Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Air Force												Date: March 2023
Appropriation/Budget Activity 3620F: *Research, Development, Test & Evaluation, Space Force* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 1206432SF / *Polar MILSATCOM (SPACE)*							
COST ($ in Millions)	**Prior Years**	**FY 2022**	**FY 2023**	**FY 2024 Base**	**FY 2024 OCO**	**FY 2024 Total**	**FY 2025**	**FY 2026**	**FY 2027**	**FY 2028**	**Cost To Complete**	**Total Cost**
Total Program Element	123.519	79.557	67.215	73.757	0.000	73.757	0.000	0.000	0.000	0.000	0.000	344.048
654215: *EPS Recap*	123.519	79.557	67.215	73.757	0.000	73.757	0.000	0.000	0.000	0.000	0.000	344.048
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
Program MDAP/MAIS Code: 121												

Note

In FY 2024, PE 1206432SF (Polar MILSATCOM Space)/Project 654215 EPS Recap was completed.

A. Mission Description and Budget Item Justification

This program element acquires the Polar Military Satellite Communications (MILSATCOM) system that provides protected communications (anti-jam and low probability of intercept and detection) for users in the North Polar Region.

In FY 2006, the Department of Defense (DoD) began funding Enhanced Polar System (EPS). The host spacecraft and the polar communications packages took advantage of the Advanced Extremely High Frequency (AEHF) technology including the extended Data Rate (XDR) waveform. The EPS Capability Development Document (CDD), approved by the Joint Requirements Oversight Council in September 2006, is based on a two-package, hosted XDR program with operational availability in CY 2015 and CY 2017. EPS is comprised of four segments: Payload, Ground Control, Gateway, and Terminal (acquired by each Service's Terminal Program Office). Milestone B review was completed April 2, 2014.

In FY 2019, the United States Air Force (USAF) and Norwegian Ministry of Defense signed the Arctic Memorandum of Agreement (MOA), which enforces the international collaboration with Norway to host two EPS-Recapitalization (EPS-R) payloads on Space Norway-procured spacecraft. EPS-R continues to develop and acquire two Extremely High Frequency (EHF) payloads hosted on Space Norway-procured spacecraft and continues to upgrade/modify the existing EPS Ground Control and Gateway.

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

This program element may include necessary civilian pay expenses required to manage, execute, and deliver Polar MILSATCOM 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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Air Force	Date: March 2023
Appropriation/Budget Activity 3620F: *Research, Development, Test & Evaluation, Space Force I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 1206432SF *I Polar MILSATCOM (SPACE)*

This program is in Budget Activity 5, System Development and Demonstration (SDD) because it has passed Milestone B approval and is conducting engineering and manufacturing development tasks aimed at meeting validated requirements prior to full rate production.

B. Program Change Summary ($ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	112.170	67.465	26.522	0.000	26.522
Current President's Budget	79.557	67.215	73.757	0.000	73.757
Total Adjustments	-32.613	-0.250	47.235	0.000	47.235
• Congressional General Reductions	0.000	-0.250			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-3.613	0.000			
• Other Adjustments	-29.000	0.000	47.235	0.000	47.235

Change Summary Explanation

FY 2022: -29.000M; reduction for execution
FY 2033: -3.613M; Small Business Innovation Research
FY 2023: -0.250M Congressional General Reduction
FY 2024: +47.000M; to address Host vehicle launch delay.
FY 2024: -0.175M; to realign funding to APPN 3410, PE 1207804SF (SAG 13C), for fiscal policy compliance as Space Systems Command (SSC) establishes Headquarters functions and a Chief Information Office (CIO) for integrated cybersecurity.
FY 2024: +0.410M; inflation adjustment

C. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Title: Space Segment	54.413	20.706	22.366
Description: Develop and acquire two EHF payloads, using AEHF's XDR waveform, for integration on host spacecraft. ***FY 2023 Plans:*** Continue testing of both EPS-R payloads that were initiated in FY 2018 to include on-orbit testing starting in FY 2023. Fund FY 2023 DAF share of Arctic MOA collaboration costs for hosting of the EPS-R payloads. Facilitate coordination between Space Norway, space vehicle vendor, and payload contractor. Provide representation, technical expertise, and assistance as necessary at Space Norway and space vehicle vendor facilities to support activities including payload integration, testing, and deficiency			

