PE NUMBER: 0101113F
PE TITLE: B-52 SQUADRONS

# Exhibit R-2, RDT&E Budget Item Justification

DATE **May 2009**

BUDGET ACTIVITY
**07 Operational System Development**

PE NUMBER AND TITLE
**0101113F B-52 SQUADRONS**

| Cost ($ in Millions) | | FY 2008 Actual | FY 2009 Estimate | FY 2010 Estimate | FY 2011 Estimate | FY 2012 Estimate | FY 2013 Estimate | FY 2014 Estimate | FY 2015 Estimate | Cost to Complete | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total Program Element (PE) Cost | 51.336 | 38.546 | 93.930 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | Continuing | TBD |
| 5039 | B-52 Modernization | 51.336 | 38.546 | 93.930 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | Continuing | TBD |

**(U) A. Mission Description and Budget Item Justification**

B-52 Modernization is a comprehensive program to assure B-52 viability to perform future wartime missions. B-52 modernization (initiated in FY05) integrates and adds both tactical and global data link communications for real time command and control, targeting, intelligence and upgrades antiquated air traffic management systems with those supported by three key functions using satellite technology: Communications, Navigation and Surveillance. Modernization also upgrades training devices to support aircrew and maintenance training with the latest B-52 capability. In addition, modernization improves conventional warfare capability with additional MIL-STD-1760 smart weapons and fully integrates advanced targeting pods with the offensive avionics system.

CONECT

The B-52 Combat Network Communication Technology (CONECT) acquisition program will support nuclear and conventional operations by upgrading the B-52 fleet with tactical data link and voice communications capabilities along with improved threat and situational awareness to support participation in network centric operations. The CONECT upgrade includes new Multi-Functional Color Displays (MFCDs) and a digital interphone system which will survive and function through the nuclear environment to enhance crew interaction and situational awareness. To enable net centric operations, the CONECT upgrade integrates: on-board client/server architecture supporting distributed processing with independent control functions; UHF Beyond Line-Of-Sight (BLOS) Joint Range Extension (JRE) capability via ARC-210 Warrior radio to exchange J-Series messaging within theater; Intelligence Broadcast Receiver; limited Internet Protocol (IP)-based UHF BLOS link supporting email and file transfers; and Improved Data Modem (IDM)-based digital Variable Message Format (VMF) datalink to significantly enhance close air support (CAS) missions. This integrated suite will provide the B-52 fleet with a machine-to-machine capability supporting aircraft re-tasking and re-targeting of Conventional Air Launched Cruise Missile (CALCM) and J-series weapons across the range of military operations the B-52 is assigned.

B-52 EHF

B-52 EHF will provide the B-52 fleet with assured and survivable two-way Extremely High Frequency (EHF) SATCOM link for emergency action messages (EAMs) and report-backs to meet Joint Chiefs of Staff (JCS) nuclear protected Information Exchange Requirements (IER). B-52 EHF will integrate the Family of Advanced Beyond Line of Sight (BLOS) Terminals (FAB-T) Increment 1 system developed and procured by Electronic Systems Center (ESC) through PE 0303601F. The FAB-T system consists of the Operator Interface Group, Modem Processor Group, Antenna Group, and Radome. B-52 EHF will integrate the following capabilities into CONECT: a high data rate BLOS communication link supporting IP-based Global Information Grid (GIG) interoperability; two additional Multi-Functional Color Displays (MFCDs) which will survive and function through the nuclear environment; automated reporting of aircraft fuel level status off-board the jet; additional J-series messages; and additional software for integration.

Trainers & CONECT

In order to maintain currency with the latest aircraft configuration, the CONECT and EHF programs will update existing trainers or use computer-based training to add CONECT and EHF functionality to meet user-training requirements, and establish a system integration laboratory for updates of the Weapon System Trainers.

