Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force											Date: May 2017	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 1206422F / *Weather System Follow-on*							
COST ($ in Millions)	**Prior Years**	**FY 2016**	**FY 2017**	**FY 2018 Base**	**FY 2018 OCO**	**FY 2018 Total**	**FY 2019**	**FY 2020**	**FY 2021**	**FY 2022**	**Cost To Complete**	**Total Cost**
Total Program Element	146.931	46.307	118.953	112.088	0.000	112.088	153.391	101.921	36.907	37.662	297.300	1,051.460
644289: *Weather Satellite Follow-On*	146.931	46.307	118.953	112.088	0.000	112.088	153.391	101.921	36.907	37.662	297.300	1,051.460
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
Program MDAP/MAIS Code: 488												

Note

In FY2018, PE 0604422F, Weather Satellite Follow-On efforts were transferred to PE 1206422F, Weather Satellite Follow-On due to the creation of a new Major Force Program for Space. FY2016 and FY2017 funding is now documented in the exhibits for PE 1206422F.

A. Mission Description and Budget Item Justification

Weather System Follow-on (WSF) is the Department of Defense's (DoD) future weather system. The program will leverage a group of systems to provide timely, reliable, and high quality remote sensing capabilities that will make global environmental observations of atmospheric, terrestrial, oceanographic, solar-geophysical conditions and meet other requirements validated by the Joint Requirements Oversight Council (JROC).

Based on the completed Space-Based Environmental Monitoring (SBEM) Analysis of Alternatives (AoA), capabilities will be developed to satisfy weather gaps for which no known mitigation exists to include Gap 3 Ocean Surface Vector Winds (OSVW), Gap 8 Tropical Cyclone Intensity (TCI), and Gap 11 Low Earth Orbit (LEO) Energetic Charged Particles (LEO ECP). Gap 3 OSVW and Gap 8 TCI require a space-based microwave sensor to provide polarimetric ocean surface wind direction and speed required for naval sea operations, as well as fighter sortie generations and marine amphibious operations. Gap 11 LEO ECP requires in situ ECP sensor for space situational awareness. The earliest possible launch options are being integrated in the design for critical gaps.

DoD established WSF as a Pre-Major Defense Acquisition Program (MDAP) with the Air force as the lead component. Based on the SBEM AoA results, the WSF initial thrusts will be to enable:
1) DoD use of data collected by civil, international and other DoD space systems;
2) Timely weather collection over broad oceans in support of maneuvering forces;
3) Space weather capabilities to characterize operational orbits, space situational awareness, and the ionosphere.

Secondary investments may be supported to address weather gaps identified in the Meteorological and Oceanographic (METOC) Initial Capability Document (ICD).

This program is in Budget Activity 4, Advanced Component Development and Prototypes (ACD&P) because efforts are necessary to evaluate integrated technologies, representative modes or prototype systems in a high fidelity and realistic operating environment.

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force	Date: May 2017
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 1206422F / *Weather System Follow-on*

B. Program Change Summary ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	56.044	118.953	151.650	0.000	151.650
Current President's Budget	46.307	118.953	112.088	0.000	112.088
Total Adjustments	-9.737	0.000	-39.562	0.000	-39.562
• 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	-5.873	0.000			
• SBIR/STTR Transfer	-3.864	0.000			
• Other Adjustments	0.000	0.000	-39.562	0.000	-39.562

Change Summary Explanation

FY2016: -$5.873M transferred for higher Air Force priorities.

FY2018: -$40.000M reduction due to availability of prior year execution balances; +$0.438M inflation adjustment

C. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
Title: WSF Microwave System (SV1-2)	17.235	90.200	92.743

Description: WSF Microwave System (SV 1-2): the Air Force intends to pursue a full and open competition with industry aimed at procuring the most affordable and capable WSF Microwave System (WSF-M) to meet all three capability gaps.

WSF-M SV-2 will be an option to exercise, should AF wish to replenish WSF constellation post-SV-1. SV-2 will be functionally equivalent to SV-1. The WSF-M SV-1 projected Initial Launch Capability (ILC) is FY22.

Secondary investments may also be considered to address weather gaps identified in the Meteorological and Oceanographic (METOC) Initial Capabilities Document (ICD).

FY 2016 Accomplishments:

In FY16, the Service Acquisition Executive (SAE) signed the WSF-M Acquisition Strategy Document (ASD) on 18 Oct 16. Per FY16 NDAA Sec 825 language, WSF-M was designated an ACAT IC program as of 01 Oct 16 (i.e., FY17) with the AF SAE as the MDA. WSF-M released a draft Development Request for Proposal (dDev RFP) to industry for comments in Sep 2016. Continued program office and other related support activities that may include, but are not limited to studies, technical analysis, etc.

