

UNCLASSIFIED

PE NUMBER: 0101122F
 PE TITLE: AIR LAUNCHED CRUISE MISSILE

| | |
|---|------------------------------|
| Exhibit R-2, RDT&E Budget Item Justification | DATE February 2005 |
|---|------------------------------|

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|--|---|
| BUDGET ACTIVITY 07 Operational System Development | PE NUMBER AND TITLE 0101122F AIR LAUNCHED CRUISE MISSILE |
|--|---|

| Cost (\$ in Millions) | FY 2004 Actual | 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 |
|--|-------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|-------|
| Total Program Element (PE) Cost | 23.007 | 11.732 | 2.250 | 3.763 | 5.822 | 0.395 | 0.412 | 0.428 | Continuing | TBD |
| 4797 Flight Testing & Navigation Enhancement | 23.007 | 11.732 | 2.250 | 3.763 | 5.822 | 0.395 | 0.412 | 0.428 | Continuing | TBD |

(U) A. Mission Description and Budget Item Justification

The AGM-86B, Air Launched Cruise Missile (ALCM), is a subsonic, air-to-surface strategic nuclear missile, operational since 1982. Armed with a W-80 warhead, it is designed to evade air and ground-based defenses in order to strike targets at any location within any enemy's territory. The ALCM is designed for B-52H internal and external carriage.

A Service Life Extension Plan (SLEP) was developed to meet an AF Long Range Plan requirement to extend ALCM Service Life to FY30. The results of Service Life Extension Program (SLEP) studies identified system components that cannot be sustained beyond the standard service life. The current system is experiencing obsolescence of parts/components. Missile components and support equipment are becoming non-supportable. Service Life Extension of this critical weapon is essential to meet Air Combat Command (ACC) and United States Strategic Command (USSTRATCOM) commitments (also known as OPLAN 8044).

Initial SLEP assessment required the development and acquisition of new Conventional Air Launched Cruise Missile (CALCM)/ALCM Test Instrumentation Kit (CATIK) flight test payload doors, replacement of the current navigation system, and replacement of Operational Test & Evaluation (OT&E) hardware and software. CATIK commenced in FY00 based on the AF decision to maintain this weapon system beyond its current design life. Previous payload doors were purchased to support the original service life only. CATIK development efforts are driven by depleting test assets, parts obsolescence, Range Command Council 319 (RCC-319) safety requirements and re-certification of the Flight Termination System. Five CATIK RDT&E test articles will be developed to support Developmental Test & Evaluation (DT&E) flight tests. The five test articles will be used to conduct one ALCM Operational Test Launch, one ALCM Joint Test Assembly (JTA) integration test to ensure compatibility with the warhead package, one CALCM Operational Test Launch, one Captive Carry and a backup test asset.

CATIK payload doors, containing range transponder and battery, are required to be replaced due to depleting test assets to continue flight tests beyond FY06. The new CATIK payload doors will provide an inventory of test assets for continued flight testing through FY16, based on current flight test requirements. W-80 LEP (current interface) - CATIK will be designed to a JTA-R1. If the W-80 LEP program changes interface, CATIK will require modification and additional funding/schedule. The CATIK payload door is a critical component for determining Weapon System Reliability (WSR) and for supporting the W-80 Life Extension Program (LEP) (current interface).

Operational Test & Evaluation (OT&E) hardware and software replacement will occur concurrently with the CATIK development effort.

FY04 EMD efforts consist of qualification tests of the CATIK doors. Individual component qualification will have already been completed at the subvendors. FY05 EMD efforts is flight tests finishing up with the flight test report FY06. Contract period of performance ends April 06.

INE - The original ALCM Inertial Navigation Element (INE) service life design expired in 1996. The AF took action to study the INE components and determine

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which components were expected to become increasingly difficult to maintain or support. The completed studies indicate the ALCM INE failure rate has remained constant over the past 10 yrs and the INE is sustainable to 2030 with software modifications and Sub-Terminal Map Upgrades, hardware cannibalization and depot support/test equipment replacement. The Sub-Terminal map software upgrade will help maintain the credibility of the ALCM threat for the remainder of its service life.