Weapons Improvements

B-52 Modernization also includes improvement of conventional warfare capability. This effort provides development and testing to rapidly integrate weapons with a large array of properties, but not limited to: stealth, hard target penetration, standoff, adverse weather, precision strike, loiter, decoy, defense suppression, post-release/launch re-target capability, area denial, mobile targets, and multiple simultaneous attack. These capabilities are provided through the integration of advanced weapons both internally (MIL-STD-1760 in the bomb bay) and externally.

Advanced Targeting Pod Functionality

The B-52 Modernization program fully integrates the Advanced Targeting Pod (ATP) by linking pod control, display and target geo-location with the B-52 offensive avionics system. The B-52 ATP effort continues the ATP (Sniper or LITENING) integration effort which began in FY07 with GWOT funding. The ATP effort develops aircraft software updates to add and incorporate advanced pod functionality into the B-52. In addition, this effort upgrades the software functions of the Alternate Mission Equipment (AME) (Multi Function Display and the Integrated Hand Controller), and enables the B-52 to utilize a LITENING, or Sniper pod. This effort provides hardware and software upgrades to the existing aircrew/maintenance trainers and the system integration lab.

B-52 Communication Navigation Surveillance/Air Traffic Management (CNS/ATM)

The Communication Navigation Surveillance/Air Traffic Management effort, will develop and integrate modern technology into the B-52 to enable it to operate in the evolving air traffic environment. This effort is driven by the International Civil Aviation Organization (ICAO) and Federal Aviation Administration (FAA) mandates to comply with performance standards to allow the B-52 to operate safely in controlled airspaces. This program will also yield significant savings through more efficient flight routes and altitudes. Functions requiring updated technology in the B-52 are communications, navigation, and surveillance. More specifically the capabilities upgraded under CNS/ATM activities will include FM Immunity, Digital Communications (voice to data), improved navigation accuracy such as Required Navigation Performance (RNP) or Global Positioning System (GPS) enhancements, Reduced Vertical Separation Minimum (RVSM), Traffic Alert and Collision Avoidance System (TCAS), enhanced situational awareness such as Mode S/Mode 5 Identify Friend or Foe (IFF), Communications Management Unit, HF Data Link, 8.33MHz VHF, Auto Dependent Surveillance (both address and broadcast), and any follow-on activities to associated components/systems resulting from modifications to CNS/ATM systems.

Replace B-52 Anti-Skid

The B-52 Anti-Skid is a system used to maintain control of aircraft during landings and taxi operations. Anti-skid automatically activates the brake system without crew input to insure safe operation of aircraft on the ground. Aircraft not equipped with anti-skid capabilities require special procedures not conducive to normal operations and face increased risk of damage during taxi, landings and emergency stops. Ogden Air Logistics Center (OO-ALC) has identified the Anti-Skid skid detector as a Diminishing Manufacturing Sources (DMS) item that will need to be replaced beginning in FY11. The Anti-Skid is a joint effort between OO-ALC and Oklahoma City Air Logistics Center (OC-ALC). This effort covers costs associated with the Group A and Group B hardware Development, flight test costs, and

installation of the system to include upgrade of the maintenance trainers.

Strategic Radar Replacement

The Strategic Radar Replacement Program replaces the current B-52 Strategic Radar which was installed in the 1980s and is estimated to be unsupportable by 2016. Although this system has been modified several times since 1980, it has never been totally replaced. Several parts of the system remain from the original design such as the antenna reflector, feed, and casting. The system is showing increasing signs of performance degradation, reliability and maintainability issues, and design limitations. This radar replacement program is a Reliability & Maintainability (R&M) modification which will take advantage of technical insertion to capture the advanced capabilities of Non-Developmental Item (NDI) radars, maximizing commonality with other platforms. There have been significant advances in radar technology over the past 20 years and it is no longer reasonable to update the existing hardware. The current radar system uses a mechanically scanned antenna. Current radar technology involves electronically scanned arrays with greatly increased performance and reliability. The Strategic Radar Replacement Program will develop, integrate, test, and field a modern radar system.

