

Exhibit R-2, RDT&E Budget Item Justification								DATE February 2004	
BUDGET ACTIVITY 07 Operational System Development				PE NUMBER AND TITLE 0101120F ADVANCED CRUISE MISSILE					
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	2.562	13.212	7.740	5.779	6.903	3.005	0.387	0.000	45.973
4798 Life Extension Program	2.562	13.212	7.740	5.779	6.903	3.005	0.387	0.000	45.973

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

AGM-129, The Advanced Cruise Missile (ACM), is a low-observable air-launched, strategic missile with significant improvements over the Air Launched Cruise Missile B version (ALCM-B) in range, accuracy, and survivability. Armed with a W-80 warhead, it is designed to evade air and ground-based defenses in order to strike heavily defended, hardened targets at any location within any enemy's territory. The ACM is designed for B-52H external carriage and there is currently 402 ACM in the inventory. The ACM fleet design service life expires between the years 2003 and 2008.

A Service Life Extension Plan (SLEP) was developed to meet an AF Long Range Plan requirement to extend ACM Service Life to FY30. The results of Service Life Extension Program (SLEP) studies will identify system components that cannot be sustained beyond the standard service life. The current system is experiencing obsolescence of parts/components. Missile support equipment and components are becoming non-supportable. Service Life Extension of this critical weapon is essential to meet ACC and STRATCOM SIOP commitments.

The initial requirement for ACM SLEP was the development of a conforming JTIK door design. The program developed 2 prototype JTIK doors for qualification and system-level testing. JTIK development satisfied test range safety requirements by incorporating GPS tracking capability and a Department of Energy (DOE) Joint Test Assembly (JTA) redesign.

Together government and contractor personnel prepared an efficient, economical program schedule, in order to realize potential program economies of scale and to ensure the contractor can manage any increased workload. The JTIK development effort was a low risk program, but an essential effort because DOE-compliant JTIK doors are required in FY04 in order to continue conducting flight testing for weapon system reliability data collection used for Nuclear Certification and support of the W-80 Warhead Life Extension Program (LEP).

The ACM Subsystem Simulator (SSS) and Advanced Missile Simulator (AMS) Upgrade will develop, integrate, test and install a real-time simulation system that replaces aging and obsolete equipment. This requirement was identified as part of the ACM SLEP study to upgrade the simulation systems in the AF Avionics Software Integration Facility (ASIF) and the System Integration Lab (SIL). To extend the service life of the ACM to FY30, the real-time computer based simulation systems must be upgraded to resolve aging and obsolescence issues. These systems have many irreplaceable electronic components with high probability of failure. The ability to resolve real-time missile hardware and software anomalies and missile flight test investigations will not be possible without a reliable simulation system provided by this upgrade.

Development of an ACM Aging and Surveillance (A&S) program for the Nuclear Weapons Sub-System (NWSS) components is a Program Management Directive (PMD) requirement. The A&S program is required to analyze critical warhead interface missile components. Fault diagnostics will be accomplished and the data collected from

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the A&S tests will indicate failure trends and the rate of aging within each component. This effort is the second phase of what was initiated in 1999 to develop test equipment, utilizing Commercial Off-the-Shelf (COTS) to the maximum extent possible, and software necessary to lay in a test program for the NWSS components.

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 cost of flight test mission 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 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 ACM/W-80 integration. Integration includes evaluation of interface control changes as part of the Initial Concept Design, 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 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	2.788	13.364	7.760
(U) Current PBR/President's Budget	2.562	13.212	7.740
(U) Total Adjustments	-0.226	-0.152	
(U) Congressional Program Reductions		-0.038	
Congressional Rescissions	-0.030	-0.114	
Congressional Increases			
Reprogrammings	-0.031		
SBIR/STTR Transfer	-0.165		
(U) <u>Significant Program Changes:</u>			

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07 Operational System Development			0101120F ADVANCED CRUISE MISSILE				4798 Life Extension Program		
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
4798 Life Extension Program	2.562	13.212	7.740	5.779	6.903	3.005	0.387	0.000	45.973
Quantity of RDT&E Articles	0	0	0	0	0	0	0		

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The initial requirement for ACM SLEP was the development of a conforming JTIK door design. The program developed 2 prototype JTIK doors for qualification and system-level testing. JTIK development satisfied test range safety requirements by incorporating GPS tracking capability and a Department of Energy (DOE) Joint Test Assembly (JTA) redesign.

