Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy											Date: February 2020	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0204136N *I F/A-18 Squadrons*							
COST ($ in Millions)	**Prior Years**	**FY 2019**	**FY 2020**	**FY 2021 Base**	**FY 2021 OCO**	**FY 2021 Total**	**FY 2022**	**FY 2023**	**FY 2024**	**FY 2025**	**Cost To Complete**	**Total Cost**
Total Program Element	5,243.078	199.881	187.911	171.030	-	171.030	160.460	155.378	149.558	148.220	Continuing	Continuing
1662: *F/A-18 Improvement*	4,439.845	101.694	97.011	130.407	-	130.407	146.912	141.890	139.308	138.082	378.368	5,713.517
2065: *F/A-18 Radar Upgrade*	745.271	6.812	8.706	8.113	-	8.113	8.996	9.558	9.176	9.347	Continuing	Continuing
2071: *F/A-18 Block III*	57.962	79.984	80.194	27.072	-	27.072	0.000	0.000	0.000	0.000	0.000	245.212
9099: *Physiological Episodes*	0.000	0.000	0.000	5.438	-	5.438	4.552	3.930	1.074	0.791	Continuing	Continuing
9999: *Congressional Adds*	0.000	11.391	2.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	13.391

A. Mission Description and Budget Item Justification

The F/A-18 is required to perform multiple missions. The continued F/A-18 E/F and EA-18G "Flight Plan" spiral capability development is critical to the baseline of the Super Hornet next generation mission system capability to maintain the platform's tactical relevance in support of Navy Aviation Plan 2030.

Development continues for a platform solution to threat Advanced Electronic Attack and Counter-Electronic Attack (CEA). F/A-18 solutions to CEA include upgrades to existing sensors such as F/A-18 Radar Upgrade, Infrared Search and Track Block I/II, and development of a fused Common Tactical Picture (CTP) that provides fusion between aircraft. Continued advanced development engineering for improvements in reliability and maintainability is required to ensure maximum benefit is achieved through reduced cost of ownership and provides enhanced availability.

Capabilities of the F/A-18 weapon system and ancillary equipment can be upgraded to accommodate and incorporate new or enhanced weapons and advances in technology to respond effectively to emerging future threats. Future integrated Carrier Air Wing Concept of Operations (CONOPS) demand changes to the base line Block II Super Hornet. In response, the Block III Super Hornet was submitted. None of the changes to the aircraft are revolutionary; however, the combined impact to the aircraft's capability and its contribution to the Airwing are significant. The initial F/A-18 Block III concept includes low risk changes which will be incorporated in the near term with a combination of forward fit production line incorporation and retrofit modifications to the aircraft already planned as part of the Service Life Modification (SLM) Plan.

USMC upgrades to the platform are being developed; to include integration and capability expansion of Activity Electronically Scanned Array (AESA) Radar for F/A-18 A-D, evaluation and development of an Automatic Ground Collision Avoidance System (AUTOGCAS) for all F/A-18 variants, development of increased sensor and Electronic Warfare (EW) capability for F/A-18 A-D, weapons carriage and employment capability expansion, and enhancement of Mission Computer (MC) processing and memory capability.

Naval Aviation Physiological Episodes (PE) funding is for mitigation and root cause investigation in aircraft.

Funding is added for the Advanced Capability Display Computer (ACDC)/Advanced Crew Station (ACS) Improved Tactical Displays which will enable Panoramic "Big Picture" view of the Battle Space for improved weapons employment and engagement.

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy	Date: February 2020
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0204136N *I F/A-18 Squadrons*

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	204.886	213.715	169.009	-	169.009
Current President's Budget	199.881	187.911	171.030	-	171.030
Total Adjustments	-5.005	-25.804	2.021	-	2.021
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-27.804			
• Congressional Rescissions	-	-			
• Congressional Adds	-	2.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	0.992	0.000			
• SBIR/STTR Transfer	-5.997	0.000			
• Program Adjustments	0.000	0.000	1.933	-	1.933
• Rate/Misc Adjustments	0.000	0.000	0.088	-	0.088

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2019	FY 2020
Project: 9999: *Congressional Adds*		
Congressional Add: *Noise Reduction*	1.931	0.000
Congressional Add: *Navy Joint Air-to-Ground Missile for Fixed Wing Aircraft*	9.460	0.000
Congressional Add: *Noise reduction research*	0.000	2.000
Congressional Add Subtotals for Project: 9999	11.391	2.000
Congressional Add Totals for all Projects	11.391	2.000

Change Summary Explanation

Technical:
1662: F/A-18 E/F Block III Wholeness
2065: Not Applicable
2071: Not Applicable
9099: Physiological Episodes Mitigation

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy	Date: February 2020
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0204136N *I F/A-18 Squadrons*

Schedule:
1662: Updated according to the FY2021 Presidents Budget Guidance.
Added schedule for Advanced Capability Display Computer Improved Tactical Displays

The FY 2021 funding request was increased by $0.073 million for Blk III Wholeness.

Schedule:
2065: Updated according to the FY2021 Presidents Budget Guidance.

The FY 2021 funding request was reduced by $0.561 million to account for the availability of prior year execution balances.

Schedule:
2071: Updated according to the FY2021 Presidents Budget Guidance.

The FY 2021 funding request was reduced by $2.929 million to account for the availability of prior year execution balances and rephasing of the development and test schedules.

Schedule:
9099: Physiological Episodes Mitigation - schedule unchanged; PE moved into standalone PU 9099

The FY 2021 funding request was increased by $5.438 million as a result of the transfer of Physiological Episode efforts from PU 1662 to PU 9099, beginning in FY 2021.

Schedule:
9999:
Added Wind tunnel test study 4Q1FY19-4QFY20
Removed Boeing strength, loads, N&V & flutter analysis
Removed E3 chamber testing
Added Design & development of weapon 4QFY19-4QFY21

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204136N / *F/A-18 Squadrons*	Project (Number/Name) 1662 / *F/A-18 Improvement*	

COST ($ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
1662: *F/A-18 Improvement*	4,439.845	101.694	97.011	130.407	-	130.407	146.912	141.890	139.308	138.082	378.368	5,713.517
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The F/A-18 is required to perform multiple missions. The continued F/A-18 E/F and EA-18G "Flight Plan" spiral capability development is critical to the baseline of the Super Hornet next generation mission system capability to maintain the platform's tactical relevance in support of Navy Aviation Plan 2030.

Development continues for a platform solution to threat Advanced Electronic Attack and Counter-Electronic Attack (CEA). F/A-18 solutions to CEA include upgrades to existing sensors such as F/A-18 Radar Upgrade, Infrared Search and Track Block I/II, and development of a fused Common Tactical Picture (CTP) that provides fusion between aircraft. Continued advanced development engineering for improvements in reliability and maintainability is required to ensure maximum benefit is achieved through reduced cost of ownership and provides enhanced availability.

Capabilities of the F/A-18 weapon system and ancillary equipment can be upgraded to accommodate and incorporate new or enhanced weapons and advances in technology to respond effectively to emerging future threats. Future integrated Carrier Air Wing Concept of Operations (CONOPS) demand changes to the base line Block II Super Hornet. In response, the Block III Super Hornet was submitted. None of the changes to the aircraft are revolutionary; however, the combined impact to the aircraft's capability and its contribution to the Airwing are significant. The initial F/A-18 Block III concept includes low risk changes which will be incorporated in the near term with a combination of forward fit production line incorporation and retrofit modifications to the aircraft already planned as part of the Service Life Modification (SLM) Plan.

USMC upgrades to the platform are being developed; to include integration and capability expansion of AESA Radar for F/A-18 A-D, evaluation and development of an Automatic Ground Collision Avoidance System (AUTOGCAS) for all F/A-18 variants, development of increased sensor and Electronic Warfare (EW) capability for F/A-18 A-D, weapons carriage and employment capability expansion, and enhancement of Mission Computer (MC) processing and memory capability.

Funding is added for the Advanced Capability Display Computer (ACDC)/Advanced Crew Station (ACS) Improved Tactical Displays which will enable Panoramic "Big Picture" view of the Battle Space for improved weapons employment and engagement.

Funding is added for Naval Aviation Physiological Episode (PE) mitigation and root cause investigation in aircraft.

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate funding in the current or subsequent fiscal year.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Advanced Capability Display Computer (ACDC)	0.000	0.000	21.690	0.000	21.690