Test & Evaluation

B-52 Modernization funds test activities at the Air Force Flight Test Center (AFFTC), engineering and planning studies for potential future weapon system enhancements (weapons, sensors, and avionics), upgrades to the B-52 System Integration Labortory (SIL) and weapon system operational/safety, supportability, reliability, and Total Ownership Cost (TOC) improvements.

Additional Efforts

B-52 Modernization funds additional efforts that stem from the operation and maintenance of a 48 year-old aircraft, such as parts obsolescence and Diminishing Manufacturing Sources (DMS). Examples include, but are not limited to upgrades to outdated avionics computers, mission planning interface to the Air Force Mission Support System (AFMSS) and upgrades to the Electronic Countermeasures (ECM) suite, and studies and analysis.

All B-52 development programs support planned requirements for unique identification in their production phases. The B-52 Modernization upgrade program is included in Budget Activity (BA) 7, Operational System Development.

| Exhibit R-2, RDT&E Budget Item Justification | DATE May 2009 |
|---|---|
| BUDGET ACTIVITY 07 Operational System Development | PE NUMBER AND TITLE 0101113F B-52 SQUADRONS |

**(U) B. Program Change Summary ($ in Millions)**

| | | FY 2008 | FY 2009 | FY 2010 |
|---|---|---|---|---|
| (U) | Previous President's Budget | 42.121 | 38.651 | 68.381 |
| (U) | Current PBR/President's Budget | 51.336 | 38.546 | 93.930 |
| (U) | Total Adjustments | 9.215 | -0.105 | |
| (U) | Congressional Program Reductions | | | |
| | Congressional Rescissions | | -0.105 | |
| | Congressional Increases | | | |
| | Reprogrammings | 10.363 | | |
| | SBIR/STTR Transfer | -1.148 | | |

(U) Significant Program Changes:

FY08 - Increase of $9.215M reprogramming for B-52 CONECT efforts.

FY10 - Increase of $25.6M for B-52 CONECT development (+$17.3), B-52 Anti-Skid replacement program (+$.8M), Advanced Targeting Pod program (+$3.7M), Strategic Radar Replacement program (+$12.4M) and a one-year slip to the Mode S/5 program (-$8.6M).

# Exhibit R-2a, RDT&E Project Justification

DATE **May 2009**

BUDGET ACTIVITY **07 Operational System Development**

PE NUMBER AND TITLE **0101113F B-52 SQUADRONS**

PROJECT NUMBER AND TITLE **5039 B-52 Modernization**

| Cost ($ in Millions) | FY 2008 Actual | FY 2009 Estimate | FY 2010 Estimate | FY 2011 Estimate | FY 2012 Estimate | FY 2013 Estimate | FY 2014 Estimate | FY 2015 Estimate | Cost to Complete | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| 5039 B-52 Modernization | 51.336 | 38.546 | 93.930 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | Continuing | TBD |
| Quantity of RDT&E Articles | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |

**(U) A. Mission Description and Budget Item Justification**

B-52 Modernization is a comprehensive program to assure B-52 viability to perform future wartime missions. B-52 modernization (initiated in FY05) integrates and adds both tactical and global data link communications for real time command and control, targeting, intelligence and upgrades antiquated air traffic management systems with those supported by three key functions using satellite technology: Communications, Navigation and Surveillance. Modernization also upgrades training devices to support aircrew and maintenance training with the latest B-52 capability. In addition, modernization improves conventional warfare capability with additional MIL-STD-1760 smart weapons and fully integrates advanced targeting pods with the offensive avionics system.

