

**UNCLASSIFIED**

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

<b>Exhibit R-2, RDT&amp;E Budget Item Justification</b>	DATE <b>February 2004</b>
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<b>BUDGET ACTIVITY</b> <b>07 Operational System Development</b>	<b>PE NUMBER AND TITLE</b> <b>0101122F AIR LAUNCHED CRUISE MISSILE</b>
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	Cost (\$ in Millions)	FY 2003 Actual	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	Cost to Complete	Total
	Total Program Element (PE) Cost	19.400	29.466	11.837	2.238	3.693	5.718	0.387	0.000	94.700
4797	Flight Testing & Navigation Enhancement	19.400	29.466	11.837	2.238	3.693	5.718	0.387	0.000	94.700

**(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

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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 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 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>
(U) Previous President's Budget	20.513	29.804	11.837
(U) Current PBR/President's Budget	19.400	29.466	11.837
(U) Total Adjustments	-1.113	-0.338	
(U) Congressional Program Reductions	-0.217	-0.085	
Congressional Rescissions	-0.226	-0.253	
Congressional Increases			
Reprogrammings			
SBIR/STTR Transfer	-0.670		
(U) <u>Significant Program Changes:</u>			

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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		
Cost (\$ in Millions)	FY 2003 Actual	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	Cost to Complete	Total
4797 Flight Testing & Navigation Enhancement	19.400	29.466	11.837	2.238	3.693	5.718	0.387	0.000	94.700
Quantity of RDT&E Articles	0	0	0	0	0	0	0		

(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.

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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.

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BUDGET ACTIVITY <b>07 Operational System Development</b>	PE NUMBER AND TITLE <b>0101122F AIR LAUNCHED CRUISE MISSILE</b>	PROJECT NUMBER AND TITLE <b>4797 Flight Testing &amp; Navigation Enhancement</b>

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 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.

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

<b>(U) <u>B. Accomplishments/Planned Program (\$ in Millions)</u></b>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>
(U) - Accomplishments/Planned Program	0.000	0.000	
(U) - Continue CATIK payload door Interface Design/Development; pre-planning for integration testing	15.635		
(U) - Continue update of CATIK Interface Control Documents and purchase hardware	1.690		
(U) - Begin INE Software Emulation Development, Testing and Integration	2.075		
(U) - Conduct flight test planning for integration testing		0.180	
(U) - Continue update of CATIK Interface Control Documents and assemble hardware		0.320	
(U) CATIK Test and Evaluation/Government costs		4.500	
(U) Continue CATIK Test & Evaluation/Government costs			0.937
(U) Begin INE Software Subterminal Map Development, Testing and Integration		2.146	
(U) Continue INE Software Subterminal Map Development, Testing and Integration		0.000	0.500

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(U) Begin Cruise Missile Functional Ground Test (FGT) software design & development	7.128		
(U) Begin Cruise Missile FGT hardware design/development	7.128		
(U) Begin FGT System/Missile Integration & Test	1.244		
(U) Continue FGT System/Missile Integratin & 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			1.360
(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) Begin Big Crow Alternative hardware and software devlopement	5.100		
(U) Continue Big Crow Alternative hardware and softare development			2.900
(U) Total Cost		19.400	29.466
			11.837

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

	<u>FY 2003</u>	<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>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>Complete</u>	
(U) MPAF, Missile Modifications (BA 03, PE 0101122F, P-13)	1.961	1.981	21.154	24.440	9.519	9.753	9.902	Continuing	TBD
(U) MPAF, Missile Modifications Initial Spares (BA 04 PE 0101122F, P-16 )	1.006	1.661	0.375	0.178	0.182	0.185	0.189	Continuing	TBD
(U) MPAF, Replenishment Spares (BA 04, PE 0101122F, P-17)	4.143	3.785	4.234	4.249	0.282	0.286	0.293	Continuing	TBD
(U) OPAF, Electronics and Telecommunications Equipment (BP83) (BA 03, PE 0101122F, P-18)	1.312	1.305	1.328	1.374	1.407	1.438	1.466	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 3rd quarter FY04 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).

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MISSILE

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Enhancement

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

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 2004		
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 &amp; Type</u>	<u>Performing Activity &amp; Location</u>	<u>Total</u> <u>Prior to FY</u> <u>2003</u> <u>Cost</u>	<u>FY</u> <u>2003</u> <u>Cost</u>	<u>FY</u> <u>2003</u> <u>Award</u> <u>Date</u>	<u>FY</u> <u>2004</u> <u>Cost</u>	<u>FY</u> <u>2004</u> <u>Award</u> <u>Date</u>	<u>FY</u> <u>2005</u> <u>Cost</u>	<u>FY</u> <u>2005</u> <u>Award</u> <u>Date</u>	<u>Cost to</u> <u>Complete</u>	<u>Total</u> <u>Cost</u>	<u>Target</u> <u>Value of</u> <u>Contract</u>
(U) <u>Product Development</u>												
Development:											0.000	
CATIK	Eng Asgn/ CPAF	Boeing, Seattle, WA.	8.191	17.680		0.500		0.050		0.050	26.471	
TRW- INE	Eng Asgn/T&M		1.441							0.000	1.441	
Boeing-INE	Eng Asgn/ CPAF		1.200							0.000	1.200	
	TBD									7.668	7.668	
Functional Ground Test ( FGT)	FFP	Raytheon, Tuscon AZ				15.500		4.300		0.000	19.800	
W80 LEP Support	Eng Asgn/T&M	Boeing, Seattle, WA.		1.720		2.035		1.360		1.600	6.715	
W80 LEP Support, Service STAR	FFP	E-Spectrums, San Antonio TX.						1.000			1.000	
INE Software Subterminal Map Development	Eng Asgn/T&M	Boeing, Seattle, WA.				0.500		0.500			1.000	
Big Crow Alternative Hardware and Software Development	CPFF	SAIC, San Diego				3.874		1.127			5.001	
											0.000	
Subtotal Product Development			10.832	19.400		22.409		8.337		9.318	70.296	0.000
Remarks:												
(U) <u>Support</u>												
OC-ALC/PSM			0.101							0.652	0.753	
W80 Support/PSM										1.436	1.436	
Subtotal Support			0.101	0.000		0.000		0.000		2.088	2.189	0.000
Remarks:												
(U) <u>Test &amp; Evaluation</u>												
Utah Test Range	MIPR		0.000			2.875		1.400		0.475	4.750	
49th Test Wing	MIPR		0.000			2.475		1.000		0.450	3.925	
Responsible Test Org	TBD					0.612		0.260		0.025	0.897	
Eglin AFB	MIPR					0.500				0.000	0.500	