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equipment, utilizing Commercial Off-the-Shelf (COTS) to the maximum extent possible, and software necessary to lay in a test program for the NWSS components.

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(U) B. Accomplishments/Planned Program (\$ in Millions)

	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>
(U) Subsystem Simulator (SS) and Advanced Missile Simulator (AMS) Upgrade Accomplishments/Planned Program			
(U) Initiate System Design for Subsystem Simulator (SS) and Advanced Missile Simulator (AMS) Upgrade	0.913		
(U) Begin Integration Design for 3rd Party Software to Support PDR of SS and AMS upgrade	0.930		
(U) Re-Host Raytheon Developed/Maintained software for SS and AMS	0.719		
(U) Subsystem Simulator (SS) and Advanced Missile Simulator (AMS) Upgrade Accomplishments/Planned Program			
(U) Continue system design efforts for SS and AMS, SS software CDR, Interface design review, detailed component design, component fabrication and test, hardware acquisition,		1.360	
(U) Conduct SS and AMS software development, system integration and test, validation and verification (V&V)		1.120	
(U) SS and AMS Component fabrication and test, hardware integration and test.		0.530	
(U) Nuclear Weapons Sub-system (NWSS) Aging & Surveillance Accomplishments/Planned Program			
(U) Conduct Nuclear Weapons Subsystem (NWSS) component aging & surveillance program, initial design, PDR, hardware acquisition, software design & code		0.807	
(U) Complete Final Design Review, system integration and test, engineering data		0.687	
(U) Conduct acceptance testing, documentation, delivery and installation, demonstration		0.560	
(U) Cruise Missile Functional Ground Test (FGT) Accomplishments/Planned Program			
(U) Begin Cruise Missile Functional Ground Test (FGT) software design/development		1.800	
(U) Begin FGT hardware design/development		1.800	
(U) Begin FGT System/Missile integration and test		1.400	
(U) ACM/W-80 Warhead Life Extension Program (LEP) Support Accomplishments/Planned Program			
(U) ACM Interface Change evaluations and contractor Interface Control Document Support for W-80 LEP		2.035	
(U) ACM/W-80 Integration Data development		0.125	
(U) ACM/W-80 Integration Ground Test and Flight Test support		0.988	

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(U) Subsystem Simulator (SS) and Advanced Missile Simulator (AMS) Upgrade Accomplishments/Planned Program	
(U) Complete SS software, delivery of both Subsystem Simulators (SS) and Computer Support System (CSS), and documentation delivery	1.200
(U) Accomplish validation/acceptance testing of Subsystem Simulators and Computer Support System	0.500
(U) Complete delivery, validation & acceptance testing of AMS, and documentation delivery	1.330
(U) ACM/W-80 Warhead Life Extension Program (LEP) Support Accomplishments/Planned Program	
(U) Continue contractor Interface Control Document (ICD) support and interface change evaluations for W-80 LEP	1.110
(U) Continue ACM/W-80 Integration Ground Test and Flight Test Support	2.600
(U) ACM/W-80 Service System Test And Repair (Service STAR) re-design/modification	1.000
(U) Total Cost	7.740

(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 (BA03, PE 0101120F, P-9)	5.313	3.465	4.094	3.208	1.273	0.096	0.000	0.000	16.380
(U) MPAF, Replenishment Spares (BA04, PE 0101120F, P-17)	9.565	9.379	7.712	6.301	1.949	0.343	0.353	Continuing	TBD
(U) MPAF, Missile Modification Initial Spares (BA04, PE 0101120F, P-16)	0.379	0.311	0.308	0.308	0.244	0.252	0.259	Continuing	TBD

