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**Exhibit R-2, RDT&E Budget Item Justification:** PB 2019 Air Force **Date:** February 2018

<b>Appropriation/Budget Activity</b> 3600: <i>Research, Development, Test &amp; Evaluation, Air Force I BA 7: Operational Systems Development</i>	<b>R-1 Program Element (Number/Name)</b> PE 1203182F / <i>Spacelift Range System (SPACE)</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	21.082	10.549	10.641	0.000	10.641	10.837	11.023	11.253	11.459	Continuing	Continuing
674137: <i>Launch and Test Range System (LTRS) Modernization</i>	-	21.082	10.549	10.641	0.000	10.641	10.837	11.023	11.253	11.459	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

The Spacelift Range System (SLRS), also known as the Launch and Test Range System (LTRS), provides public safety and assured access to space. LTRS operates at the Eastern Range (ER) at Patrick AFB/Cape Canaveral AFS, FL and the Western Range (WR) at Vandenberg AFB, CA. LTRS provides tracking, telemetry, communications, flight safety, and other capabilities to support launch of national security space (NSS), civil and commercial space payloads, Intercontinental and Sea Launched ballistic missile and missile defense evaluations, and aeronautical and guided weapon tests. LTRS enables national security, civil, and commercial spacelift operations to be conducted safely; together with national security space launch capability, LTRS provides assured access to space for the nation. The ER and WR are designated as Department of Defense Major Range and Test Facility Bases (MRTFB).

LTRS is comprised of twelve subsystems that together provide this capability to the ranges. The Range Safety and Command Destruct subsystems provide the capability to destroy an errant rocket, if necessary to protect public safety. These subsystems rely on the Telemetry, Radar, and Optics subsystems to provide tracking data. The Weather and Surveillance subsystems allow range operators and customers to determine if conditions are safe for launch. The Communications, Data Handling, and Timing & Sequencing subsystems ensure critical data is expeditiously routed from remote sensors (e.g. radars, optics) to range operators and customers. Finally, the Planning and Scheduling subsystem ensures all assets are available when needed for a launch or test operation.

As aging range systems exhibit decreasing reliability, leading to higher operations and maintenance costs and increasing the risk of launch delays, the Air Force requires RDT&E funds to conduct architecture analyses to optimize investment planning for safety of flight (such as the use of drones, high definition optics, phased-array radars etc.) and commercial launch.

The current and future space domain demands that space systems be responsive to new and changing threats, and can rapidly integrate new capabilities to make our warfighting force more resilient in a contested battlespace. This agility, survivability, and rapid reconstitution must extend through the entire space warfighting enterprise, to include how we learn about the threat; develop solutions; acquire, test, deploy, train, operate and integrate new systems into the greater system of systems; and ensure our space mission force is ready to defeat a thinking adversary in a complex, multi-domain battlespace. The enterprise will use all of its elements to accelerate decision-making, prototype potential solutions, rapidly integrate decision-making tools and sustain a war-winning capability by delivering multi-domain effects in, from, and through space and cyberspace enabling battle management and resilience options to "fight through."

This program element may include necessary civilian pay expenses required to manage, execute, and deliver LTRS weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 1206392F and 1206398F.

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This program activity is in Budget Activity 7, Operational System Development, because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production fielding in the current or subsequent fiscal year.

<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2017</b>	<b>FY 2018</b>	<b>FY 2019 Base</b>	<b>FY 2019 OCO</b>	<b>FY 2019 Total</b>
Previous President's Budget	11.867	10.549	10.721	0.000	10.721
Current President's Budget	21.082	10.549	10.641	0.000	10.641
Total Adjustments	9.215	0.000	-0.080	0.000	-0.080
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	10.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-0.785	0.000			
• Other Adjustments	0.000	0.000	-0.080	0.000	-0.080

**Congressional Add Details (\$ in Millions, and Includes General Reductions)**

**Project:** 674137: *Launch and Test Range System (LTRS) Modernization*

Congressional Add: *Wallops Flight Facility Security Improvements*

Congressional Add Subtotals for Project: 674137

Congressional Add Totals for all Projects

	<b>FY 2017</b>	<b>FY 2018</b>
	10.000	0.000
	10.000	0.000
	10.000	0.000

**Change Summary Explanation**

FY2017: \$10.000M Congressional increase for launch range services and capability.

**C. Accomplishments/Planned Programs (\$ in Millions)**

	<b>FY 2017</b>	<b>FY 2018</b>	<b>FY 2019</b>
<b>Title:</b> Systems Engineering Support to Operational Baseline	5.803	6.453	7.055
<b>Description:</b> Provides Advisory and Assistance Services (A&AS) support of the operational baseline (all twelve subsystems) to include configuration management of all range assets, requirements analyses, and special studies. Provides support for Systems Program Office operations, Systems Engineering and Technical Assistance (SETA), and Federally Funded Research and Development Centers (FFRDC).			
<b>FY 2018 Plans:</b>			