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204136N / *F/A-18 Squadrons*	**Project (Number/Name)** 1662 / *F/A-18 Improvement*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Articles:	-	-	-	-	-
Description: Funds development of Advanced Capability Display Computer (ACDC) to leverage Large Area Displays and Advanced Networking Infrastructure (ANI) in Block III to provide greater situational awareness and incorporate Tactical Decision Aids such as Common Tactical Picture. ***FY 2020 Plans:*** N/A ***FY 2021 Base Plans:*** Begin design and development for the Advanced Capability Display Computer (ACDC) hardware & software that will enable Larger Area Display surface to be fully utilized with advanced graphical tactical displays and intuitive touch screen interface capabilities. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** FY20 to FY21 increase of $21.690 is for the development of the Advanced Capability Display Computer.					
Title: Multi-System Integration (MSI) / Common Tactical Picture (CTP)	43.560	44.767	70.374	0.000	70.374
Articles:	-	-	-	-	-
Description: MSI transitions to integration of new sensors and tuning, while Common Tactical Picture (CTP) starts with H16 Block III efforts to merge data fusion and sensors from single aircraft to multiple aircraft. CTP represents an incremental approach to accelerating kill chains through fusion and automation. System Configuration Set (SCS) methodology of bundling capabilities and modifications into a single fleet mission computer Operational Flight Program (OFP) continue, but augmented to more modern Continuous Development & Integration (CCD&I) method that results in rapid releases of capabilities. ***FY 2020 Plans:*** Flight Plan MSI and associated Common Tactical Picture (CTP) capabilities will continue through mission computer, Joint Mission Planning System (JMPS) Unique Planning Component (UPC), and weapon system software SCS updates associated with each incremental Block (H build) software update to include Software Modernization, Cyber protections, and speed to fleet initiatives. Advances in Super Hornet Air and Surface Warfare will continue with ongoing integration of weapons and sensors into a CTP, Display Improvements to enhance air-to-air and air-to-surface situational awareness and aircrew decision superiority, continued development of third party software applications and protocols for rapid fleet capability delivery, and Counter					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204136N / *F/A-18 Squadrons*	**Project (Number/Name)** 1662 / *F/A-18 Improvement*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Electronic Attack enhancements to improve survivability and lethality. Increased engineering efforts for integration of active and passive kill chain capabilities and sensors associated with Flight Plan Naval Integrated Fire Control(NIFC) and Over the Horizon Anti-Surface Warfare (OASuW) Future Naval Capability (FNC) Target Identification transition efforts continues. Airwing interoperability requirements, CTP algorithm and aircraft division level sensor fusion and management, and developmental test efforts also increase at test activities, including ongoing modeling and simulation upgrades such as Net Enabled Weapon Controller Interface Model interoperability software and equipment, Live Virtual Constructive developmental efforts, and Minotaur research and integration testing. Funding in FY 2020 is provided for CTP development and risk reduction, interoperability and testing associated with H16 Operational Testing.					
FY 2021 Base Plans: Flight Plan MSI and associated Common Tactical Picture (CTP) incremental capabilities continue through mission computer, JMPS UPC, and weapon system software SCS updates associated with each incremental Block (H build) software update to include Software Modernization, Cyber protections, and speed to fleet initiatives. Advances in Super Hornet Air and Surface Warfare will continue with ongoing integration of weapons and sensors into a CTP, Display Improvements to enhance air-to-air and air-to-surface situational awareness and aircrew decision superiority, continued development of third party software applications and protocols for rapid fleet capability delivery, and Counter Electronic Attack enhancements to improve survivability and lethality. Increased engineering efforts for integration of active and passive kill chain capabilities and sensors associated with Flight Plan NIFC and OASuW FNC Target Identification transition efforts continues. Airwing interoperability requirements, CTP algorithm and aircraft division level sensor fusion and management, and developmental test efforts also increase at test activities, including ongoing modeling and simulation upgrades such as Net Enabled Weapon Controller Interface Model interoperability software and equipment, Live Virtual Constructive developmental efforts, and Minotaur research and integration testing. FY 2021 funding continues CTP development and risk reduction, interoperability and testing associated with H16 Operational Testing, and transition to developmental tools such as Agile software.					
FY 2021 OCO Plans: N/A					
FY 2020 to FY 2021 Increase/Decrease Statement: Increase of $25.607 from FY20 to FY21 is due to the increased software development of Common Tactical Picture (CTP Increment 1) capability that introduces Air to Air and Air to Surface Track fusion between multiple					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204136N / *F/A-18 Squadrons*	**Project (Number/Name)** 1662 / *F/A-18 Improvement*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
aircraft within a division (4 F/A-18). The increase is also required to address Operational Test and interoperability of H16 SCS					
Title: USMC Capability Upgrades	17.616	11.687	29.504	0.000	29.504
Articles:	-	-	-	-	-
Description: USMC upgrades to the platform are being developed to include evaluation and development of an Automatic Ground Collision Avoidance System (AUTOGCAS) for all F/A-18 variants, development of increased sensor and EW capability for F/A-18 A-D, weapons carriage and employment capability expansion, and enhancement of MC processing and memory capability.					
FY 2020 Plans: Conduct evaluation and development of AUTOGCAS for all F/A-18 variants. Supports development of increased sensor and EW capability for F/A-18 A-D. Funding supports weapon carriage and employment capability expansion, enhanced MC processing and memory capability, and rapid technology insertion upgrades to F/A-18 A-D to accommodate shifts in technology. AUTOGCAS has high Congressional interest as noted in the FY 2019 NDAA language.					
FY 2021 Base Plans: Conduct testing on the AUTOGCAS sensor and EW capability for the F/A-18 A-D. Funding will support the testing of the weapon carriage and employment capability expansion. Continue evaluation and development of AUTOGCAS for F/A-18.					
FY 2021 OCO Plans: N/A					
FY 2020 to FY 2021 Increase/Decrease Statement: Increase of $17.817 from FY20 to FY21 supports the onset of AUTOGCAS test efforts.					
Title: Flight Plan Engineering / System Configuration Set Development and Integration	20.774	13.781	8.733	0.000	8.733
Articles:	-	-	-	-	-
Description: Continue F/A-18 E/F and EA-18G "Flight Plan" spiral capability development, which is critical to the baseline of the Super Hornet next generation mission system capability. Funding will support the development, test, and integration efforts required to maintain tactical relevance in support of the Naval Aviation Plan 2030.					
FY 2020 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204136N / *F/A-18 Squadrons*	**Project (Number/Name)** 1662 / *F/A-18 Improvement*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Continue Flight Plan Engineering efforts to include F/A-18E/F improvements necessary for Super Hornet relevance and tactical supremacy, Software Modernization and Cyber, Navy Integrated Fire Control-Counter Air system configuration set requirements to support Navy Integrated Air and Missile Defense capability requirements and enhanced F/A-18 Cooperative Engagement Capability. ***FY 2021 Base Plans:*** Continue Flight Plan Engineering efforts to include F/A-18E/F improvements necessary for Super Hornet relevance and tactical supremacy, Software Modernization and Cyber, Navy Integrated Fire Control-Counter Air system configuration set requirements to support Navy Integrated Air and Missile Defense capability requirements and enhanced F/A-18 Cooperative Engagement Capability. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Decrease of $5.048 from FY20 to FY21 is due to the ramp-down of some of modeling and simulation efforts.					
Title: Physiological Episode Mitigation	17.231	26.672	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: Funding provides for design, development, integration and test of platform improvements for F/A-18A-F and EA-18G Weapon Systems as determined through a Root Cause and Corrective Action (RCCA) process to mitigate and reduce the occurrences of Physiological Episode (PE) in Naval Aviation per NDAA 2019 Congressional direction. ***FY 2020 Plans:*** Continue RCCA investigations, directed studies & development efforts for platform improvements in the F/A-18A-F and EA-18G Weapon Systems, utilizing a data-driven approach with Failure/Fault Tree and closure planning. Efforts will consist of: Manned and unmanned pressure testing, redesign of the F-18 life support system as directed by Congress in NDAA 2019 through development of the Life Support System Integration (LSSI) effort, and required logistics and engineering support. ***FY 2021 Base Plans:*** N/A ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:***					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204136N / *F/A-18 Squadrons*	**Project (Number/Name)** 1662 / *F/A-18 Improvement*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Decrease from FY20 to FY21 in the amount of $26.672 accounts for realignment of Physiological Episode Mitigation efforts to Project Unit 9099.					
Title: Test Wing Maintenance Conversion ***Articles:*** ***Description:*** Funding supported maintenance of aircraft at NAVAIR Test Wing used to support Program Office objectives. ***FY 2020 Plans:*** N/A ***FY 2021 Base Plans:*** N/A ***FY 2021 OCO Plans:*** N/A	2.413 -	0.000 -	0.000 -	0.000 -	0.000 -
Title: F/A-18 Obsolescence Redesign ***Articles:*** ***Description:*** Develop and test modifications to address obsolescence issues. ***FY 2020 Plans:*** Develop and test design modifications to hardware components and software systems in response to F/A-18 weapon system and ancillary equipment obsolescence issues. ***FY 2021 Base Plans:*** Develop and test design modifications to hardware components and software systems in response to F/A-18 weapon system and ancillary equipment obsolescence issues. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** FY20 to FY21 increase in the amount of $0.002 is due to inflation rate adjustment.	0.100 -	0.104 -	0.106 -	0.000 -	0.106 -
Accomplishments/Planned Programs Subtotals	101.694	97.011	130.407	0.000	130.407

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204136N / *F/A-18 Squadrons*	**Project (Number/Name)** 1662 / *F/A-18 Improvement*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• APN/0525: *F-18 SERIES*	1,086.661	1,129.318	379.351	-	379.351	393.554	593.626	638.606	877.957	4,746.766	20,931.518
• APN/0145: *FA-18E/F*	1,922.275	1,762.775	1,814.300	-	1,814.300	207.831	67.524	44.028	0.000	0.000	52,657.654
• APN/0145C: *FA-18E/F*	53.977	53.154	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	160.102
• APN/0505: *F-18E/F 7 EA-18G Modernization & Sustainment*	0.000	0.000	468.954	-	468.954	558.476	844.065	847.521	826.835	488,591.834	492,137.685

Remarks

D. Acquisition Strategy

The F/A-18 Improvement program consists of extensive spiral development efforts mapped out in the capability-based approach F/A-18 E/F "Flight Plan." These efforts are critical to the baseline of the Super Hornet next generation mission system capability and maintaining tactical relevance in support of the Naval Aviation Plan 2030. The major programs within the F/A-18 Improvement project are based on multiple Weapon System Capabilities including: Net Centric Operations/Battle Space Management, Sensor Integration, Air to Ground and Maritime Attack, and Air to Air Attack. The major efforts included in this project are: Dual Mode Weapons integration; Multi-System Integration; Common Tactical Picture (CTP); continued advanced development and F/A-18E/F Flight Plan engineering and analysis; continued enhanced software capabilities development; and engineering support to perform technical evaluations, modeling and simulations, and investigative flight testing.
- Multi-System Integration and Common Tactical Picture capability is being developed under the NAWCWD System Configuration Set (SCS) Cost Plus Fixed Fee contract.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204136N / *F/A-18 Squadrons*	Project (Number/Name) 1662 / *F/A-18 Improvement*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MSI/CTP Develop Sensor Integration	C/IDIQ	Boeing : St Louis, MO	16.965	2.342	Feb 2019	10.015	Feb 2020	19.010	Feb 2021	-		19.010	131.786	180.118	180.118
MSI/CTP Develop Sensor Integration	WR	NAWCWD : China Lake, CA	23.920	9.368	Nov 2018	5.555	Nov 2019	8.481	Nov 2020	-		8.481	151.356	198.680	-
MSI/CTP Development Support	WR	NSMA : Arlington, VA	0.000	0.000		0.000		2.636	Dec 2020	-		2.636	9.628	12.264	-
MSI/CTP Strike Accelerator ASUW ICP3	WR	NAWCWD : China Lake, CA	0.000	7.607	Dec 2018	20.391	Nov 2019	21.524	Nov 2020	-		21.524	55.207	104.729	-
USMC Upgrades - Electronic Warfare	C/CPIF	Raytheon : El Segundo, CA	0.000	0.000		2.960	Jan 2020	1.956	Jan 2021	-		1.956	0.300	5.216	5.216
USMC Upgrades - Mission Computer	C/CPIF	General Dynamics : Reston, VA	0.000	0.000		1.015	Jan 2020	0.000		-		0.000	0.000	1.015	1.015
USMC Upgrades - Software development & Integration	C/CPIF	Boeing : St Louis, MO	0.000	0.000		1.485	Jan 2020	13.585	Jan 2021	-		13.585	9.733	24.803	24.803
USMC Upgrades - AUTOGCAS - Software development & Risk Reduction	WR	NAWCWD : China Lake, CA	3.004	0.000		2.889	Nov 2019	4.410	Nov 2020	-		4.410	10.596	20.899	-
USMC Upgrades - AUTOGCAS	C/CPIF	Boeing : St Louis, MO	0.000	0.000		0.000		3.101	Jan 2021	-		3.101	19.858	22.959	22.959
USMC Upgrades - AUTOGCAS - ATAWS software development	Various	PMA 209 Various : Various	1.600	0.000		0.000		1.230	Nov 2020	-		1.230	0.000	2.830	-
USMC Data/Software engineering support	WR	DMEA : McClellan, CA	0.000	13.482	Dec 2018	0.000		0.000		-		0.000	0.000	13.482	-
ACDC (ACS) Improved Tactical Displays Development	C/CPIF	Boeing : St. Louis, MO	0.000	0.000		0.000		14.920	Feb 2021	-		14.920	196.632	211.552	211.552
ACDC Advance Capability Mission Computer (ACMC)	WR	NSMA : Arlington, VA	0.000	0.000		0.000		1.100	Dec 2020	-		1.100	1.000	2.100	-
ACDC Software Development	WR	NAWCWD : China Lake, CA	0.000	0.000		0.000		4.730	Nov 2020	-		4.730	56.020	60.750	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204136N / *F/A-18 Squadrons*	**Project (Number/Name)** 1662 / *F/A-18 Improvement*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Flight Plan/SCS - PALC & Magic Carpet	C/CPIF	Boeing : St. Louis, MO	34.247	6.737	Dec 2018	4.857	Dec 2019	0.000		-		0.000	0.000	45.841	45.841
Flight Plan/SCS Development	WR	NAWCAD : Pax River, MD	16.336	1.020	Dec 2018	1.790	Nov 2019	0.000		-		0.000	0.000	19.146	-
Flight Plan/SCS Development	Various	DMEA : McClellan, CA	4.600	2.193	Dec 2018	1.002	Dec 2019	0.000		-		0.000	0.000	7.795	-
Flight Plan/SCS WAAS/ PALC H16 Software Development	WR	NAWCWD : China Lake, CA	0.224	0.204	Nov 2018	0.000		0.000		-		0.000	0.000	0.428	-
Flight Plan/SCS ATFLIR Modernization	Various	Various : Various	0.740	0.100	Dec 2018	0.100	Dec 2019	0.000		-		0.000	0.000	0.940	-
PE Design & Development	C/CPIF	Boeing : St Louis, MO	16.330	0.000		19.065	Mar 2020	0.000		-		0.000	0.000	35.395	35.395
PE Data Software Study	WR	NAWCTSD ORLANDO : ORLANDO, FL	0.543	3.201	Nov 2018	2.671	Nov 2019	0.000		-		0.000	0.000	6.415	-
PE DIUX	WR	DIUX : Silicon Valley, CA	0.000	2.830	Dec 2018	0.000		0.000		-		0.000	0.000	2.830	-
Prior Year Prod Dev cost no longer funded in FYDP	Various	Various : Various	783.476	0.000		0.000		0.000		-		0.000	0.000	783.476	-
		Subtotal	901.985	49.084		73.795		96.683		-		96.683	642.116	1,763.663	N/A

