

Exhibit R-2, RDT&E Budget Item Justification	DATE February 2004
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BUDGET ACTIVITY 05 System Development and Demonstration (SDD)	PE NUMBER AND TITLE 0604735F Combat Training Ranges
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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	15.244	24.077	18.714	17.490	17.935	18.454	18.732	Continuing	TBD
2286 Combat Training Range Equipment	15.244	24.077	18.714	17.490	17.935	18.454	18.732	Continuing	TBD

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

Air Combat Training Systems (ACTS) provide equipment and support for Air Force units and combat training ranges to support mission test, training and evaluation of aircrews, as well as the operational testing of weapons systems and tactics under simulated combat conditions. This program element develops the electronic, telecommunications, instrumentation equipment/systems and standards for the training ranges. Air Force ACTS are interoperable with Navy Tactical Air Combat Training System (TACTS) ranges. ACTS provide capabilities to train aircrews in air-to-air and air-to-surface combat and electronic warfare. ACTS provide real-time monitoring and control of aircraft during large force exercises and small unit training, and record events for post-mission debrief and analysis. This program funds aircraft-to-pod interfaces and software interoperability among service ranges and aircraft platforms. It developed the Nellis Air Combat Training System (NACTS) Range Security Initiative (RSI), Range Security Upgrade (RSU) and Range Security Enhancement (RSE) to improve range/aircraft data link security and integration that supports Red Flag, Coalition Flag, USAF Fighter Weapons School training and tactics development. FY04 funding has been made available to continue these security and operational integration improvements to the NACTS. In FY03, this program funded the P5 Combat Training System (P5CTS) (formerly P4RC Plus). The P5CTS develops improved ACTS capabilities including: real-time monitoring, real-time kill notification, system security initiatives that will protect classified aircraft systems information, and no-drop weapon scoring. FY04 and FY05 funding provides for additional P5CTS development.

This program also funds development of range instrumentation standards that will facilitate live/virtual connectivity and standardization across all platforms to include the F/A-22 and Joint Strike Fighter (JSF). Development of a set of range instrumentation standards begins in FY04 as part of the Next-Generation Range Instrumentation (NEXRI) initiative. The NexRI initiative is using a business model approach and will produce standards that new range systems may be manufactured and integrated to that will result in interoperability of systems between ranges and services. The standards will also be used to upgrade legacy systems in order to achieve a seamless, joint interoperability capability between air, ground, and live instrumentation and with virtual and constructive training networks as well. FY05 continues NEXRI development.

This program develops and upgrades advanced threat emitters. In FY03, the Advanced Threat Emitter System (ATES) incorporated other service requirements and evolved into the Joint Threat Emitter (JTE) system. The JTE continues the development of a comprehensive suite of threat signals for aircrew tactics and electronic combat training for simulated penetrations of hostile airspace. The JTE program will complement existing range threat simulators by emulating signals that simulate the most advanced air defense and threat radars. In FY04 the Threat Reaction Analysis Indicator System (TRAINS) will undergo improvements to increase reliability, maintainability and availability and to increase its functional capabilities including Reactive Threats, Deceptive Analysis and Site electronic countermeasure information database capabilities. The TRAINS is an electronic combat analysis system that is paired with the Multiple Threat Emitter System (MUTES) to provide analysis of aircraft Electronic Countermeasure (ECM) responses to threat signals. FY05 funding provides additional JTE and TRAINS development.

Aerial Targets are used to determine air-to-air weapons systems accuracy and reliability by developing improved aerial target systems for Air Force weapons system test and

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evaluation. This program element also funds development of full-scale and subscale aerial targets and target control systems. Specialized target payload subsystems are developed for requirements such as: missile scoring, electronic and infrared (IR) countermeasures, radar and IR signature augmentation, and chaff and flare dispensing. In FY04 the Air Force Subscale Aerial Target (AFSAT) program will begin to evaluate product improvement opportunities to support growth initiatives. Funding for Aerial Targets and AFSAT moves to PE 35116F in FY05.