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<b>Exhibit R-3, RDT&amp;E Project Cost Analysis</b>					DATE <b>February 2004</b>			
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<b>07 Operational System Development</b>	<b>0101122F AIR LAUNCHED CRUISE MISSILE</b>			<b>4797 Flight Testing &amp; Navigation Enhancement</b>				
49th Test Wing (W-80 LEP) MIPR			0.595	0.840	8.000	9.435		
None						0.000		
Subtotal Test & Evaluation	0.000	0.000	7.057	3.500	8.950	19.507	0.000	
Remarks:								
(U) <u>Management</u>						0.000		
Subtotal Management	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
Remarks:								
(U) Total Cost	10.933	19.400	29.466	11.837	20.356	91.992	0.000	

Exhibit R-4, RDT&E Schedule Profile

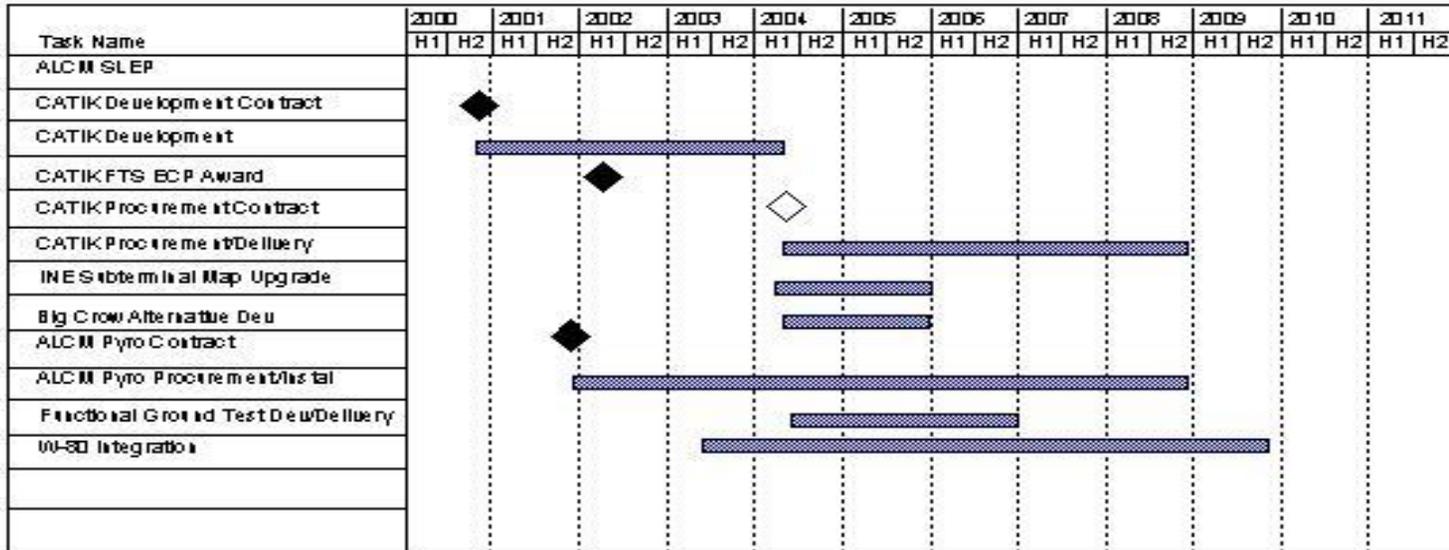
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MISSILE

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Enhancement



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Exhibit R-4a, RDT&E Schedule Detail		DATE <b>February 2004</b>		
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT NUMBER AND TITLE		
<b>07 Operational System Development</b>	<b>0101122F AIR LAUNCHED CRUISE MISSILE</b>	<b>4797 Flight Testing &amp; Navigation Enhancement</b>		
		<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>
(U) <u>Schedule Profile</u>				
(U) -- Contract Award - CATIK (2QFY00)		2Q		
(U) CATIK Development Milestones				4Q
(U) -- Critical Design Review (CDR)		3Q		
(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	
(U) ALCM/W-80 Ground Test Support			3Q	
(U) ALCM/W-80 Flight Test Support			3Q	
(U) INE Software Subterminal Map Development Contract Award			3Q	
(U) Big Crow Alternative Hardware and Software Development			3Q	