Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3620F: *Research, Development, Test & Evaluation, Space Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 1203182SF / *Spacelift Range System (SPACE)*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	20.358	31.115	11.658	0.000	11.658	11.199	10.812	11.052	11.268	Continuing	Continuing
674137: *Launch and Test Range System (LTRS) Modernization*	-	20.358	31.115	11.658	0.000	11.658	11.199	10.812	11.052	11.268	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 SFB/Cape Canaveral AFS, FL and the Western Range (WR) at Vandenberg SFB, 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.

The Space Force requires RDT&E funds to conduct digital data processing and transport prototype projects supporting Range of the Future (ROTF) launch operations. Funds will: provide engineering and analysis to develop promising technology; develop Cloud infrastructure and software development factory and services to prototype and deliver software solutions; validate LTRS architecture capability to meet the accelerating national launch requirement; and introduce advanced data transport formats. These efforts include demonstration of virtualized and remote data processing as well as dispersed and disaggregated flight tracking. Funds will allow for development of Eastern Range (ER)/Western Range (WR) Data Handling Application prototypes for ROTF integration.

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 1206392SF and 1206398SF.

Space acquisition must respond with speed and agility to emerging adversary threats. Space Systems Command (SSC) has transformed the organization and implementation of space acquisition to an enterprise approach, to increase innovation and resiliency, leveraging international, commercial, and mission partnerships, and managing program/project priorities according to an integrated unclassified/classified enterprise space architecture. Expanding the appropriate acquisition

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authorities and contract mechanisms to deliver capability sooner, SSC will strategically execute experimentation, prototyping, risk reduction, and other efforts to develop new or repurpose existing capabilities.

This program 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 funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	21.020	11.115	0.000	0.000	0.000
Current President's Budget	20.358	31.115	11.658	0.000	11.658
Total Adjustments	-0.662	20.000	11.658	0.000	11.658
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	20.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-0.662	0.000			
• Other Adjustments	0.000	0.000	11.658	0.000	11.658

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2021	FY 2022
Project: 674137: *Launch and Test Range System (LTRS) Modernization*		
Congressional Add: *Space Launch and Services Capability*	10.000	20.000
Congressional Add Subtotals for Project: 674137	10.000	20.000
Congressional Add Totals for all Projects	10.000	20.000

Change Summary Explanation

FY 2023: +$31.312M; The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY 2023 cannot be made in a relevant manner.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Enterprise Systems Engineering and Integration to Support Government-Controlled Baseline	5.746	2.080	2.290
Description: 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			

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C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
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. ***FY 2022 Plans:*** Increase system resiliency and agility to meet National launch capacity and cadence requirements per Chief of Space Operations' ROTF agility to meet National launch requirements. Sustain MRTFB activity capability. Additionally, FY 2022 funding will allow the program to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities include, but are not limited to, program office support, studies, technical analysis, experimentation, prototyping, etc. ***FY 2023 Plans:*** Continue to increase system resiliency and agility to meet National launch capacity and cadence requirements per Chief of Space Operations' ROTF agility to meet National launch requirements. Invest in Cloud infrastructure and software development to deliver prototype Range operations concepts focused on increasing space launch capability and sustainment of MRTFB capability. Implement system resiliency and situational awareness necessary to operate in the contested space domain. Continuing activities include, but are not limited to, program office support, studies, technical analysis, experimentation, prototyping, etc. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 increased compared to FY 2022. FY 2023 funding was increased due to inflation.			
Title: LTRS Range Technology Integration ***Description:*** 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). Strategically executes experimentation, prototyping, risk reduction, and other efforts to develop new or repurpose capabilities. ***FY 2022 Plans:*** Analyze, engineer and prototype ROTF concepts to increase LTRS authorization, data transport and data processing. Prototype data-driven applications to provide agile flight vehicle situational awareness as well as automation of LTRS equipment to facilitate rapid range reconfiguration and enable conduct of simultaneous launch operations. Additionally, FY 2022 funding will allow the program to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities include, but are not limited to, program office support, studies, technical analysis, experimentation, prototyping, etc. ***FY 2023 Plans:*** Continue efforts to analyze, engineer and prototype ROTF concepts to include Cloud infrastructure and software factory prototypes. Development services will prototype data-driven applications to provide agile flight vehicle situational awareness	4.612	9.035	9.368

