Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Navy											Date: March 2019	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0205633N *I Aviation Improvements*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	1,460.130	120.940	134.823	125.461	-	125.461	139.748	131.031	124.054	126.529	Continuing	Continuing
0601: *Acft Handling & Service Equip*	34.105	2.717	4.868	6.711	-	6.711	3.063	2.721	4.775	4.869	Continuing	Continuing
0852: *Consolidated Auto Support System*	167.697	6.465	4.752	13.858	-	13.858	19.962	13.932	6.870	7.009	Continuing	Continuing
1041: *Acft Equip Repl/Maint Prog*	58.222	3.263	3.369	3.452	-	3.452	3.484	3.555	3.624	3.698	Continuing	Continuing
1355: *Propulsion and Power Component Improvement Program*	1,143.526	91.528	105.223	99.372	-	99.372	112.398	110.823	108.785	110.953	Continuing	Continuing
2269: *Expeditionary Airfield Improvements*	56.580	12.139	1.611	2.068	-	2.068	0.841	0.000	0.000	0.000	0.000	73.239
9999: *Congressional Adds*	0.000	4.828	15.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	19.828

A. Mission Description and Budget Item Justification

Project 0601 - Common Ground Equipment is a Naval Aviation Project to apply new technology to common support equipment necessary to support multiple aircraft.

Project 0852: Consolidated Automated Support System is a standardized Automated Test Equipment with computer assisted, multi-function capabilities to support the maintenance of aircraft weapons systems and missiles.

Project 1041 - Aircraft Equipment Reliability/Maintainability Improvement Program is the only Navy program that provides engineering support for in-service out-of-production aircraft equipment, and provides increased readiness at reduced operational and support cost.

Project 1355 - Aircraft Engine Component Improvement Program develops reliability and maintainability and safety enhancements for in-service Navy aircraft engines, transmissions, propellers, starters, auxiliary power units, electrical generating systems, fuel systems, fuels, and lubricants.

Project 2269 - The Expeditionary Airfields (EAF) program designs, develops, tests and fields a sustainment lighting system to replace existing obsolete legacy EAF lighting system.

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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Navy	Date: March 2019
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0205633N *I Aviation Improvements*

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	119.099	121.805	127.327	-	127.327
Current President's Budget	120.940	134.823	125.461	-	125.461
Total Adjustments	1.841	13.018	-1.866	-	-1.866
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-1.982			
• Congressional Rescissions	-	-			
• Congressional Adds	-	15.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-3.158	0.000			
• Program Adjustments	0.000	0.000	-1.640	-	-1.640
• Rate/Misc Adjustments	-0.001	0.000	-0.226	-	-0.226
• Congressional Add Adjustments	5.000	-	-	-	-

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2018	FY 2019
Project: 9999: *Congressional Adds*		
Congressional Add: *Program Increase*	4.828	0.000
Congressional Add: *F/A-18 E/F and E/A-18G Engine Enhancements*	0.000	15.000
Congressional Add Subtotals for Project: 9999	4.828	15.000
Congressional Add Totals for all Projects	4.828	15.000

Change Summary Explanation

The FY 2020 funding request was reduced by $9.000 million to account for the availability of prior year execution balances.

FY 2020 increase to standup Fourth Generation Electro-Optic (EO4) program and award the development contract.

Schedule:

Project 0852: The Fourth Generation Electro-Optic (EO4) development program will design, develop, integrate, and test a modernized electro-optic system to replace the legacy Third Generation Electro-Optic (EO3) systems which are experiencing untenable obsolescence issues. The continuation of this repair capability at both shore-based and afloat sites is critical to sustain maintenance and repair capabilities for the F/A-18 Advanced Targeting Forward Looking

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Navy	Date: March 2019
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0205633N *I Aviation Improvements*

Infrared (ATFLIR) and the H-60 Multi-Spectral Targeting (MTS) weapon systems. EO4 funds support development of tester to replace legacy EO3. Program schedule added to budget.

The Test Technology development project includes continued development of technical solutions to meet emerging weapons system testing requirements and to resolve other imminent obsolescence issues. Emerging capability requirements include advanced inertial device, expanded high-speed bus, virtual instrument, cybersecurity, and other technology advancements required to address capability requirements.

Project 2269: Due to system maturity design concerns with the Lead Systems Integrator (LSI), the Sustainment Lighting System (SLS) program was re-scoped to focus on the development of a new Light Emitting Diode (LED) CAT I Instrumented Flight Rules (IFR)/Visual Flight Rules (VFR) Approach Light System and the schedule has been updated accordingly. The following are changes to the schedule as a result: Added Systems Engineering Support from 1QFY 2018 to 2Q FY 2021; Hardware/Software System Design and Development end date moved from 1Q FY 2019 to 3Q FY 2019; Critical Design Review (CDR) moved from 4Q FY 2017 to 2Q FY 2019; Test Readiness Review (TRR) moved from 1Q FY 2018 to 3Q FY 2019; Developmental Test & Evaluation (DT&E) start date moved from 1Q FY 2018 to 3Q FY 2019 and the end date moved from 3Q FY 2018 to 4Q 2019; Combined Integration Test and Operational Test was moved from 1Q FY 2019 to 4Q FY 2019; Production Readiness Review (PRR) was added to 2Q FY 2020; Milestone C moved from 4Q FY 2019 to 3Q FY 2020; Full Rate Production decision moved from 2Q FY 2020 to 1Q FY 2021; IOC moved from 2Q FY 2020 to1Q FY2021.

Technical: Not Applicable.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy											Date: March 2019	
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0205633N / *Aviation Improvements*				Project (Number/Name) 0601 / *Acft Handling & Service Equip*			
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
0601: *Acft Handling & Service Equip*	34.105	2.717	4.868	6.711	-	6.711	3.063	2.721	4.775	4.869	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Common Ground Equipment is a Naval Aviation project to apply new technology to common support equipment necessary to support multiple systems/aircraft within the Navy. The common support equipment items developed with this budget are briefed to the Air Force, Army and Coast Guard for possible use in joint procurement in the production phase.

Crash cranes are used for lifting and moving disabled aircraft on CVN and L-Class ship flight decks. The Carrier/Amphibious Assault Ship Crash Crane (CV/AACC) will be a diesel powered lift system performing crash and salvage functions on board CVN and L-class ships. The CV/AACC will replace the legacy A/S32A-35A, Carrier Vessel Crash Crane (CVCC) and the A/S32A-36A Amphibious Assault Crash Crane (AACC). The CV/AACC will support all aircraft on CVN and L-Class ships.

Funding supports the evaluation, testing and integration to develop Portable Electronic Maintenance Aids (PEMA) Commercial Off the Shelf solution for portable device deployments across the Naval Aviation Enterprise. PEMA is a portable device utilized by maintainers with the implementation of digital maintenance capabilities (digital publications, Interactive Electronic Technical Manuals, Internet Protocol based data uploads, Binary digit data downloads, automated diagnostics, and planeside Naval Aviation Logistics Command/Management Information System. PEMAs are a mandatory display device supporting modern day Automated Maintenance Environment implemented for weapon systems.

Future Readiness Initiative to Develop Standard PEMA Cyber Solution (SPECS) architecture for all Portable Electronic Maintenance Aids (PEMA)s to standardize software across NAE, leverage existing enterprise tools, and to correct cyber shortfalls identified by the Cyber Warfare Detachment (CWD). A Cyber Risk Assessment (CRA) identified vulnerabilities on the Portable Electronic Maintenance Aid (PEMA) system that could be exploited to threaten U.S. capabilities. A new software image and configuration management process has been identified to mitigate the top 60% of identified risk groups and 100% of penetration test findings from the CRA. The Abbreviated Acquisition Program (AAP) will be executed as a software Engineering Change Proposal (ECP) to the PEMA POR using a Model 3: Incrementally Deployed Software Intensive Program / Agile method.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**
Title: Turbo Shaft Engine Dynamometer Technology Development	0.570	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: Develop, integrate, and evolve dynamometer technologies and capabilities for insertion into testing of turbo shaft engines. Current V35 dynamometer used to test T700 engines at the intermediate maintenance level has obsolescence issues and worn components that have been overhauled three times since initial fielding					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 0601 / *Acft Handling & Service Equip*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
in the 1980s. The OEM has stated that it does not recommend a fourth overhaul due to structural issues. Insertion of new dynamometer technologies is required to test next generation T700 engines with increased torque and horsepower and to retire legacy units which have tired metal due to cycle fatigue. ***FY 2019 Plans:*** N/A ***FY 2020 Base Plans:*** N/A ***FY 2020 OCO Plans:*** N/A					
Title: Borescope Technology Development ***Articles:*** ***Description:*** Develop, integrate, and evolve borescope technologies to meet emergent jet engine inspection requirements. Current fielded engine borescopes are unable to measure required defects on aircraft turbine engine compressor blades to the accuracy required. Additionally, current legacy borescopes will not be supported by the original equipment manufacturer beyond FY22. Legacy borescopes are susceptible to damage due to the insertion tube not being detachable/removable. A detachable insertion tube would increase system availability and reduce repair costs. New borescope technology is needed to improve defect measurement accuracy and equipment supportability. ***FY 2019 Plans:*** N/A ***FY 2020 Base Plans:*** N/A ***FY 2020 OCO Plans:*** N/A	0.483 -	0.000 -	0.000 -	0.000 -	0.000 -
Title: Standard PEMA Cyber Solution (SPECS) ***Articles:*** ***Description:*** Capability/Program Description: The Portable Electronic Maintenance Aid (PEMA) Cyber Risk Assessment (CRA) has identified cyber vulnerabilities that could be exploited to threaten US fighting forces. Implementation of mandatory Cyber Security (CS) requirements would decrease the CS attack surface. Develop	0.000 -	1.974 -	2.000 -	0.000 -	2.000 -