(U) D. Acquisition Strategy

JTIK door development was performed by the prime contractor, Raytheon, utilizing Cost Plus Fixed Fee (CPFF). Sub-System Simulator and Advanced Missile Simulator Upgrades will be performed by the prime contractor, Raytheon, utilizing a Firm Fixed Price (FFP) contract. Aging & Surveillance (A&S) program development is planned to be by a FFP contract with E-Spectrum Technologies. The Cruise Missile FGT development will be performed by the prime contractor, utilizing a FFP contract. Contract support for W-80 LEP will be acquired using Time & Materials (T&M) on existing sustainment contract.

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Exhibit R-3, RDT&E Project Cost Analysis

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(U) <u>Cost Categories</u> (Tailor to WBS, or System/Item Requirements) (\$ in Millions)	<u>Contract Method & Type</u>	<u>Performing Activity & Location</u>	<u>Total</u> Prior to FY 2003 Cost	<u>FY</u> 2003 Cost	<u>FY</u> 2003 Award Date	<u>FY</u> 2004 Cost	<u>FY</u> 2004 Award Date	<u>FY</u> 2005 Cost	<u>FY</u> 2005 Award Date	<u>Cost to Complete</u>	<u>Total</u> Cost	<u>Target</u> Value of Contract
(U) <u>Product Development</u>												
Joint Test Instrumentation Kit (JTIK) Development	CPFF	Raytheon, Tucson AZ	6.183								6.183	
Subsystem Simulator (SS)/Advanced Missile Simulator (AMS) Development	FFP	Raytheon, Tucson AZ		1.995	Apr-03	2.971	Oct-03	2.961			7.927	7.927
Nuclear Weapons Sub-System (NWSS) Aging & Surveillance (A&S)	FFP	E-Spectrums, San Antonio TX				2.054					2.054	2.054
Functional Ground Test (FGT) Development	FFP	Raytheon, Tucson AZ				5.000					5.000	5.000
W80 LEP Support	T&M	Raytheon, Tucson AZ				2.035		1.110		1.170	4.315	13.170
W80 LEP support, Service STAR	FFP	E-Spectrums, San Antonio TX						1.000			1.000	1.000
Service Life Extension Program (SLEP)	CPFF	Raytheon, Tucson AZ								6.012	6.012	
Subtotal Product Development			6.183	1.995		12.060		5.071		7.182	32.491	29.151
Remarks:												
(U) <u>Support</u>												
W80 Support	T&M	OC-ALC/PSM, Tinker AFB OK								0.892	0.892	
SS/AMS Support	T&M	OC-ALC/MAS, Tinker AFB OK		0.202				0.069			0.271	
Subtotal Support			0.000	0.202		0.000		0.069		0.892	1.163	0.000
Remarks:												
(U) <u>Test & Evaluation</u>												
W80 Support	Fund cite/MIPR	49 TES, Barksdale AFB LA				0.608		2.600		8.000	11.208	
W80 Support	T&M	OC-ALC/LHMR, Tinker AFB OK/Boeing, Wichita KS				0.075					0.075	

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Subtotal Test & Evaluation				0.000	0.000	0.683	2.600	8.000	11.283	0.000
Remarks: None										
(U) <u>Management</u>										
W-80 Support	T&M	OC-ALC/PSM, Tinker AFB OK				0.430			0.430	
SS/AMS Support	T&M	OC-ALC/PSM, Tinker AFB OK			0.365	0.039			0.404	
Subtotal Management				0.000	0.365	0.469	0.000	0.000	0.834	0.000
Remarks:										
(U) Total Cost				6.183	2.562	13.212	7.740	16.074	45.771	29.151