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| Exhibit R-2a, RDT&E Project Justification | | DATE May 2009 |
|---|---|---|
| BUDGET ACTIVITY 07 Operational System Development | PE NUMBER AND TITLE 0101113F B-52 SQUADRONS | PROJECT NUMBER AND TITLE 5039 B-52 Modernization |

Strategic Radar Replacement

The Strategic Radar Replacement Program replaces the current B-52 Strategic Radar which was installed in the 1980s and is estimated to be unsupportable by 2016. Although this system has been modified several times since 1980, it has never been totally replaced. Several parts of the system remain from the original design such as the antenna reflector, feed, and casting. The system is showing increasing signs of performance degradation, reliability and maintainability issues, and design limitations. This radar replacement program is a Reliability & Maintainability (R&M) modification which will take advantage of technical insertion to capture the advanced capabilities of Non-Developmental Item (NDI) radars, maximizing commonality with other platforms. There have been significant advances in radar technology over the past 20 years and it is no longer reasonable to update the existing hardware. The current radar system uses a mechanically scanned antenna. Current radar technology involves electronically scanned arrays with greatly increased performance and reliability. The Strategic Radar Replacement Program will develop, integrate, test, and field a modern radar system.

Test & Evaluation

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Additional Efforts

B-52 Modernization funds additional efforts that stem from the operation and maintenance of a 48 year-old aircraft, such as parts obsolescence and Diminishing Manufacturing Sources (DMS). Examples include, but are not limited to upgrades to outdated avionics computers, mission planning interface to the Air Force Mission Support System (AFMSS) and upgrades to the Electronic Countermeasures (ECM) suite, and studies and analysis.

All B-52 development programs support planned requirements for unique identification in their production phases. The B-52 Modernization upgrade program is included in Budget Activity (BA) 7, Operational System Development.

| (U) | **B. Accomplishments/Planned Program ($ in Millions)** | FY 2008 | FY 2009 | FY 2010 |
|---|---|---|---|---|
| (U) | Common Reconfigurable Advanced Thermal Management System | 0.482 | | |
| (U) | Advanced Targeting Pod Functions | 0.980 | 3.459 | 3.685 |
| (U) | Pod Software Trainer Upgrades | 4.000 | | |
| (U) | Advanced Targeting Pod Flight Test | 0.120 | | |
| (U) | Advanced Targeting Pod Management Support | 0.100 | | |
| (U) | CONECT Product Development | 39.855 | 18.232 | 20.074 |
| (U) | CONECT/EHF Simulation/Trainer Development | 0.510 | 3.572 | 24.830 |
| (U) | CONECT Government Test | 1.600 | 3.639 | 3.133 |
| (U) | CONECT/EHF Program Support/Modeling and Simulation/Studies and Analysis | 1.339 | 1.053 | 1.126 |
| (U) | CONECT/EHF Program Management Support | 2.350 | 5.591 | 5.954 |

| Exhibit R-2a, RDT&E Project Justification | | DATE May 2009 |
|---|---|---|
| BUDGET ACTIVITY<br>07 Operational System Development | PE NUMBER AND TITLE<br>0101113F B-52 SQUADRONS | PROJECT NUMBER AND TITLE<br>5039 B-52 Modernization |

| (U) | **B. Accomplishments/Planned Program ($ in Millions)** | FY 2008 | FY 2009 | FY 2010 |
|---|---|---|---|---|
| (U) | EHF Product Development | | 3.000 | 21.908 |
| (U) | Replace B-52 Anti-Skid | | | 0.795 |
| (U) | Strategic Radar Replacement | | | 12.425 |
| (U) | Total Cost | 51.336 | 38.546 | 93.930 |

**(U) C. Other Program Funding Summary ($ in Millions)**

| | | FY 2008 Actual | FY 2009 Estimate | FY 2010 Estimate | FY 2011 Estimate | FY 2012 Estimate | FY 2013 Estimate | FY 2014 Estimate | FY 2015 Estimate | Cost to Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| (U) | APAF, PE 0101113F, B52 Squadrons, Aircraft Procurement BP11, Mods | 42.645 | 41.581 | 78.788 | | | | | | Continuing | TBD |
| (U) | APAF, PE 0101113F, B52 Squadrons, Aircraft Procurement BP16, Initial Spares | 0.039 | 0.063 | 8.487 | | | | | | Continuing | TBD |