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 0601 / *Acft Handling & Service Equip*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Standard PEMA Cyber Solution (SPECS) architecture for all PEMAs to standardize software across NAE, leverage existing enterprise tools, and to correct cyber shortfalls identified by the Cyber Warfare Detachment (CWD) Cyber Risk Assessment (CRA). Implement CS enhancements to reduce risk from cyber-attack. ***FY 2019 Plans:*** Develop Standard PEMA Cyber Solution (SPECS) core software solution enhancements to correct cyber shortfalls, develop/enhance Enterprise products (CMDS, PREP, and CFE) for software standardization across NAE, and develop/integrate T/M/S unique applications to be hosted on a common image. ***FY 2020 Base Plans:*** Develop Standard PEMA Cyber Solution (SPECS) core software solution enhancements to correct cyber shortfalls, develop/enhance Enterprise products (CMDS, PREP, and CFE) for software standardization across NAE, and develop/integrate T/M/S unique applications to be hosted on a common image. Production delivery for group 1 SPECS to the fleet. ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** No significant change from FY 2019 to FY 2020					
Title: Carrier/Amphibious Assault Ship Crash Crane (CV/AACC) ***Articles:***	0.964 -	2.194 -	4.011 2	0.000 -	4.011 2
Description: Name change from Carrier Crash Crane (CV) to Carrier/Amphibious Assault Ship Crash Crane (CV/AACC) due to adding the amphibious assault ship back to the procurement. CV are required to remove damaged aircraft from the flight deck. In 2004, a solicitation for a commerical off the shelf replacement for the existing shipboard crash crane was issued. Two bids were received, and after a complete evaluation with many rounds of discussions with the companies bidding, both proposals were found to be technically inadequate and the procurement effort was discontinued. As a result, the crash cranes have continued operation unchanged. Designed in the late 1980's, major systems are beginning to experience the obsolescence of spare parts and are in need of updating. R&D resources are needed to identify not only replacements, but new technologies, which can increase the reliability and maintainability of this flight ops critical piece of equipment. Systems updates would include the engine/generator and electrical updates to the motor drive/control system. An exploration of power sources other than diesel engines would be considered and a corrosion resistant boom. ***FY 2019 Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 0601 / *Acft Handling & Service Equip*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Conduct Milestone B and award contract. ***FY 2020 Base Plans:*** Manufacture 2 Nuclear Powered Aircraft Carrier (CVN) Prototype Cranes and begin contractor testing. ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2020 funds the increase in scope due to better defined system requirements. FY 2020 funds the manufacturing of two CVN prototype cranes and testing.					
Title: Portable Electronic Maintenance Aid (PEMA) ***Articles:*** ***Description:*** Portable Electronic Maintenance Aid (PEMA) funding supports the evaluation, testing and integration to develop PEMA Commercial Off-the-Shelf (COTS) solution for portable device deployments across the Naval Aviation Enterprise. PEMA is a portable device utilized by maintainers with the implementation of digital maintenance capabilities (digital publications, Interactive Electronic Technical Manuals, Internet Protocol based data uploads, Binary digit data downloads, automated diagnostics, and planeside Naval Aviation Logistic Command Management Information System. PEMAs are a mandatory display device supporting modern day Automated Maintenance Environment implemented for weapon systems. ***FY 2019 Plans:*** Evaluate, test and integrate evolving COTS solutions. Conduct test & evaluation of T/M/S peculiar software/ hardware requirements and network connectivity compliance across the GIG prior to deployment to the fleet by a yearly release cycle. ***FY 2020 Base Plans:*** Evaluate, test and integrate evolving COTS solutions. Conduct test & evaluation of T/M/S peculiar software/ hardware requirements and network connectivity compliance across the GIG prior to deployment to the fleet by a yearly release cycle. ***FY 2020 OCO Plans:*** N/A	0.700 -	0.700 -	0.700 -	0.000 -	0.700 -
Accomplishments/Planned Programs Subtotals	2.717	4.868	6.711	0.000	6.711

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 0601 / *Acft Handling & Service Equip*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• APN/0705: *Ground Support Equipment - CSE/ICP*	84.816	111.163	82.464	-	82.464	84.887	86.216	88.747	91.017	Continuing	Continuing
• OPN/4268: *Aviation Support Equipment - PEMA*	12.909	11.885	10.988	-	10.988	11.873	11.146	11.379	11.607	Continuing	Continuing

Remarks

D. Acquisition Strategy

Common Ground Equipment: This is a non ACAT program. Field activities propose tentative projects. Internal panel merits and selects projects. Field activities develop projects and submit results. Operational Advisory Group process selects projects to transition to procurement.

Carrier/Amphibious Assault Ship Crash Crane (CV/AACC): Market research results indicate that six (6) companies have the potential to develop (modified COTS) and manufacture crash cranes that meet the specification requirements, inclusive of the lift requirements and unique shipboard environmental requirements including shock, vibration, Electromagnetic Interference (EMI) and ship motion characteristics. The program will enter the acquisition process at Milestone B (MS-B). The contracting strategy consists of awarding a best value, competitive, Firm Fixed Price (FFP) Indefinite Delivery, Indefinite Quantity (IDIQ) contract.

The selected contractor will design, develop, manufacture, test, and deliver two (2) CCSCs and one (1) ACSC Engineering Development Model (EDM), along with all required technical data and logistics documentation. Following MS C approval, one (1) CCSC and one (1) ACSC LRIP will be procured to support DT-C1 testing and production. Following FRPDR approval, 25 additional production units consisting of 13 CCSCs and 12 ACSCs will be procured using priced delivery orders which will meet the total fleet inventory of 27 units.

Portable Electronic Maintenance Aids: The management approach includes the Program Management Office residing at NAVAIR with Milestone Decision Authority delegated to the Naval Air Systems Command Chief Information Officer. The evolutionary development approach will be used to execute requirements. Contracting for the prime integrator will be via competitively awarded Indefinite Delivery/Indefinite Quantity contracts.

E. Performance Metrics

Milestone Reviews

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205633N / *Aviation Improvements*	Project (Number/Name) 0601 / *Acft Handling & Service Equip*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hdw Dev - CV	C/FFP	TBD : TBD	0.000	0.000		1.380	Jan 2019	2.407	Jan 2020	-		2.407	0.000	3.787	3.787
Systems Engineering - CV	WR	NAWCAD : LAKEHURST, NJ	3.164	0.964	Nov 2017	0.814	Nov 2018	0.847	Nov 2019	-		0.847	Continuing	Continuing	Continuing
Systems Engineering - Dynamometer	WR	NAWCAD : LAKEHURST, NJ	0.000	0.570	Nov 2017	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering - Borescope	WR	NAWCAD : LAKEHURST	0.000	0.483	Nov 2017	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering - SPECS	C/IDIQ	TBD : TBD	0.000	0.000		1.383	Dec 2018	1.400	Dec 2019	-		1.400	0.000	2.783	2.783
Prior year Prod Dev cost no longer funded in the FYDP	Various	Various : Various	18.639	0.000		0.000		0.000		-		0.000	0.000	18.639	-
		Subtotal	21.803	2.017		3.577		4.654		-		4.654	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior year Support cost no longer funded in the FYDP	Various	Various : Various	8.857	0.000		0.000		0.000		-		0.000	0.000	8.857	-
		Subtotal	8.857	0.000		0.000		0.000		-		0.000	0.000	8.857	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Operational T & E - PEMA	WR	NAWCAD : PAX RIVER, MD	1.133	0.425	Nov 2017	0.425	Nov 2018	0.425	Nov 2019	-		0.425	Continuing	Continuing	Continuing
Operational T & E - PEMA	WR	FRC SE : Jacksonville, FL	1.076	0.275	Nov 2017	0.275	Nov 2018	0.275	Nov 2019	-		0.275	0.000	1.901	-
C&G Test - CV	WR	NAWCAD : PAX RIVER, MD	0.317	0.000		0.000		0.757	Nov 2019	-		0.757	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205633N / *Aviation Improvements*	Project (Number/Name) 0601 / *Acft Handling & Service Equip*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Operational T & E - SPECS	WR	FRC SE : Jacksonville, FL	0.000	0.000		0.591	Dec 2018	0.600	Dec 2019	-		0.600	0.000	1.191	-
Prior year T&E cost no longer funded in the FYDP	Various	Various : Various	0.919	0.000		0.000		0.000		-		0.000	0.000	0.919	-
		Subtotal	3.445	0.700		1.291		2.057		-		2.057	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	34.105	2.717		4.868		6.711		-		6.711	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 0601 / *Acft Handling & Service Equip*