This program is in budget activity 5 - Systems Development and Demonstration because the Combat Training Ranges (CTR) Program directly contributes to the effectiveness and survivability of US combat forces by developing range instrumentation and training systems to increase the effectiveness of the training spectrum from individual aircrew skill training to large-scale exercises.

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

	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>
(U) Previous President's Budget	15.713	20.383	18.714
(U) Current PBR/President's Budget	15.244	24.077	18.714
(U) Total Adjustments	-0.469	3.694	
(U) Congressional Program Reductions			
Congressional Rescissions		-0.206	
Congressional Increases		3.900	
Reprogrammings	-0.266		
SBIR/STTR Transfer	-0.203		
(U) <u>Significant Program Changes:</u>			
FY04: Congress added \$3.9M for Nellis Air Combat Training Range System Integration			

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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	
2286 Combat Training Range Equipment	15.244	24.077	18.714	17.490	17.935	18.454	18.732	Continuing	TBD	
Quantity of RDT&E Articles	0	0	0	0	0	0	0			

(U) A. Mission Description and Budget Item Justification

Air Combat Training Systems (ACTS) provide equipment and support for Air Force units and combat training ranges to support mission test, training and evaluation of aircrews, as well as the operational testing of weapons systems and tactics under simulated combat conditions. This program element develops the electronic, telecommunications, instrumentation equipment/systems and standards for the training ranges. Air Force ACTS are interoperable with Navy Tactical Air Combat Training System (TACTS) ranges. ACTS provide capabilities to train aircrews in air-to-air and air-to-surface combat and electronic warfare. ACTS provide real-time monitoring and control of aircraft during large force exercises and small unit training, and record events for post-mission debrief and analysis. This program funds aircraft-to-pod interfaces and software interoperability among service ranges and aircraft platforms. It developed the Nellis Air Combat Training System (NACTS) Range Security Initiative (RSI), Range Security Upgrade (RSU) and Range Security Enhancement (RSE) to improve range/aircraft data link security and integration that supports Red Flag, Coalition Flag, USAF Fighter Weapons School training and tactics development. FY04 funding has been made available to continue these security and operational integration improvements to the NACTS. In FY03, this program funded the P5 Combat Training System (P5CTS) (formerly P4RC Plus). The P5CTS develops improved ACTS capabilities including: real-time monitoring, real-time kill notification, system security initiatives that will protect classified aircraft systems information, and no-drop weapon scoring. FY04 and FY05 funding provides for additional P5CTS development.

This program also funds development of range instrumentation standards that will facilitate live/virtual connectivity and standardization across all platforms to include the F/A-22 and Joint Strike Fighter (JSF). Development of a set of range instrumentation standards begins in FY04 as part of the Next-Generation Range Instrumentation (NEXRI) initiative. The NexRI initiative is using a business model approach and will produce standards that new range systems may be manufactured and integrated to that will result in interoperability of systems between ranges and services. The standards will also be used to upgrade legacy systems in order to achieve a seamless, joint interoperability capability between air, ground, and live instrumentation and with virtual and constructive training networks as well. FY05 continues NEXRI development.

This program develops and upgrades advanced threat emitters. In FY03, the Advanced Threat Emitter System (ATES) incorporated other service requirements and evolved into the Joint Threat Emitter (JTE) system. The JTE continues the development of a comprehensive suite of threat signals for aircrew tactics and electronic combat training for simulated penetrations of hostile airspace. The JTE program will complement existing range threat simulators by emulating signals that simulate the most advanced air defense and threat radars. In FY04 the Threat Reaction Analysis Indicator System (TRAINS) will undergo improvements to increase reliability, maintainability and availability and to increase its functional capabilities including Reactive Threats, Deceptive Analysis and Site electronic countermeasure information database capabilities. The TRAINS is an electronic combat analysis system that is paired with the Multiple Threat Emitter System (MUTES) to provide analysis of aircraft Electronic Countermeasure (ECM) responses to threat signals. FY05 funding provides additional JTE and TRAINS development.