Cruise Missile Functional Ground Testing (FGT) is required to provide the capability to non-destructively accomplish functional flight simulation of a full-up missile flight profile on the ground to obtain additional reliability data. This capability will provide critical reliability data without the costs of flight test missions and will also retain the missiles in the inventory. This effort will develop the software and hardware for an existing test facility for accomplishment of the ground tests.

The Big Crow Alternative development effort will produce a telemetry relay system mounted in B-52H wings. The Big Crow aircraft are used for Air Force flight testing and ensure continued Air Force conventional and nuclear cruise missile flight test capability at all times. Currently, two Big Crow aircraft provide a telemetry gathering capability for Army, Navy and Air Force requirements. The Big Crow aircraft perform a classified wartime mission, which takes precedence over Air Force cruise missile flight tests. This effort will design, develop, produce and test two aircraft systems (2 Pylons each) worth of equipment to ensure Air Force cruise missile flight testing/telemetry gathering capability when Big Crow is unavailable. The Pylons produced in the development effort will remain operational at the conclusion of the test effort.

The W-80 LEP replaces warhead components to extend its service life. The National Nuclear Security Administration (NNSA) is responsible for most of the refurbishment costs associated with the W-80 warhead. The Air Force is responsible for funding ALCM W-80 integration. Integration includes evaluation of interface control changes as part of the Initial Concept Design (ICD), missile testing, and logistics requirements necessary to support a First Production Unit (FPU) delivery of 2008.

These programs are in Budget Activity 7, Operational System Development, due to efforts supporting a fielded, post Milestone III operational weapon system.

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

| | <u>FY 2004</u> | <u>FY 2005</u> | <u>FY 2006</u> | <u>FY 2007</u> |
|---|----------------|----------------|----------------|----------------|
| (U) Previous President's Budget | 29.466 | 11.837 | 2.238 | 3.693 |
| (U) Current PBR/President's Budget | 23.007 | 11.732 | 2.250 | 3.763 |
| (U) Total Adjustments | -6.459 | -0.105 | | |
| (U) Congressional Program Reductions | | -0.105 | | |
| Congressional Rescissions | | | | |
| Congressional Increases | | | | |
| Reprogrammings | -5.751 | | | |
| SBIR/STTR Transfer | -0.708 | | | |
| (U) <u>Significant Program Changes:</u> | | | | |

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| BUDGET ACTIVITY | | PE NUMBER AND TITLE | | | | | | PROJECT NUMBER AND TITLE | | |
|--|----------------|--------------------------------------|------------------|------------------|------------------|------------------|------------------|--|------------------|-------|
| 07 Operational System Development | | 0101122F AIR LAUNCHED CRUISE MISSILE | | | | | | 4797 Flight Testing & Navigation Enhancement | | |
| Cost (\$ in Millions) | FY 2004 Actual | 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 |
| 4797 Flight Testing & Navigation Enhancement | 23.007 | 11.732 | 2.250 | 3.763 | 5.822 | 0.395 | 0.412 | 0.428 | Continuing | TBD |
| Quantity of RDT&E Articles | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |

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

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PROJECT NUMBER AND TITLE

4797 Flight Testing & Navigation
Enhancement

which components were expected to become increasingly difficult to maintain or support. The completed studies indicate the ALCM INE failure rate has remained constant over the past 10 yrs and the INE is sustainable to 2030 with software modifications and Sub-Terminal Map Upgrades, hardware cannibalization and depot support/test equipment replacement. The Sub-Terminal map software upgrade will help maintain the credibility of the ALCM threat for the remainder of its service life.