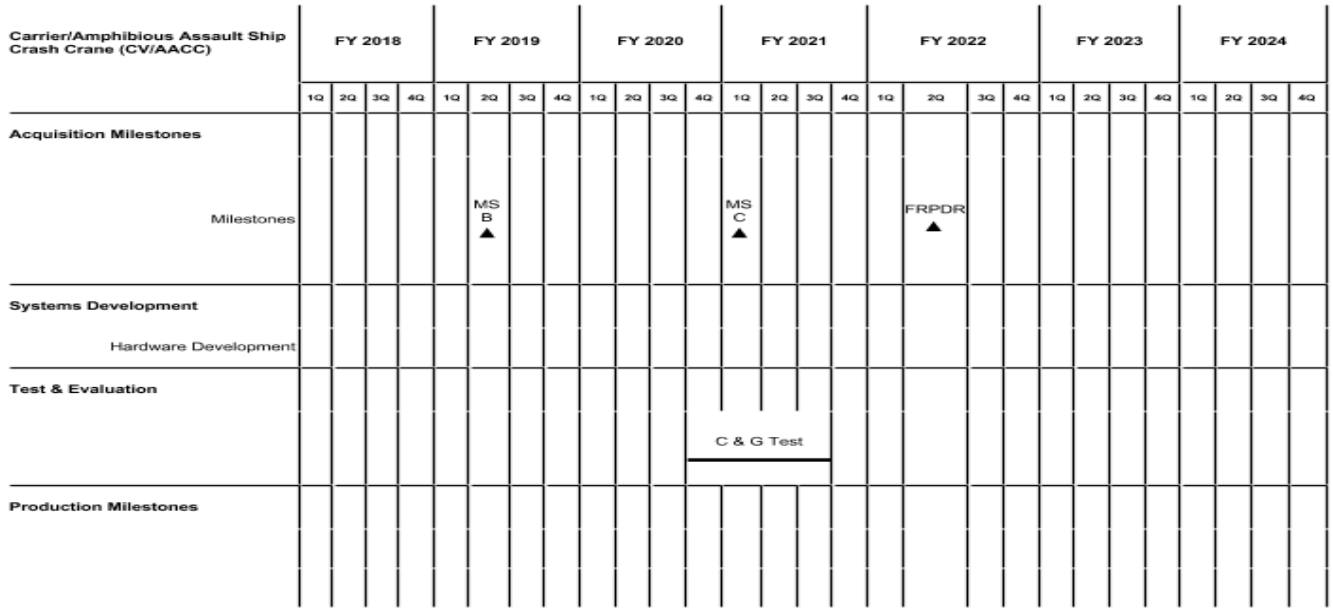
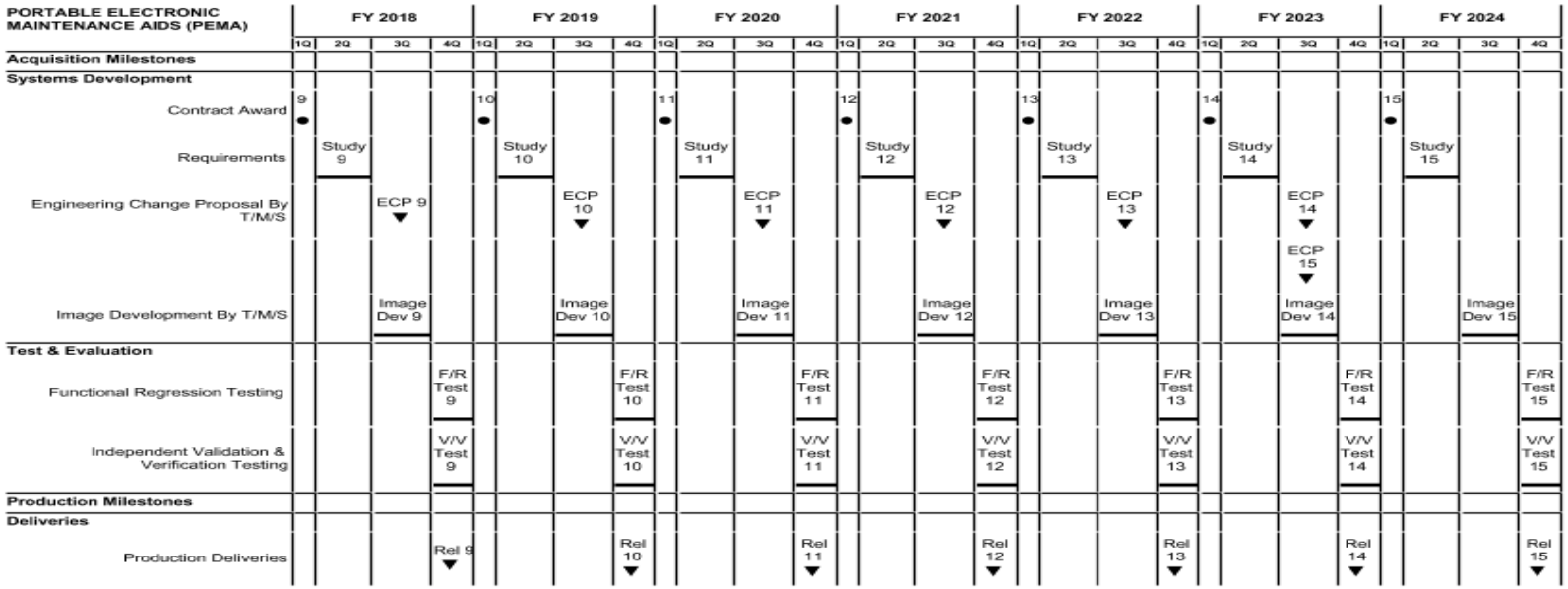
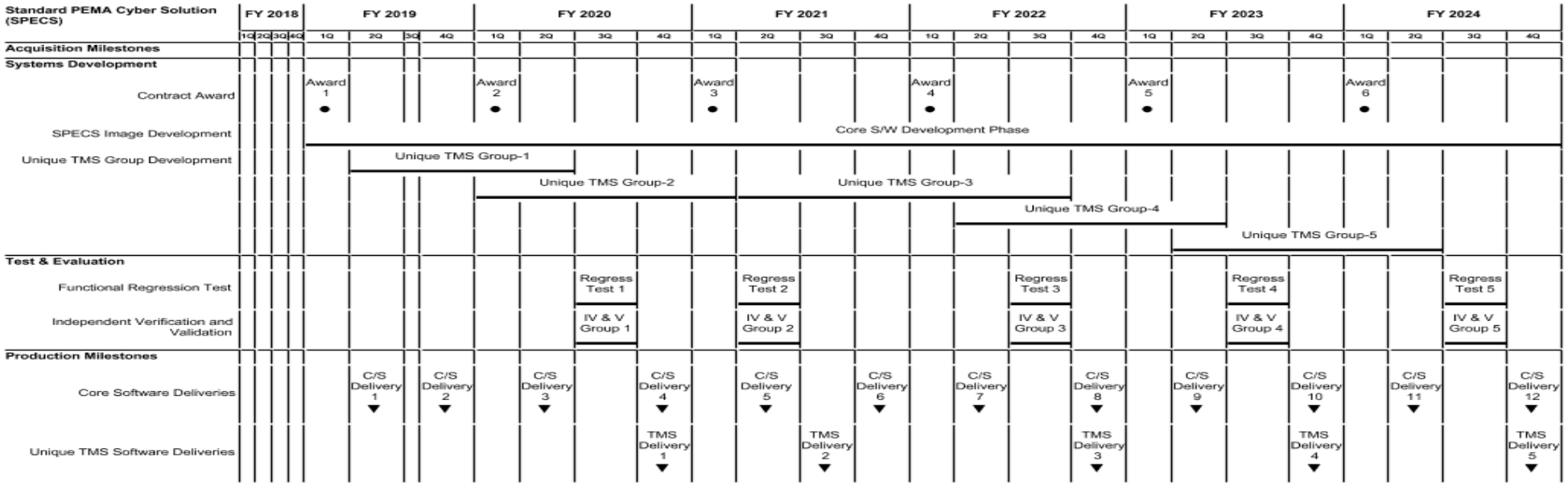


Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 0601 / *Acft Handling & Service Equip*



2020DON - 0205633N - 0601

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 0601 / *Acft Handling & Service Equip*



2020DON - 0205633N - 0601

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 0601 / *Acft Handling & Service Equip*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Carrier/Amphibious Assault Ship Crash Crane (CV/AACC)				
Acquisition Milestones: Milestones: MILESTONE B	2	2019	2	2019
Acquisition Milestones: Milestones: MILESTONE C	1	2021	1	2021
Acquisition Milestones: Milestones: FRPDR	2	2022	2	2022
Test & Evaluation: CV - CONTRACTOR AND GOVT RUN TESTING	4	2020	3	2021
PORTABLE ELECTRONIC MAINTENANCE AIDS (PEMA)				
Systems Development: Contract Award: Contract Award 9	1	2018	1	2018
Systems Development: Contract Award: Contract Award 10	1	2019	1	2019
Systems Development: Contract Award: Contract Award 11	1	2020	1	2020
Systems Development: Contract Award: Contract Award 12	1	2021	1	2021
Systems Development: Contract Award: Contract Award 13	1	2022	1	2022
Systems Development: Contract Award: Contract Award 14	1	2023	1	2023
Systems Development: Contract Award: Contract Award 15	1	2024	1	2024
Systems Development: Requirements: Requirements Study Complete 9	2	2018	2	2018
Systems Development: Requirements: Requirements Study Complete 10	2	2019	2	2019
Systems Development: Requirements: Requirements Study Complete 11	2	2020	2	2020
Systems Development: Requirements: Requirements Study Complete 12	2	2021	2	2021
Systems Development: Requirements: Requirements Study Complete 13	2	2022	2	2022
Systems Development: Requirements: Requirements Study Complete 14	2	2023	2	2023
Systems Development: Requirements: Requirements Study Complete 15	2	2024	2	2024
Systems Development: Engineering Change Proposal By T/M/S: Engineering Change Proposal By T/M/S, ECP 9	3	2018	3	2018

