PE NUMBER: 0101120F
PE TITLE: ADVANCED CRUISE MISSILE

Exhibit R-2, RDT&E Budget Item Justification

DATE: February 2005

BUDGET ACTIVITY: 07 Operational System Development

PE NUMBER AND TITLE: 0101120F ADVANCED 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	12.188	7.672	1.989	7.034	3.060	0.395	0.412	0.428	Continuing	TBD
4798	Life Extension Program	12.188	7.672	1.989	7.034	3.060	0.395	0.412	0.428	Continuing	TBD

(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 are currently 401 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 Joint Test Instrumentation Kit (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 Global Positioning System (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 anomolies 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 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 2009.

The ACM Guidance Suite SLEP is required to ensure the current Guidance Suite consisting of the Navigation Control Set (NCS) and laser Dopplar Velocimeter (LDV) are supportable and reliable past the current service life. The SLEP will include a study to determine if these systems' service life can be extended to 2030 in the current configuration or if modification will be required. The NCS and LDV have known deficiencies that have been identified. There hae also been flight test failures attributed to the NCS. Highly Accelerated Life Test (HALT) testing will be required to determine existing and pending failure modes. There are diminishing sources of supply for many system components and new sources will have to be identified. Component and system level testing will be required to qualify new vendors.

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)

		FY 2004	FY 2005	FY 2006	FY 2007
(U)	Previous President's Budget	13.212	7.740	5.779	6.903
(U)	Current PBR/President's Budget	12.188	7.672	1.989	7.034
(U)	Total Adjustments	-1.024	-0.068		
(U)	Congressional Program Reductions		-0.068		
	Congressional Rescissions				
	Congressional Increases				
	Reprogrammings	-0.707			
	SBIR/STTR Transfer	-0.317			

(U) Significant Program Changes:

FY06 funds were redirected to higher DOD priorities.

Exhibit R-2a, RDT&E Project Justification			DATE: February 2005
BUDGET ACTIVITY: 07 Operational System Development	PE NUMBER AND TITLE: 0101120F ADVANCED CRUISE MISSILE	PROJECT NUMBER AND TITLE: 4798 Life Extension Program	

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
4798 Life Extension Program	12.188	7.672	1.989	7.034	3.060	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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The initial requirement for ACM SLEP was the development of a conforming Joint Test Instrumentation Kit (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 Global Positioning System (GPS) tracking capability and a Department of Energy (DOE) Joint Test Assembly (JTA) redesign.

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Exhibit R-2a, RDT&E Project Justification		DATE February 2005
BUDGET ACTIVITY **07 Operational System Development**	PE NUMBER AND TITLE **0101120F ADVANCED CRUISE MISSILE**	PROJECT NUMBER AND TITLE **4798 Life Extension Program**

components.

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

(U)	**B. Accomplishments/Planned Program ($ in Millions)**	FY 2004	FY 2005	FY 2006	FY 2007
(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	1.511			
(U)	ACM/W-80 Integration Data development	0.125			

Exhibit R-2a, RDT&E Project Justification		DATE February 2005
BUDGET ACTIVITY **07 Operational System Development**	PE NUMBER AND TITLE **0101120F ADVANCED CRUISE MISSILE**	PROJECT NUMBER AND TITLE **4798 Life Extension Program**

(U)	ACM/W-80 Integration Ground Test and Flight Test support	0.488				
(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		2.532			
(U)	ACM/W-80 Service System Test And Repair (Service STAR) re-design/modification		1.000			
(U)	ACM/W-80 Warhead Life Extension Program (LEP) Support Accomplishments/Planned Program					
(U)	Continue ACM/W-80 Integration and data development support			0.185		
(U)	Conduct of ACM/W-80 Development Flight Testing			1.225		
(U)	ACM/W-80 interface compatability testing			0.579		
(U)	Conduct ACM/W-80 Qualification Flight Testing				2.000	
(U)	Conduct Electromagnetic Interference and Compatability (EMIC) Testing				1.000	
(U)	Continue missile interface compatability testing				1.017	
(U)	ACM Guidance Suite Service Life Extension Program (SLEP) Accomplishments/Planned Program					
(U)	Initiate Study/Plan for Determining Obsolescence in ACM Navigation Control Set (NCS) and Laser Dopplar Velocimeter (LDV)				0.865	
(U)	Develop Supportability Plan				0.902	
(U)	Identify New Sources for system components and Qualify sources/vendors for system components				1.250	
(U)	Total Cost	12.188	7.672	1.989	7.034	

(U) C. Other Program Funding Summary ($ 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 Cost
(U)	MPAF, Missile Modifications (BA03, PE 0101120F, P-11)	3.441	4.078	3.251	1.298	0.098	0.000			0.000	16.380
(U)	MPAF, Replenishment Spares (BA04, PE 0101120F, P-16)	9.379	7.683	6.322	1.946	0.350	0.362	1.688	1.712	Continuing	TBD
(U)	MPAF, Missile Modification	0.311	0.307	0.312	0.249	0.257	0.265			Continuing	TBD

Exhibit R-2a, RDT&E Project Justification		DATE February 2005
BUDGET ACTIVITY **07 Operational System Development**	PE NUMBER AND TITLE **0101120F ADVANCED CRUISE MISSILE**	PROJECT NUMBER AND TITLE **4798 Life Extension Program**

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

Initial Spares (BA04, PE 0101120F, P-16)

(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 by a FFP contract with E-Spectrum Technologies. The Cruise Missile FGT development will be performed by the prime contractor, utilizing a FFP and Time & Materials (T&M) contract. Contract support for W-80 LEP will be acquired using T&M on existing sustainment contract. Guidance Suite SLEP is planned for T&M on existing sustainment contract.