**(U) D. Acquisition Strategy**

B-52 Modernization is a comprehensive program to assure B-52 viability to perform future wartime missions. The B-52 CONECT EMD prime contract is sole source to Boeing, Wichita, KS. Boeing will design, develop, test and procure the necessary equipment from their subcontractors; develop engineering drawings, logistic and technical data, and time compliance technical order (TCTO) for installation on the B-52. The EMD effort includes installing and testing CONECT equipment on a B-52 aircraft. The B-52 trainer will be modified to support the CONECT modification through OO-ALC via their trainer contract with Rockwell Collins, Sterling, VA.

The B-52 EHF EMD prime contract is sole source to Boeing, Wichita, KS. Boeing will integrate the Government Furnished Equipment (GFE) Family of Beyond-Line-Of-Sight Terminals (FAB-T); develop engineering drawings, logistic and technical data, and time compliance technical order (TCTO) for installation on the B-52. The EMD effort includes installing and testing EHF equipment on a B-52 aircraft. The B-52 trainer will be modified to support the EHF modification through OO-ALC via their trainer contract with Rockwell Collins, Sterling, VA.

The B-52 Advanced Targeting Pod (ATP) Program managed by the the B-52 System Program Office (SPO) sole sourced the software development contract to Boeing, Wichita. The ATP trainer development contract will be awarded by OO-ALC via their trainer contract with Rockwell Collins, Sterling VA.

The B-52 Anti-Skid program is a joint effort between OC-ALC and OO-ALC. The modification will be implemented via Program Depot Maintenance and Contract Field Team.

The Strategic Radar Replacement program is planned to be a sole-source contract to Boeing, Wichita KS.

# Exhibit R-3, RDT&E Project Cost Analysis

DATE **May 2009**

BUDGET ACTIVITY **07 Operational System Development**

PE NUMBER AND TITLE **0101113F B-52 SQUADRONS**

PROJECT NUMBER AND TITLE **5039 B-52 Modernization**

| (U) Cost Categories (Tailor to WBS, or System/Item Requirements) ($ in Millions) | Contract Method & Type | Performing Activity & Location | Total Prior to FY 2008 Cost | FY 2008 Cost | FY 2008 Award Date | FY 2009 Cost | FY 2009 Award Date | FY 2010 Cost | FY 2010 Award Date | Cost to Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (U) Product Development | | | | | | | | | | | | |
| CONECT EMD | CPFF | Boeing, Wichita KS | 64.920 | 39.855 | | 18.232 | | 20.074 | | Continuing | TBD | |
| B-52 EHF EMD | TBD | Boeing, Wichita KS | | | | 3.000 | | 21.908 | | Continuing | TBD | |
| 1760 Studies and Analysis | T&M | Boeing, Wichita KS | | | | | | | | | 0.000 | |
| Advanced Pod Functions | Various | Boeing, Wichita KS | 0.000 | 0.980 | Sep-08 | | | 3.685 | | | 4.665 | |
| Common Reconfigurable Advanced Thermal Management System | MIPR | ISR (SprayCool Technology) and Wichita State University, Wichita KS | 1.000 | 0.482 | | | | | | | 1.482 | |
| B-52 Communication Navigation/Surveillance/Air Traffic Management | Engineering Assignment T&M | Boeing, Wichita KS | | | | | | | | Continuing | TBD | |
| Strategic Radar Replacement | TBD | TBD | | | | | | 12.208 | Jan-10 | | 12.208 | |
| Subtotal Product Development | | | 65.920 | 41.317 | | 21.232 | | 57.875 | | Continuing | TBD | 0.000 |
| Remarks: | | | | | | | | | | | | |
| (U) Support | | | | | | | | | | | | |
| CONECT Simulator/Trainer | 616 | 509 ACSS, OO-ALC, UT | 18.810 | 0.510 | | 3.572 | | 19.118 | | Continuing | TBD | |
| B-52 EHF Simulator/Trainer | 616 | 509 ACSS, OO-ALC, UT | | | | | | 1.612 | | Continuing | TBD | |
| B-52 EHF Satellite Simulator - Lincoln Labs (FFRDC) | | | | | | | | 4.000 | | | 4.000 | |
| CONECT Program Support, Studies & Analysis | Various | | 2.039 | 1.339 | | 1.093 | | 1.126 | | Continuing | TBD | |
| B-52 EHF Program Support, Studies & Analysis | Various | | | | | | | 0.100 | | Continuing | TBD | |
| Pod Software Trainer Upgrades | Contract | OO-ALC | 0.000 | 4.000 | Nov-08 | | | | | | 4.000 | |
| Strategic Radar Replacement | TBD | TBD | | | | | | | | | 0.000 | |
| Subtotal Support | | | 20.849 | 5.849 | | 4.665 | | 25.956 | | Continuing | TBD | 0.000 |
| Remarks: | | | | | | | | | | | | |
| (U) Test & Evaluation | | | | | | | | | | | | |
| CONECT 419 FLTS | Project Order | Edwards AFB, CA | 2.188 | 1.300 | | 3.274 | | | | Continuing | TBD | |
| B-52 EHF 419 FLTS | Project Order | Edwards AFB, CA | | | | | | 3.092 | | Continuing | TBD | |