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 0601 / *Acft Handling & Service Equip*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Systems Development: Engineering Change Proposal By T/M/S: Engineering Change Proposal By T/M/S, ECP 10	3	2019	3	2019
Systems Development: Engineering Change Proposal By T/M/S: Engineering Change Proposal By T/M/S, ECP 11	3	2020	3	2020
Systems Development: Engineering Change Proposal By T/M/S: Engineering Change Proposal By T/M/S, ECP 12	3	2021	3	2021
Systems Development: Engineering Change Proposal By T/M/S: Engineering Change Proposal By T/M/S, ECP 13	3	2022	3	2022
Systems Development: Engineering Change Proposal By T/M/S: Engineering Change Proposal By T/M/S, ECP 14	3	2023	3	2023
Systems Development: Engineering Change Proposal By T/M/S: Engineering Change Proposal By T/M/S, ECP 15	3	2023	3	2023
Systems Development: Image Development By T/M/S: Image Development By T/M/S 9	3	2018	3	2018
Systems Development: Image Development By T/M/S: Image Development By T/M/S 10	3	2019	3	2019
Systems Development: Image Development By T/M/S: Image Development By T/M/S 11	3	2020	3	2020
Systems Development: Image Development By T/M/S: Image Development By T/M/S 12	3	2021	3	2021
Systems Development: Image Development By T/M/S: Image Development By T/M/S 13	3	2022	3	2022
Systems Development: Image Development By T/M/S: Image Development By T/M/S 14	3	2023	3	2023
Systems Development: Image Development By T/M/S: Image Development By T/M/S 15	3	2024	3	2024
Test & Evaluation: Functional Regression Testing: Functional/Regression Testing 9	4	2018	4	2018
Test & Evaluation: Functional Regression Testing: Functional/Regression Testing 10	4	2019	4	2019
Test & Evaluation: Functional Regression Testing: Functional/Regression Testing 11	4	2020	4	2020

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 0601 / *Acft Handling & Service Equip*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Test & Evaluation: Functional Regression Testing: Functional/Regression Testing 12	4	2021	4	2021
Test & Evaluation: Functional Regression Testing: Functional/Regression Testing 13	4	2022	4	2022
Test & Evaluation: Functional Regression Testing: Functional/Regression Testing 14	4	2023	4	2023
Test & Evaluation: Functional Regression Testing: Functional/Regression Testing 15	4	2024	4	2024
Test & Evaluation: Independent Validation & Verification Testing: Independent Validation & Verification Testing 9	4	2018	4	2018
Test & Evaluation: Independent Validation & Verification Testing: Independent Validation & Verification Testing 10	4	2019	4	2019
Test & Evaluation: Independent Validation & Verification Testing: Independent Validation & Verification Testing 11	4	2020	4	2020
Test & Evaluation: Independent Validation & Verification Testing: Independent Validation & Verification Testing 12	4	2021	4	2021
Test & Evaluation: Independent Validation & Verification Testing: Independent Validation & Verification Testing 13	4	2022	4	2022
Test & Evaluation: Independent Validation & Verification Testing: Independent Validation & Verification Testing 14	4	2023	4	2023
Test & Evaluation: Independent Validation & Verification Testing: Independent Validation & Verification Testing 15	4	2024	4	2024
Deliveries: Production Deliveries: Production Delivery, Release 9	4	2018	4	2018
Deliveries: Production Deliveries: Production Delivery, Release 10	4	2019	4	2019
Deliveries: Production Deliveries: Production Delivery, Release 11	4	2020	4	2020
Deliveries: Production Deliveries: Production Delivery, Release 12	4	2021	4	2021
Deliveries: Production Deliveries: Production Delivery, Release 13	4	2022	4	2022
Deliveries: Production Deliveries: Production Delivery, Release 14	4	2023	4	2023
Deliveries: Production Deliveries: Production Delivery, Release 15	4	2024	4	2024
Standard PEMA Cyber Solution (SPECS)				
Systems Development: Contract Award: Contract Award 1	1	2019	1	2019
Systems Development: Contract Award: Contract Award 2	1	2020	1	2020

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 0601 / *Acft Handling & Service Equip*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Systems Development: Contract Award: Contract Award 3	1	2021	1	2021
Systems Development: Contract Award: Contract Award 4	1	2022	1	2022
Systems Development: Contract Award: Contract Award 5	1	2023	1	2023
Systems Development: Contract Award: Contract Award 6	1	2024	1	2024
Systems Development: SPECS Image Development: SPECS Image	1	2019	4	2024
Systems Development: Unique TMS Group Development: Unique TMS Group-1	2	2019	2	2020
Systems Development: Unique TMS Group Development: Unique TMS Group-2	1	2020	1	2021
Systems Development: Unique TMS Group Development: Unique TMS Group-3	2	2021	3	2022
Systems Development: Unique TMS Group Development: Unique TMS Group-4	2	2022	2	2023
Systems Development: Unique TMS Group Development: Unique TMS Group-5	2	2023	2	2024
Test & Evaluation: Functional Regression Test: Group 1	3	2020	3	2020
Test & Evaluation: Functional Regression Test: Group 2	2	2021	2	2021
Test & Evaluation: Functional Regression Test: Group 3	3	2022	3	2022
Test & Evaluation: Functional Regression Test: Group 4	3	2023	3	2023
Test & Evaluation: Functional Regression Test: Group 5	3	2024	3	2024
Test & Evaluation: Independent Verification and Validation: Group 1	3	2020	3	2020
Test & Evaluation: Independent Verification and Validation: Group 2	2	2021	2	2021
Test & Evaluation: Independent Verification and Validation: Group 3	3	2022	3	2022
Test & Evaluation: Independent Verification and Validation: Group 4	3	2023	3	2023
Test & Evaluation: Independent Verification and Validation: Group 5	3	2024	3	2024
Production Milestones: Core Software Deliveries: Deliveries 1	2	2019	2	2019
Production Milestones: Core Software Deliveries: Deliveries 2	4	2019	4	2019
Production Milestones: Core Software Deliveries: Deliveries 3	2	2020	2	2020
Production Milestones: Core Software Deliveries: Deliveries 4	4	2020	4	2020
Production Milestones: Core Software Deliveries: Deliveries 5	2	2021	2	2021
Production Milestones: Core Software Deliveries: Deliveries 6	4	2021	4	2021

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 0601 / *Acft Handling & Service Equip*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Production Milestones: Core Software Deliveries: Deliveries 7	2	2022	2	2022
Production Milestones: Core Software Deliveries: Deliveries 8	4	2022	4	2022
Production Milestones: Core Software Deliveries: Deliveries 9	2	2023	2	2023
Production Milestones: Core Software Deliveries: Deliveries 10	4	2023	4	2023
Production Milestones: Core Software Deliveries: Deliveries 11	2	2024	2	2024
Production Milestones: Core Software Deliveries: Deliveries 12	4	2024	4	2024
Production Milestones: Unique TMS Software Deliveries: Deliveries 1	4	2020	4	2020
Production Milestones: Unique TMS Software Deliveries: Deliveries 2	3	2021	3	2021
Production Milestones: Unique TMS Software Deliveries: Deliveries 3	4	2022	4	2022
Production Milestones: Unique TMS Software Deliveries: Deliveries 4	4	2023	4	2023
Production Milestones: Unique TMS Software Deliveries: Deliveries 5	4	2024	4	2024

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205633N / *Aviation Improvements*	Project (Number/Name) 0852 / *Consolidated Auto Support System*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
0852: *Consolidated Auto Support System*	167.697	6.465	4.752	13.858	-	13.858	19.962	13.932	6.870	7.009	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The electronic Consolidated Automated Support System (eCASS) project is the system design and development of the latest generation of the US Navy's CASS family of automatic test systems. The legacy CASS system was designed and developed in the 1980's and commenced fielding in 1992. As such, it is reaching the end of its useful life due to obsolescence issues. eCASS is the replacement system for legacy CASS systems, which provides Naval aircraft avionics component maintenance and repair support at Intermediate and Depot maintenance facilities both shore-based and afloat. As a CASS replacement program, the eCASS program objectives remain the same as that of CASS. Specifically: (1) increase material readiness; (2) reduce life cycle costs; (3) improve tester sustainability at depot and intermediate maintenance levels; (4) reduce proliferation of unique test equipment, and (5) provide test capability for existing and emerging avionics/electronics aircraft weapon systems.

The Test Technology development project includes analysis, application, maturation, integration and testing of emerging electronic, mechanical, and optical test technologies for potential military utility for emerging requirements or obsolescence resolution in support of Naval avionics testing and repair. Specifically included are next-generation electro-optics, synthetic instruments, high-speed bus technologies, inertial device technologies, and various other elements of modernization for the Consolidated Automated Support System (CASS) family of automated test equipment, including associated Test Program Sets (TPSs) and ancillary equipment.

The Third Generation Electro-Optical (EO3) Technology Development project consists of the design and development of technology solutions, including a near-infrared camera solution to replace the existing obsolete EO3 console camera, for use in 65 fielded Navy test systems at both shore-based and afloat sites. The EO3 console subsystem is hosted by the US Navy Consolidated Automated Support System (CASS/eCASS) family of automatic test systems and is used to test, diagnose and repair the H-60 Multi-spectral Targeting System (MTS) and F/A-18 Advanced Targeting Forward Looking Infrared (ATFLIR) weapon systems. The objective of the EO3 Technology Development project is to extend the useful life of fielded EO3 systems in order to sustain H-60 MTS and F/A-18 ATFLIR weapon system readiness until a next-generation EO replacement system can be designed, developed, produced, and fielded.