Exhibit R-3, RDT&E Project Cost Analysis

DATE: **February 2005**

BUDGET ACTIVITY: **07 Operational System Development**

PE NUMBER AND TITLE: **0101120F ADVANCED CRUISE MISSILE**

PROJECT NUMBER AND TITLE: **4798 Life Extension Program**

(U) Cost Categories (Tailor to WBS, or System/Item Requirements) ($ in Millions)	Contract Method & Type	Performing Activity & Location	Total Prior to FY 2004 Cost	FY 2004 Cost	FY 2004 Award Date	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
(U) Product Development														
Joint Test Instrumentation Kit (JTIK) Development	CPFF	Raytheon, Tucson AZ											0.000	
Subsystem Simulator (SS)/Advanced Missile Simulator (AMS) Development	FFP	Raytheon, Tucson AZ	1.970	2.971	Oct-03	2.961	Nov-04						7.902	7.902
Nuclear Weapons Sub-System (NWSS) Aging & Surveillance (A&S)	FFP	E-Spectrums, San Antonio TX		2.025	Apr-04								2.025	2.025
Functional Ground Test (FGT) Development	FFP	Raytheon, Tucson AZ		5.000	Jun-04								5.000	5.000
W80 LEP Support	T&M	Raytheon, Tucson AZ		1.780		1.110	Feb-05	0.764	Jan-06	1.017	Jan-07	1.457	6.128	6.107
W80 LEP support, Service STAR	FFP	E-Spectrums, San Antonio TX				1.000	Feb-05						1.000	1.000
Guidance Suite Service Life Extension Program (SLEP)	T&M	Raytheon, Tucson AZ								3.017	Oct-06	3.000	6.017	6.012
Subtotal Product Development			1.970	11.776		5.071		0.764		4.034		4.457	28.072	28.046
Remarks:														
(U) Support														
W80 Support	T&M	OC-ALC/PSM, Tinker AFB OK											0.000	
SS/AMS Support	T&M	OC-ALC/MAS, Tinker AFB OK				0.069	Mar-05						0.069	
Subtotal Support			0.000	0.000		0.069		0.000		0.000		0.000	0.069	0.000
Remarks:														
(U) Test & Evaluation														
W80 Support	Fund cite/MIPR	49 TES, Barksdale AFB LA				2.532	Jan-05						2.532	
W80 Support	T&M	OC-ALC/LHMR, Tinker AFB OK/Boeing, Wichita KS								1.000	Jul-07		1.000	
W80 Support	Fund cite/MIPR	419 FTS, Edwards AFB CA						1.225	Aug-06	2.000	Aug-07	1.935	5.160	

Exhibit R-3, RDT&E Project Cost Analysis

DATE: **February 2005**

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT NUMBER AND TITLE
07 Operational System Development	**0101120F ADVANCED CRUISE MISSILE**	**4798 Life Extension Program**

	Subtotal Test & Evaluation			0.000	0.000	2.532	1.225	3.000	1.935	8.692	0.000
	Remarks: None										
(U)	Management										
	W-80 Support	T&M	OC-ALC/PSM, Tinker AFB OK		0.344					0.344	
	SS/AMS Support	T&M	OC-ALC/PSM, Tinker AFB OK		0.039					0.039	
	Nuclear Weapons Sub-System (NWSS) Aging & Surveillance (A&S)				0.029					0.029	
	Subtotal Management			0.000	0.412	0.000	0.000	0.000	0.000	0.412	0.000
	Remarks:										
(U)	Total Cost			1.970	12.188	7.672	1.989	7.034	6.392	37.245	28.046

Exhibit R-4, RDT&E Schedule Profile

DATE: **February 2005**

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT NUMBER AND TITLE
07 Operational System Development	**0101120F ADVANCED CRUISE MISSILE**	**4798 Life Extension Program**