# Exhibit R-3, RDT&E Project Cost Analysis

DATE **May 2009**

BUDGET ACTIVITY **07 Operational System Development**

PE NUMBER AND TITLE **0101113F B-52 SQUADRONS**

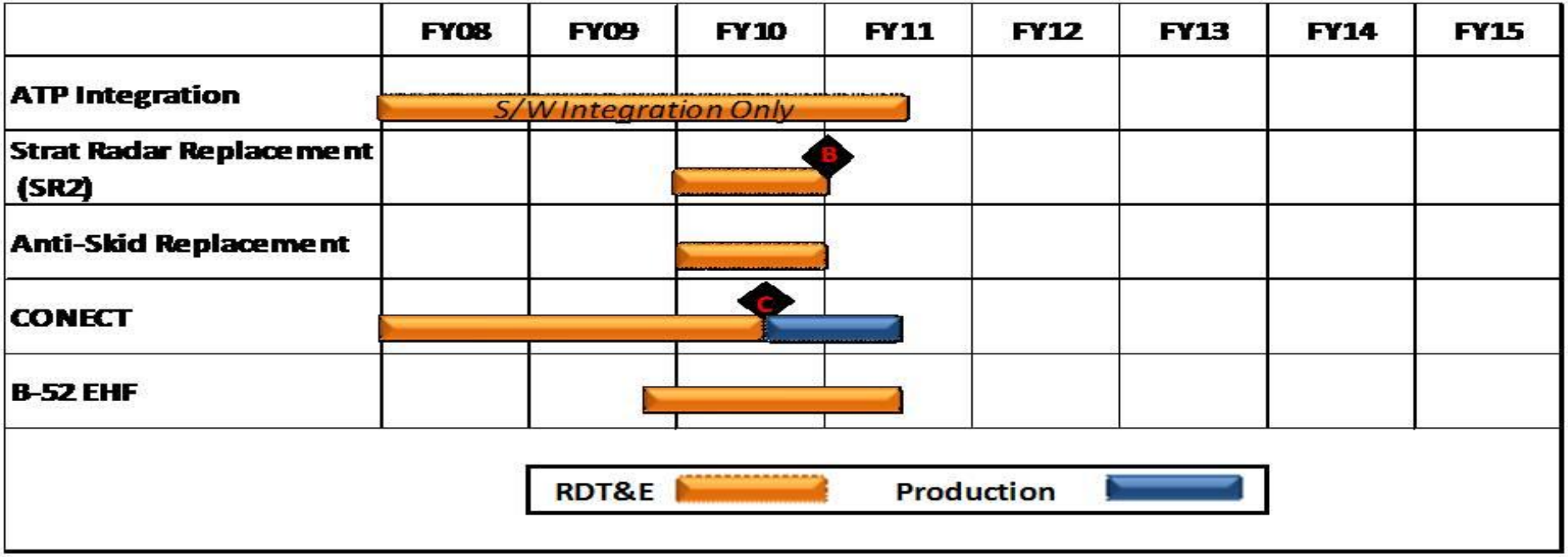
PROJECT NUMBER AND TITLE **5039 B-52 Modernization**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CONECT JTIC | MIPR | Fort Huachuca, AZ | 0.384 | 0.300 | | 0.365 | | | Continuing | TBD | |
| | B-52 EHF JTIC | MIPR | Fort Huachuca, AZ | | | | | | 0.041 | Continuing | TBD | |
| | Advanced Pod Test 419 FLTS | Project Order | Edwards AFB, CA | | 0.120 | Feb-08 | 3.459 | Dec-09 | | | 3.579 | |
| | Subtotal Test & Evaluation | | | 2.572 | 1.720 | | 7.098 | | 3.133 | Continuing | TBD | 0.000 |
| | Remarks: | | | | | | | | | | | |
| (U) | Management | | | | | | | | | | | |
| | CONECT 651 AESS | | Wright-Patterson AFB, OH | 2.205 | 1.412 | | 4.525 | | 3.136 | Continuing | TBD | |
| | B-52 EHF 651 AESS | | Wright-Patterson AFB, OH | | | | | | 2.023 | Continuing | TBD | |
| | CONECT 327 ACSG | | Tinker AFB, OK | 0.758 | 0.938 | | 1.026 | | | Continuing | TBD | |
| | B-52 EHF 327 ACSG | | Tinker AFB, OK | | | | | | 0.795 | Continuing | TBD | |
| | ATP Management Support | | | | 0.100 | | | | | | 0.100 | |
| | Strategic Radar Replacement | | Tinker AFB, OK | | | | | | 0.217 | | 0.217 | |