FY 2017 Plans:

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force	Date: May 2017
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 1206422F / *Weather System Follow-on*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
Complete WSF-M dRFP Release Decision DAB and release RFP to industry. Complete special studies to address secondary weather gaps. Complete WSF-M source selection and contract award. Modify existing ground segment and begin planning and transition to new ground system as required. Stand up contractor personnel, purchase long-lead items for WSF-M and start development/procurement effort for payload algorithms. Compete launch service contract. Continue program office and other related support activities that may include, but are not limited to studies, technical analysis, etc. ***FY 2018 Plans:*** Will complete WSF-M system Preliminary Design Review (PDR) and enter WSF-M Milestone B with all required acquisition documentation. Will complete WSF-M ground system Telemetry, Tracking & Commanding (TT&C) development. Will fund program support activities. Continue program office and other related support activities that may include, but are not limited to studies, technical analysis, etc.			
Title: COWVR Tech Demo ***Description:*** Air Force priority is to deliver an interim materiel solution to mitigate projected WindSat mission End of Life (EOL). In order to achieve this goal, Space and Missile Systems Center/Remote Sensing Systems Directorate (SMC/RS) is working with the Operationally Responsive Space (ORS) office to launch Compact Ocean Surface Wind Vector Radiometer (COWVR) technical demonstration payload, which would provide residual operational capability to address the immediate Gap 3 requirements, once on-orbit checkout is successfully completed. ***FY 2016 Accomplishments:*** Delivered COWVR to ORS office for integration with the Modular Space Vehicle (MSV) bus enabling the ORS-6 mission to be on track for projected Nov 17 launch. Continued program office and other related support activities that may include, but are not limited to studies, technical analysis, etc. ***FY 2017 Plans:*** Combine efforts with ORS to launch COWVR Tech Demo as ORS-6 mission. ***FY 2018 Plans:*** Will complete COWVR calibration/validation and initiate steps to transition sensor to Navy operation.	26.330	23.363	6.765
Title: WSF ECP ***Description:*** WSF ECP will fulfill the Space-based Environmental Monitoring (SBEM) Weather Gap 11 and address the Secretary of the Air Force (SECAF) policy which directs each USAF Satellite Office to plan for and integrate ECP sensors on all pre-Milestone B new satellite acquisitions. To accomplish this requirement, the ECP sensor will be integrated on the WSF-M satellite. ***FY 2016 Accomplishments:***	2.742	5.390	12.580

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force	Date: May 2017
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 1206422F / *Weather System Follow-on*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
Provided funding to Air Force Research Lab (AFRL) to mature Compact Environmental Sensor (CEASE-III) design as Gov't reference architecture for future industry ECP sensor competition; completed CEASE-III System Readiness Review (SRR). ***FY 2017 Plans:*** Complete WSF-M dRFP and release to industry and initiate source selection. Complete special studies to address secondary weather gaps. Modify existing ground segment and begin planning and transition to new ground system as required. ***FY 2018 Plans:*** Will complete source selection and award contract. Will stand up contractor personnel, purchase long-lead items for WSF-M and start development/procurement effort for payload algorithms. Will compete launch service contract. Continue program office and other related support activities that may include, but are not limited to studies, technical analysis, etc.			
Accomplishments/Planned Programs Subtotals	46.307	118.953	112.088

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

E. Acquisition Strategy

DoD established WSF as a pre-MDAP. The acquisition strategy for WSF is based on validated SBEM AoA results from FY14 and subsequent acquisition strategy development activities that were conducted in FY15. The WSF acquisition strategy focuses on streamlined acquisition process for providing materiel solutions to OSWV, TCI & LEO ECP, as validated by the JROC; deliver microwave sensing solution to address DoD needs for OSVW and TCI capabilities and deliver space environment sensing solution to address LEO ECP capabilities for on-orbit attributions and anomaly resolutions. Impending WindSat mission EOL required WSF to approach the program acquisition in two phases; Phase I to address imminent OSWV/TCI needs via COWVR tech demo option, while Phase II involves a more robust set of capabilities for WSF-M.

In Phase I, the AF intends to deliver an interim materiel solution to address the immediate OSWV and TCI needs to mitigate WindSat EOL. In order to achieve this goal in a timely manner, WSF program plans on utilizing Jet Propulsion Lab (JPL)-developed COWVR sensor for integration with ORS office's Modular Space Vehicle (MSV) spacecraft as the ORS-6 mission. ORS office will lead contractual actions to procure the space vehicle, the launch service and reserve commercial ride-share spot for projected 2017 ILC. Once COWVR sensor is launched and completes on-orbit checkout, the payload is expected to provide partial residual operational capabilities until WSF-M system is implemented.