Remarks

FY21 increases to MSI/CTP are due to the increased software development of Common Tactical Picture (CTP Increment 1) capability that introduces Air to Air and Air to Surface Track fusion between multiple aircraft within a division (4 F/A-18).
FY21 increase to Boeing USMC Upgrades - Software Development & Integration is in support of the start of AUTOGCAS-Flight Control Computer Software Development.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MSI/CTP Development Support - 31C SCS	WR	NSMA : Arlington, VA	7.250	5.649	Mar 2019	1.082	Mar 2020	1.737	Mar 2021	-		1.737	5.200	20.918	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204136N / *F/A-18 Squadrons*	**Project (Number/Name)** 1662 / *F/A-18 Improvement*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MSI/CTP Government Developmental Engineering Support	WR	Pt. Mugu : Pt. Mugu, CA	0.426	0.426	Nov 2018	0.432	Nov 2019	0.435	Nov 2020	-		0.435	4.853	6.572	-
MSI/CTP Gov't Engineering Support	WR	NAWCAD : Pax River, MD	0.155	3.517	Nov 2018	0.189	Nov 2019	3.731	Nov 2020	-		3.731	53.469	61.061	-
MSI/CTP Gov't Engineering Support	WR	NAWCWD : China Lake	0.662	0.702	Nov 2018	0.716	Nov 2019	2.479	Nov 2020	-		2.479	27.579	32.138	-
USMC Capability Upgrades /AUTOGCAS Gov't Engineering Support	C/BA	NAWCWD : China Lake	0.401	0.409	Nov 2018	1.142	Nov 2019	1.530	Nov 2020	-		1.530	3.036	6.518	-
USMC Data/Software Engineering Support	WR	DMEA : McClellan, CA	0.000	0.188	Dec 2018	0.000		0.000		-		0.000	0.000	0.188	-
ACDC Gov't Engineering Support	WR	NAWCAD : Pax River, MD	0.000	0.000		0.000		0.524	Nov 2020	-		0.524	3.372	3.896	-
Flight Plan/SCS Gov't Engineering Support	WR	NAWCAD : Pax River, MD	9.402	3.926	Nov 2018	0.000		0.000		-		0.000	0.000	13.328	-
Flight Plan/SCS Gov't Engineering Support	WR	NAWCWD : China Lake	0.000	2.450	Nov 2018	4.646	Nov 2019	7.511	Nov 2020	-		7.511	11.463	26.070	-
PE Developmental Engineering Support	Various	Various : Various	1.304	0.820	Nov 2018	0.620	Nov 2019	0.000		-		0.000	0.000	2.744	-
PE Gov't Engineering Support	WR	NAWCAD : Pax River, MD	0.783	2.288	Nov 2018	1.512	Nov 2019	0.000		-		0.000	0.000	4.583	-
Obsolescence Redesign	Various	Various : Various	2.000	0.100	Nov 2018	0.104	Nov 2019	0.106	Nov 2020	-		0.106	0.000	2.310	-
Prior Year Support costs no longer funded in FYDP	Various	Various : Various	3,106.545	0.000		0.000		0.000		-		0.000	0.000	3,106.545	-
		Subtotal	3,128.928	20.475		10.443		18.053		-		18.053	108.972	3,286.871	N/A

Remarks

FY21 increase for MSI/CTP is due to the realignment of requirements to Support, which were previously funded under Product Development. This update was made to reflect actual execution plan.
FY21 increase for Flight Plan/SCS Gov't Engineering Support is due to the Strike Accelerator ICP3 efforts.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy			Date: February 2020
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Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MSI/CTP - T&E	WR	OPTEVFOR : Norfolk, VA	4.122	9.539	Dec 2018	4.354	Dec 2019	6.081	Dec 2020	-		6.081	82.292	106.388	-
*MSI/CTP Multi-System Integration T&E	WR	NAWCAD : Pax River, MD	0.682	1.360	Nov 2018	0.000		1.387	Nov 2020	-		1.387	7.363	10.792	-
MSI/CTP Developmental T&E	WR	NAWCAD : Pax River, MD	0.440	0.901	Nov 2018	0.000		0.919	Nov 2020	-		0.919	4.878	7.138	-
USMC Capability Upgrades Developmental T&E	WR	NAWCAD : Pax River, MD	0.000	1.900	Nov 2018	0.000		0.000		-		0.000	0.000	1.900	-
USMC Developmental T&E	WR	NAWCWD : China Lake, CA	0.000	0.100	Nov 2018	0.759	Nov 2019	2.300	Nov 2020	-		2.300	25.404	28.563	-
ACDC - Developmental T&E	WR	NAWCWD : China Lake, CA	0.000	0.000		0.000		0.000		-		0.000	18.346	18.346	-
Flight Plan Engineering/ System Configuration Set Development & Integration	WR	NAWCAD : Pax River, MD	2.365	0.361	Nov 2018	0.368	Nov 2019	0.376	Nov 2020	-		0.376	4.195	7.665	-
Flight Plan /SCS ATFLIR Modernization Developmental T&E	WR	NAWCWD : China Lake, CA	0.000	0.100	Nov 2018	0.200	Nov 2019	0.000		-		0.000	0.000	0.300	-
PE Capsule Manned Studies- NEDU	WR	NEDU : NEDU	0.450	1.160	Dec 2018	0.000		0.000		-		0.000	0.000	1.610	-
PE Developmental Test & Eval	WR	NSWC : Panama City, FL	1.070	0.670	Nov 2018	0.000		0.000		-		0.000	0.000	1.740	-
PE NAMRU-D Pressure Studies	WR	NMRC : Silver Spring, MD	1.300	1.000	Dec 2018	0.000		0.000		-		0.000	0.000	2.300	-
PE Developmental Test & Eval	WR	NAWCAD : Pax River, MD	0.000	3.433	Nov 2018	2.268	Nov 2019	0.000		-		0.000	0.000	5.701	-
Test Wing Maintenance Conversion	WR	NAWCAD : Pax River, MD	0.000	1.361	Nov 2018	0.000		0.000		-		0.000	0.000	1.361	-
Prior Year T&E costs no longer funded in FYDP	Various	Various : Various	196.223	0.000		0.000		0.000		-		0.000	0.000	196.223	-
		Subtotal	206.652	21.885		7.949		11.063		-		11.063	142.478	390.027	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204136N / *F/A-18 Squadrons*	Project (Number/Name) 1662 / *F/A-18 Improvement*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract

Remarks

*Biennial increases in funding aligns with planned SCS fleet releases.
FY21 increase to MSI/CTP addresses Operational Test and interoperability of H16 SCS.
FY21 increase to USMC Development T&E supports the 29C+ delivery.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MSI/CTP- Program Management Support	WR	NAWCAD : Pax River, MD	8.882	0.748	Nov 2018	0.753	Nov 2019	0.795	Nov 2020	-		0.795	8.749	19.927	-
MSI/CTP- CSS Program Management Support	C/CPFF	Wyle Lab : Pax River, MD	28.240	1.225	Dec 2018	1.107	Dec 2019	0.981	Dec 2020	-		0.981	10.829	42.382	42.382
MSI/CTP Travel	Various	NAVAIR : Pax River, MD	5.837	0.177	Oct 2018	0.173	Oct 2019	0.177	Oct 2020	-		0.177	1.975	8.339	-
USMC Capability Upgrades Program Management Support	WR	NAWCAD : Pax River, MD	0.252	0.693	Nov 2018	0.696	Nov 2019	0.701	Nov 2020	-		0.701	7.709	10.051	-
USMC Capability Upgrades Seaport CSS	C/CPFF	Wyle Lab : Pax River, MD	0.000	0.829	Dec 2018	0.741	Dec 2019	0.692	Dec 2020	-		0.692	7.729	9.991	9.991
USMC Capability Upgrades Travel	Various	NAVAIR : Pax River, MD	0.007	0.015	Oct 2018	0.000		0.000		-		0.000	0.000	0.022	-
ACDC Program Management Support	WR	NAWCAD : Pax River, MD	0.000	0.000		0.000		0.191	Nov 2020	-		0.191	2.124	2.315	-
ACDC Seaport CSS	C/CPFF	Wyle Lab : Pax River, MD	0.000	0.000		0.000		0.225	Nov 2020	-		0.225	2.513	2.738	2.738
Flight Plan Engineering/ SCS Program Mgmt Support	WR	NAWCAD : Pax River, MD	15.299	2.507	Nov 2018	0.401	Nov 2019	0.425	Nov 2020	-		0.425	4.665	23.297	-
Flight Plan Engineering/ SCS Seaport CSS	C/CPFF	Wyle Lab : Pax River, MD	0.000	1.175	Dec 2018	0.417	Dec 2019	0.421	Dec 2020	-		0.421	4.701	6.714	6.714
PE Program Management Support	WR	NAWCAD : Pax River, MD	0.063	0.557	Nov 2018	0.107	Nov 2019	0.000		-		0.000	0.000	0.727	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204136N / *F/A-18 Squadrons*	Project (Number/Name) 1662 / *F/A-18 Improvement*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PE Seaport CSS	C/CPFF	Wyle Lab : Pax River, MD	0.000	1.172	Dec 2018	0.329	Dec 2019	0.000		-		0.000	0.000	1.501	1.501
PE Travel	Various	NAVAIR : Pax River, MD	0.046	0.100	Oct 2018	0.100	Oct 2019	0.000		-		0.000	0.000	0.246	-
Test Wing Maintenance Conversion Program Mgmt Support	WR	NAWCWD : China Lake, CA	36.877	1.052	Nov 2018	0.000		0.000		-		0.000	0.000	37.929	-
Prior Year Mgmt costs no longer funded in FYDP	Various	Various : Various	106.777	0.000		0.000		0.000		-		0.000	0.000	106.777	-
		Subtotal	202.280	10.250		4.824		4.608		-		4.608	50.994	272.956	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	4,439.845	101.694		97.011		130.407		-		130.407	944.560	5,713.517	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204136N / *F/A-18 Squadrons*	**Project (Number/Name)** 1662 / *F/A-18 Improvement*