The Fourth Generation Electro-Optical (EO4) development project consists of the design and development of the latest generation electro-optic test console for use with the electronic CASS (eCASS) automatic test system. The EO4 system will replace the legacy Third Generation Electro-Optical (EO3) system, which is facing imminent obsolescence, in providing test, repair, and maintenance capability for Naval and Marine Corps electro-optic weapon systems at both shore-based and afloat sites. As an EO3 replacement program, the EO4 program objectives remain the same as EO3. Specifically: (1) provide test capability for existing and emerging electro-optic weapon systems and components; (2) increase ready basic aircraft (RBA) metrics (operational availability); (3) reduce life-cycle costs; (4) improve sustainability at intermediate and depot levels of maintenance; and (5) reduce proliferation of unique test equipment.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 0852 / *Consolidated Auto Support System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: eCASS Development	0.316	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: Develop, integrate and test an Automatic Test System (ATS) to replace legacy CASS systems. The new ATS will be compatible with and capable of hosting the hundreds of existing Test Programs that are currently utilized on legacy CASS at the Intermediate and Depot levels of maintenance, as well as any emerging Test Programs that may require greater test capability than provided by legacy CASS. ***FY 2019 Plans:*** N/A ***FY 2020 Base Plans:*** N/A ***FY 2020 OCO Plans:*** N/A					
Title: Test Technology Development	2.382	2.380	3.295	0.000	3.295
Articles:	-	-	-	-	-
Description: Develops, integrates, and evolves enhanced test capabilities and technologies for insertion into the Consolidated Automated Support System (CASS) family of test systems. As weapon system electronics evolve, new test capabilities are required to support advanced systems. Existing test capabilities must be extended in range, accuracy, time and frequency domains in order to sustain the required test accuracy ratios for weapon systems support (the automatic test system must be four times as accurate as the asset being tested). ***FY 2019 Plans:*** Research and evaluate solutions for next-generation inertial device, global positioning system, and video processing system test capabilities. Research and evaluate Test Program Set (TPS) software development and coding alternatives for enhanced TPS performance capabilities and reduced TPS execution time. ***FY 2020 Base Plans:*** Research and evaluate high-power and fiber-optic test requirements with a focus on Joint Strike Fighter. Analyze required incremental enhancements for Rack 1 of the eCASS automatic test systems. ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:***					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 0852 / *Consolidated Auto Support System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
FY20 increase for research and evaluation of alternatives for Joint Strike Fighter emerging requirements.					
Title: EO3 Technology Development	3.767	2.372	0.000	0.000	0.000
Articles:	2	-	-	-	-
Description: This project will develop, integrate and test technical solutions to resolve EO3 obsolescence issues, including a near infrared camera, that are capable of supporting the maintenance and repair of the F/A-18 ATFLIR and H-60 MTS weapon systems. ***FY 2019 Plans:*** Test and evaluate interoperability of two prototype near infrared camera assemblies with the existing Test Program Sets and the eCASS EO3 system to verify compatibility. Perform an EO3 system technical evaluation to determine that the near IR camera solution is reliable and maintainable. Research and analyze solutions for other EO3 obsolescence issues in order to extend the EO3 service life until a modernized EO replacement system can be developed and fielded. ***FY 2020 Base Plans:*** N/A ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease in funding due to realignment of efforts from EO3 Technology Development to the EO4 Development program which will replace legacy EO3 systems.					
Title: EO4 Developement	0.000	0.000	10.563	0.000	10.563
Articles:	-	-	-	-	-
Description: Design, develop, integrate, and test a Fourth Generation Electro-Optics (EO4) test system to replace the legacy EO3 test system. EO4 systems will provide the capability to test and diagnose an array of electro-optic weapons systems on F/A-18, H-60, JSF, and other aircraft platforms to support visual imaging, target identification and tracking, range finding, night-vision, and other electro-optic weapon system capabilities. ***FY 2019 Plans:*** N/A ***FY 2020 Base Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 0852 / *Consolidated Auto Support System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Award an engineering and manufacturing development contract to design and develop an EO4 test system. Analyze the EO4 preliminary design to ensure it provides the capabilities required to test the requisite emerging weapon systems, including the enhanced version of the F/A-18 ATFLIR, JSF Distributed Aperature System (DAS), and the H-60 MTS electro-optic weapon systems. ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to standup of new start EO4 program and award of EO4 development contract.					
Accomplishments/Planned Programs Subtotals	6.465	4.752	13.858	0.000	13.858

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• APN/0705: *Common Ground Equipment-CASS/ATE*	104.142	111.816	109.599	-	109.599	117.857	120.241	121.744	123.691	Continuing	Continuing

Remarks

D. Acquisition Strategy

Formal test technology reviews with industry are conducted annually (cooperative Joint Services initiative) to define maturity of needed technologies. Further studies are conducted as needed. Procurement strategy is determined by market survey and cooperative opportunities.

E. Performance Metrics

Milestone Reviews

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205633N / *Aviation Improvements*	Project (Number/Name) 0852 / *Consolidated Auto Support System*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hdw Dev - eCASS	C/CPIF	Lockheed Martin : Orlando, FL	103.592	0.316	Dec 2017	0.000		0.000		-		0.000	0.000	103.908	103.908
Primary Hdw Dev - Test Technology	C/CPFF	Various : Various	3.780	1.664	Dec 2017	1.643	Dec 2018	1.966	Dec 2019	-		1.966	Continuing	Continuing	Continuing
Primary Hdw Dev - EO3	SS/CPFF	Northrop Grumman : Rolling Meadows, IL	0.000	3.221	Mar 2018	1.839	Dec 2018	0.000		-		0.000	0.000	5.060	5.060
Primary Hdw Dev - EO4	C/CPIF	TBD : TBD	0.000	0.000		0.000		7.919	Feb 2020	-		7.919	14.493	22.412	22.412
Prior Year Prod Dev no longer funded in the FYDP	Various	Various : Various	28.397	0.000		0.000		0.000		-		0.000	0.000	28.397	-
		Subtotal	135.769	5.201		3.482		9.885		-		9.885	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
eCASS Support	WR	Various : Various	5.895	0.000		0.000		0.000		-		0.000	0.000	5.895	-
eCASS Support	WR	NAWC AD : Lakehurst, NJ	8.955	0.000		0.000		0.000		-		0.000	0.000	8.955	-
Test Technology Support	WR	NAWC AD : Lakehurst, NJ	1.260	0.674	Dec 2017	0.689	Dec 2018	1.280	Dec 2019	-		1.280	Continuing	Continuing	Continuing
EO3 Support	WR	NAWC AD : Lakehurst, NJ	0.000	0.497	Dec 2017	0.480	Dec 2018	0.000		-		0.000	0.000	0.977	-
EO4 Support	WR	NAWC AD : Lakehurst, NJ	0.000	0.000		0.000		2.567	Dec 2019	-		2.567	7.295	9.862	-
Prior Year Support no longer funded in the FYDP	Various	Various : Various	12.853	0.000		0.000		0.000		-		0.000	0.000	12.853	-
		Subtotal	28.963	1.171		1.169		3.847		-		3.847	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205633N / *Aviation Improvements*	Project (Number/Name) 0852 / *Consolidated Auto Support System*	

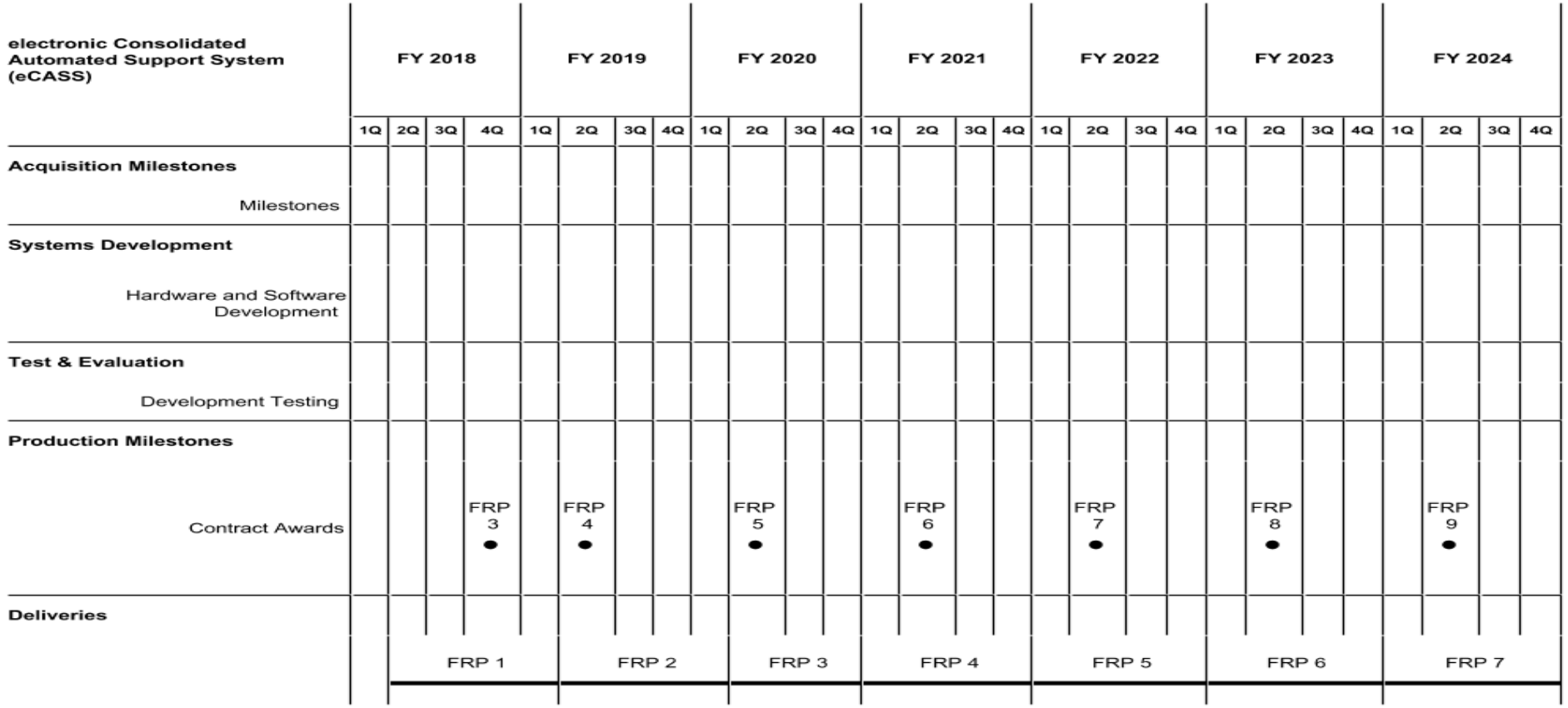
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
eCASS Travel	WR	Various : Various	0.990	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Test Tech Travel	WR	Various : Various	0.306	0.044	Nov 2017	0.048	Nov 2018	0.050	Nov 2019	-		0.050	Continuing	Continuing	Continuing
EO3 Travel	WR	Various : Various	0.000	0.049	Nov 2017	0.053	Nov 2018	0.000		-		0.000	0.000	0.102	-
EO4 Travel	WR	Various : Various	0.000	0.000		0.000		0.076	Nov 2019	-		0.076	0.000	0.076	-
Prior Year Mgmt no longer funded in the FYDP	Various	Various : Various	1.669	0.000		0.000		0.000		-		0.000	0.000	1.669	-
		Subtotal	2.965	0.093		0.101		0.126		-		0.126	Continuing	Continuing	N/A