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<b>C. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2017</b>	<b>FY 2018</b>	<b>FY 2019</b>
Continue to manage the baseline (all twelve subsystems) to include configuration management and all range assets, requirements, analysis and special studies. <b>FY 2019 Plans:</b> Continue to manage the baseline (all twelve subsystems) to include configuration management and all range assets, requirements, analysis and special studies. <b>FY 2018 to FY 2019 Increase/Decrease Statement:</b> FY 2019 increased compared to FY 2018 by \$0.602M. Justification for this increase is described in plans above.				
<b>Title:</b> Enterprise Systems Engineering and Integration to Support Government-Controlled Baseline <b>Description:</b> SE&I manages the government controlled system and subsystem level baseline requirements including analysis of future changes to the fielded baseline. SE&I provides "government as the integrator" engineering support to ensure multiple separate modernizations and the sustainment baseline are synchronized. SE&I will develop and recommend investment strategies to keep the Eastern and Western Ranges operating well beyond the FYDP. <b>FY 2018 Plans:</b> Continue independent SE&I efforts as required to integrate modernization and sustainment efforts into future ranges. Provide systems and subsystem level definition, baseline, architecture, integration planning and support for future ranges. <b>FY 2019 Plans:</b> Continue independent SE&I efforts as required to integrate modernization and sustainment efforts into future ranges. Provide systems and subsystem level definition, baseline, architecture, integration planning and support for future ranges. Focus activities on the Range Command Destruct programs for the Eastern and Western Launch Ranges. Continue program office support and other related support activities. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. These activities may include, but are not limited to program office support, studies, technical analysis, prototyping, etc. <b>FY 2018 to FY 2019 Increase/Decrease Statement:</b> FY 2019 decreased compared to FY 2018 by \$0.510M. Justification for this decrease is described in plans above.		5.279	4.096	3.586
<b>Accomplishments/Planned Programs Subtotals</b>		11.082	10.549	10.641
		<b>FY 2017</b>	<b>FY 2018</b>	
<b>Congressional Add:</b> Wallops Flight Facility Security Improvements		10.000	0.000	

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	<b>FY 2017</b>	<b>FY 2018</b>
<b>FY 2017 Accomplishments:</b> N/A		
<b>FY 2018 Plans:</b> Funds to be executed by NASA to perform upgrades in support of NSS missions from Wallops Flight Facility/Mid-Atlantic Regional Spaceport. Upgrades include a classified payload processing facility and security upgrades.		
<b>Congressional Adds Subtotals</b>	10.000	0.000

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

<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u> <u>Base</u>	<u>FY 2019</u> <u>OCO</u>	<u>FY 2019</u> <u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• SPAF 01 Line Item SPRNGE: <i>Spacelift Range System Space</i>	120.785	113.874	117.637	-	117.637	131.140	115.298	111.621	113.714	Continuing	Continuing

**Remarks**

**E. Acquisition Strategy**

Due to the fielded LTRS age and obsolescence issues, many systems need to be replaced (e.g. communications systems at ER & WR). These major modifications will be competed, typically among small business contractors, and selected through best value source selections. The competitively-selected SE&I contractor manages government-controlled requirements and processes as well as provide support to the "government as the integrator" between LTRS Integrated Support Contract (LISC) and separately competed modernization projects. FFRDC provides mission assurance oversight to ensure capabilities meet operational need.

**F. Performance Metrics**

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force** **Date:** February 2018

<b>Appropriation/Budget Activity</b> 3600 / 7	<b>R-1 Program Element (Number/Name)</b> PE 1203182F / <i>Spacelift Range System (SPACE)</i>	<b>Project (Number/Name)</b> 674137 / <i>Launch and Test Range System (LTRS) Modernization</i>
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<b>Product Development (\$ in Millions)</b>				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Enterprise Systems Engineering and Integration	C/TBD	TBD : TBD	-	5.279	Oct 2016	4.096	Oct 2017	3.586	Oct 2018	-		3.586	Continuing	Continuing	-
LTRS Range Technology Integration	C/Various	Various : TBD	-	5.135	May 2017	5.799	May 2018	6.384	May 2019	-		6.384	Continuing	Continuing	-
Wallops Flight Facility Security Improvements	SS/TBD	NASA : Wallops, VA	-	10.000		-		-		-		-	Continuing	Continuing	-
<b>Subtotal</b>			-	20.414		9.895		9.970		-		9.970	Continuing	Continuing	N/A

<b>Test and Evaluation (\$ in Millions)</b>				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
TEST AND EVALUATION (WS)	Various	MIT, 17th Test Squad, NAVAIR : Various	-	-		-		-		-		-	Continuing	Continuing	-
<b>Subtotal</b>			-	-		-		-		-		-	Continuing	Continuing	N/A

<b>Management Services (\$ in Millions)</b>				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
FFRDC	RO	Aerospace : El Segundo, CA	-	0.431	Nov 2016	0.444	Nov 2017	0.457	Nov 2018	-		0.457	Continuing	Continuing	-
OTHER SUPPORT	PO	Various : El Segundo, CA	-	0.237	Nov 2016	0.210	Nov 2017	0.214	Nov 2018	-		0.214	Continuing	Continuing	-
<b>Subtotal</b>			-	0.668		0.654		0.671		-		0.671	Continuing	Continuing	N/A

			Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
<b>Project Cost Totals</b>			-	21.082	10.549	10.641	-	10.641	Continuing	Continuing	N/A

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	<b>Prior Years</b>	<b>FY 2017</b>	<b>FY 2018</b>	<b>FY 2019 Base</b>	<b>FY 2019 OCO</b>	<b>FY 2019 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>	

Remarks

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<b>Exhibit R-4, RDT&amp;E Schedule Profile:</b> PB 2019 Air Force		<b>Date:</b> February 2018
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FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

<b>LTRS</b>	
Range Technology Integration	
Enterprise SE&I	

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2019 Air Force		<b>Date:</b> February 2018
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b>LTRS</b>				
Range Technology Integration	1	2017	4	2023
Enterprise SE&I	1	2017	4	2023