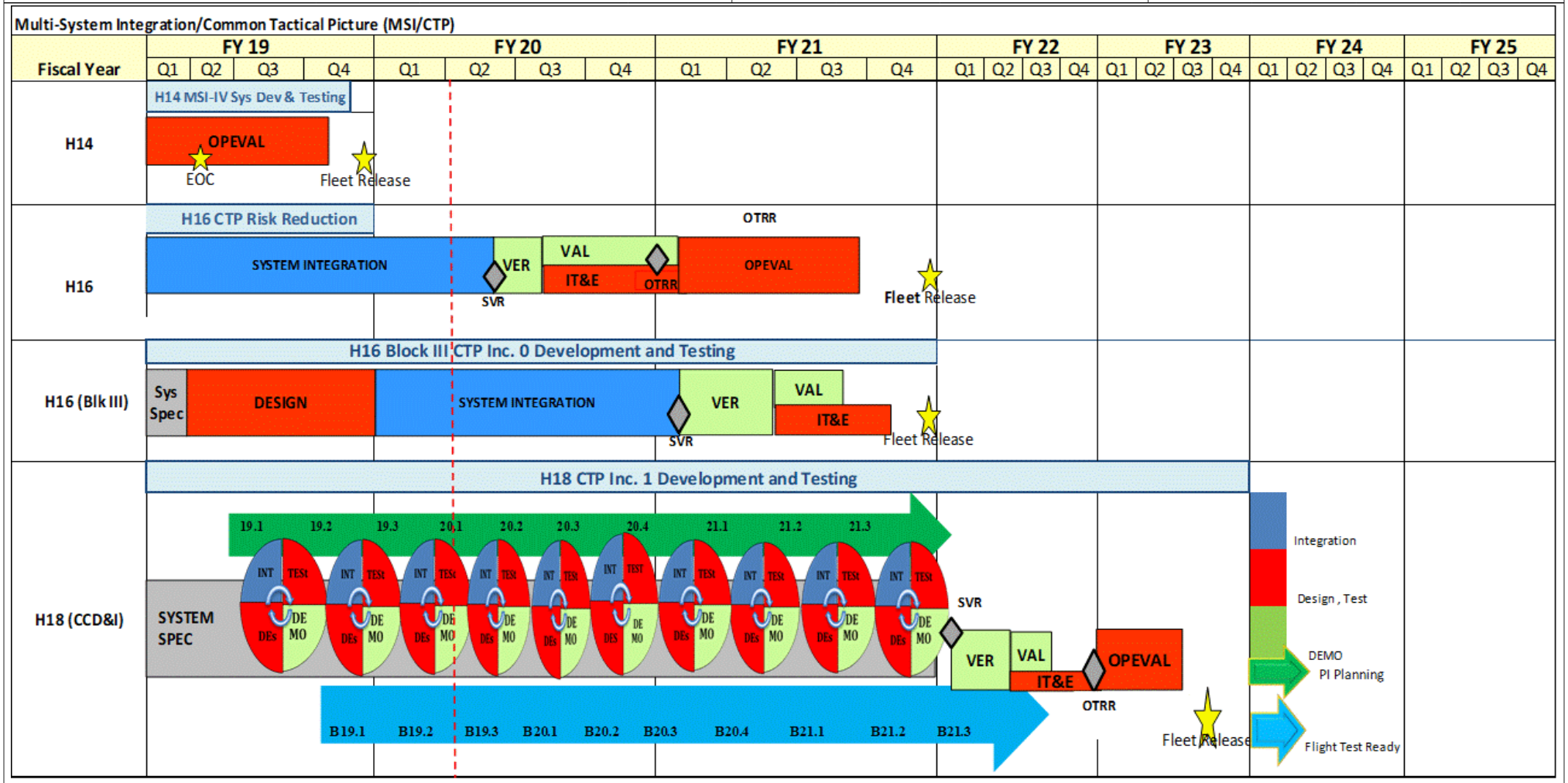

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204136N / *F/A-18 Squadrons*	**Project (Number/Name)** 1662 / *F/A-18 Improvement*

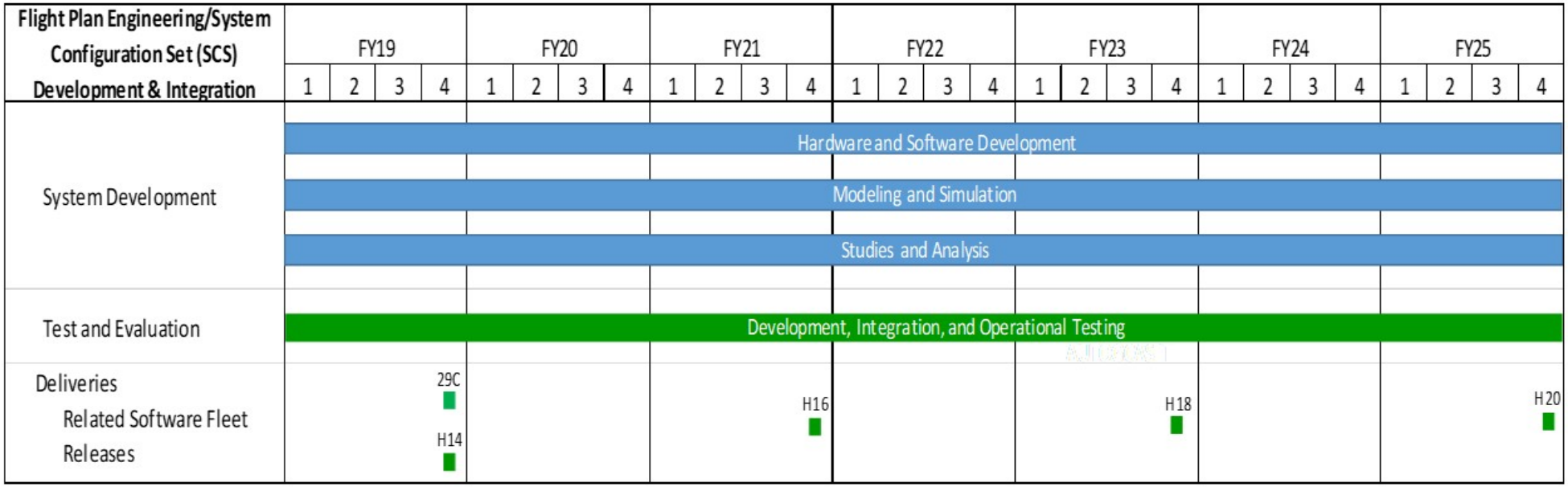

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204136N / *F/A-18 Squadrons*	**Project (Number/Name)** 1662 / *F/A-18 Improvement*

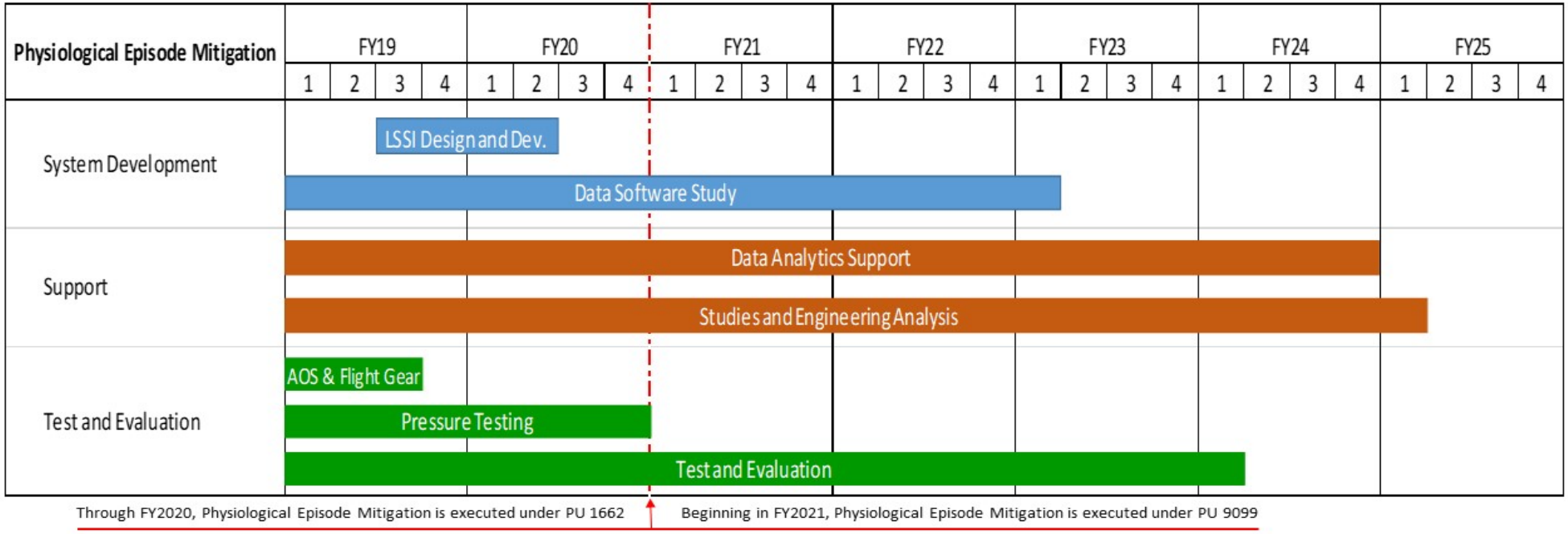

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204136N / *F/A-18 Squadrons*	**Project (Number/Name)** 1662 / *F/A-18 Improvement*

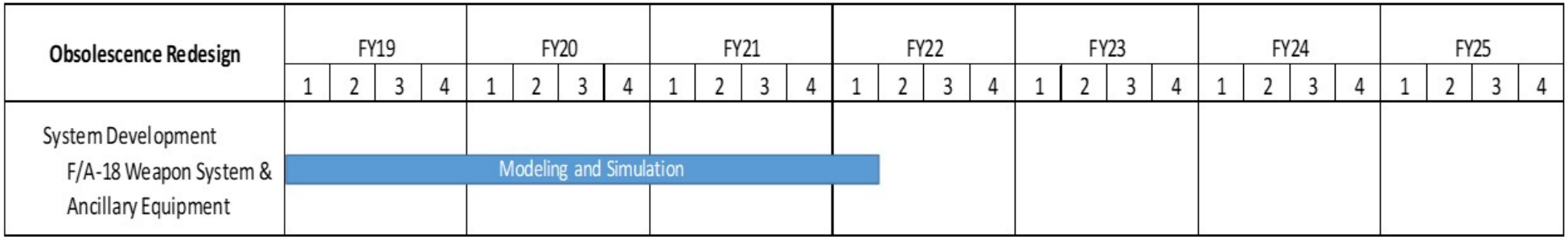

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204136N / *F/A-18 Squadrons*	**Project (Number/Name)** 1662 / *F/A-18 Improvement*

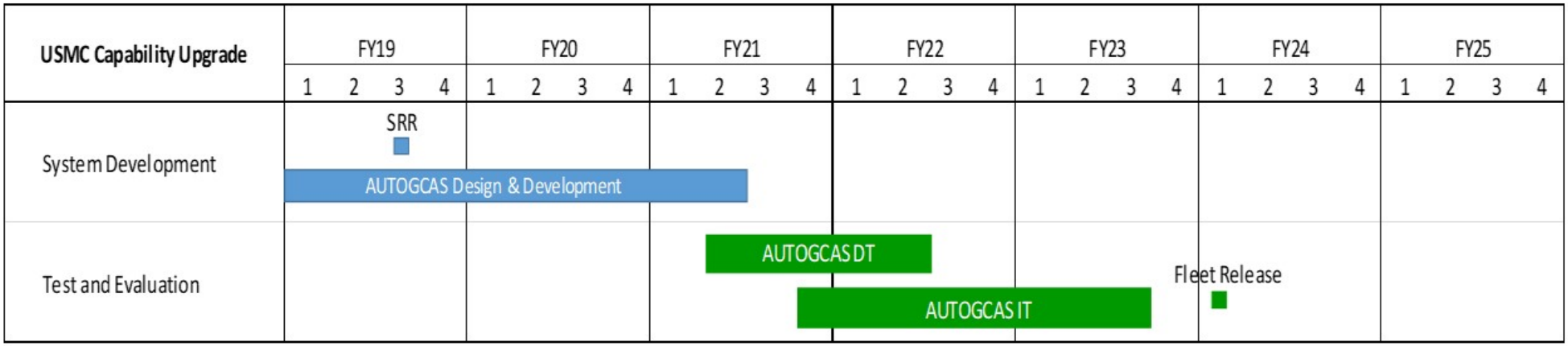

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204136N / *F/A-18 Squadrons*	**Project (Number/Name)** 1662 / *F/A-18 Improvement*