	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	167.697	6.465		4.752		13.858		-		13.858	Continuing	Continuing	N/A

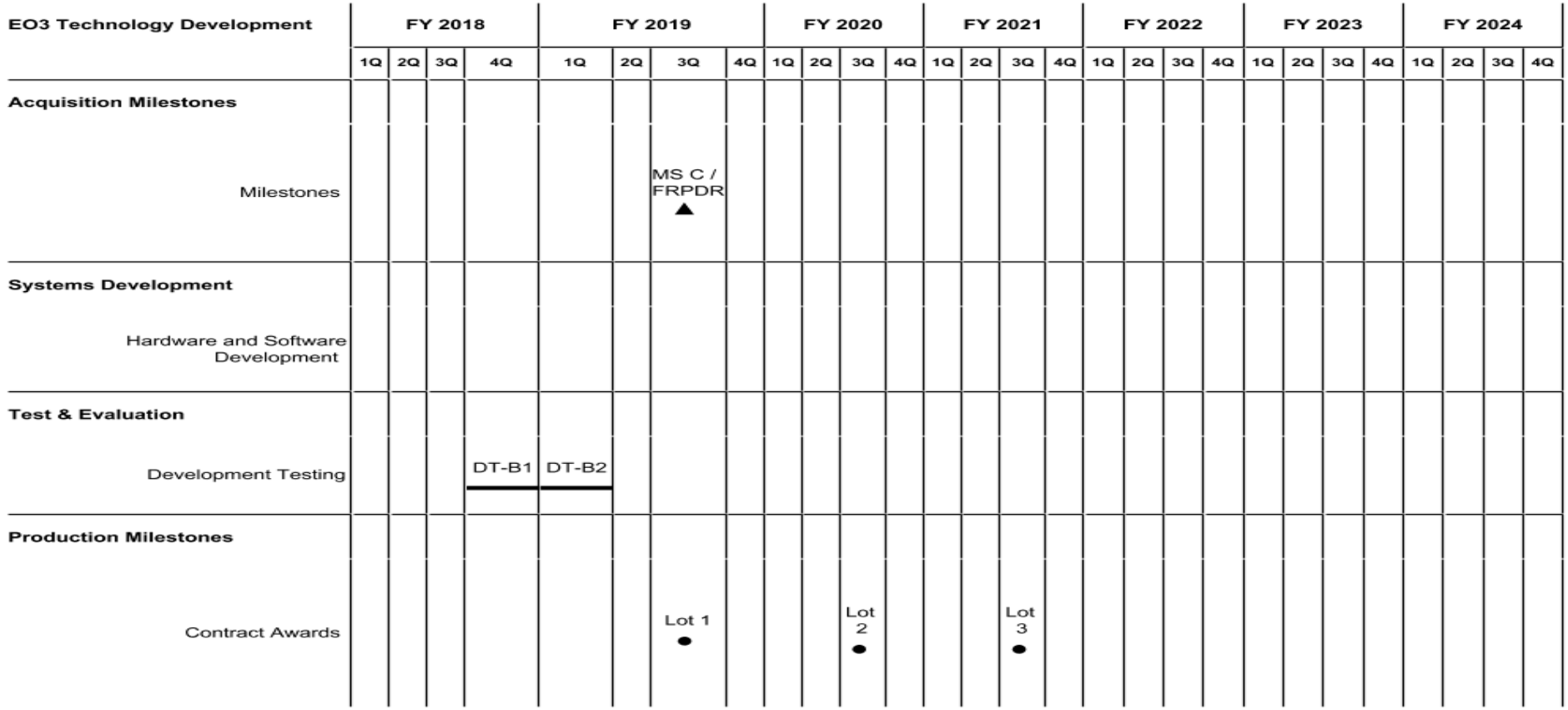
Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 0852 / *Consolidated Auto Support System*



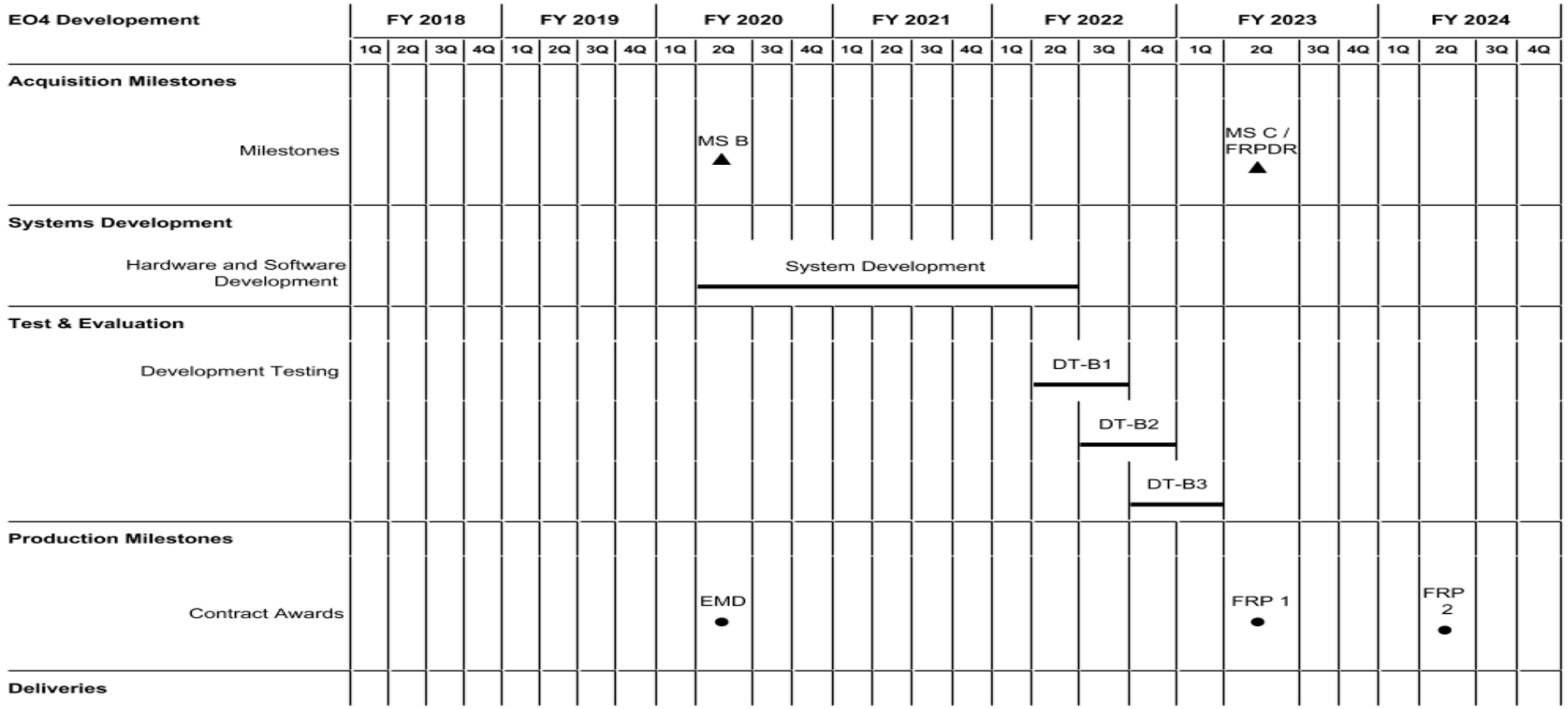
2020DON - 0205633N - 0852

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 0852 / *Consolidated Auto Support System*



2020DON - 0205633N - 0852

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 0852 / *Consolidated Auto Support System*



2020DON - 0205633N - 0852

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 0852 / *Consolidated Auto Support System*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
electronic Consolidated Automated Support System (eCASS)				
Production Milestones: Contract Awards: eCASS FRP 3-APN	4	2018	4	2018
Production Milestones: Contract Awards: eCASS FRP 4-APN	2	2019	2	2019
Production Milestones: Contract Awards: eCASS FRP 5-APN	2	2020	2	2020
Production Milestones: Contract Awards: eCASS FRP 6-APN	2	2021	2	2021
Production Milestones: Contract Awards: eCASS FRP 7-APN	2	2022	2	2022
Production Milestones: Contract Awards: eCASS FRP 8-APN	2	2023	2	2023
Production Milestones: Contract Awards: eCASS FRP 9-APN	2	2024	2	2024
Deliveries: eCASS FRP 1	2	2018	1	2019
Deliveries: eCASS FRP 2	2	2019	1	2020
Deliveries: eCASS FRP 3	2	2020	4	2020
Deliveries: eCASS FRP 4	1	2021	4	2021
Deliveries: eCASS FRP 5	1	2022	4	2022
Deliveries: eCASS FRP 6	1	2023	4	2023
Deliveries: eCASS FRP 7	1	2024	4	2024
EO3 Technology Development				
Acquisition Milestones: Milestones: Milestone C / FRPDR	3	2019	3	2019
Test & Evaluation: Development Testing: Design Verification Testing: DT-B1	1	2019	1	2019
Test & Evaluation: Development Testing: Regression Testing: DT-B2	2	2019	2	2019
Production Milestones: Contract Awards: Lot 1 - 33 Units-APN	3	2019	3	2019
Production Milestones: Contract Awards: Lot 2 - 32 Units-APN	3	2020	3	2020
Production Milestones: Contract Awards: Lot 3 - 26 Units-APN	3	2021	3	2021
EO4 Developement				