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Air Force	Date: March 2023
Appropriation/Budget Activity 3620F: *Research, Development, Test & Evaluation, Space Force I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 1206432SF *I Polar MILSATCOM (SPACE)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
resolution as needed. Support segment and system level testing. Continue cyber certification efforts. Support development and integration for the EPS-R system strategic requirements. ***FY 2024 Plans:*** Finalize coordination between Space Norway, space vehicle vendor, and payload contractor. Provide representation, technical expertise, and assistance as necessary at space vehicle vendor facilities to support activities including payload integration, testing, and deficiency resolution as needed. Support segment and system level testing. Lead launch activities including launch base processing, rehearsals, initialization, calibrations, testing and activation of the EPS-R payloads. Complete cyber certification and evaluation efforts. Manage readiness of the Engineering Model Test Bed, Hosted Payload Interface Unit, XDR Processing Unit test beds, flight software and databases. ***FY 2023 to FY 2024 Increase/Decrease Statement:*** FY 2024 funding decreased because program completes launch, launch checkout, and on-orbit testing.			
Title: Ground Updates	19.862	39.667	45.549
Description: Modify and upgrade the existing EPS Control and Planning Segment (CAPS) to provide command and control and XDR mission planning capability for the two new payloads. ***FY 2023 Plans:*** Continue testing EPS CAPS to include on-orbit testing starting in FY 2023. Continue efforts with Defense Information Systems Agency (DISA) on ground nodes to provide out-of-band connectivity to the EPS-R payload as well as in-band connectivity between EPS-R ground nodes. Provide representation, technical expertise, and assistance as necessary at Space Norway and/or space vehicle vendor facilities to support activities including payload integration and ground to payload testing. Support segment and system level testing. Continue cyber certification and Authority To Operate (ATO) efforts. Provide updates, fixes, and retests to ground software deficiencies found in Factory Acceptance Testing, Site Acceptance Testing, and On-orbit Testing. Support development and integration for the EPS-R system strategic requirements. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, etc. ***FY 2024 Plans:*** Complete on-orbit testing with EPS CAPS. Complete efforts with DISA on ground nodes to provide out-of-band connectivity to the EPS-R payload as well as in-band connectivity between EPS-R ground nodes. Provide representation, technical expertise, and assistance as necessary at Space Norway and/or space vehicle vendor facilities to support activities including payload integration and ground to payload testing. Support segment and system level testing. Complete cyber certification and evaluation efforts. Provide updates, fixes, and retests to ground software deficiencies found in Site Acceptance Testing and On-orbit Testing. Complete CAPS integration activities with the Family of Advanced Beyond Line-of-Sight Terminals (FAB-Ts). Rapidly respond			

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Air Force	Date: March 2023
Appropriation/Budget Activity 3620F: *Research, Development, Test & Evaluation, Space Force I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 1206432SF *I Polar MILSATCOM (SPACE)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, etc. ***FY 2023 to FY 2024 Increase/Decrease Statement:*** FY 2024 funding increased due to host satellite launch delay, resulting in delay in on-orbit testing with CAPS and the start of Interim Contractor Support (ICS).			
Title: Gateway Updates ***Description:*** Modify and upgrade the existing EPS Gateway to support the two new payloads. ***FY 2023 Plans:*** Continue EPS Gateway upgrades, segment, and system integration testing. Complete terminals installation efforts and continue testing for a second telemetry and control terminal as well as a fourth Navy Multiband Terminal to support dual EPS/EPS-R operations to the extent EPS legacy remains operational. Prepare for two FAB-Ts to replace two aging Telemetry & Control Terminals (T&C-T). Continue to support risk reduction, development upgrades, and integration for the EPS-R system strategic requirements to include any modification required for the FAB-Ts' software as needed. ***FY 2024 Plans:*** Complete EPS Gateway upgrades, segment, and system integration testing. Complete terminal support as required by System-level or Integration tests. Complete software modifications for FAB-Ts and install the two FAB-T terminals and towers/shelters to augment the two aging T&C-T at Clear Space Force Station. ***FY 2023 to FY 2024 Increase/Decrease Statement:*** FY 2024 funding decreased due to primary focus shifting to FAB-T modifications and installation.	5.282	6.842	5.842
Accomplishments/Planned Programs Subtotals	79.557	67.215	73.757

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

E. Acquisition Strategy

Awarded payloads contract to Northrop Grumman Aerospace Systems (NGAS) and initiated fabrication of two EPS functional-equivalent payloads in FY 2018. In FY 2019, the USAF and Norwegian Ministry of Defence signed the Arctic Memorandum of Agreement, which enforces the international collaboration with Norway to host the two EPS-R payloads on the Space Norway-procured spacecraft. Conducted market research to identify industry capabilities and acquisition concepts. Awarded CAPS contract for EPS ground upgrade. Gateway updates will be accomplished by Naval Information Warfare Center Pacific, the EPS Gateway Segment developer.

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Air Force	Date: March 2023
Appropriation/Budget Activity 3620F: *Research, Development, Test & Evaluation, Space Force I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 1206432SF *I Polar MILSATCOM (SPACE)*

