PE NUMBER: 0604857F
PE TITLE: Operationally Responsive Space

Exhibit R-2, RDT&E Budget Item Justification

DATE: February 2006

BUDGET ACTIVITY: 04 Advanced Component Development and Prototypes (ACD&P)

PE NUMBER AND TITLE: 0604857F Operationally Responsive Space

Cost ($ in Millions)		FY 2005 Actual	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	0.000	0.000	35.625	41.663	75.720	77.064	78.122	Continuing	TBD
A015	Tactical Satellites	0.000	0.000	0.101	0.102	0.000	0.000	0.000	Continuing	TBD
A016	Operationally Responsive Lift	0.000	0.000	35.524	41.561	75.720	77.064	78.122	Continuing	TBD

In FY 2007, this is a new PE. The funding is being transferred from PE 0604855F, Operationally Responsive Launch. This new PE recognizes the broader scope of not just responsive launchers, but also satellites and ranges, necessary for a responsive space system.

In FY 2007, the Affordable Responsive Spacelift (ARES) effort in Project 64A016 and the Tactical Satellite (TacSat) effort in Project 64A015 are new starts to meet some of the requirements of the Operationally Responsive Space Analysis of Alternatives.

(U) A. Mission Description and Budget Item Justification

Responsive Space is the rapid reaction combination of payloads, launch systems, and ranges; optimized to provide surge operations, reconstitution capability, and prompt global strike. This encompasses the spacelift missions of delivering payloads to, or from, mission orbit and changing the orbit of existing systems to better satisfy new mission requirements. It includes small satellite demonstrations aimed at proving out the technologies needed to create a low-cost, operational capability for the rapid launch, checkout, and theater integration of space systems to support the tactical needs of the combatant commanders. It also requires on-demand, flexible, and cost effective range operations.

In December 2002 the DepSecDef directed the Air Force and the Defense Advanced Research Projects Agency (DARPA) to establish a joint program office to accelerate the Operationally Responsive Space (ORS) effort to meet portions of this requirement. This joint technology development program is focused on the development and transition of more mature technologies into a future weapon system capable of delivering and deploying payloads worldwide from and through space such as tactical satellites (TacSats). Concept development, risk reduction and technology maturation are key elements of the ORS program; and demonstrations, modeling and simulations are the critical tools.

In July 2004 the Air Force Requirements for Operational Capabilities Council (AFROCC) reviewed the Operationally Responsive Spacelift Analysis of Alternatives (AoA), and approved the following recommendations: (1.) Leverage lessons learned from AF-DARPA Falcon demo (2.) Conduct Architecture Studies -- Responsive spacecraft: size and functions study, -- Integration and technology needs (3.) Pursue a hybrid (part reusable, part expendable) launch vehicle: spiral development approach, Step one: Small scale hybrid integration demonstrator, Step two: Full scale operational hybrid demonstrator, Step three: Vehicle production /operations. AFSPC plans to operationalize the small scale hybrid vehicle to provide a 2,000 to 5,000 pound capability to low earth orbit.

In FY07 the Affordable Responsive Spacelift (ARES) hybrid launch vehicle demonstrator will be initiated. Early activities will include requirements development, preliminary design and test planning.

In parallel, operationally responsive satellite concepts and requirements will be studied, and in the future Operationally Responsive Range mission planning will be

Exhibit R-2, RDT&E Budget Item Justification	DATE February 2006
BUDGET ACTIVITY 04 Advanced Component Development and Prototypes (ACD&P)	PE NUMBER AND TITLE 0604857F Operationally Responsive Space

conducted.

This program is Budget Activity 4, Advanced Component Development and Prototypes (ACDP), because it involves evaluating integrated technologies in as realistic an operating environment as possible to assess the performance or cost reduction potential of advanced technology.

