Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 1206422F / *Weather System Follow-on*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	0.000	0.000	2.237	0.000	2.237	2.527	2.583	1.413	0.000	Continuing	Continuing
65A038: *SSA Environmental Monitoring*	-	0.000	0.000	2.237	0.000	2.237	2.527	2.583	1.413	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Space Situational Awareness Environment Monitoring (SSAEM) project is a continuation of the Air Force technology demonstration of environmental monitoring sensors on the NOAA COSMIC-2 mission. SSAEM funding was transferred starting in FY 2020 from Project 644289, Weather Satellite Follow-On, to Project 65A038 in PE 1206422F, and was funded in Prior Years through PE 0604425F and 1206425F, Space Situational Awareness Systems.

A. Mission Description and Budget Item Justification

The Space Situational Awareness Environmental Monitoring (SSAEM) program is a non-ACAT, Class D technology demonstration project to support international Constellation Observing System for Meteorology, Ionosphere and Climate 2 (COSMIC-2) mission. The SSAEM program provides the acquisition, development and launch/on-orbit support of 18 space/terrestrial weather sensors to COSMIC-2 partnership in coordination with National Oceanic and Atmospheric Administration (NOAA) and Taiwan's National Space Organization (NSPO). COSMIC-2 is launching six satellites in an equatorial, Low Earth Orbit (LEO) with 3 SSAEM sensors in each spacecraft by FY 2019. The sensor types are; Tri-Global Navigation Satellite System (Tri-GNSS) Radio occultation System (TGRS), Ion Velocity Meter (IVM) and Radio Frequency Beacon (RFB). The SSAEM sensors will address three distinct Joint Requirement Oversight Committee (JROC)-approved Category A weather gaps, specifically Gap #4 (Ionospheric Density), Gap #7 (Equatorial Ionospheric Scintillation) and Gap #12 (Electric Field), to provide additional space meteorological data to improve forecast capabilities and improve warfighter navigation/communication capabilities over the next five years.

Space acquisition must respond with speed and agility to emerging adversary threats. Space & Missile Systems Center (SMC) is transforming 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, SMC 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 WSF 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.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

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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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	0.000	0.000	2.237	0.000	2.237
Total Adjustments	0.000	0.000	2.237	0.000	2.237
• Congressional General Reductions	0.000	0.000			
• 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	0.000	0.000			
• Other Adjustments	0.000	0.000	2.237	0.000	2.237

Change Summary Explanation

FY 2020: $2.237M transferred from PE 1206422F, Project 644289, Weather System Follow-On.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Space Situational Awareness Environmental Monitoring (SSAEM)	-	-	2.237

Description: The SSAEM program is a non-ACAT, Class D technology demonstration project to support international Constellation Observing System for Meteorology, Ionosphere and Climate 2 (COSMIC-2) mission. The SSAEM program provides the acquisition, development and launch/on-orbit support of 18 space/terrestrial weather sensors to COSMIC-2 partnership in coordination with National Oceanic and Atmospheric Administration (NOAA) and Taiwan's National Space Organization (NSPO). COSMIC-2 is launching six satellites in an equatorial, Low Earth Orbit (LEO) with 3 SSAEM sensors in each spacecraft by FY19. The sensor types are; Tri-GNSS Radio occultation System (TGRS), Ion Velocity Meter (IVM) and Radio Frequency Beacon (RFB). The SSAEM sensors will address three distinct Joint Requirement Oversight Committee (JROC)-approved Category A weather gaps, specifically Gap 4(Ionospheric Density), 7 (Equatorial Ionospheric Scintillation) and 12 (Electric Field), to provide additional space meteorological data to improve forecast capabilities and improve warfighter navigation/communication capabilities over the next five years.

FY 2020 Plans:

Will continue on-orbit support of SSAEM sensors onboard COSMIC-2 once it reaches proper orbit, and initiates on-orbit checkout, as well as sensor calibration/validation (cal/val). Once the sensors complete on-orbit checkout, and successful cal/val, the

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C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
program will provide continued remote sensing of space weather coverage until the satellites reach their designed mission End of Life (EoL). 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 2019 to FY 2020 Increase/Decrease Statement:*** FY2020 increased compared to FY2019 by $2.237M. Justification for this increase is described in plans above.			
Accomplishments/Planned Programs Subtotals	-	-	2.237

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

E. Acquisition Strategy

SSAEM sensors support contract will be a sole-source contract to University Corporation Atmospheric Research (UCAR) due to their expertise in radio occultation and space weather monitoring for SSAEM sensors. The Justification & Approval (J&A) was approved in Jun 18, enabling Request for Proposal to be released in 1 Aug 18. The contract is slated to be awarded in 2Q FY 2019 for a 5-year support contract for the launch/checkout, cal/val and on-orbit activities.

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 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 1206422F / *Weather System Follow-on*	Project (Number/Name) 65A038 / *SSA Environmental Monitoring*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
UCAR Sensor R&D Support	SS/TBD	UCAR : Boulder, CO	-	-		-		2.099	Feb 2019	-		2.099	Continuing	Continuing	-
		Subtotal	-	-		-		2.099		-		2.099	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FFRDC	RO	Aerospace Corp : El Segundo, CA	-	-		-		0.138	Oct 2019	-		0.138	Continuing	Continuing	-
		Subtotal	-	-		-		0.138		-		0.138	Continuing	Continuing	N/A

	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		0.000		2.237		-		2.237	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 1206422F / *Weather System Follow-on*	**Project (Number/Name)** 65A038 / *SSA Environmental Monitoring*

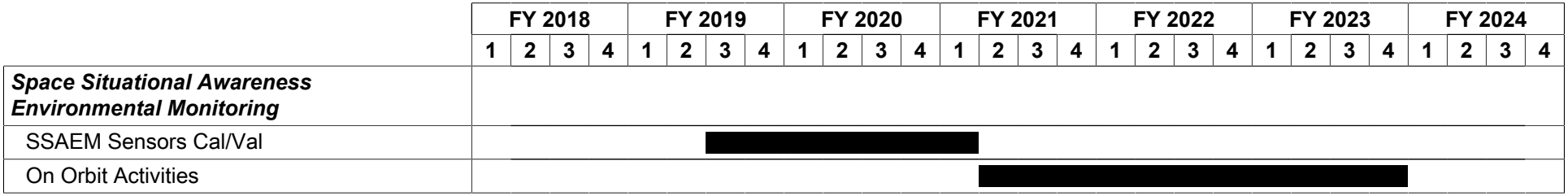

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 1206422F / *Weather System Follow-on*	**Project (Number/Name)** 65A038 / *SSA Environmental Monitoring*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Space Situational Awareness Environmental Monitoring				
SSAEM Sensors Cal/Val	3	2019	1	2021
On Orbit Activities	2	2021	4	2023