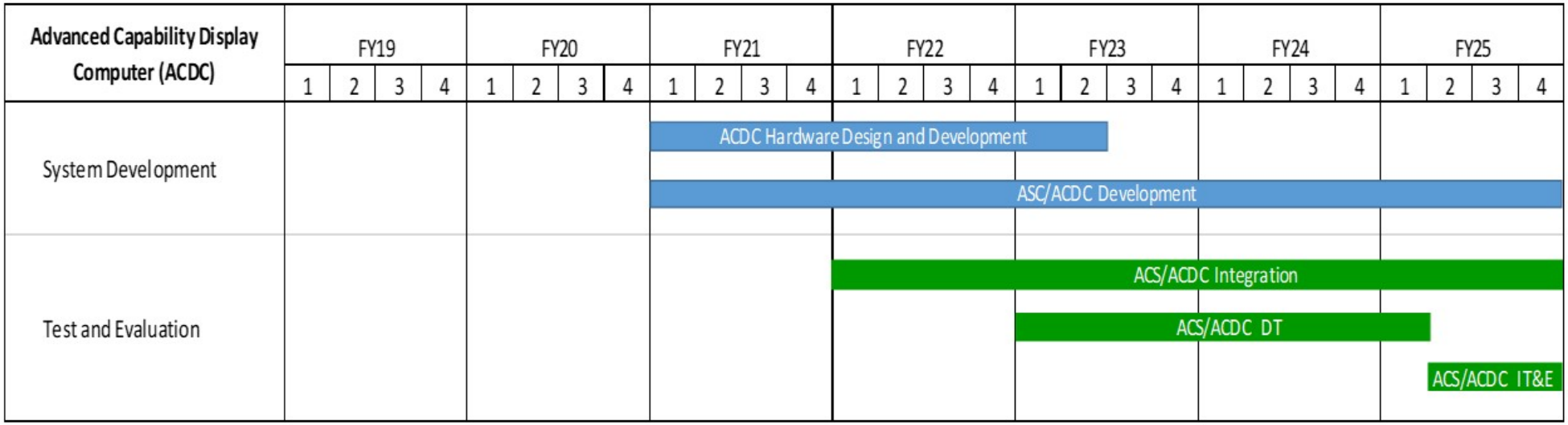

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204136N / *F/A-18 Squadrons*	**Project (Number/Name)** 1662 / *F/A-18 Improvement*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Multi-System Integration / Common Tactical Picture				
Systems Development & Testing: H14 MSI-IV Development & Testing	1	2019	4	2019
Systems Development & Testing: H16 Blk III CTP Inc 0 Development & Testing	1	2019	4	2021
Systems Development & Testing: H18 CTP Inc 1 Development & Testing	1	2019	4	2023
Risk Reduction: H16 CTP Risk Reduction	1	2019	4	2019
Flight Plan Engineering				
System Development: Hardware and Software Development	1	2019	4	2025
System Development: Modeling and Simulation	1	2019	4	2025
System Development: Studies and Analysis	1	2019	4	2025
Test and Evaluation: Developmental, Integration and Operational Testing	1	2019	4	2025
Deliveries: Software Fleet Release: 29C Fleet Release	4	2019	4	2019
Deliveries: Software Fleet Release: H14 Fleet Release	4	2019	4	2019
Deliveries: Software Fleet Release: H16 Fleet Release	4	2021	4	2021
Deliveries: Software Fleet Release: H18 Fleet Release	4	2023	4	2023
Deliveries: Software Fleet Release: H20 Fleet Release	4	2025	4	2025
Physiological Episode Mitigation				
System Development: LSSI Design & Development	3	2019	2	2020
System Development: Support: Data Software Study	1	2019	1	2023
Support: Office of Naval Research Data Analytics Support Studies & Eng Analysis	1	2019	1	2025
Test and Evaluation: AOS & Flight Gear Testing	1	2019	3	2019
Test and Evaluation: Capsule Manned Studies - Pressure Testing	1	2019	4	2020
Test and Evaluation: Physiological Episdoe Test and Evaluation	1	2019	1	2024
Obsolescence Redesign				

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
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	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
System Development: F/A-18 Weapon System & Ancillary Equipment: Obsolescence Redesign Development & Testing	1	2019	1	2022
USMC Capability Upgrade				
System Requirement Review	3	2019	3	2019
AUTOGCAS Design and Development	1	2019	2	2021
AUTOGCAS DT	2	2021	2	2022
AUTOGCAS IT	4	2021	3	2023
Fleet Release	1	2024	1	2024
Advanced Capability Display Computer (ACDC)				
System Development: ACDC Hardware Design and Development	1	2021	2	2023
System Development: ACS Situational Awareness w/ACDC Development	1	2021	4	2025
Test and Evaluation: ACS Situational Awareness w/ACDC SCS Integration	1	2022	4	2025
Test and Evaluation: ACS Situational Awareness w/ACDC DT	1	2023	1	2025
Test and Evaluation: ACS Situational Awareness w/ACDC IT&E	2	2025	4	2025

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204136N / *F/A-18 Squadrons*	Project (Number/Name) 2065 / *F/A-18 Radar Upgrade*	

COST ($ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
2065: *F/A-18 Radar Upgrade*	745.271	6.812	8.706	8.113	-	8.113	8.996	9.558	9.176	9.347	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

F/A-18 Radio Detection and Ranging (RADAR) Upgrade: The F/A-18 RADAR Upgrade, Active Electronically Scanned Array (AESA) development program, which began in FY 1999, is the last of three pre-planned upgrades to the F/A-18 EF/EA-18G RADAR. The AESA system corrects operational test deficiencies noted in the AN/APG-73. It provides multi-target tracking, Synthetic Aperture RADAR (SAR) imagery, SAR Target Location Error (TLE), and improved spotlight map resolution. In addition, it provides greater lethality than previous F/A-18 RADARs by allowing full tactical support of existing and planned air-to-air (A/A) and air-to-ground (A/G) weapons and it significantly increases A/A and A/G detection and tracking ranges. The AESA system provides greater survivability through self-protection and standoff jamming capabilities, while its greater range allows for reduced detection by enemy RADAR. AN/APG-73 will be upgrade to AN/APG-79. The APG-79 AESA Radar system improvement will significantly advance the radar technology - from the front-end array to the back-end processor and operational software. This combat-proven AESA radar system substantially increases the power of the F/A-18E/F EA-18G. This budget continues spiral capability development of AESA with increased efforts to address Phase II Operational Requirements Document requirements such as Counter-Electronic Attack(CEA) against multiple Radio Frequency Emitters, AESA Multi-Jammer Electronic Protection, Precision TLE Improvement, Monopulse and 5th/6th Channel development and Air Combat Maneuvering/Short Range Search and Track development and includes upgrades to RADAR Instrumentation, test and evaluation assets, threat assets, and upgraded modeling and simulation of both clean and Electronic Attack threat environments. This budget includes the overarching Anti-Surface Warfare (ASuW) software improvements, which includes Aided Target Recognition (AiTR), and Strike Accelerator/Kill Chain capabilities. This budget request supports development and testing of design modifications to address obsolescence issues with APG-65, APG-73 and APG-79 RADAR systems. USMC upgrades to the platform are being developed to include capability expansion of AESA Radar for F/A-18 A-D.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Distributed Targeting - Counter-Electronic Attack (CEA) Software Development, Developmental Testing, Operational Testing, & Integration	6.522	8.302	7.629	0.000	7.629
Articles:	-	-	-	-	-
Description: Funding being utilized to support hardware (HW) and software (SW) capabilities development, integration and associated testing for AESA, ASuW and Strike Accelerator.					
FY 2020 Plans: Continue HW/SW development for Target Location Error (TLE), ACM Mode , integration and testing of instrumentation required to support AESA RADAR spiral capability upgrades. Funds engineering efforts for software development and integration of active and passive kill chain capabilities and sensors into the AESA					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Radar in support of CEA. Funding supports USMC capability upgrades for integration and capability expansion of AESA Radar for F/A-18 A-D. ***FY 2021 Base Plans:*** Continue Counter-Electronic Attack II(CEA) HW/SW development in support of AESA radar capability upgrades. Funds engineering efforts for software development and integration of active and passive kill chain capabilities and sensors into the AESA Radar in support of CEA. Funding supports USMC capability upgrades for integration and capability expansion of AESA Radar for F/A-18 A-D. Begin the development of Aided Target Recognition software and hardware. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Decrease of $.673 from FY20 to FY21 is due to the reduction in the CEA engineering support.					
Title: F/A-18 RADAR Obsolescence Redesign	0.290	0.404	0.484	0.000	0.484
Articles:	-	-	-	-	-
Description: Funding provided for development and design modifications to address obsolescence issues in the RADAR. ***FY 2020 Plans:*** Continue development and test design modifications to hardware components and software systems in response to F/A-18 RADAR system redesign of the Anti-Surface Warfare (ASuW) and Strike Accelerator. ***FY 2021 Base Plans:*** Funding provided for the continued development and redesign of the Anti-Surface Warfare (ASuW) Radar and Strike Accelerator . ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Increase of $.080 from FY20 to FY21 is due to an anticipated increase in redesign requirements for projected obsolescence issues.					
Accomplishments/Planned Programs Subtotals	6.812	8.706	8.113	0.000	8.113

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204136N / *F/A-18 Squadrons*	**Project (Number/Name)** 2065 / *F/A-18 Radar Upgrade*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• APN/0525: *F-18 Series Mod (OSIP 002-07)*	1,086.661	1,129.318	379.351	-	379.351	393.554	593.626	638.606	877.957	4,746.766	20,931.518
• APN/0145: *FA-18E/F*	1,922.275	1,762.775	1,814.300	-	1,814.300	207.831	67.524	44.028	0.000	0.000	52,657.654
• APN/0145C: *FA-18E/F*	53.977	53.154	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	160.102

Remarks

D. Acquisition Strategy

The Active Electronically Scanned Array program continues developmental efforts following a successful Full Rate Production milestone decision, after completing a two-phase Acquisition approach during the FY 1999 through FY 2007 timeframe. This strategy continues utilization of reform initiatives such as: early partnering with industry; leveraging industry investment; optimizing use of Commercial Off-The Shelf software and Non-Developmental Item; using Cost as an Independent Variable; and Electronic Data Deliverables. Basic Ordering Agreement orders for Request for Proposal developments are in place for Boeing, the airframe prime manufacturer/ integrator, and Raytheon, the Radio Detection and Ranging RADAR manufacturer, for focused risk reduction and sustainment of prior developmental activities.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204136N / *F/A-18 Squadrons*	Project (Number/Name) 2065 / *F/A-18 Radar Upgrade*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Distributed Targeting Systems Engineering - Capabilities	WR	NAWCWD : China lake, CA	0.000	1.877	Nov 2018	1.439	Nov 2019	1.077	Nov 2020	-		1.077	Continuing	Continuing	Continuing
Distributed Targeting Systems Engineering	WR	NAWCAD : Pax River, MD	8.264	1.758	Nov 2018	2.493	Nov 2019	2.133	Nov 2020	-		2.133	8.488	23.136	-
Distributed Targeting Product Development Aided Target Recongnition	WR	NAWCWD CL : China lake, CA	0.000	0.000		0.000		0.372	Nov 2020	-		0.372	5.858	6.230	-
Prior Year Prod Dev Cost no longer funded in FYDP	Various	Various : Various	556.992	0.000		0.000		0.000		-		0.000	0.000	556.992	-
		Subtotal	565.256	3.635		3.932		3.582		-		3.582	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Distributed Targeting Software Development (Instrumentation)	WR	NAWCWD : China Lake, CA	44.636	0.757	Nov 2018	0.156	Nov 2019	0.161	Nov 2020	-		0.161	0.667	46.377	-
Distributed Targeting Chamber Support	WR	NSMA : Arlington, VA	0.000	0.000		0.520	Dec 2019	0.536	Dec 2020	-		0.536	2.221	3.277	-
Distributed Targeting Gov't Engineering Support	WR	NAWCAD : PAX River, MD	1.217	0.000		1.687	Nov 2019	1.689	Nov 2020	-		1.689	6.995	11.588	-
Prior Year Support cost no longer funded in the FYDP	Various	Various : Various	4.684	0.000		0.000		0.000		-		0.000	0.000	4.684	-
		Subtotal	50.537	0.757		2.363		2.386		-		2.386	9.883	65.926	N/A