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 0852 / *Consolidated Auto Support System*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Acquisition Milestones: Milestones: Milestone B	2	2020	2	2020
Acquisition Milestones: Milestones: Milestone C / FRPDR	2	2023	2	2023
Systems Development: Hardware and Software Development: System Development	2	2020	2	2022
Test & Evaluation: Development Testing: Design Verification Testing: DT-B1	2	2022	3	2022
Test & Evaluation: Development Testing: Environmental Testing: DT-B2	3	2022	4	2022
Test & Evaluation: Development Testing: Government Testing: DT-B3	4	2022	1	2023
Production Milestones: Contract Awards: EMD	2	2020	2	2020
Production Milestones: Contract Awards: FRP1-APN	2	2023	2	2023
Production Milestones: Contract Awards: FRP2-APN	2	2024	2	2024

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205633N / *Aviation Improvements*	Project (Number/Name) 1041 / *Acft Equip Repl/Maint Prog*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
1041: *Acft Equip Repl/Maint Prog*	58.222	3.263	3.369	3.452	-	3.452	3.484	3.555	3.624	3.698	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Aircraft Equipment Reliability/Maintainability Improvement Program (AERMIP) is the only Navy program which provides Research, Development, Test & Evaluation engineering support specifically for in-service, out-of-production aircraft equipment. AERMIP increases readiness through reliability, maintainability, and safety improvements to existing systems and equipment installed in Naval aircraft. It also provides a transition vehicle to deploy Total Ownership Cost reduction initiatives through flight-test support and Fleet Test & Evaluation. It meets affordable readiness objectives by providing a cost-effective solution to obsolescence problems encountered when service lives are extended. AERMIP promotes commonality and standardization across aircraft platform lines and among the services through extension of application and use of non-developmental items. AERMIP also decreases life cycle costs through reduced operational and support costs. AERMIP facilitates the Operational, Safety and Improvement Program by applying proven low-risk solutions to current fleet problems. AERMIP also funds high-priority flight testing which is not associated with any acquisition or development program under the Flight Test General task.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Avionics and Wiring	0.268	0.416	0.440	0.000	0.440
Articles:	-	-	-	-	-
FY 2019 Plans: Test and evaluate equipment for effectiveness of wiring diagnostics and prognostics. Address avionics related reliability/maintainability issues impacting multiple aircraft platforms while continuing to investigate high value return on investment initiatives. Qualify additional material or pieces of equipment and the procedures or processes required for implementation.					
FY 2020 Base Plans: Test and evaluate equipment for effectiveness of wiring diagnostics and prognostics. Address avionics related reliability/maintainability issues impacting multiple aircraft platforms while continuing to investigate high value return on investment initiatives. Qualify additional material or pieces of equipment and the procedures or processes required for implementation.					
FY 2020 OCO Plans: N/A					
FY 2019 to FY 2020 Increase/Decrease Statement:					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1041 / *Acft Equip Repl/Maint Prog*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
No significant change from FY 2019 to FY 2020					
Title: Air Vehicle	2.322	2.040	2.069	0.000	2.069
Articles:	-	-	-	-	-
FY 2019 Plans: Based on advancement in technology, test and qualify new materials or equipment and the procedures/process required for their implementation to improve operational reliability, while containing cost growth. Continue to test and qualify improved corrosion preventative compounds. Address subsystem related reliability/maintainability issues impacting multiple aircraft platforms while continuing to investigate high value return on investment initiatives. Maintain efforts to qualify improved methods of structural component repair.					
FY 2020 Base Plans: Based on advancement in technology, test and qualify new materials or equipment and the procedures/process required for their implementation to improve operational reliability, while containing cost growth. Continue to test and qualify improved corrosion preventative compounds. Address subsystem related reliability/maintainability issues impacting multiple aircraft platforms while continuing to investigate high value return on investment initiatives. Maintain efforts to qualify improved methods of structural component repair.					
FY 2020 OCO Plans: N/A					
FY 2019 to FY 2020 Increase/Decrease Statement: No significant change from FY 2019 to FY 2020					
Title: Systems Engineering Revitalization	0.673	0.913	0.943	0.000	0.943
Articles:	-	-	-	-	-
FY 2019 Plans: Continue the transition to model based system engineering methodology. Continue to develop and establish infrastructure and tools for an Integrated Modeling Environment. Establish processes and procedures for developing and extending systems models. Develop standard model libraries and stereotypes for NAVAIR use. Continue research in relevant technical areas.					
FY 2020 Base Plans: Continue the transition to model based system engineering methodology. Continue to develop and establish					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205633N / *Aviation Improvements*	Project (Number/Name) 1041 / *Acft Equip Repl/Maint Prog*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
infrastructure and tools for an Integrated Modeling Environment. Establish processes and procedures for developing and extending systems models. Develop standard model libraries and stereotypes for NAVAIR use. Continue research in relevant technical areas. ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** No significant change from FY 2019 to FY 2020					
Accomplishments/Planned Programs Subtotals	3.263	3.369	3.452	0.000	3.452

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

This is a non-ACAT program. Procurement strategy is determined by market survey and cooperative opportunities.

E. Performance Metrics

The Aircraft Equipment Reliability/Maintainability Improvement Program (AERMIP) program will, at a minimum, fund 8 to 15 projects a year that investigate and evaluate reliability and maintainability improvements to in-service, out-of-production aircraft equipment. AERMIP projects will have a greater than 75% success rate of insertion into Department of the Navy warfighting systems or support infrastructure.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205633N / *Aviation Improvements*	Project (Number/Name) 1041 / *Acft Equip Repl/Maint Prog*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Sys Eng - Avionics/Wiring	WR	NAWCAD : Patuxent River, MD	9.074	0.267	Oct 2017	0.276	Oct 2018	0.270	Oct 2019	-		0.270	Continuing	Continuing	Continuing
Sys Eng - Avionics/Wiring	C/FFP	Various : Various	2.755	0.055	Jan 2018	0.060	Jan 2019	0.080	Jan 2020	-		0.080	0.000	2.950	2.950
Sys Eng - Avionics/Wiring	WR	FRC-E : Cherry Point, NC	0.110	0.010	Nov 2017	0.010	Nov 2018	0.020	Nov 2019	-		0.020	Continuing	Continuing	Continuing
Sys Eng - Avionics/Wiring	WR	FRC-SE : Jacksonville, FL	0.010	0.010	Nov 2017	0.010	Nov 2018	0.010	Nov 2019	-		0.010	Continuing	Continuing	Continuing
Sys Eng - Avionics/Wiring	WR	FRC-SW : San Diego, CA	0.010	0.010	Nov 2017	0.010	Nov 2018	0.010	Nov 2019	-		0.010	Continuing	Continuing	Continuing
Sys Eng - Air Vehicle	WR	NAWCAD : Patuxent River, MD	11.757	1.169	Oct 2017	0.245	Nov 2018	1.119	Nov 2019	-		1.119	Continuing	Continuing	Continuing
Sys Eng - Air Vehicle	WR	FRC-SW : San Diego, CA	2.381	0.025	Nov 2017	0.175	Nov 2018	0.300	Nov 2019	-		0.300	Continuing	Continuing	Continuing
Sys Eng - Air Vehicle	WR	FRC-E : Cherry Point, NC	2.101	0.025	Nov 2017	0.060	Nov 2018	0.150	Nov 2019	-		0.150	Continuing	Continuing	Continuing
Sys Eng - Air Vehicle	WR	FRC-SE : Jacksonville, FL	1.216	0.020	Nov 2017	0.020	Nov 2018	0.100	Nov 2019	-		0.100	Continuing	Continuing	Continuing
Sys Eng - Air Vehicle	C/FFP	Various : Various	0.962	0.800	Jan 2018	1.390	Jan 2019	0.250	Dec 2019	-		0.250	0.000	3.402	3.402
Sys Eng - Air Vehicle	C/CPFF	Innovative Technology, Inc. : Santa Barbara, CA	0.100	0.000		0.000		0.000		-		0.000	0.000	0.100	0.100
Sys Eng - SE Revitalization	WR	NAWCAD : Patuxent River, MD	0.997	0.018	Nov 2017	0.006	Dec 2018	0.019	Dec 2019	-		0.019	Continuing	Continuing	Continuing
Sys Eng - SE Revitalization	C/FFP	Engility Corp. : Chantilly, VA	5.027	0.325	Jan 2018	0.232	May 2019	0.234	Feb 2020	-		0.234	0.000	5.818	5.818
Sys Eng - SE Revitalization	C/CPFF	Stevens Inst of Technology : Hoboken, NJ	2.270	0.329	Dec 2017	0.675	Jan 2019	0.690	Feb 2020	-		0.690	0.000	3.964	3.964
Prior Year Sys Eng NAE/ Prod Dev no longer funded in the FYDP	Various	Various : Various	2.713	0.000		0.000		0.000		-		0.000	0.000	2.713	-
		Subtotal	41.483	3.063		3.169		3.252		-		3.252	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205633N / *Aviation Improvements*	Project (Number/Name) 1041 / *Acft Equip Repl/Maint Prog*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Support cost no longer funded in the FYDP	Various	Various : Various	12.480	0.000		0.000		0.000		-		0.000	0.000	12.480	-
		Subtotal	12.480	0.000		0.000		0.000		-		0.000	0.000	12.480	N/A