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

		FY 2005	FY 2006	FY 2007
(U)	Previous President's Budget	0.000	0.000	0.000
(U)	Current PBR/President's Budget	0.000	0.000	35.625
(U)	Total Adjustments	0.000	0.000	
(U)	Congressional Program Reductions			
	Congressional Rescissions			
	Congressional Increases			
	Reprogrammings			
	SBIR/STTR Transfer			

(U) Significant Program Changes:

FY07: Initial funding for new PE, transferred from PE 0604855F, Operationally Responsive Launch

Exhibit R-2a, RDT&E Project Justification			DATE: February 2006
BUDGET ACTIVITY: 04 Advanced Component Development and Prototypes (ACD&P)	PE NUMBER AND TITLE: 0604857F Operationally Responsive Space	PROJECT NUMBER AND TITLE: A015 Tactical Satellites	

Cost ($ in Millions)	FY 2005 Actual	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	Cost to Complete	Total
A015 Tactical Satellites	0.000	0.000	0.101	0.102	0.000	0.000	0.000	Continuing	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0		

In FY 2007, Project 64A015, Tactical Satellites, is a new start to meet some of the requirements defined in the ORS Analysis of Alternatives

(U) A. Mission Description and Budget Item Justification

Responsive Space is the rapid reaction combination of payloads, launch systems, and ranges; optimized to provide surge operations, reconstitution capability, and prompt global strike. It includes small satellite demonstrations aimed at proving out the technologies needed to create a low-cost, operational capability for the rapid launch, checkout, and theater integration of space systems to support the tactical needs of the combatant commanders.

Operationally Responsive Space will provide a broad range of capabilities directly supporting warfighter needs. Potential missions include communications, data exfiltration, blue-force situational awareness, positioning, navigation and timing, weather, and battlefield intelligence, surveillance and reconnaissance.

Tactical satellites will be optimized for dedicated theater use and/or surge, augmentation and replenishment of more traditional space capabilities. Current Concepts of Operation (CONOPS) call for the production of satellites as war reserve material, featuring high degrees of modularity and the use of plug and play payloads and buses, in support of the above missions. Further, responsive satellites must be capable of rapid satellite initialization and be networked with other national security space, air and surface systems.

The TACSAT Demonstration Program with participation from a wide consortium of operators, developers and technologists, including the Office of Force Transformation, Air Force Research Labs and Air Force Space Command is the principal testbed for proving out the technologies required to develop and field future Operationally Responsive Space/Spacecraft capabilities. This FY07 effort will perform analysis, costing, and utility assessment of TACSAT concepts and requirements.

The TACSAT Demonstration Program will consist of a series of small satellite demonstrations, whose goal is to demonstrate affordable and responsive launch, checkout, and theater integration of systems to support the tactical needs of the Combatant Commanders. TACSAT demonstrations will validate common interfaces, subsystems, new payloads, and new CONOPS. The TACSAT demonstrations also will facilitate the development of Joint Warfighting Space requirements and future mission(s) planning. Follow-on development of operational satellites will leverage lessons learned, processes and mature technology demonstrated in the TACSAT program.

	B. Accomplishments/Planned Program ($ in Millions)	FY 2005	FY 2006	FY 2007
(U)	Perform analysis, costing and assess utility for operationally responsive satellite concepts/requirements.			0.101
(U)				
(U)				
(U)	Total Cost	0.000	0.000	0.101

Exhibit R-2a, RDT&E Project Justification		DATE: February 2006
BUDGET ACTIVITY: 04 Advanced Component Development and Prototypes (ACD&P)	PE NUMBER AND TITLE: 0604857F Operationally Responsive Space	PROJECT NUMBER AND TITLE: A015 Tactical Satellites

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

	FY 2005 Actual	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	Cost to Complete	Total Cost
(U) AF RDT&E, PE 0604855F, ORL (R-xx)		13.500	0.000	0.000	0.000	0.000	0.000	0.000	13.500
(U) Defensewide RDT&E, PE 0605799D8Z, Force Transformation (R-xx)	20.000	39.000	0.000	0.000	0.000	0.000	0.000	Continuing	TBD

(U) D. Acquisition Strategy

Use existing government contracts.