| | Anti-Skid Replacement | | | | | | | | 0.795 | | 0.795 | |
| | Subtotal Management | | | 2.963 | 2.450 | | 5.551 | | 6.966 | Continuing | TBD | 0.000 |
| | Remarks: | | | | | | | | | | | |
| (U) | Total Cost | | | 92.304 | 51.336 | | 38.546 | | 93.930 | Continuing | TBD | 0.000 |

| Exhibit R-4, RDT&E Schedule Profile | | DATE May 2009 |
|---|---|---|
| BUDGET ACTIVITY<br>07 Operational System Development | PE NUMBER AND TITLE<br>0101113F B-52 SQUADRONS | PROJECT NUMBER AND TITLE<br>5039 B-52 Modernization |

U.S. AIR FORCE

# B-52H Modernization Schedule FY10PB




*Integrity - Service - Excellence*

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# Exhibit R-4a, RDT&E Schedule Detail

DATE
**May 2009**

| BUDGET ACTIVITY | PE NUMBER AND TITLE | PROJECT NUMBER AND TITLE |
|---|---|---|
| **07 Operational System Development** | **0101113F B-52 SQUADRONS** | **5039 B-52 Modernization** |

| **(U) Schedule Profile** | FY 2008 | FY 2009 | FY 2010 |
|---|---|---|---|
| (U) CONECT EMD | 1-4Q | 1-4Q | 1-4Q |
| (U) CONECT Flight Test Drop C | | 4Q | 1Q |
| (U) CONECT LRIP Milestone C | | | 3Q |
| (U) B-52 EHF EMD Increment 1 | | 3-4Q | 1-2Q |
| (U) B-52 EHF EMD Increment 2 | | | 2-4Q |
| (U) Anti-Skid EMD | | | 2-4Q |
| (U) Anti-Skid Flight Test | | | 4Q |
| (U) Strategic Radar Replacement EMD | | | 2-4Q |