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| (U) <u>B. Accomplishments/Planned Program (\$ in Millions)</u> | <u>FY 2004</u> | <u>FY 2005</u> | <u>FY 2006</u> | <u>FY 2007</u> |
|---|-----------------------|-----------------------|-----------------------|-----------------------|
| (U) - Conducted flight test planning for integration testing | 0.180 | | | |
| (U) - Continued update of CATIK Interface Control Documents and assembled hardware | 0.320 | | | |
| (U) CATIK Test and Evaluation/Government costs | 4.500 | | | |
| (U) Continue CATIK Test & Evaluation/Government costs | | 3.837 | | |
| (U) Continue INE Software Subterminal Map Development, Testing and Integration | | 0.500 | | |
| (U) Began Cruise Missile Functional Ground Test (FGT) software design & development | 6.113 | | | |
| (U) Began Cruise Missile FGT hardware design/development | 6.114 | | | |
| (U) Began FGT System/Missile Integration & Test | 1.244 | | | |
| (U) Continue FGT System/Missile Integration & Test | | 4.300 | | |
| (U) ALCM interface change evaluations and contractor Interface Control Document support for W-80 LEP | 1.000 | | | |
| (U) Continue ALCM interface change evaluations and contractor Interface Control Document support for W-80 LEP | | 1.255 | | |

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|--|---|--|

| | | | | |
|--|--------|--------|-------|-------|
| (U) ALCM/W-80 integration data development | 0.125 | | | |
| (U) ALCM/W-80 integration ground test and flight test support | 0.595 | | | |
| (U) Continue ALCM/W-80 integration ground test and flight test support | | 0.840 | | |
| (U) Begin ALCM/W-80 Service System Test and repair (Service STAR) re-design/modification | | 1.000 | | |
| (U) Continue ALCM interface change evaluations/changes and contractor ICD support for W-80 LEP | | | 1.029 | |
| (U) Continue ALCM W-80 integration data development | | | 0.097 | |
| (U) Continue ALCM W-80 integration ground test and flight test support | | | 1.124 | |
| (U) Conduct ALCM/W-80 Environmental Flight Test | | | | 1.180 |
| (U) Conduct ALCM/W-80 Development Flight Test | | | | 1.750 |
| (U) Continue contractor and organic missile interface compatibility testing | | | | 0.833 |
| (U) Begin Big Crow Alternative hardware and software development | 2.816 | | | |
| (U) Total Cost | 23.007 | 11.732 | 2.250 | 3.763 |

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

| | | <u>FY 2004</u> | <u>FY 2005</u> | <u>FY 2006</u> | <u>FY 2007</u> | <u>FY 2008</u> | <u>FY 2009</u> | <u>FY 2010</u> | <u>FY 2011</u> | <u>Cost to</u> | <u>Total Cost</u> |
|--|--|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-------------------|
| | | <u>Actual</u> | <u>Estimate</u> | <u>Estimate</u> | <u>Estimate</u> | <u>Estimate</u> | <u>Estimate</u> | <u>Estimate</u> | <u>Estimate</u> | <u>Complete</u> | |
| (U) MPAF, Missile Modifications (BA 03, PE 0101122F, P-15) | | 1.967 | 21.072 | 24.764 | 9.708 | 9.956 | 10.141 | 0.000 | 0.000 | Continuing | TBD |
| MPAF, Missile Modifications | | | | | | | | | | | |
| (U) Initial Spares (BA 04 PE 0101122F, P-16) | | 1.661 | 0.374 | 0.180 | 0.186 | 0.189 | 0.194 | 0.000 | 0.000 | Continuing | TBD |
| (U) MPAF, Replenishment Spares (BA 04, PE 0101122F, P-16) | | 3.785 | 4.218 | 4.305 | 0.288 | 0.292 | 0.300 | 11.010 | 11.295 | Continuing | TBD |
| OPAF, Electronics and | | | | | | | | | | | |
| (U) Telecommunications Equipment (BP83) (BA 03, PE 0101122F, P-18) | | 1.305 | 1.343 | 1.383 | 1.423 | 1.452 | 1.487 | 1.554 | 1.611 | Continuing | TBD |

(U) D. Acquisition Strategy

Begun in FY00, CATIK payload door development efforts are performed by Boeing utilizing a Cost Plus Award Fee (CPAF) contract. A CATIK Low Rate Initial Production contract will be awarded in the 2nd quarter FY05 to ensure CATIK production assets are available in late FY06/early FY07 to continue ALCM flight testing beyond FY06 and support W-80 LEP (current interface).

The Cruise Missile FGT development will be performed by the prime contractor, utilizing a Firm Fixed Price (FFP) contract.

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PROJECT NUMBER AND TITLE

**4797 Flight Testing & Navigation
Enhancement**

The ALCM/W-80 LEP integration will be performed by the prime contractor utilizing a Time and Materials (T&M) engineering assignment on an existing sustainment contract.