Aerial Targets are used to determine air-to-air weapons systems accuracy and reliability by developing improved aerial target systems for Air Force weapons system test and evaluation. This program element also funds development of full-scale and subscale aerial targets and target control systems. Specialized target payload subsystems are

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BUDGET ACTIVITY 05 System Development and Demonstration (SDD)	PE NUMBER AND TITLE 0604735F Combat Training Ranges	PROJECT NUMBER AND TITLE 2286 Combat Training Range Equipment
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developed for requirements such as: missile scoring, electronic and infrared (IR) countermeasures, radar and IR signature augmentation, and chaff and flare dispensing. In FY04 the Air Force Subscale Aerial Target (AFSAT) program will begin to evaluate product improvement opportunities to support growth initiatives. Funding for Aerial Targets and AFSAT moves to PE 35116F in FY05.

This program is in budget activity 5 - Systems Development and Demonstration because the Combat Training Ranges (CTR) Program directly contributes to the effectiveness and survivability of US combat forces by developing range instrumentation and training systems to increase the effectiveness of the training spectrum from individual aircrew skill training to large-scale exercises.

(U) <u>B. Accomplishments/Planned Program (\$ in Millions)</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>
(U) Accomplishments/Planned Program			
(U) Continue P5 CTS (formerly P4RC Plus) system development efforts, funding software and hardware upgrades to include new capabilities and Joint Tactical Radio System (JTRS) compliance (first year was FY03)	0.395	3.640	3.430
(U) Continue development and testing of aircraft/Pod integration for range applications and coordinating upgrades with aircraft program offices	0.637	1.760	2.164
(U) Continue interoperability improvements with existing Air Force and Navy ranges to include software, upgrades, and weapons simulation development	2.518	3.589	3.555
(U) Continue Range Instrumentation Technical Support efforts	0.145	0.155	0.155
(U) Continue CTR basic operating support, system acquisition, and engineering support for range and threat systems	6.327	3.099	3.410
(U) Continue Advanced Threat Emitter System (ATES) development to incorporate joint requirements and evolve to a Joint Threat Emitter (JTE) System	2.700	4.791	4.631
(U) Continue numerous upgrades to the Nellis Air Combat Training System (NACTS) including integration of tactical information and ground tracking	2.331	3.900	
(U) Continue Aerial Target basic operating support, system acquisition, and engineering support (funding in FY05 moves to PE 35116F)	0.191	0.774	
(U) Next Generation Range Initiative (NexRI) standards development (first year was FY04)		1.000	1.000
(U) Continue TRAINS improvements to expand the site database distribution network to add Electronic Countermeasure equipment performance data to address hardware problems (first year was FY04)		0.369	0.369
(U) Begin Air Force Subscale Aerial Target (AFSAT) Product Improvements (AFSAT PI) program. Funding will be used to evaluate product improvements to support AFSAT growth potential to satisfy objective requirements (funding in FY05 moves to PE 35116F)		1.000	
(U) Total Cost	15.244	24.077	18.714

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2286 Combat Training Range
Equipment(U) C. Other Program Funding Summary (\$ in Millions)(U) D. Acquisition Strategy

The acquisition strategy is competitive, with cost plus and fixed price contracts.