Remarks

Chamber Support: Funding is for (test) chamber support; supports testing of CEA and software capabilities on the RADAR.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204136N / *F/A-18 Squadrons*	Project (Number/Name) 2065 / *F/A-18 Radar Upgrade*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Distributed Targeting Operational Test	WR	NAWCWD : China Lake, CA	0.300	1.770	Nov 2018	1.411	Nov 2019	1.052	Nov 2020	-		1.052	3.037	7.570	-
Radar Obsol Redesign Operational Test	WR	NAWCAD : PAX River, MD	0.000	0.000		0.211	Nov 2019	0.288	Nov 2020	-		0.288	0.760	1.259	-
Radar Obsol Redesign Operational Test	WR	NSWC : Crane, IN	0.000	0.175	Dec 2018	0.000		0.000		-		0.000	0.000	0.175	-
Prior Year T&E cost no longer funded in FYDP	Various	Various : Various	111.911	0.000	Dec 2018	0.000		0.000		-		0.000	0.000	111.911	-
		Subtotal	112.211	1.945		1.622		1.340		-		1.340	3.797	120.915	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Distributed Targeting CSS Program Management Support (Seaport CSS)	C/CPFF	Various : Various	8.708	0.261	Dec 2018	0.495	Dec 2019	0.505	Dec 2020	-		0.505	2.123	12.092	12.092
Distributed Targeting Gov't Program Management Support	WR	NAWCAD : Pax River, MD	2.240	0.064	Nov 2018	0.066	Nov 2019	0.068	Nov 2020	-		0.068	0.278	2.716	-
Distributed Targeting Travel	Various	NAVAIR : Pax River, MD	1.762	0.035	Oct 2018	0.035	Oct 2019	0.036	Oct 2020	-		0.036	0.151	2.019	-
Radar Obsol Redesign CSS Support	C/CPFF	Various : Various	3.272	0.082	Dec 2018	0.159	Dec 2019	0.162	Dec 2020	-		0.162	0.682	4.357	4.357
Radar Obsol Redesign Gov't Program Management	WR	NAWCAD : Pax River, MD	1.159	0.022	Nov 2018	0.022	Nov 2019	0.022	Nov 2020	-		0.022	0.093	1.318	-
Radar Obsol Redesign Travel	Various	NAVAIR : Pax River, MD	0.126	0.011	Oct 2018	0.012	Oct 2019	0.012	Oct 2020	-		0.012	0.050	0.211	-
		Subtotal	17.267	0.475		0.789		0.805		-		0.805	3.377	22.713	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204136N / *F/A-18 Squadrons*	Project (Number/Name) 2065 / *F/A-18 Radar Upgrade*	

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	745.271	6.812		8.706		8.113		-		8.113	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204136N / *F/A-18 Squadrons*	**Project (Number/Name)** 2065 / *F/A-18 Radar Upgrade*

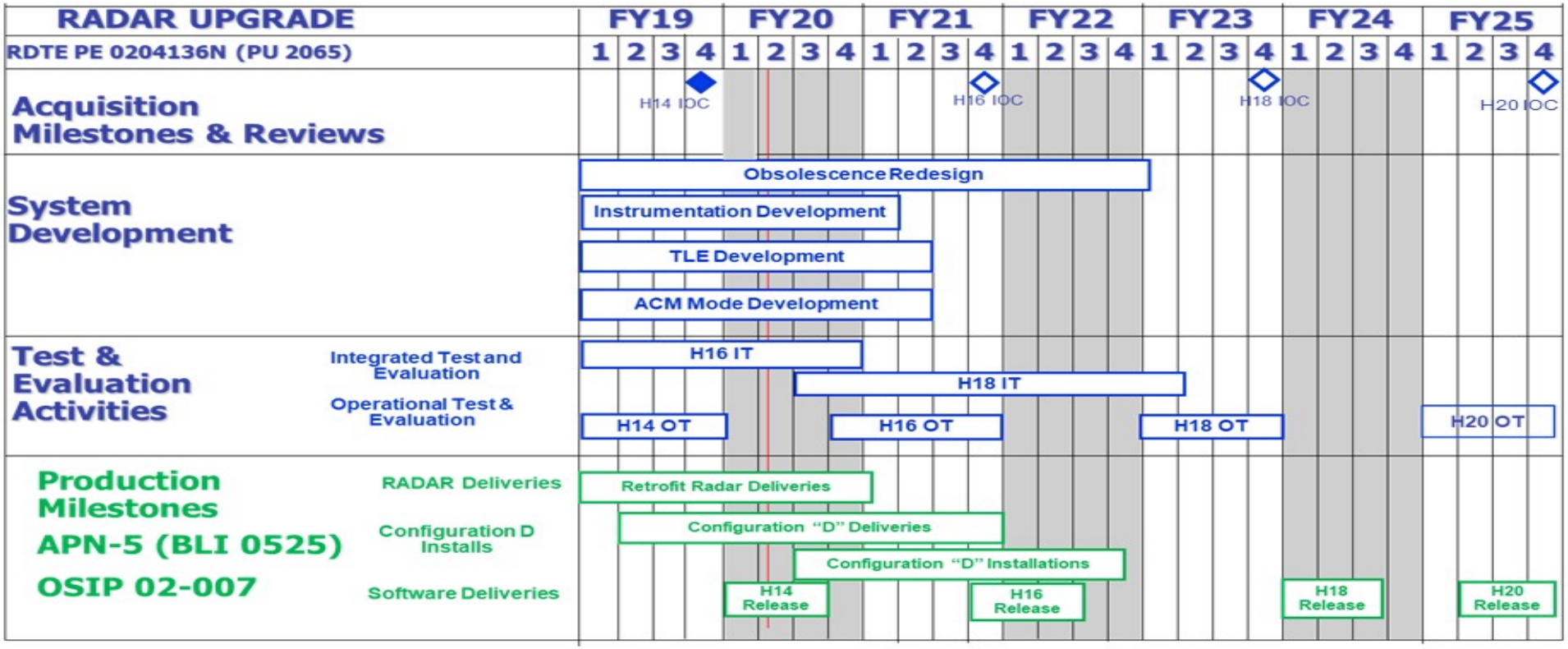

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204136N / *F/A-18 Squadrons*	**Project (Number/Name)** 2065 / *F/A-18 Radar Upgrade*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
F/A-18 Radar Ugrade				
Acquisition Milestones: Milestones: H14 IOC	4	2019	4	2019
Acquisition Milestones: Milestones: H16 IOC	4	2021	4	2021
Acquisition Milestones: Milestones: H18 IOC	4	2023	4	2023
Acquisition Milestones: Milestones: H20 IOC	4	2025	4	2025
Systems Development: Hardware/Software Development: Obsolescence Redesign Development & Testing	1	2019	4	2022
Systems Development: Hardware/Software Development: Instrumentation Development	1	2019	1	2021
Systems Development: Hardware/Software Development: TLE Development	1	2019	2	2021
Systems Development: Hardware/Software Development: ACM Mode Development	1	2019	2	2021
Test & Evaluation: Integrated Test & Evaluation: H16 Integration Testing	1	2019	4	2020
Test & Evaluation: Integrated Test & Evaluation: H18 Integration Testing	3	2020	1	2023
Test & Evaluation: Operational Test & Evaluation: H14 Operational Testing	1	2019	4	2019
Test & Evaluation: Operational Test & Evaluation: H16 Operational Testing	4	2020	4	2021
Test & Evaluation: Operational Test & Evaluation: H18 Operational Testing	1	2023	4	2023
Test & Evaluation: Operational Test & Evaluation: H20 Operational Testing	1	2025	4	2025
Production Milestones: Software Deliveries: H14 FLEET RELEASE	1	2020	3	2020
Production Milestones: Software Deliveries: H16 FLEET RELEASE	4	2021	3	2022
Production Milestones: Software Deliveries: H18 FLEET RELEASE	1	2024	3	2024
Production Milestones: Software Deliveries: H20 FLEET RELEASE	2	2025	4	2025

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204136N / *F/A-18 Squadrons*	Project (Number/Name) 2071 / *F/A-18 Block III*	

COST ($ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
2071: *F/A-18 Block III*	57.962	79.984	80.194	27.072	-	27.072	0.000	0.000	0.000	0.000	0.000	245.212
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

F/A-18 Block III is a series of several Engineering Change Proposals (ECPs), which includes Conformal Fuel Tanks (CFT), that bring planned upgrades to the F/A-18E/F. The combined impact of these upgrades brings increased capabilities to Block III aircraft, such as increased range, lower drag, and improved radar cross section. Block III is a follow-on to Block II upgrades.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: F/A-18 Block III	79.984	80.194	27.072	0.000	27.072
Articles:	-	-	-	-	-
Description: Block III Super Hornet upgrades provide additional capability to the aircraft and its contribution to the Airwing are significant. The capability upgrades consist of several Engineering Change Proposals (ECPs) which will be incorporated in the near term with a combination of forward fit production line incorporation and via retrofit modifications to the aircraft already planned as part of the Service Life Modification (SLM) Plan. The FY2021 budget request funds Non-Recurring Engineering (NRE) for Conformal Fuel Tank.					
FY 2020 Plans: The FY2020 budget request funds the Non-Recurring (NRE) needed for the Conformal Fuel Tank ECP. F/A Block III test asset modification will begin and developmental testing will significantly increase in support of CFT development.					
FY 2021 Base Plans: In FY2021, development testing will continue in addition to a significant increase in flight test efforts. Technical Directive validation installations will begin and supportability development efforts will continue.					
FY 2021 OCO Plans: N/A					
FY 2020 to FY 2021 Increase/Decrease Statement: Funds decrease in the amount of $53.122 from FY20 to FY21 following the completion of the CDR and as design efforts begin to finalize.					
Accomplishments/Planned Programs Subtotals	79.984	80.194	27.072	0.000	27.072

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204136N / *F/A-18 Squadrons*	**Project (Number/Name)** 2071 / *F/A-18 Block III*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• APN/0525: *F-18 Series*	1,086.661	1,129.318	379.351	-	379.351	393.554	593.626	638.606	877.957	4,746.766	20,931.518
• APN/0145: *FA-18E/F*	1,922.275	1,762.775	1,814.300	-	1,814.300	207.831	67.524	44.028	0.000	0.000	52,657.654
• APN/0505: *FA-18E/F & EA-18G Modernization & Sustainment*	0.000	0.000	468.954	-	468.954	558.476	844.065	847.521	826.835	488,591.834	492,137.685