Exhibit R-3, RDT&E Project Cost Analysis

DATE: **February 2006**

BUDGET ACTIVITY: **04 Advanced Component Development and Prototypes (ACD&P)**

PE NUMBER AND TITLE: **0604857F Operationally Responsive Space**

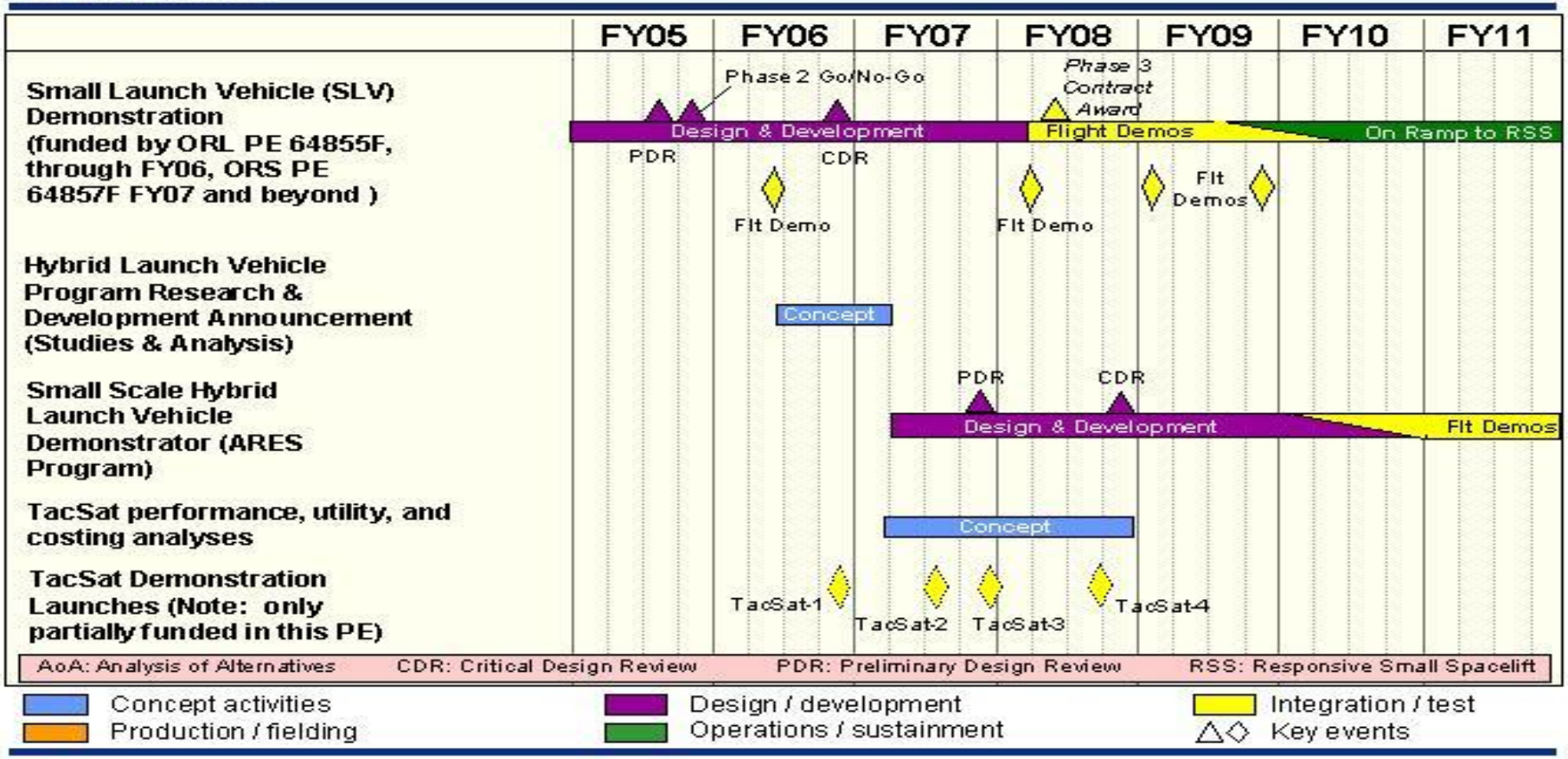
PROJECT NUMBER AND TITLE: **A015 Tactical Satellites**