In Phase II, the program intends to procure a more robust WSF-M system, capable of meeting all three weather capability gaps, in a full and open competition environment, in order to reduce overall program cost. There will be one WSF-M to be procured, with option for a second system. WSF-M first system (SV-1) ILC is FY2022 to mitigate any potential weather coverage gaps. WSF-M SV-2 ILC is currently projected for FY2027. The WSF-M SV-2 will be functionally equivalent to SV-1.

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force	Date: May 2017
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 1206422F / *Weather System Follow-on*

The WSF ECP sensor development will leverage current AFRL sensor and hazard assessment technology to accelerate availability of ECP sensor for integration on WSF-M and other planned AF satellite acquisitions. The AF intends to transition AFRL's technology to industry for production via competitive award. Two Tech Demo ECP sensors are projected to be delivered and ready for satellite integration by FY2020. Post-Tech Demo ECP phase, each respective program offices will be responsible for the procurement/integration and sustainment of the sensors required to meet the SecAF's Space Situational Awareness (SSA) policy.

Complete Broad Agency Announcement (BAA) proposal evaluation and negotiations for SBEM EO/IR.

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: FY 2018 Air Force			Date: May 2017
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 1206422F / *Weather System Follow-on*	Project (Number/Name) 644289 / *Weather Satellite Follow-On*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ORS COWVR Technology Demonstration	Various	Various : Various	10.500	19.710	Jan 2016	32.649	Jan 2017	12.008	Jan 2018	0.000		12.008	1.028	75.895	-
WSF Microwave System (SV1-2)	TBD	TBD : TBD	0.000	0.000		45.816	Sep 2017	66.553	Sep 2018	0.000		66.553	426.145	538.514	426.145
WSF ECP (Gap 11)	MIPR	Kirtland AFB : Albuquerque, NM	0.300	0.916	Jan 2016	6.084	Apr 2017	12.839	Apr 2018	0.000		12.839	0.600	20.739	-
Enterprise Systems Engineering & Integration	C/CPAF	The Analytical Science Corp : El Segundo, CA	0.000	0.535	Dec 2016	9.039	Dec 2016	3.131	Dec 2017	0.000		3.131	17.360	30.065	-
Technical Mission Analysis	RO	Aerospace Corp : El Segundo, CA	4.334	2.240	Oct 2016	4.909	Oct 2017	5.721	Oct 2018	0.000		5.721	51.820	69.024	-
BAA	TBD	TBD : TBD	0.000	0.000		2.000		0.000		0.000		0.000	0.000	2.000	-
Pre-Acquisition Activities	Various	Various : Various	103.432	18.272	Aug 2017	4.971	Jul 2017	0.438	Jan 2018	0.000		0.438	0.000	127.113	-
		Subtotal	118.566	41.673		105.468		100.690		0.000		100.690	496.953	863.350	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Advanced Concepts and Planning	TBD	TBD : TBD	0.000	0.000		0.000		0.000		0.000		0.000	8.000	8.000	-
Requirements/Engineering Analysis Support	RO	Defense Information Technical Center : El Segundo, CA	1.500	0.043		0.000		0.000		0.000		0.000	0.000	1.543	-
Engineering Risk Reduction Studies	Various	Various : Various	1.171	0.000		0.000		0.000		0.000		0.000	0.000	1.171	-
		Subtotal	2.671	0.043		0.000		0.000		0.000		0.000	8.000	10.714	-

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Air Force			Date: May 2017
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 1206422F / *Weather System Follow-on*	Project (Number/Name) 644289 / *Weather Satellite Follow-On*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Subtotal			-	-		-		-		-		-	-	-	-

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FFRDC	RO	Aerospace Corp : Los Angeles, CA	14.109	1.744	Oct 2015	5.459	Oct 2016	4.959	Oct 2017	0.000		4.959	13.030	39.301	-
Other Support	Various	Various : TBD	4.456	0.156	Nov 2015	2.169	Nov 2016	3.042	Nov 2017	0.000		3.042	13.480	23.303	-
A&AS	Various	Various : TBD	7.129	2.691	Nov 2015	5.857	Nov 2016	3.397	Nov 2018	0.000		3.397	16.627	35.701	-
Subtotal			25.694	4.591		13.485		11.398		0.000		11.398	43.137	98.305	-

	Prior Years	FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	146.931	46.307		118.953		112.088		0.000		112.088	548.090	972.369	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force		Date: May 2017
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 1206422F / *Weather System Follow-on*	**Project (Number/Name)** 644289 / *Weather Satellite Follow-On*