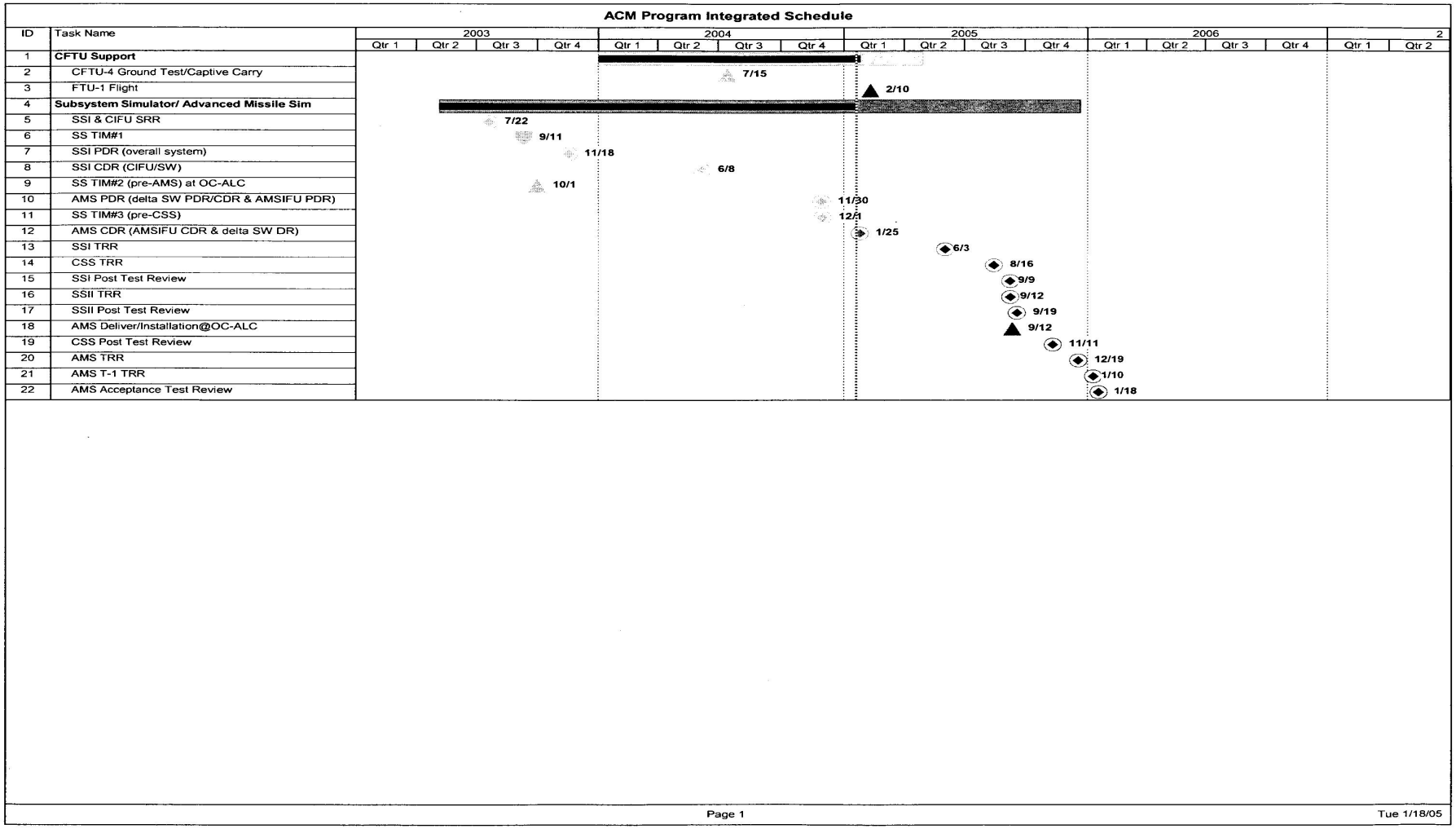

Exhibit R-4a, RDT&E Schedule Detail

DATE: February 2005

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT NUMBER AND TITLE
07 Operational System Development	0101120F ADVANCED CRUISE MISSILE	4798 Life Extension Program

(U) Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007
(U) JTIK Dev Integration Testing	2Q			
(U) JTIK Test & Evaluation	4Q			
(U) SS PDR (overall system)	1Q			
(U) SS CDR (CIFU/SW)	3Q			
(U) AMS PDR (delta SW design/AMS IFU)		1Q		
(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) ACM NWSS A&S Preliminary Design Review	3Q			
(U) ACM NWSS A&S Critical Design Review	4Q			
(U) ACM NWSS A&S Demo Arm/Disarm Device Tests		1Q		
(U) ACM NWSS A&S Demo Separation Switch Tests		1Q		
(U) ACM NWSS A&S Demo Impact Sensor Dynamic Test		2Q		
(U) ACM NWSS A&S Demo Warhead Mount Tests		3Q		
(U) Functional Ground Test (FGT) Development Contract Award	3Q			
(U) FGT PDR		1Q		
(U) FGT CDR		2Q		
(U) ACM/W-80 Life Extension Program (LEP) Integration Support Contract Award	1Q			
(U) ACM/W-80 Interface Control Changes/Documentation (Support)	1-4Q	1Q		
(U) ACM/W-80 Ground Test (Support)	2-3Q	1Q		
(U) ACM/W-80 Flight Test (Support)	4Q	2Q		
(U) ACM/W-80 Development Flight Test			4Q	
(U) ACM/W-80 Qualification Flight Test				4Q
(U) ACM/W-80 Electromagnetic Interference and Compatability (EMI/C)				4Q