400 | 1-3Q | 27900 | 1-3Q | 0 | 0 | 0 |
| Subtotal: | | | 0 | 150949 | | 361629 | | 503786 | | 0 | 0 | 0 |

| III. Test And Evaluation | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2005 Cost | FY 2005 Award Date | FY 2006 Cost | FY 2006 Award Date | FY 2007 Cost | FY 2007 Award Date | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CONTRACTOR - SoS Test | OTA/FAR | The Boeing Company - Seattle, WA | 0 | 29204 | 1-3Q | 34763 | 1-3Q | 42332 | 1-3Q | 0 | 0 | 0 |
| GOVERNMENT - STE | DIRECT | PM FCS-UA - ST. Louis, MO , see remarks 1-6 | 0 | 68072 | 1-3Q | 117010 | 1-3Q | 166301 | 1-3Q | 0 | 0 | 0 |
| GOVERNMENT MODELING & SIMULATION | DIRECT | PM FCS-UA - ST. Louis, MO | 0 | 21355 | 1-3Q | 11000 | 1-3Q | 21000 | 1-3Q | 0 | 0 | 0 |
| Subtotal: | | | 0 | 118631 | | 162773 | | 229633 | | 0 | 0 | 0 |

Remarks: Remark 1:Subcontractor, Whitman, Requardt & Assoc, Baltimore, MD;
2: John C. Grimberg Co., Rockville, MD
3: ADT Corp, Baltimore, MD
4. Netversant Co., Baltimore, MD
5. 3D Research, Huntsville, AL
6. Jacobs/Sverdrup, Aberdeen, MD

| IV. Management Services | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2005 Cost | FY 2005 Award Date | FY 2006 Cost | FY 2006 Award Date | FY 2007 Cost | FY 2007 Award Date | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Subtotal: | | | 0 | | | | | | | | | |

Remarks: FY05 estimates do not reflect the latest two reprogrammings that were approved in June and August 2005. Actuals ratioed to reflect this adjustment.

FY06 estimates do not reflect the current Earned Value Management Baseline; they reflect the FY06 President's Budget. The FY06 President's Budget submit occurred prior to contract definitization and baselining. Once the FY06 Budget is approved, a reprogramming action will be submitted to realing the Budget with the EVM Baseline. For purpose of this estimate, the FY06 Baseline numbers were adjusted to fit within the President's Budget allocation.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Total Cost:** | **313348** | **1597139** | | **1879210** | | **2403139** | | **0** | **0** | **0** |

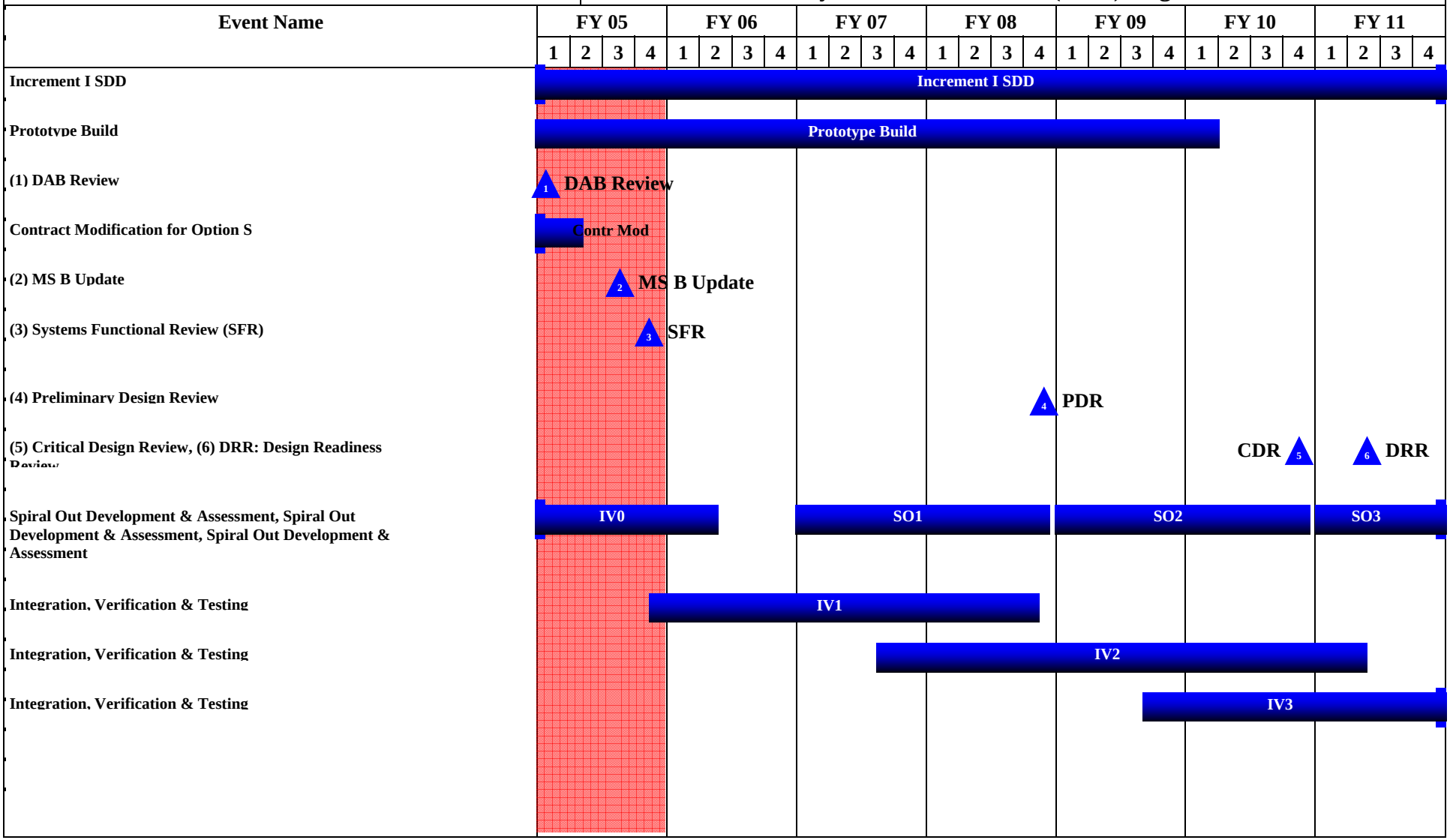
# Schedule Profile (R4 Exhibit)

**February 2006**

BUDGET ACTIVITY
**5 - System Development and Demonstration**

PE NUMBER AND TITLE
**0604645A - Armored Systems Modernization (ASM)-Eng. Dev.**

PROJECT
**F61**



# Schedule Detail (R4a Exhibit)

**February 2006**

| BUDGET ACTIVITY | PE NUMBER AND TITLE | PROJECT |
|---|---|---|
| **5 - System Development and Demonstration** | **0604645A - Armored Systems Modernization (ASM)-Eng. Dev.** | **F61** |

| Schedule Detail | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| ADM Required MS B Update | 3Q | | | | | | |
| Definitization of Contract Modification for POM- Adjusted Program | 2Q | | | | | | |
| SoS Functional Review (FR) | | | | | | | |
| SoS Preliminary Design Review (PDR) | | | | 4Q | | | |
| Phase 1 Integration at Test Completion | 4Q | | | | | | |
| Phase 2 Integration at Test Completion | | | 3Q | | | | |
| SoS Critical Design Review (CDR) | | | | | | 4Q | |
| Phase 3 Integration at Test Completion | | | | 2Q | | | |
| Design Ready Review | | | | | | | 2Q |