Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force												Date: February 2018
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 1206432F / *Polar MILSATCOM (SPACE)*							
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	273.056	44.306	33.644	27.337	0.000	27.337	0.000	0.000	0.000	0.000	0.000	378.343
657105: *Polar Satellite Communications*	273.056	44.306	33.644	27.337	0.000	27.337	0.000	0.000	0.000	0.000	0.000	378.343
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
Program MDAP/MAIS Code: 121												

Note

As of the December 2016 Selected Acquisition Report, Prior Years dollars total $1,251.8M.

A. Mission Description and Budget Item Justification

This program element acquires the Polar MILSATCOM system that provides protected communications (anti-jam and low probability of intercept and detection) for users in the north polar region.

Through FY 2005, Polar Satellite Communications funded three low data rate Milstar packages on three classified host satellites as an expedited, interim solution for protected connectivity requirements in the north polar region (i.e., Interim Polar System (IPS)). Two satellites with hosted packages are required to provide the necessary 24-hour coverage. The third package went into operations in November 2008 to sustain the 24-hour coverage.

In FY 2006, the DoD began funding the next generation Polar Satellite Communications capability with two more polar packages via the same host vehicle type (i.e., Enhanced Polar System (EPS)). The host spacecraft and the polar communications packages required design modifications that replaced obsolete components and took advantage of the more capable 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 2 April 2014.

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."

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force	Date: February 2018
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 1206432F / *Polar MILSATCOM (SPACE)*

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 1206392F and 1206398F.

The Polar MILSATCOM program is in Budget Activity 5, 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 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	50.815	33.644	0.000	0.000	0.000
Current President's Budget	44.306	33.644	27.337	0.000	27.337
Total Adjustments	-6.509	0.000	27.337	0.000	27.337
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	-5.000	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	-1.509	0.000			
• Other Adjustments	0.000	0.000	27.337	0.000	27.337

Change Summary Explanation

FY 2017: -$5.000M Congressional Directed Reduction due to unjustified request.
FY 2019: +$27.337M: +$27.542M for software sustainment builds and cyber security updates to Gateway Segment and Control and Planning Segment (CAPS), and Preoperational Support (PS)/Interim Contractor Support (ICS); -$0.205M inflation adjustment.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
Title: EPS	44.306	33.644	27.337
Description: Develop and acquire EPS MILSATCOM which consists of: 1) two Extremely High Frequency payloads, using AEHF's XDR waveform, on hosted spacecraft; 2) a standalone Control and Planning Segment (CAPS) to provide command and control and XDR mission planning capability; and 3) one gateway to provide connectivity between polar and mid-latitude users through the Global Information Grid.			
FY 2018 Plans:			

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force	Date: February 2018
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 1206432F / *Polar MILSATCOM (SPACE)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
Complete test activities for Lead Development Test Organization. Execute MOT&E. Complete PEO certification. Execute Payload #2 on-orbit testing. Continue program office and other related support activities that may include, but are not limited to studies, technical analysis, etc. ***FY 2019 Plans:*** Complete software sustainment builds, cyber security updates, and Operational Test and Evaluation (OT&E) report. Funds Preoperational Support (PS)/Interim Contractor Support (ICS) in order to support final O&M contract award. Continue to appropriately staff contractor-operated protected communications satellite system for operational trial period and troubleshoot system anomalies during PS/ICS period. 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, prototyping, etc. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY 2019 decreased compared to FY 2018 by $6.307M. Justification for this decrease is described in plans above.			
Accomplishments/Planned Programs Subtotals	44.306	33.644	27.337

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

E. Acquisition Strategy

The EPS is the follow-on to the currently operational IPS and is a component of the Extremely High Frequency SATCOM architecture providing secure, protected communications to worldwide users. The EPS acquisition consists of four segments (Payload, Ground Control, Gateway, and Terminal) acquired by separate procurement actions. Each EPS payload and its integration onto classified host satellites is funded by the EPS program while the development and integration is performed by the host organization. The MILSATCOM Systems Directorate will procure the Ground Control and Planning Segment. The Ground Gateway segment, funded by the EPS program, will be organically developed by the Navy's Space and Naval Warfare Systems Center Pacific, San Diego, CA. The MILSATCOM Systems Directorate is the prime systems integrator for the EPS payload, ground control, and gateway segments. The Terminals that will use EPS will be acquired by each Service's Terminal Program Office.