(U) Cost Categories (Tailor to WBS, or System/Item Requirements) ($ in Millions)	Contract Method & Type	Performing Activity & Location	Total Prior to FY 2005 Cost	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												
											0.000	
Subtotal Product Development			0.000	0.000		0.000		0.000		0.000	0.000	0.000
Remarks:												
(U) Support												
											0.000	
Subtotal Support			0.000	0.000		0.000		0.000		0.000	0.000	0.000
Remarks:												
(U) Test & Evaluation												
											0.000	
Subtotal Test & Evaluation			0.000	0.000		0.000		0.000		0.000	0.000	0.000
Remarks:												
(U) Management												
Perform analysis and assess alternative concepts/requirements & program support	various	various						0.101	Oct-06	Continuing	TBD	TBD
Subtotal Management			0.000	0.000		0.000		0.101		Continuing	TBD	TBD
Remarks:												
(U)												
											0.000	
Subtotal			0.000	0.000		0.000		0.000		0.000	0.000	0.000
Remarks:												
(U) Total Cost			0.000	0.000		0.000		0.101		Continuing	TBD	TBD

Exhibit R-4, RDT&E Schedule Profile		DATE February 2006
BUDGET ACTIVITY **04 Advanced Component Development and Prototypes (ACD&P)**	PE NUMBER AND TITLE **0604857F Operationally Responsive Space**	PROJECT NUMBER AND TITLE **A015 Tactical Satellites**

U.S. AIR FORCE

ORS Schedule



FY07 Staffer Brief

1

Exhibit R-4a, RDT&E Schedule Detail		DATE February 2006
BUDGET ACTIVITY **04 Advanced Component Development and Prototypes (ACD&P)**	PE NUMBER AND TITLE **0604857F Operationally Responsive Space**	PROJECT NUMBER AND TITLE **A015 Tactical Satellites**

(U) Schedule Profile	FY 2005	FY 2006	FY 2007
(U) TACSAT performance, utility and costing analyses			2-4Q

Exhibit R-2a, RDT&E Project Justification		DATE: February 2006
BUDGET ACTIVITY: 04 Advanced Component Development and Prototypes (ACD&P)	PE NUMBER AND TITLE: 0604857F Operationally Responsive Space	PROJECT NUMBER AND TITLE: A016 Operationally Responsive Lift

Cost ($ in Millions)		FY 2005 Actual	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	Cost to Complete	Total
A016	Operationally Responsive Lift	0.000	0.000	35.524	41.561	75.720	77.064	78.122	Continuing	TBD
	Quantity of RDT&E Articles	0	0	0	0	0	0	0		

(U) A. Mission Description and Budget Item Justification

Responsive Space is the rapid reaction combination of payloads, launch systems, and ranges; optimized to provide surge operations, reconstitution capability, and prompt global strike. This encompasses the spacelift missions of delivering payloads to, or from, mission orbit and changing the orbit of existing systems to better satisfy new mission requirements.

In December 2002 the DepSecDef directed the Air Force and the Defense Advanced Research Projects Agency (DARPA) to establish a joint program office to accelerate the Operationally Responsive Space (ORS) effort to meet portions of this requirement. This joint technology development program is focused on the development and transition of more mature technologies into a future weapon system capable of delivering and deploying payloads worldwide from and through space such as tactical satellites (TacSats). Concept development, risk reduction and technology maturation are key elements of the Small Launch Vehicle (SLV) portion of this effort. The ongoing SLV phase II will include the initial launches of one or more technology demonstrations.

In FY07 the Affordable Responsive Spacelift (ARES) hybrid launch vehicle demonstrator will be initiated. Early activities will include requirements development, preliminary design and test planning. Early ARES demonstration and development effort will consist of a series of phases designed to: 1) Reduce technology risk/mature integration technology, 2) Validate a Concept of Operations (CONOPS) for use of the system, 3) Execute smaller scale subsystem and system demonstrations which validate requirements and test methods for system evaluation, and 4) Enhance the ability of the developer to design reliability, responsiveness, and affordability into a future operational system.