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C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
as well as automation of LTRS equipment to facilitate rapid range reconfiguration and enable conduct of simultaneous launch operations. Implement system resiliency and situational awareness necessary to operate in the contested space domain by deploying a Dev/Sec/Ops capability and supporting software Minimum Viable Product (MVP) via a continuous integration/ continuous delivery strategy. Activities include, but are not limited to, program office support, studies, technical analysis, experimentation, prototyping, etc. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 increased compared to FY 2022. FY 2023 funding was increased to account for capability development requirements and support MVP acceleration.			
Accomplishments/Planned Programs Subtotals	10.358	11.115	11.658

	FY 2021	FY 2022
Congressional Add: Space Launch and Services Capability	10.000	20.000
FY 2021 Accomplishments: Congressional Add Funding was used to improve commercial spaceport capability to provide mid-to-low inclination orbits or polar-to-high inclination orbits in support of the national security space at Pacific Spaceport Complex, AK and Mid-Atlantic Regional Spaceport, Wallops Island, VA.		
FY 2022 Plans: Congressional Add Funding will improve commercial spaceport capability to provide mid-to-low inclination orbits or polar-to-high inclination orbits in support of the national security space at Pacific Spaceport Complex, AK and Mid-Atlantic Regional Spaceport, Wallops Island, VA.		
Congressional Adds Subtotals	10.000	20.000

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• SPSF 01 1203182SF: *Spacelift Range System (Space)*	90.492	93.774	71.712	-	71.712	115.429	109.487	109.267	112.116	Continuing	Continuing

Remarks

E. Acquisition Strategy

ROTF ensures LTRS Architecture is not a constraint to the accelerating National launch cadence executing on the ER and WR. Innovative utilization of Cloud infrastructure, software factory, and development services to facilitate data-driven Range activities and digital processing and distribution capability is targeted as enabling the ROTF. Promising prototypes and technology will be leveraged into LTRS architecture investments delivering increased operational capacity and state-of-art data formatting and transport to launch operations. The competitively-selected SE&I contractor manages government-controlled requirements and processes as well

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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.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Enterprise Systems Engineering and Integration	C/FPIF	ENSCO INC : Falls Church, VA	-	5.746	Oct 2020	2.080	Oct 2021	2.290	Oct 2022	-		2.290	Continuing	Continuing	-
LTRS Range of the Future (ROTF) Technology Integration	C/Various	TBD : TBD	-	4.061	May 2021	6.798	May 2022	7.090	May 2023	-		7.090	Continuing	Continuing	-
		Subtotal	-	9.807		8.878		9.380		-		9.380	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AK Spaceport Infrastructure Support	SS/FFP	Alaska Aerospace Corp : Anchorage, AK	-	5.000	May 2021	10.000	Jul 2022	-		-		-	Continuing	Continuing	-
VA Spaceport Infrastructure Support	SS/FFP	VA Comm Space Flt Auth : Norfolk, VA	-	5.000	May 2021	10.000	Jul 2022	-		-		-	Continuing	Continuing	-
		Subtotal	-	10.000		20.000		-		-		-	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FFRDC	RO	Aerospace : El Segundo, CA	-	-		0.647	Nov 2021	0.659	Nov 2022	-		0.659	Continuing	Continuing	-
OTHER SUPPORT	PO	Various : El Segundo, CA	-	0.551	Nov 2020	1.590	Nov 2021	1.619	Nov 2022	-		1.619	Continuing	Continuing	-
		Subtotal	-	0.551		2.237		2.278		-		2.278	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
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	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	20.358		31.115		11.658		-		11.658	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
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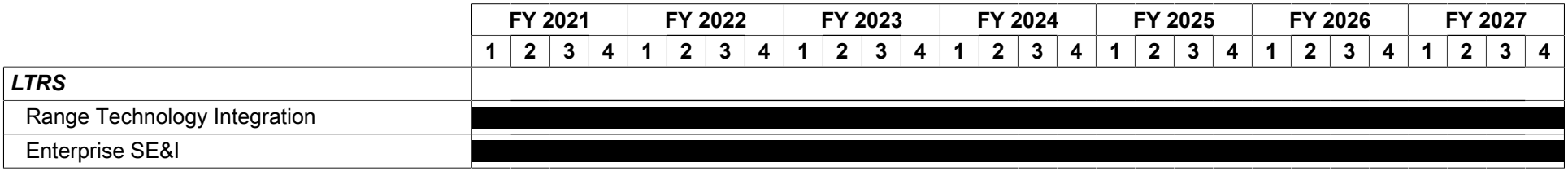

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
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Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
LTRS				
Range Technology Integration	1	2021	4	2027
Enterprise SE&I	1	2021	4	2027