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Exhibit R-3, RDT&E Project Cost Analysis										DATE February 2004		
BUDGET ACTIVITY 05 System Development and Demonstration (SDD)				PE NUMBER AND TITLE 0604735F Combat Training Ranges				PROJECT NUMBER AND TITLE 2286 Combat Training Range Equipment				
(U) Cost Categories	Contract Method & Type	Performing Activity & Location	Total Prior to FY 2003 Cost	FY 2003 Cost	FY 2003 Award Date	FY 2004 Cost	FY 2004 Award Date	FY 2005 Cost	FY 2005 Award Date	Cost to Complete	Total Cost	Target Value of Contract
(\$ in Millions)												
(U) Product Development												
Cubic Defense (NACTS)	C/CPAF/FFP		31.149	2.331	Oct-03	3.900	Jul-04	0.000		Continuing	TBD	
Raytheon (JTCTS)	Navy Contr		2.500	0.000		0.000		0.000		0.000	2.500	
Sverdrup (RITS)	CPAF		2.385	0.145	Mar-03	0.155	Mar-04	0.155	Jan-05	Continuing	TBD	
Cubic Defense (P5CTS)	CPIF/FFP		0.000	0.395	Jun-03	3.640	Feb-04	3.430	Feb-05	Continuing	TBD	
Modern Technologies Corp (ATES/JTE)	CPAF		0.000	2.700	Mar-03	4.791	Mar-04	4.631	Mar-05	Continuing	TBD	
E W Systems (TRAINS)	FFP		0.000	0.000		0.369	May-04	0.369	Mar-05	Continuing	TBD	
Joint Interoperability	Navy Contract		3.429	2.518	Feb-03	3.589	Feb-04	3.555	Feb-05	Continuing	TBD	
Stanford Research International (NexRI)	FFP					1.000	Apr-04	1.000	Apr-05	Continuing	TBD	
Aircraft Interface	Through MOAs with ALCs & Aircraft SPO Contractors		1.035	0.637	Apr-03	1.760	Apr-04	2.164	Apr-05	Continuing	TBD	
Composite Engineering Inc. (AFSAT PI)	FFP		0.000	0.000		1.000	Apr-04	0.000		Continuing	TBD	
Subtotal Product Development			40.498	8.726		20.204		15.304		Continuing	TBD	0.000
Remarks:												
(U) Support												
OO/ALC/LH, Hill AFB, UT	Various		0.000	0.286		0.343		0.386		Continuing	TBD	
AAC/YBR, Eglin AFB, FL	Various		8.576	6.041		2.756		3.024		Continuing	TBD	
AAC/YAA, Eglin AFB, FL	Various		0.000	0.191		0.774		0.000		Continuing	TBD	
NAWC, China Lake, CA	Various		0.113	0.000		0.000		0.000		Continuing	TBD	
Subtotal Support			8.689	6.518		3.873		3.410		Continuing	TBD	0.000
Remarks:												
(U) Test & Evaluation												
AAC/YBR, Eglin AFB, FL	Various		1.405	0.000		0.000		0.000		Continuing	TBD	
46 Test Wing, Eglin AFB FL	Various		0.640	0.000		0.000		0.000		Continuing	TBD	
Subtotal Test & Evaluation			2.045	0.000		0.000		0.000		Continuing	TBD	0.000
Remarks:												

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(U) Total Cost	51.232	15.244	24.077	18.714	Continuing	TBD	0.000
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Exhibit R-4, RDT&E Schedule Profile