The Big Crow Alternative development will be performed by SAIC using a CPFF contract.

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| Exhibit R-3, RDT&E Project Cost Analysis | | | | | | | | | | | | DATE February 2005 | | | |
|---|-----------------------------------|---|------------------------------------|---------------------|---------------------------|---|---------------------------|---------------------|---------------------------|--|---------------------------|-------------------------|-------------------|---------------------------------|-------|
| BUDGET ACTIVITY 07 Operational System Development | | | | | | PE NUMBER AND TITLE 0101122F AIR LAUNCHED CRUISE MISSILE | | | | PROJECT NUMBER AND TITLE 4797 Flight Testing & Navigation Enhancement | | | | | |
| (U) Cost Categories (Tailor to WBS, or System/Item Requirements) (\$ in Millions) | <u>Contract Method & Type</u> | <u>Performing Activity & Location</u> | <u>Total Prior to FY 2004 Cost</u> | <u>FY 2004 Cost</u> | <u>FY 2004 Award Date</u> | <u>FY 2005 Cost</u> | <u>FY 2005 Award Date</u> | <u>FY 2006 Cost</u> | <u>FY 2006 Award Date</u> | <u>FY 2007 Cost</u> | <u>FY 2007 Award Date</u> | <u>Cost to Complete</u> | <u>Total Cost</u> | <u>Target Value of Contract</u> | |
| (U) <u>Product Development</u> | | | | | | | | | | | | | | | |
| Development: | | | | | | | | | | | | | | | |
| CATIK | Eng Asgn/CPAF | Boeing, Seattle, WA. | | 0.500 | Nov-04 | 1.000 | Jan-05 | | | | | 0.050 | 1.550 | | 0.000 |
| TRW- INE | Eng Asgn/T&M | | | | | | | | | | | 0.000 | 0.000 | | |
| Boeing-INE | Eng Asgn/CPAF | | | | | | | | | | | 0.000 | 0.000 | | |
| Functional Ground Test (FGT) | TBD | | | | | | | | | | | 7.668 | 7.668 | | |
| W80 LEP Support | FFP | Raytheon, Tuscon AZ | 13.471 | | Jun-04 | 4.300 | Jan-05 | | | | | 0.000 | 17.771 | | |
| W80 LEP Support | Eng Asgn/T&M | Boeing, Seattle, WA. | | 2.035 | Jun-04 | 1.255 | Feb-05 | 1.041 | Feb-06 | 0.833 | Jan-07 | 1.420 | 6.584 | | |
| W80 LEP Support, Service STAR | FFP | E-Spectrums, San Antonio TX. | | | | 1.000 | Feb-05 | | | | | | | | 1.000 |
| INE Software Subterminal Map Development | Eng Asgn/T&M | Boeing, Seattle, WA. | | 0.500 | Jan-05 | 0.500 | May-05 | | | | | | | | 1.000 |
| Big Crow Alternative Hardware and Software Development | CPFF | SAIC, San Diego | | 1.590 | Jan-05 | | | | | | | | | | 1.590 |
| Subtotal Product Development | | | 0.000 | 18.096 | | 8.055 | | 1.041 | | 0.833 | | 9.138 | 37.163 | | 0.000 |
| Remarks: | | | | | | | | | | | | | | | |
| (U) <u>Support</u> | | | | | | | | | | | | | | | |
| OC-ALC/PSM | | | | | | | | 0.085 | Jan-06 | | | 0.652 | 0.737 | | |
| W80 Support/PSM | | | | | | | | | | | | 1.436 | 1.436 | | |
| Subtotal Support | | | 0.000 | 0.000 | | 0.000 | | 0.085 | | 0.000 | | 2.088 | 2.173 | | 0.000 |
| Remarks: | | | | | | | | | | | | | | | |
| (U) <u>Test & Evaluation</u> | | | | | | | | | | | | | | | |
| Utah Test Range | MIPR | | | 1.802 | Nov-04 | 1.400 | Jan-05 | | | | | 0.475 | 3.677 | | |
| 49th Test Wing | MIPR | | | 1.402 | Nov-04 | 1.000 | Jan-05 | | | | | 0.450 | 2.852 | | |
| Responsible Test Org | TBD | | | 0.612 | Nov-04 | 0.437 | Jan-05 | | | | | 0.025 | 1.074 | | |
| Eglin AFB | MIPR | | | 0.500 | Jun-04 | | | | | | | 0.000 | 0.500 | | |
| 49th Test Wing (W-80 LEP) | MIPR | | | 0.595 | Jun-04 | 0.840 | May-05 | 1.124 | Jul-06 | 2.930 | Jan-07 | 4.685 | 10.174 | | |
| None | | | | | | | | | | | | | 0.000 | | |
| Subtotal Test & Evaluation | | | 0.000 | 4.911 | | 3.677 | | 1.124 | | 2.930 | | 5.635 | 18.277 | | 0.000 |
| Remarks: | | | | | | | | | | | | | | | |
| Project 4797 | | | | | | | | | | | | | | | |