Exhibit R-4, RDT&E Schedule Profile

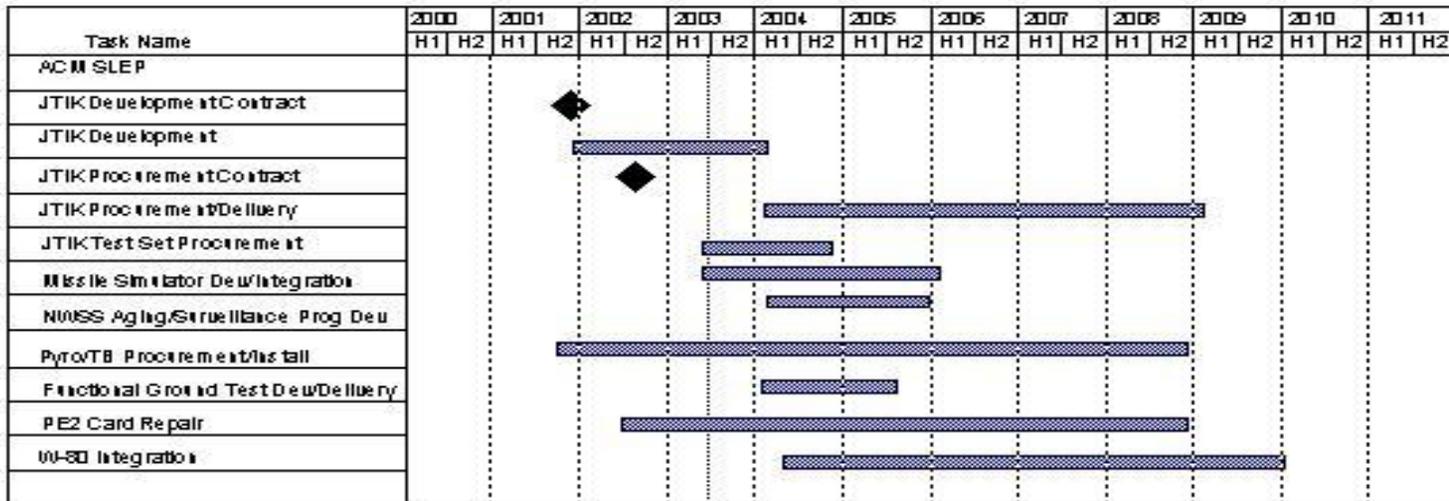
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Exhibit R-4a, RDT&E Schedule Detail		DATE February 2004		
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		<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>
(U) Schedule Profile				
(U) JTIK Dev Integration Testing			2Q	
(U) JTIK Test & Evaluation			3Q	
(U) SS/AMS Contract Award		3Q		
(U) SS & Computer Interface Unit (CIFU) SRR		4Q		
(U) SS PDR (overall system)			1Q	
(U) SS CDR (CIFU/SW)			3Q	
(U) AMS PDR (delta SW design/AMS IFU)			4Q	
(U) SS Test Readiness Review				3Q
(U) Computer Support System Test Readiness Review				4Q
(U) AMS Deliver/Installation				4Q
(U) ACM NWSS A&S program development Contract Award			2Q	
(U) Preliminary Design Review			3Q	
(U) Critical Design Review			4Q	
(U) Demo Arm/Disarm Device Tests				1Q
(U) Demo Separation Switch Tests				1Q
(U) Demo Impact Sensor Dynamic Test				2Q
(U) Demo Warhead Mount Tests				3Q
(U) Functional Ground Test (FGT) Development Contract Award			2Q	
(U) PDR				1Q
(U) CDR				2Q
(U) ACM/W-80 Life Extension Program (LEP) Integration Support Contract Award			1Q	
(U) Interface Control Changes/Documentation (Support)			1-4Q	1Q
(U) Ground Test (Support)			2-3Q	1Q
(U) Flight Test (Support)			4Q	2Q