Remarks

D. Acquisition Strategy

A series of Block III Engineering Change Proposals (ECPs) will be incorporated into production aircraft. The ECPs will provide capability upgrades to Block II aircraft to give them Block III capabilities. Block II Fleet aircraft (Lots 26 and up) will receive capability upgrades when inducted for Service Life Modification (SLM) events.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204136N / *F/A-18 Squadrons*	Project (Number/Name) 2071 / *F/A-18 Block III*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Block III Primary Development	Various	Boeing : St Louis, MO	49.577	67.657	Dec 2018	73.846	Dec 2019	23.663	Dec 2020	-		23.663	0.000	214.743	214.743
		Subtotal	49.577	67.657		73.846		23.663		-		23.663	0.000	214.743	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support (AD)	WR	NAWCAD : Pax River, MD	0.979	10.088	Nov 2018	3.101	Nov 2019	1.711	Nov 2020	-		1.711	0.000	15.879	-
Development Support (WD)	WR	NAWCWD : China Lake, CA	2.611	2.096	Nov 2018	2.138	Nov 2019	0.565	Nov 2020	-		0.565	0.000	7.410	-
BLK III Price Fighters	WR	NAVSUP : Philadelphia, PA	0.079	0.000		0.000		0.000		-		0.000	0.000	0.079	-
		Subtotal	3.669	12.184		5.239		2.276		-		2.276	0.000	23.368	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test & Evaluation (NASA)	MIPR	NASA : Moffett Field, CA	4.317	0.000		0.000		0.000		-		0.000	0.000	4.317	-
Test & Evaluation (NASA)	MIPR	NASA : Langley, VA	0.255	0.000		0.000		0.000		-		0.000	0.000	0.255	-
Test & Evaluation (AD)	WR	NAWCAD : Pax River, MD	0.000	0.000		0.964	Dec 2019	0.985	Dec 2020	-		0.985	0.000	1.949	-
		Subtotal	4.572	0.000		0.964		0.985		-		0.985	0.000	6.521	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204136N / *F/A-18 Squadrons*	Project (Number/Name) 2071 / *F/A-18 Block III*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Seaport CSS	C/CPFF	Ausley : Pax River, MD	0.144	0.143	Dec 2018	0.145	Dec 2019	0.148	Dec 2020	-		0.148	0.000	0.580	0.580
		Subtotal	0.144	0.143		0.145		0.148		-		0.148	0.000	0.580	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	57.962	79.984		80.194		27.072		-		27.072	0.000	245.212	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204136N / *F/A-18 Squadrons*	**Project (Number/Name)** 2071 / *F/A-18 Block III*

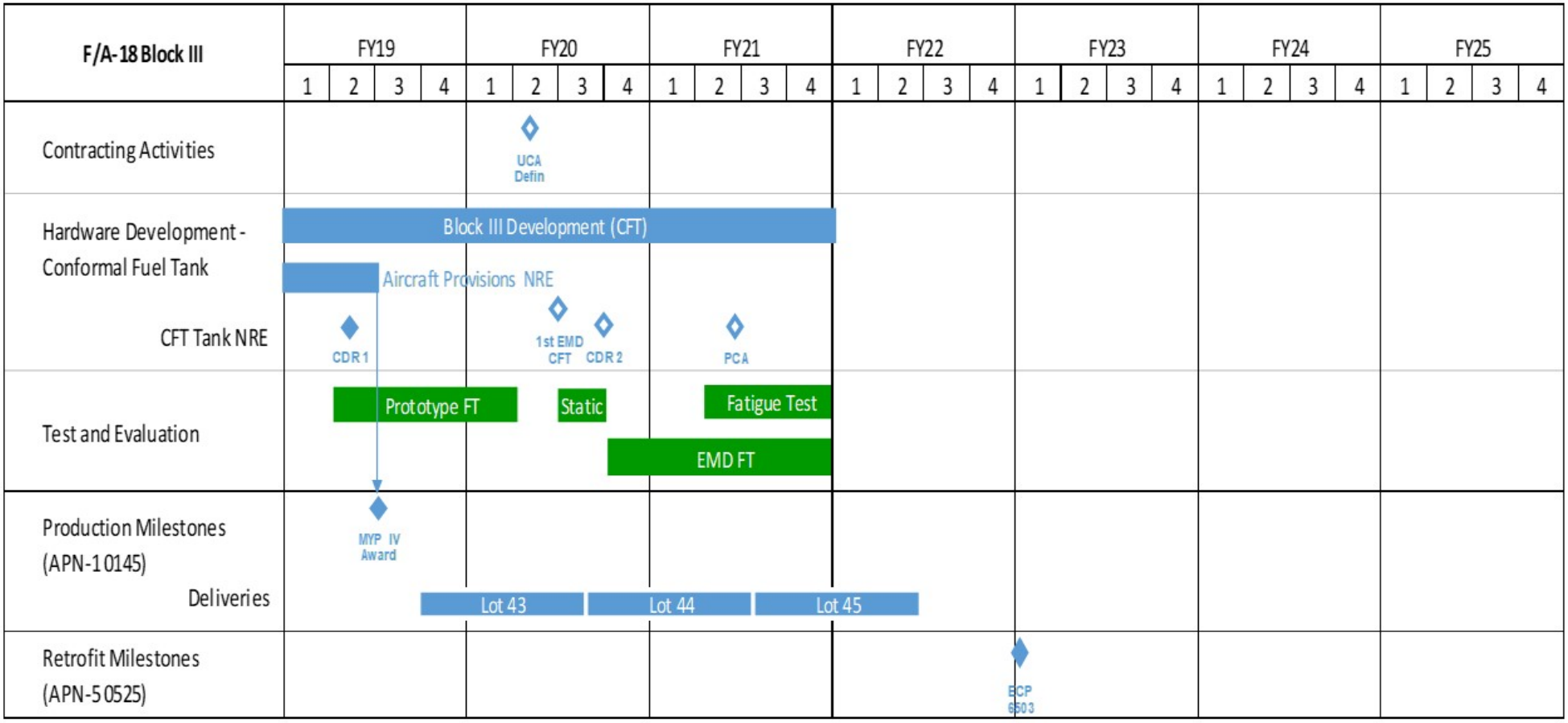

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204136N / *F/A-18 Squadrons*	**Project (Number/Name)** 2071 / *F/A-18 Block III*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
F/A-18 Block III				
Acquisition Milestone: Contract Milestones: DEFIN	2	2020	2	2020
System Development: Block III CFT Development	1	2019	4	2021
System Development: Reviews: Critical Design Review	3	2020	3	2020
Test & Evaluation: Development Testing: Prototype CFT Flight Test	2	2019	2	2020
Test & Evaluation: Development Testing: Static Test	3	2020	3	2020
Test & Evaluation: Development Testing: EMD Flight Test	4	2020	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204136N / *F/A-18 Squadrons*	Project (Number/Name) 9099 / *Physiological Episodes*	

COST ($ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
9099: *Physiological Episodes*	0.000	0.000	0.000	5.438	-	5.438	4.552	3.930	1.074	0.791	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

Efforts funded under Project Unit 9099 were previously funded under Project Unit 1662 in FY2020 and prior.

A. Mission Description and Budget Item Justification

Funding provides for design, development, integration, and test of platform improvements for F/A-18A-F and EA-18G Weapon Systems, as determined through a Root Cause and Corrective Action (RCCA) process, to mitigate and reduce the occurrences of Physiological Episode (PE) in Naval Aviation per NDAA 2019 Congressional direction.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Physiological Episode Mitigation	0.000	0.000	5.438	0.000	5.438
Articles:	-	-	-	-	-
Description: Funding provides for design, development, integration, and test of platform improvements for F/A-18A-F and EA-18G Weapon Systems, as determined through a Root Cause and Corrective Action (RCCA) process, to mitigate and reduce the occurrences of Physiological Episode (PE) in Naval Aviation per NDAA 2019 Congressional direction. ***FY 2020 Plans:*** N/A ***FY 2021 Base Plans:*** Completion of RCCA investigations, directed studies, and development efforts for platform improvements in the F/A-18A-F and EA-18G Weapon Systems, utilizing a data-driven approach with Failure/Fault Tree and closure planning. Continue required logistics and engineering support. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Increase in the amount of $5.438 from FY20 to FY21 accounts for realignment of Physiological Episode Mitigation efforts from Project Unit 1662 to Project Unit 9099.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	5.438	0.000	5.438

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204136N / *F/A-18 Squadrons*	**Project (Number/Name)** 9099 / *Physiological Episodes*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• APN/0525: *F-18 SERIES*	1,086.661	1,129.318	379.351	-	379.351	393.554	593.626	638.606	877.957	4,746.766	20,931.518

Remarks

D. Acquisition Strategy

The F/A-18 Physiological Episode PU consists of efforts in support of finalizing the Root Cause and Corrective Action Investigation process, as well as any additional design, development, integration, and testing that will be required to mitigate and reduce the occurrence of Physiological Episodes (PE).

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204136N / *F/A-18 Squadrons*	Project (Number/Name) 9099 / *Physiological Episodes*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PE Data Software Study	WR	NAWCTSD Orlando : Orlando, FL	0.000	0.000		0.000		1.724	Nov 2020	-		1.724	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		1.724		-		1.724	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PE Developmental Engineering Support	Various	Various : Various	0.000	0.000		0.000		0.501	Nov 2020	-		0.501	1.005	1.506	-
PE Gov't Engineering Support	WR	NAWCAD : Pax River, MD	0.000	0.000		0.000		1.101	Nov 2020	-		1.101	1.731	2.832	-
		Subtotal	0.000	0.000		0.000		1.602		-		1.602	2.736	4.338	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PE Developmental Test & Eval	WR	NAWCAD : Pax River, MD	0.000	0.000		0.000		1.653	Nov 2020	-		1.653	2.403	4.056	-
		Subtotal	0.000	0.000		0.000		1.653		-		1.653	2.403	4.056	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PE Program Management Support	WR	NAWCAD : Pax River, MD	0.000	0.000		0.000		0.068	Nov 2020	-		0.068	0.300	0.368	-
PE Seaport CSS	C/CPFF	Wyle Lab : Pax River, MD	0.000	0.000		0.000		0.341	Dec 2020	-		0.341	1.434	1.775	1.775
PE Travel	Various	NAVAIR : Pax River, MD	0.000	0.000		0.000		0.050	Oct 2020	-		0.050	0.125	0.175	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204136N / *F/A-18 Squadrons*	Project (Number/Name) 9099 / *Physiological Episodes*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Subtotal			0.000	0.000		0.000		0.459		-		0.459	1.859	2.318	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		0.000		5.438		-		5.438	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204136N / *F/A-18 Squadrons*	**Project (Number/Name)** 9099 / *Physiological Episodes*

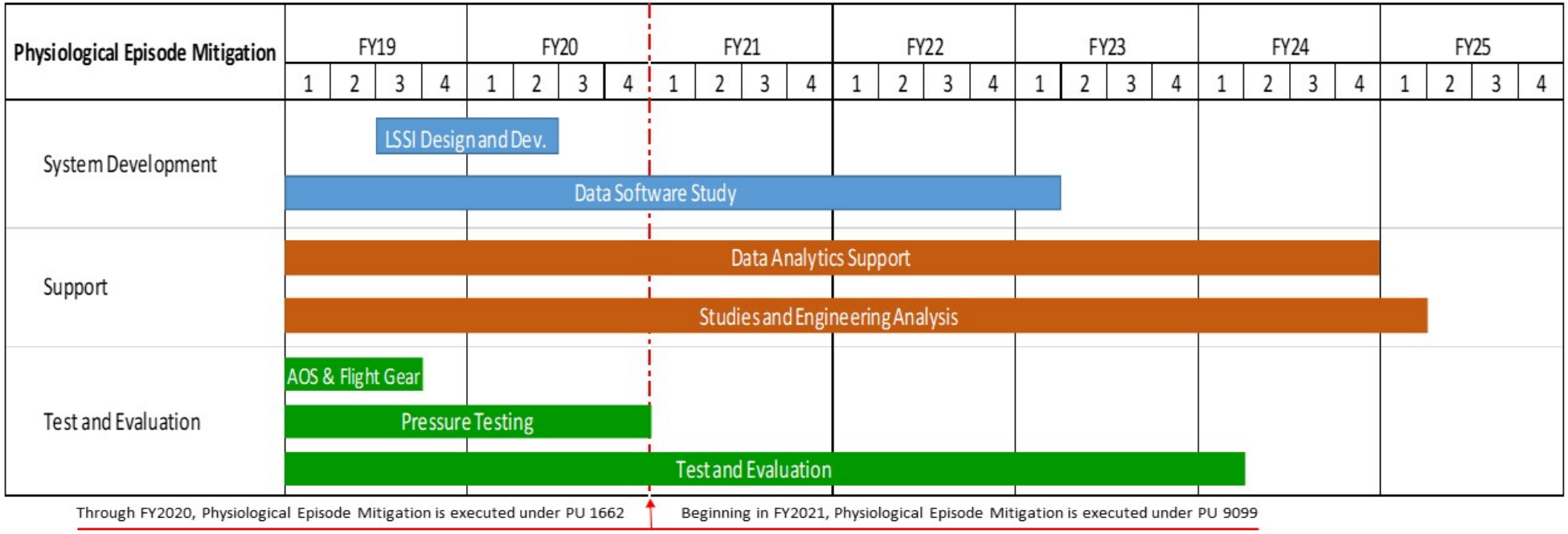

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204136N / *F/A-18 Squadrons*	**Project (Number/Name)** 9099 / *Physiological Episodes*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Physiological Episodes Mitigation				
System Development: Data Software Study	1	2021	1	2023
Support: Office of Naval Research Data Analytics Support	1	2021	4	2024
Support: Physiological Episodes Studies and Analysis Engineering	1	2021	1	2025
Test and Evaluation: Physiological Episode Test and Evaluation	1	2021	1	2024

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204136N / *F/A-18 Squadrons*	Project (Number/Name) 9999 / *Congressional Adds*	

COST ($ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
9999: *Congressional Adds*	0.000	11.391	2.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	13.391
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

1) Noise Reduction: Research, Development, Test and Evaluation (RDT&E) funding to support the redesign of Chevron seals to reduce engine exhaust plume noise. Numerous solutions have been evaluated. Chevron seals were determined to be the favorable solution for the F/A-18 and EA-18G. Previous testing of F414 chevrons demonstrated satisfactory noise reduction up to 80% power, but did not satisfy noise reduction requirements at full power. A possible cause of this problem has been identified. There are re-design options available to sustain noise reduction up to full power. Additional development and test will be required to finalize the Chevron design to achieve the desired noise reduction at all power levels. The subject funding will support the initial development efforts.