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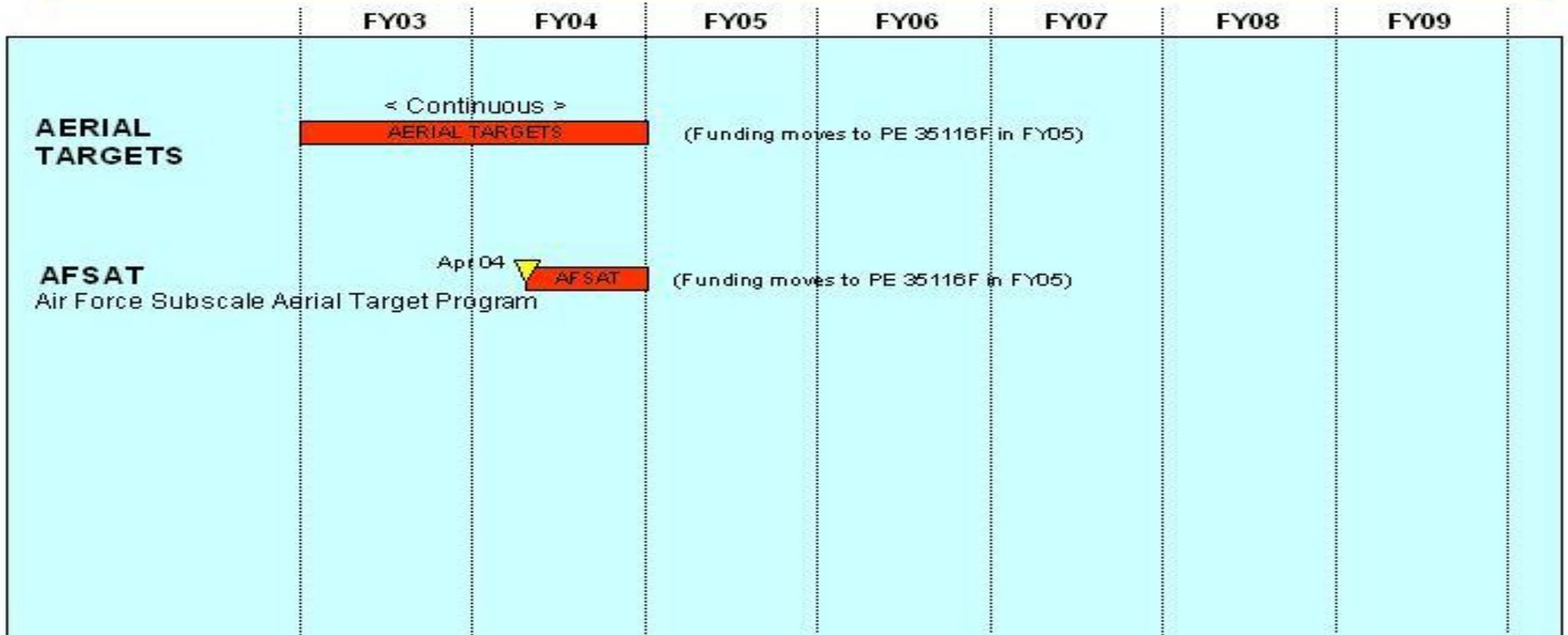
PROJECT NUMBER AND TITLE

2286 Combat Training Range Equipment



U.S. AIR FORCE

CTR
Schedule



Requirements Definition Actual Contract Award EMD Projected Contract Award Production Fielding Other Activity