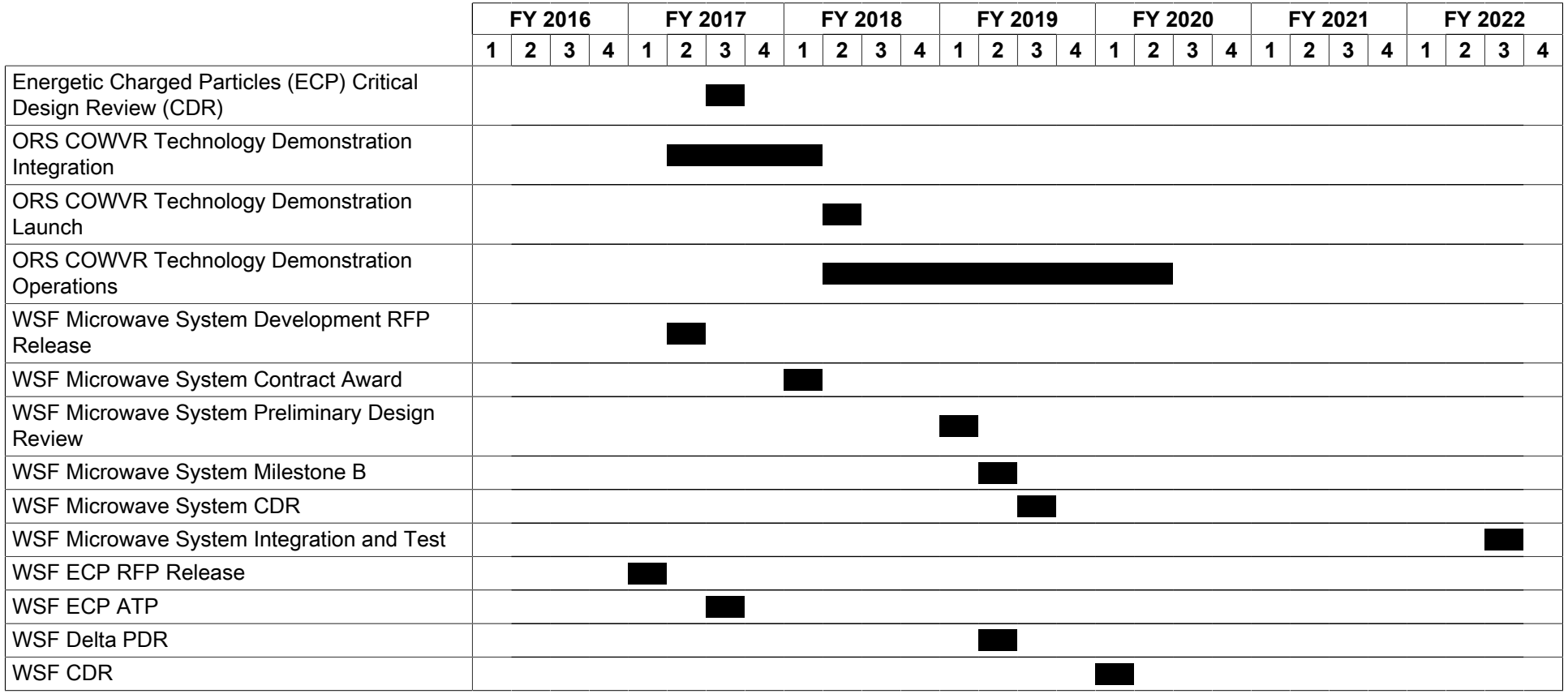

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force		Date: May 2017
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 1206422F / *Weather System Follow-on*	**Project (Number/Name)** 644289 / *Weather Satellite Follow-On*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Energetic Charged Particles (ECP) Critical Design Review (CDR)	3	2017	3	2017
ORS COWVR Technology Demonstration Integration	2	2017	1	2018
ORS COWVR Technology Demonstration Launch	2	2018	2	2018
ORS COWVR Technology Demonstration Operations	2	2018	2	2020
WSF Microwave System Development RFP Release	2	2017	2	2017
WSF Microwave System Contract Award	1	2018	1	2018
WSF Microwave System Preliminary Design Review	1	2019	1	2019
WSF Microwave System Milestone B	2	2019	2	2019
WSF Microwave System CDR	3	2019	3	2019
WSF Microwave System Integration and Test	3	2022	3	2022
WSF ECP RFP Release	1	2017	1	2017
WSF ECP ATP	3	2017	3	2017
WSF Delta PDR	2	2019	2	2019
WSF CDR	1	2020	1	2020