R-1 Shopping List - Item No. 122-7 of 122-10

Exhibit R-3 (PE 0101122F)

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Exhibit R-3, RDT&E Project Cost Analysis

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| 07 Operational System Development | 0101122F AIR LAUNCHED CRUISE MISSILE | | | | 4797 Flight Testing & Navigation Enhancement | | | |
| (U) <u>Management</u> | | | | | | | | |
| Subtotal Management | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Remarks: | | | | | | | | |
| (U) Total Cost | 0.000 | 23.007 | 11.732 | 2.250 | 3.763 | 16.861 | 57.613 | 0.000 |

Exhibit R-4, RDT&E Schedule Profile

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MISSILE

PROJECT NUMBER AND TITLE
4797 Flight Testing & Navigation
Enhancement

| | FY04 | FY05 | FY06 | FY07 | FY08 | FY09 | FY10 | FY11 |
|--------------------|------|------|------|------|------|------|------|------|
| ALCM SLEP | | | | | | | | |
| CATIK | | | | | | | | |
| Integ/Qual Testing | ▲ | | | | | | | |
| Prototype Delivery | | ▲ | | | | | | |
| FCA | | ▲ | | | | | | |
| Flight Testing | | ▲ | | ▲ | | | | |
| Production Award | | | ▲ | | | | | |
| CATIK Deliveries | | | | ▲ | | | | ▲ |
| CATIK Test Set | | ▲ | | | | | | |
| FGT Dew/Del | ▲ | | | ▲ | | | | |
| W80 Integration | | | | | | ▲ | | |
| W80 Flight Tests | ▲ | | | | ▲ | | | |

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| Exhibit R-4a, RDT&E Schedule Detail | | DATE February 2005 |
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| BUDGET ACTIVITY 07 Operational System Development | PE NUMBER AND TITLE 0101122F AIR LAUNCHED CRUISE MISSILE | PROJECT NUMBER AND TITLE 4797 Flight Testing & Navigation Enhancement |
|--|---|--|

| (U) <u>Schedule Profile</u> | <u>FY 2004</u> | <u>FY 2005</u> | <u>FY 2006</u> | <u>FY 2007</u> |
|---|----------------|----------------|----------------|----------------|
| (U) CATIK Development Milestones | | 4Q | | |
| (U) Integration/Qual Testing | 3Q | | | |
| (U) CATIK Production Contract Award | | 2Q | | |
| (U) Functional/Physical Config Audit | | 2Q | | |
| (U) 5 Prototype CATIKs delivered | | 2Q | | |
| (U) Flight Testing | | 3Q | | |
| (U) Funtional Ground Test (FGT) Contract Award | 3Q | | | |
| (U) FGT PDR | | 3Q | | |
| (U) FGT CDR | | 4Q | | |
| (U) ALCM/W-80 Contract Award | 3Q | | 2Q | 3Q |
| (U) ALCM/W-80 Ground Test Support | 3Q | | 2Q | 3Q |
| (U) ALCM/W-80 Flight Test Support | 3Q | | 2Q | 3Q |
| (U) INE Software Subterminal Map Development Contract Award | 3Q | | | |
| (U) Big Crow Alternative Hardware and Software Development | 3Q | | | |