Exhibit R-4, RDT&E Schedule Profile

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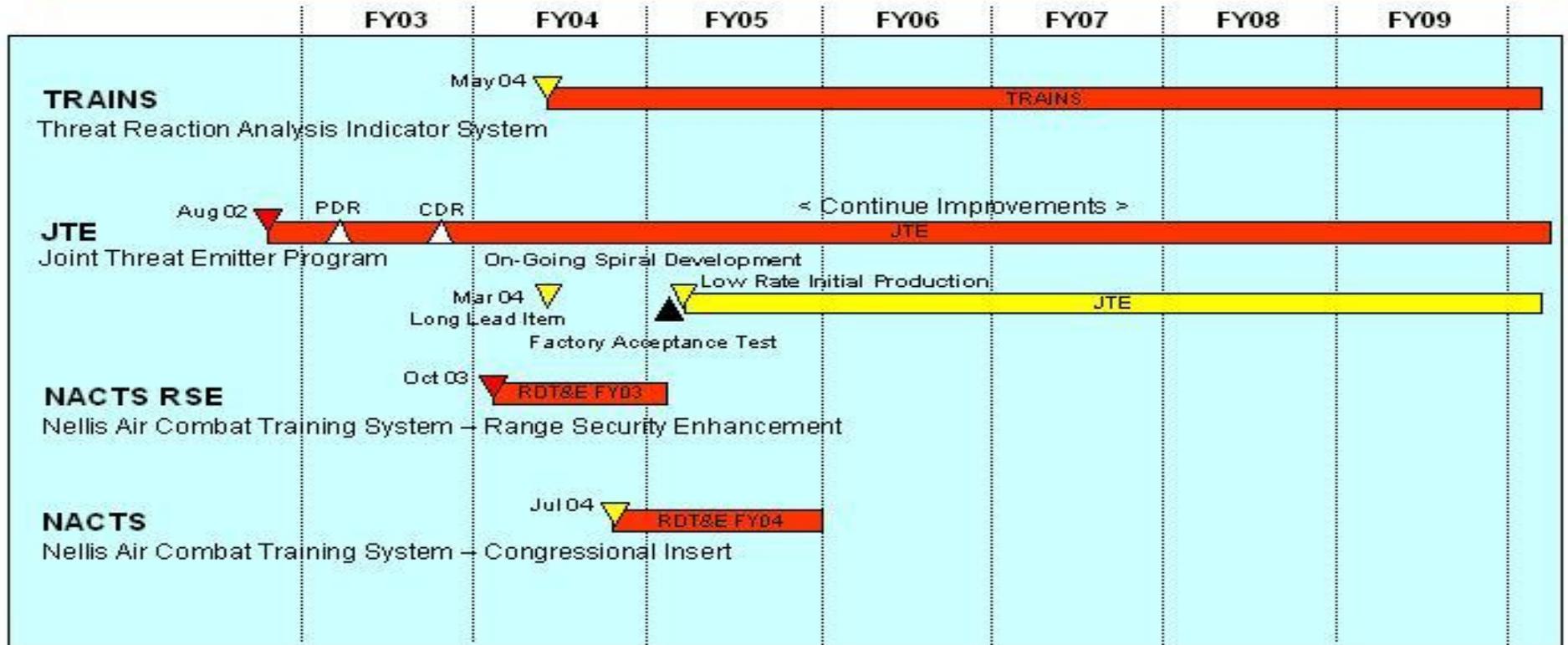
PE NUMBER AND TITLE
0604735F Combat Training Ranges

PROJECT NUMBER AND TITLE
2286 Combat Training Range Equipment



U.S. AIR FORCE

CTR
Schedule



Requirements Definition Actual Contract Award EMD Projected Contract Award Production Fielding Other Activity