Phase I will consist of the design and development of the ARES Subscale Demonstrator. This effort will include concept definition, demonstration planning, preliminary and detailed design, Demonstrator production, and ground and flight tests.

(U) B. Accomplishments/Planned Program ($ in Millions)	FY 2005	FY 2006	FY 2007
(U) Continue SLV system design and development, systems engineering and flight test planning for Phase II			11.000
(U) Perform Range readiness and mission assurance for launch			3.240
(U) Perform analysis, costing and assess utility for operationally responsive space concepts/requirements and Program Management support			1.760
(U) Begin ARES development			19.524
(U) Total Cost	0.000	0.000	35.524

Exhibit R-2a, RDT&E Project Justification		DATE February 2006
BUDGET ACTIVITY **04 Advanced Component Development and Prototypes (ACD&P)**	PE NUMBER AND TITLE **0604857F Operationally Responsive Space**	PROJECT NUMBER AND TITLE **A016 Operationally Responsive Lift**

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

		FY 2005 Actual	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	Cost to Complete	Total Cost
(U)	AF RDT&E, PE 0604855F, ORL (R-XX)	32.142	23.019	0.000	0.000	0.000	0.000	0.000	Continuing	TBD
(U)	NASA funding provided to support multiple contractors	2.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.350

(U) D. Acquisition Strategy

Efforts will be executed by the joint AF/DARPA Falcon Program Office. An open competition was held for Phase II contracts in August 2004, resulting in four awards in September 2004 using an Other Transactions contract vehicle. One or more contractors will be carried to a launch. At the completion of Phase II, a third phase will be considered to conduct additional developmental flight testing.

Exhibit R-3, RDT&E Project Cost Analysis

DATE: **February 2006**

BUDGET ACTIVITY: **04 Advanced Component Development and Prototypes (ACD&P)**

PE NUMBER AND TITLE: **0604857F Operationally Responsive Space**

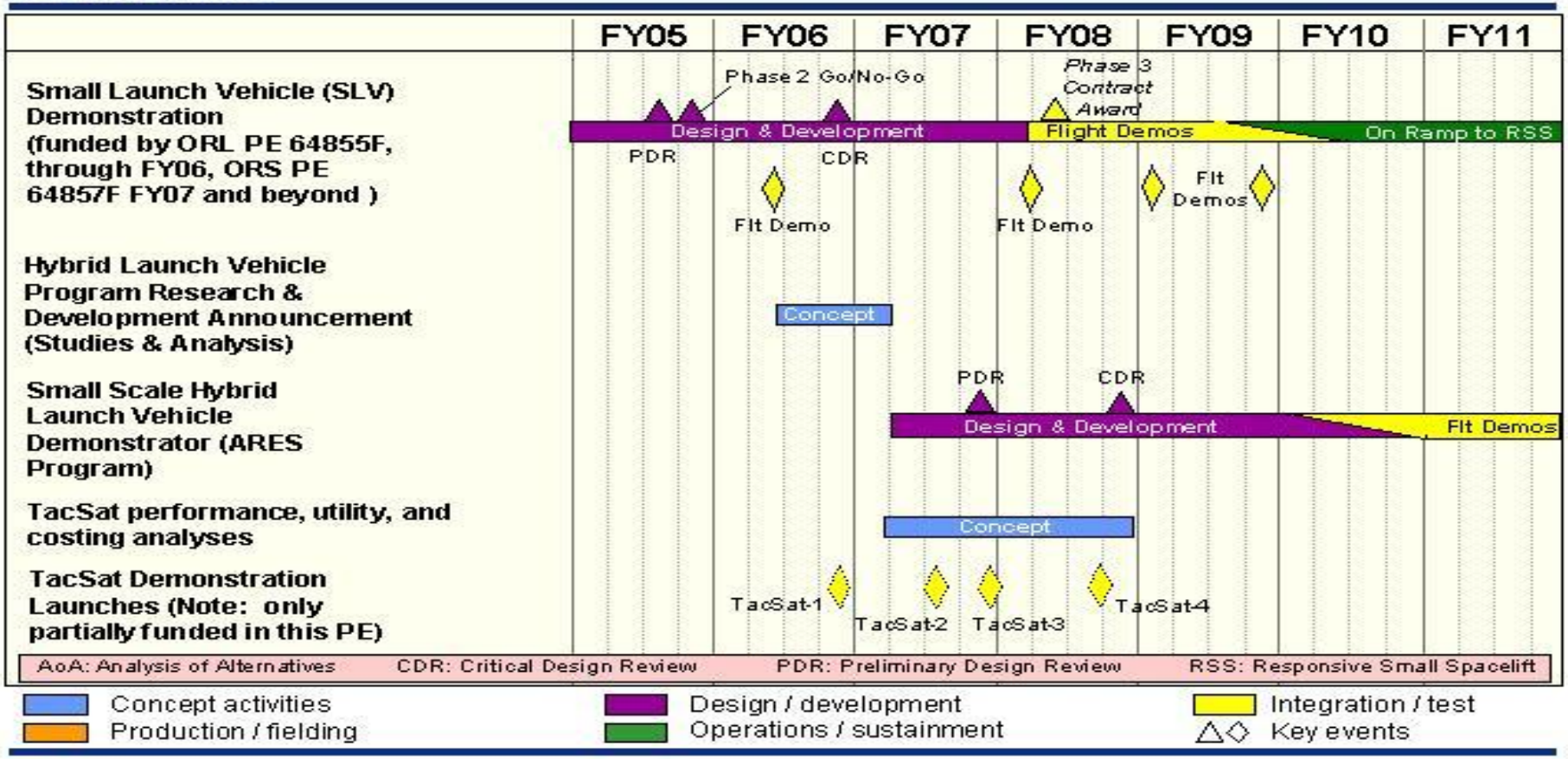
PROJECT NUMBER AND TITLE: **A016 Operationally Responsive Lift**