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.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force			Date: February 2018
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 1206432F / *Polar MILSATCOM (SPACE)*	Project (Number/Name) 657105 / *Polar Satellite Communications*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Control and Planning Segment	C/CPIF	NGMS : Redondo Beach, CA	139.914	15.078	Nov 2016	12.720	Nov 2017	14.530	Nov 2018	-		14.530	0.000	182.242	148.600
Gateway architecture development	MIPR	Space and Naval Warfare Systems Command (SPAWAR) Systems Center - Pacific : San Diego, CA	39.212	7.728	Nov 2016	3.496	Nov 2017	3.604	Nov 2018	-		3.604	0.000	54.040	75.454
EPS Design/Development Contract	SS/CPAF	NGAS : Redondo Beach, CA	6.949	2.065	Nov 2016	2.911	Nov 2017	0.850	Nov 2018	-		0.850	0.000	12.775	606.693
T&C-T Development	MIPR	Lincoln Labs : Boston, MA	6.377	2.980	Nov 2016	3.060	Nov 2017	1.595	Nov 2018	-		1.595	0.000	14.012	-
Technical Mission Analysis	Various	Various : Various	8.435	4.650	Nov 2016	3.886	Nov 2017	2.026	Nov 2018	-		2.026	0.000	18.997	-
Enterprise SE&I	Various	Various : Various	28.247	7.443	Nov 2016	3.976	Nov 2017	2.074	Nov 2018	-		2.074	0.000	41.740	-
		Subtotal	229.134	39.944		30.049		24.679		-		24.679	0.000	323.806	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Planning/Management Support for T&E	MIPR	Various : Various	1.279	-		-		-		-		-	0.000	1.279	-
		Subtotal	1.279	-		-		-		-		-	0.000	1.279	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FFRDC	Various	Various : Various	18.248	0.400	Nov 2016	0.633	Nov 2017	0.330	Nov 2018	-		0.330	0.000	19.611	-
A&AS	Various	Various : Various	23.935	3.662	Nov 2016	2.692	Nov 2017	2.187	Nov 2018	-		2.187	0.000	32.476	-
Other Support	Various	Various : Various	0.460	0.300	Oct 2016	0.270	Nov 2017	0.141	Oct 2018	-		0.141	0.000	1.171	-
		Subtotal	42.643	4.362		3.595		2.658		-		2.658	0.000	53.258	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force			Date: February 2018
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 1206432F / *Polar MILSATCOM (SPACE)*	Project (Number/Name) 657105 / *Polar Satellite Communications*	

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	273.056	44.306		33.644		27.337		-		27.337	0.000	378.343	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 1206432F / *Polar MILSATCOM (SPACE)*	**Project (Number/Name)** 657105 / *Polar Satellite Communications*

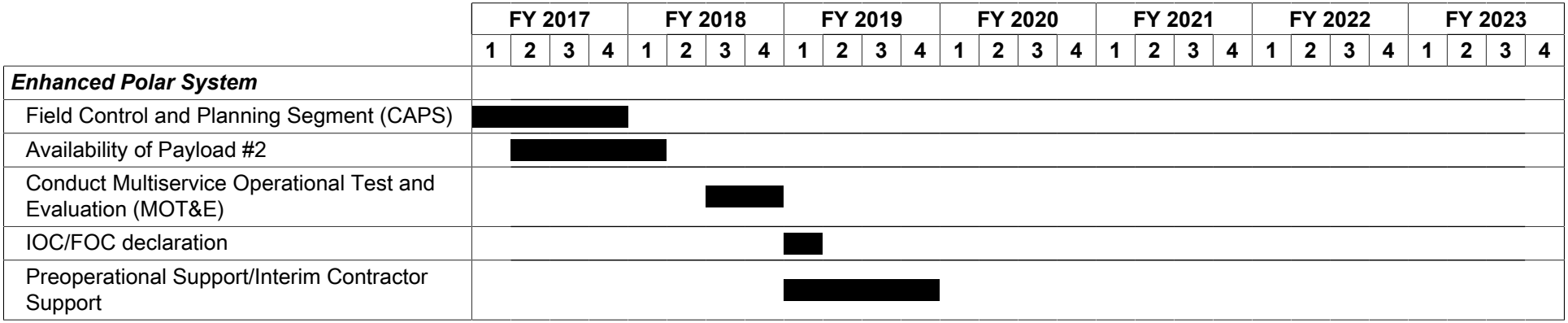

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 1206432F / *Polar MILSATCOM (SPACE)*	**Project (Number/Name)** 657105 / *Polar Satellite Communications*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Enhanced Polar System				
Field Control and Planning Segment (CAPS)	1	2017	4	2017
Availability of Payload #2	2	2017	1	2018
Conduct Multiservice Operational Test and Evaluation (MOT&E)	3	2018	4	2018
IOC/FOC declaration	1	2019	1	2019
Preoperational Support/Interim Contractor Support	1	2019	4	2019