Exhibit R-4, RDT&E Schedule Profile

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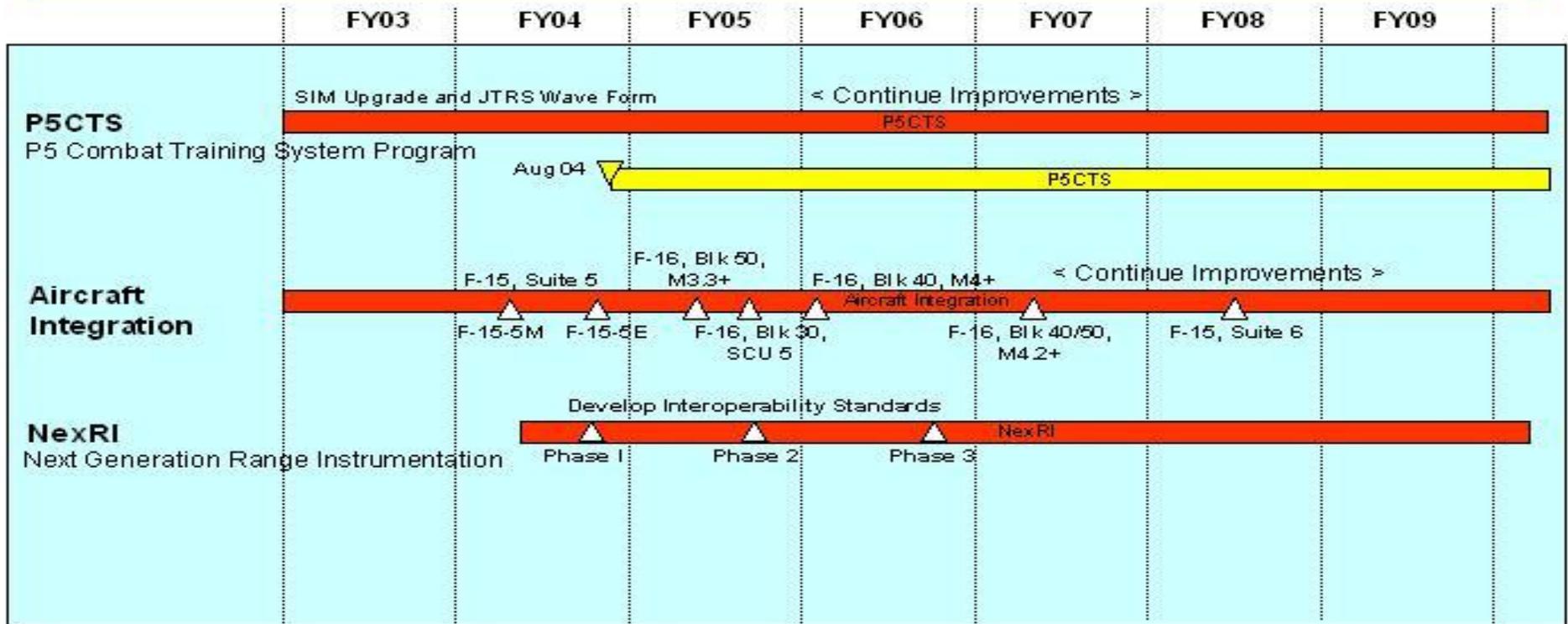
PROJECT NUMBER AND TITLE

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U.S. AIR FORCE

CTR Schedule



Requirements Definition Actual Contract Award EMD Projected Contract Award Production Fielding Other Activity

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Exhibit R-4a, RDT&E Schedule Detail		DATE February 2004		
BUDGET ACTIVITY 05 System Development and Demonstration (SDD)	PE NUMBER AND TITLE 0604735F Combat Training Ranges	PROJECT NUMBER AND TITLE 2286 Combat Training Range Equipment		
	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	
(U) Schedule Profile				
(U) P5CTS Development				
(U) -- Contract Award P5CTS First Article (NDI)	3Q			
(U) -- Start P5 CTS Spiral Development		2Q		
(U) -- Continue Joint Tactical Radio System (JTRS) Waveform Development	2-4Q	1-4Q	1-4Q	
(U) Aircraft Integration Effort				
(U) -- F-15 5E Software Upgrade		4Q		
(U) -- F-15 5M Software Upgrade		2Q		
(U) -- F-16 M3.3+ Software Upgrade			2Q	
(U) JTE Development				
(U) -- Long Lead Item Procurement		2Q		
(U) -- Factory Acceptance Test			1Q	
(U) -- Low Rate Initial Production			1-2Q	
(U) Nellis Air Combat Training Systems (NACTS) Range Security Enhancement (RSE)				
(U) -- Contract Award		1Q		
(U) -- NACTS Range Security activities (on-going)		1-4Q		
(U) -- Complete R&D			1Q	
(U) Next Generation Range Instrumentation (NexRI)				
(U) -- Phase I Studies Complete		4Q		
(U) -- Phase II Studies Complete			4Q	
(U) Threat Reaction Analysis Indicator System (TRAINS)				
(U) -- Contract Award		3Q		
(U) -- Software Delivery			1Q	
(U) Air Force Subscale Aerial Targets (AFSAT) Program (Funding moves to PE 35116F in FY05)				
(U) -- Contract Award		3Q		