2) Navy Joint Air-to-Ground Missile for Fixed Wing Aircraft (JAGM-F) - Research, Development, Test and Evaluation (RDT&E) funding to support the initial integration efforts for the next generation of air-to-ground missile onto the F/A18E/F aircraft. The JAGM-F missile test and evaluation efforts are being conducted to ensure missile compatibility with the Navy environment and to confirm the performance of the missile meets mission requirements. The JAGM-F will build on the SDB II Unique Armament Interface integration efforts that are currently underway on the F/A-18E/F.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020
Congressional Add: Noise Reduction	1.931	0.000
FY 2019 Accomplishments: Funding provides for initial platform integration efforts on DoN platforms, including fit checks, ground launch eject testing, F/A-18 wind tunnel testing, F/A-18 strength/loads/Noise Vibe/Flutter analysis, and software integration lab tests of the JAGM-F electrical interface.		
FY 2020 Plans: N/A		
Congressional Add: Navy Joint Air-to-Ground Missile for Fixed Wing Aircraft	9.460	0.000
FY 2019 Accomplishments: Funding provides for initial platform integration efforts on DoN platforms, including fit checks, ground launch eject testing, F/A-18 wind tunnel testing, F/A-18 strength/loads/Noise Vibe/Flutter analysis, and software integration lab tests of the JAGM-F electrical interface.		
FY 2020 Plans: N/A		
Congressional Add: Noise reduction research	0.000	2.000
FY 2019 Accomplishments: Funding provides design and development efforts to redesign Chevron seals.		
FY 2020 Plans: Funding provides for design, development, and test efforts to redesign Chevron seals.		
Congressional Adds Subtotals	11.391	2.000

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204136N / *F/A-18 Squadrons*	**Project (Number/Name)** 9999 / *Congressional Adds*

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

1) Noise Reduction: Noise Reduction development and test is required to study the Chevron design to achieve the desired noise reduction at all power levels.

2) Navy Joint Air-to-Ground Missile for Fixed Wing Aircraft(JAGM-F). JAGM-F is being developed for the rotary wing AGM variant, and includes development necessary to be compatible with DoN and USAF fixed wing aircraft. The DoN and USAF integration and test activities will inform the DoN's acquisition approach for JAGM as a potential successor for the DoN's aging MAVERICK program.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204136N / *F/A-18 Squadrons*	Project (Number/Name) 9999 / *Congressional Adds*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Noise Reduction	C/CPFF	GE Aviation : Lynn, Massachusetts	0.000	1.931	Aug 2019	2.000	Aug 2020	0.000		-		0.000	0.000	3.931	3.931
Design & development of JAGM-F weapon	WR	Huntsville : AL	0.000	7.051	Aug 2019	0.000		0.000		-		0.000	0.000	7.051	-
		Subtotal	0.000	8.982		2.000		0.000		-		0.000	0.000	10.982	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
JAGM-F Engineering Support	WR	NAWCAD Pax : Patuxent River, MD	0.000	0.200	Apr 2019	0.000		0.000		-		0.000	0.000	0.200	-
		Subtotal	0.000	0.200		0.000		0.000		-		0.000	0.000	0.200	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Wind tunnel testing of JAGM-F on BRU-61 on F/A-18E/Fxt	WR	NASA : Not Specified	0.000	0.999	May 2019	0.000		0.000		-		0.000	0.000	0.999	-
Wind tunnel test study of JAGM-F	C/CPFF	Boeing : St. Louis, MO	0.000	1.200	Aug 2019	0.000		0.000		-		0.000	0.000	1.200	1.200
Fit Test on BRU-61/ BRU-55 on F/A-18E/F	WR	NAWCAD : Patuxent River, MD	0.000	0.010	Aug 2019	0.000		0.000		-		0.000	0.000	0.010	-
		Subtotal	0.000	2.209		0.000		0.000		-		0.000	0.000	2.209	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	11.391		2.000		0.000		-		0.000	0.000	13.391	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204136N / *F/A-18 Squadrons*	**Project (Number/Name)** 9999 / *Congressional Adds*

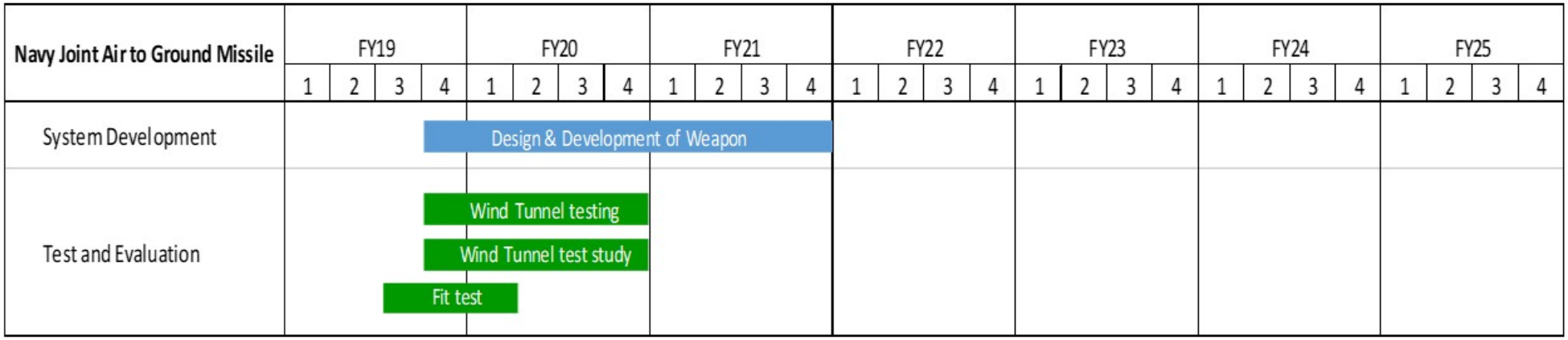

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204136N / *F/A-18 Squadrons*	**Project (Number/Name)** 9999 / *Congressional Adds*

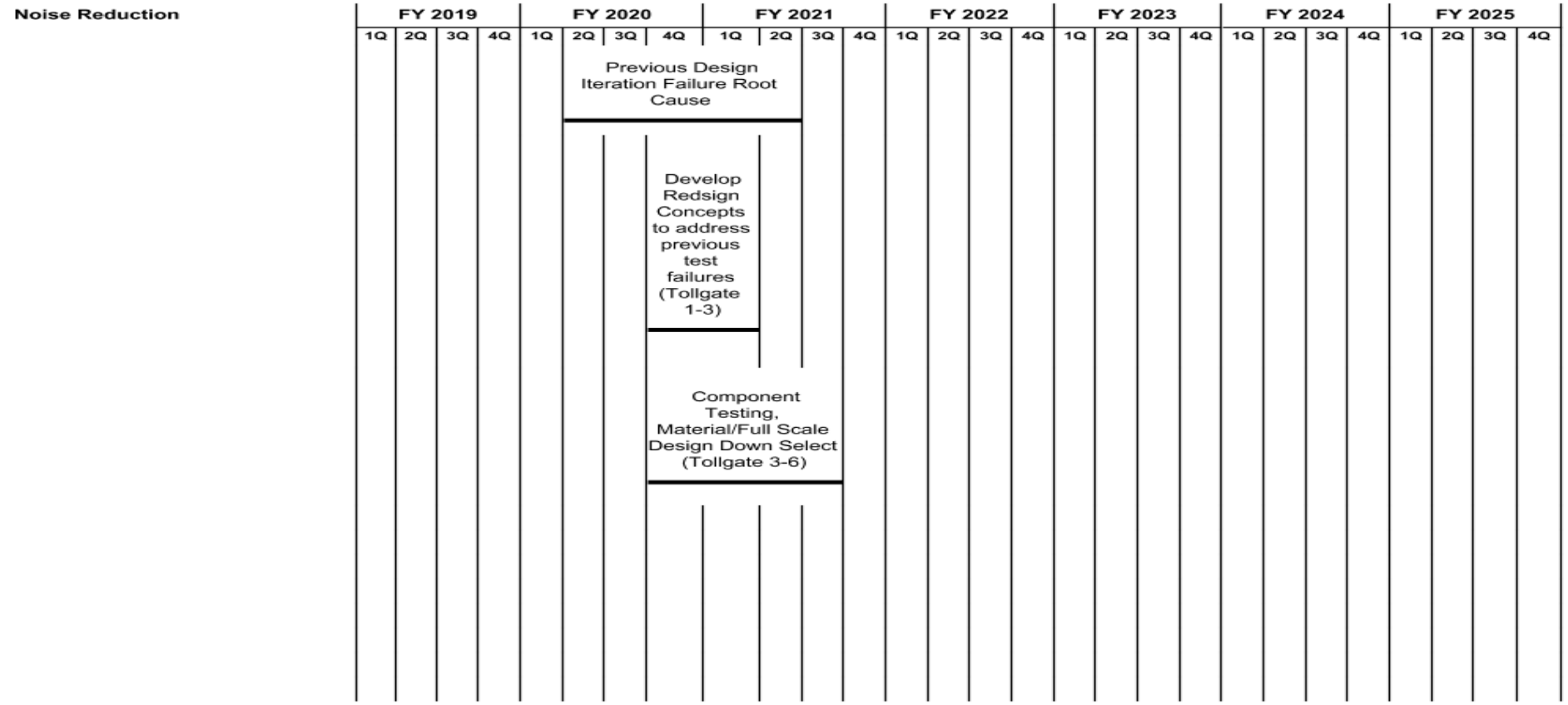

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Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204136N / *F/A-18 Squadrons*	**Project (Number/Name)** 9999 / *Congressional Adds*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Navy Joint Air to Ground Milissle				
Wind tunnel test study-NASA	4	2019	4	2020
Wind tunnel test study- Boeing	4	2019	4	2020
Fit test on BRU-61/ BR-55 on F/A-18E/F	3	2019	1	2020
Design and development of JAGM-F weapon	4	2019	4	2021
Noise Reduction				
Previous Design Iteration Failure Root Cause	2	2020	2	2021
Develop Redesign Concepts to address previous test failures (Tollgate 1-3)	4	2020	1	2021
Component Testing, Material/Full Scale Design Down Select (Tollgate 3-6)	4	2020	3	2021