(U) Cost Categories (Tailor to WBS, or System/Item Requirements) ($ in Millions)	Contract Method & Type	Performing Activity & Location	Total Prior to FY 2005 Cost	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												
Phase II contractors:	OTA	Air Launch, Kirkland, WA						11.000	Oct-06	Continuing	TBD	TBD
TBD Phase III contractors										Continuing	TBD	TBD
ARES Design and Development	TBD	TBD						19.524	Dec-06	Continuing	TBD	TBD
Subtotal Product Development			0.000	0.000		0.000		30.524		Continuing	TBD	TBD
Remarks:												
(U) Support											0.000	
Subtotal Support			0.000	0.000		0.000		0.000		0.000	0.000	0.000
Remarks:												
(U) Test & Evaluation												
Perform Range readiness and mission assurance for launch	TBD	various						3.240	Oct-06	Continuing	TBD	TBD
Subtotal Test & Evaluation			0.000	0.000		0.000		3.240		Continuing	TBD	TBD
Remarks:												
(U) Management												
Perform analysis and assess alternative concepts/requirements & program support								1.760	Oct-06	Continuing	TBD	TBD
Subtotal Management			0.000	0.000		0.000		1.760		Continuing	TBD	TBD
Remarks:												
(U) Total Cost			0.000	0.000		0.000		35.524		Continuing	TBD	TBD

Exhibit R-4, RDT&E Schedule Profile		DATE: February 2006
BUDGET ACTIVITY: 04 Advanced Component Development and Prototypes (ACD&P)	PE NUMBER AND TITLE: 0604857F Operationally Responsive Space	PROJECT NUMBER AND TITLE: A016 Operationally Responsive Lift

U.S. AIR FORCE

ORS Schedule



FY07 Staffer Brief

1

Exhibit R-4a, RDT&E Schedule Detail		DATE February 2006
BUDGET ACTIVITY **04 Advanced Component Development and Prototypes (ACD&P)**	PE NUMBER AND TITLE **0604857F Operationally Responsive Space**	PROJECT NUMBER AND TITLE **A016 Operationally Responsive Lift**

(U) Schedule Profile	FY 2005	FY 2006	FY 2007
(U) ARES Design and Development Contract Award			2Q
(U) ARES PDR			4Q