The program office initiates the procurement of a replacement terminal for the Telemetry and Command Terminal. This acquisition strategy updates the EPS Ground Segment to accommodate the EPS functional equivalent payloads and extend operations and sustainment beyond CY 2028. The U.S. Government will retain the system integrator role, as it was for EPS program of record.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Air Force			Date: March 2023
Appropriation/Budget Activity 3620F / 5	**R-1 Program Element (Number/Name)** PE 1206432SF / *Polar MILSATCOM (SPACE)*	**Project (Number/Name)** 654215 / *EPS Recap*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
EPS-R Tactical Payloads	SS/CPIF	NGAS : Redondo Beach, CA	50.268	40.069	Nov 2021	16.878	Nov 2022	19.335	Nov 2023	-		19.335	0.000	126.550	505.355
Control and Planning Segment Upgrades	SS/CPIF	NGMS : Redondo Beach, CA	31.783	14.626	Nov 2021	32.335	Nov 2022	36.792	Nov 2023	-		36.792	0.000	115.536	95.379
Gateway Upgrades	Various	Various : Various, CA	14.643	3.890	Nov 2021	5.577	Nov 2022	5.050	Nov 2023	-		5.050	0.000	29.160	68.895
SBIR/STTR	TBD	Various : Various, CA	0.000	-		-		2.581		-		2.581	0.000	2.581	-
Technical Mission Analysis	RO	Aerospace : El Segundo, CA	5.880	5.105	Nov 2021	1.780	Nov 2022	1.835	Nov 2023	-		1.835	0.000	14.600	-
Enterprise SE&I	C/CPAF	LinQuest : Los Angeles, CA	18.027	12.551	Nov 2021	8.050	Nov 2022	5.000	Nov 2023	-		5.000	0.000	43.628	-
		Subtotal	120.601	76.241		64.620		70.593		-		70.593	0.000	332.055	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FFRDC	RO	Aerospace : El Segundo, CA	0.755	0.789	Oct 2021	-		-		-		-	0.000	1.544	-
A&AS	Various	Various : Various	2.070	2.377	Oct 2021	2.445	Oct 2022	3.014	Oct 2023	-		3.014	0.000	9.906	-
Other Support	Various	Various : Various	0.093	0.150	Oct 2021	0.150	Oct 2022	0.150	Oct 2023	-		0.150	0.000	0.543	-
		Subtotal	2.918	3.316		2.595		3.164		-		3.164	0.000	11.993	N/A

	Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	123.519	79.557		67.215		73.757		-		73.757	0.000	344.048	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3620F / 5	**R-1 Program Element (Number/Name)** PE 1206432SF / *Polar MILSATCOM (SPACE)*	**Project (Number/Name)** 654215 / *EPS Recap*

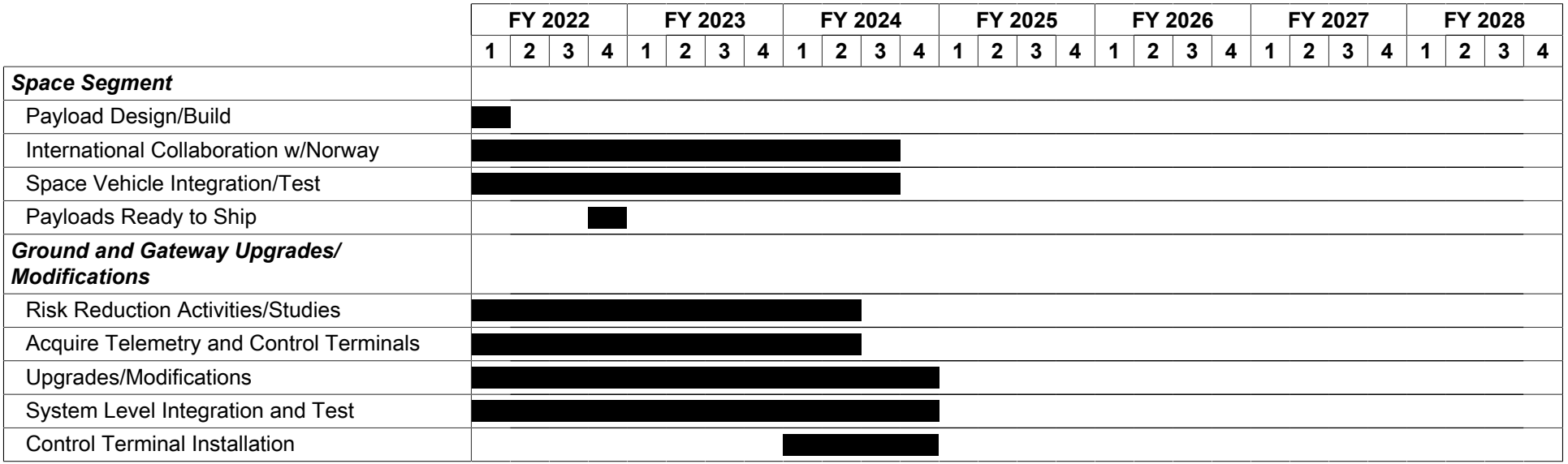

Exhibit R-4A, RDT&E Schedule Details: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3620F / 5	**R-1 Program Element (Number/Name)** PE 1206432SF / *Polar MILSATCOM (SPACE)*	**Project (Number/Name)** 654215 / *EPS Recap*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Space Segment				
Payload Design/Build	1	2022	1	2022
International Collaboration w/Norway	1	2022	3	2024
Space Vehicle Integration/Test	1	2022	3	2024
Payloads Ready to Ship	4	2022	4	2022
Ground and Gateway Upgrades/Modifications				
Risk Reduction Activities/Studies	1	2022	2	2024
Acquire Telemetry and Control Terminals	1	2022	2	2024
Upgrades/Modifications	1	2022	4	2024
System Level Integration and Test	1	2022	4	2024
Control Terminal Installation	1	2024	4	2024