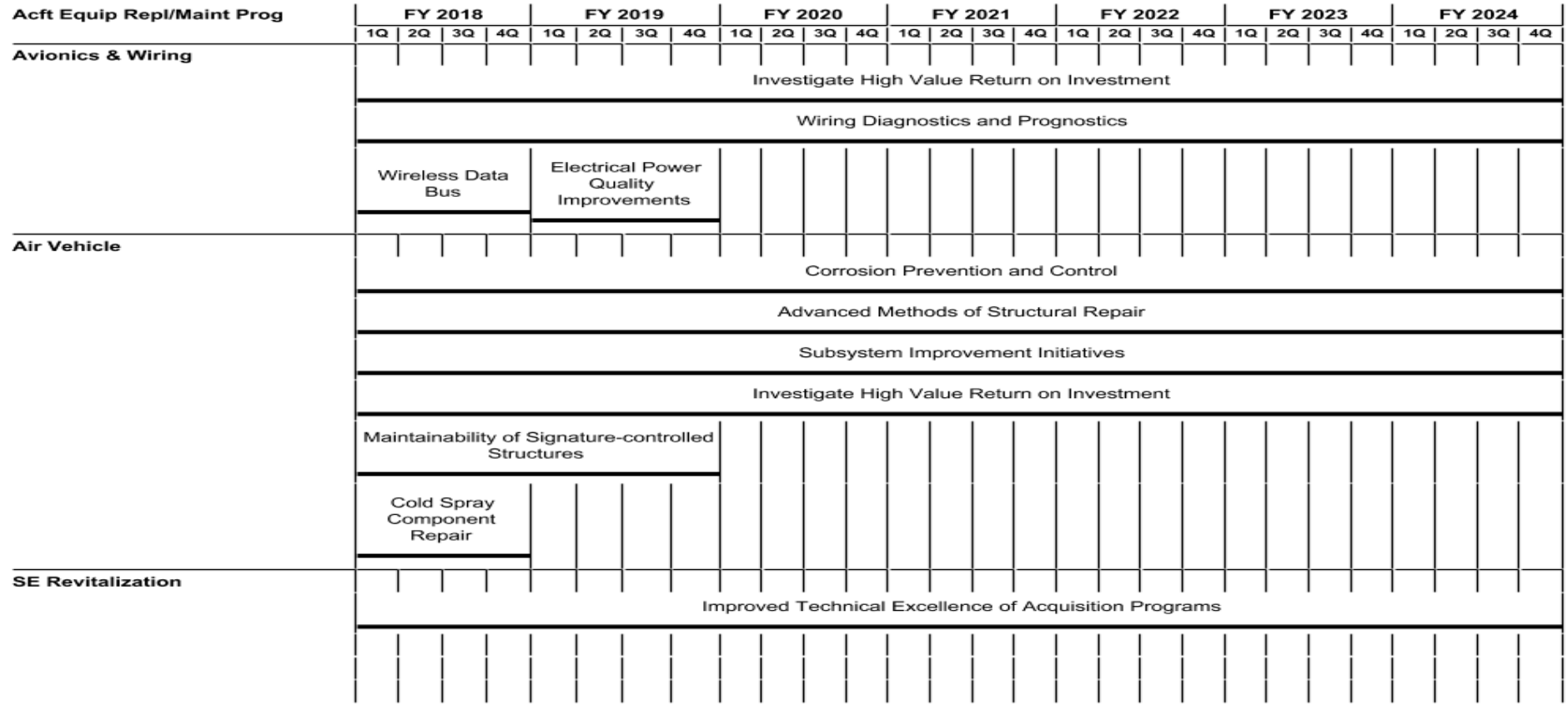
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	WR	NAWCAD : Patuxent River, MD	2.288	0.200	Oct 2017	0.200	Oct 2018	0.200	Oct 2019	-		0.200	Continuing	Continuing	Continuing
Prior Year Mgmt cost no longer funded in the FYDP	Various	Various : Various	1.971	0.000		0.000		0.000		-		0.000	0.000	1.971	-
		Subtotal	4.259	0.200		0.200		0.200		-		0.200	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	58.222	3.263		3.369		3.452		-		3.452	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1041 / *Acft Equip Repl/Maint Prog*



2020DON - 0205633N - 1041

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1041 / *Acft Equip Repl/Maint Prog*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Acft Equip Repl/Maint Prog				
Avionics & Wiring: Investigate High Value Return on Avionics & Wiring Investment	1	2018	4	2024
Avionics & Wiring: Wiring Diagnostics and Prognostics	1	2018	4	2024
Avionics & Wiring: Wireless Data Bus	1	2018	4	2018
Avionics & Wiring: Electrical Power Quality Improvements	1	2019	4	2019
Air Vehicle: Corrosion Prevention and Control	1	2018	4	2024
Air Vehicle: Advanced Methods of Structural Repair	1	2018	4	2024
Air Vehicle: Subsystem Improvement Initiatives	1	2018	4	2024
Air Vehicle: Investigate High Value Return on Air Vehicle Investment	1	2018	4	2024
Air Vehicle: Maintainability of Signature-controlled Structures	1	2018	4	2019
Air Vehicle: Cold Spray Component Repair	1	2018	4	2018
SE Revitalization: Improved Technical Excellence of Acquisition Programs	1	2018	4	2024

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205633N / *Aviation Improvements*	Project (Number/Name) 1355 / *Propulsion and Power Component Improvement Program*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
1355: *Propulsion and Power Component Improvement Program*	1,143.526	91.528	105.223	99.372	-	99.372	112.398	110.823	108.785	110.953	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

The FY 2020 funding request was reduced by $9 million to account for the availability of prior year execution balances.

A. Mission Description and Budget Item Justification

The Propulsion and Power (P&P) Component Improvement Program (CIP) provides the only source of critical design and development engineering support to resolve safety, reliability and maintainability deficiencies of in-service Navy and Marine Corps aircraft propulsion systems. The highest priority issues P&P CIP addresses concern safety-of-flight deficiencies, which account for approximately 80% of P&P CIP efforts. The program also corrects service-revealed deficiencies, improves Operational Readiness and Reliability and Maintainability, and reduces platform Life Cycle Cost. Budgets are allocated across platform-specific teams and multi-platform product support teams based upon long term strategies to achieve safety and affordable readiness goals; the R-3 exhibit details annual portions of those long-term strategies. P&P CIP tasks have reduced the rate of in-flight aborts, safety incidents, non-mission capable rates, scheduled and unscheduled engine removals, maintenance work hours, and overall cost of ownership. This is accomplished through the maintenance and validation of specification performance, testing to qualify engineering changes, verifying life limits, and improving the inherent reliability of the propulsion and power systems as an integral part of Reliability Centered Maintenance initiatives. Historically, the missions, tactics, and environmental exposure of military aircraft systems change to meet new threats or operational demands, and often result in unforeseen problems, which if not corrected, can cause critical safety/readiness degradation, such as those experienced during OPERATIONS DESERT SHIELD/DESERT STORM, ENDURING FREEDOM, and IRAQI FREEDOM due to sand erosion. In addition, new problems arise through actual fleet deployment and usage of the aircraft. System development programs, while geared to resolve as many problems as possible before deployment, cannot duplicate actual operations or account for the vast array of environmental and usage variables, particularly when aircraft missions vary from those that the aircraft was designed to perform. Therefore, it has been found that P&P CIP can provide an immediate engineering response to these flight-critical problems and accelerated engine testing can avoid potential problems. P&P CIP starts after development and Navy acceptance of the first production article and addresses usage and life problems not covered by warranties. P&P CIP addresses engines, transmissions, propellers, starters, auxiliary power units, electrical generating systems, aircraft wiring, and fuel and lubricant systems. These efforts continue over the system's life, gradually decreasing to a minimum level sufficient to maintain the reliability, and decrease the operating costs, of older inventory. P&P CIP is a highly leveraged and cooperative tri-service program with Foreign Military Sales participation.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: P3, E2, C2, C130 (T56)	11.000	10.300	10.200	0.000	10.200
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1355 / *Propulsion and Power Component Improvement Program*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
FY 2019 Plans: Continue joint projects with the USAF on the T56 Series III engine on the analysis, design and qualification of improvements to the front turbine bearing cage, front turbine bearing support, front bearing chamber labyrinth seal, engine parts and propeller brake lining obsolescence and repair engineering development. Execute engine Accelerated Mission Test. For the T56 Series IV engine perform analysis, design and qualification work related to engine performance standardization, rub tolerant turbine blades, fuel nozzle anti-coke coating, step up gearbox oil leakage and updated software for the propulsion control and monitoring unit. Develop, design and test improvements to system components including compressors, combustors, turbines, controls, diagnostics, static structures, gearboxes, bearings, seals, drives, fuels, lubricants, auxiliary power, electrical power systems. ***FY 2020 Base Plans:*** Continue joint projects with the USAF on the T56 Series III engine on the analysis, design and qualification of improvements to address Service Revealed Deficiencies and preform repair engineering development to system components including bearings, seals and drives, the compressor, combustor, turbine, control system, static structures, and gearboxes. For the T56 Series IV engine perform analysis, design and qualification work related to address Service Revealed Deficiencies and safety, readiness and cost drivers on system components and execute projects on engine performance standardization, rub tolerant turbine blades, fuel nozzle anti-coke coating, step up gearbox oil leakage and updated software for the propulsion control and monitoring unit. Develop, design and test improvements to system components including the compressor, combustor, turbine, controls and diagnostic systems, static structures, gearboxes, bearings, seals, drives, engine fuel and lubrication systems and auxiliary power, and electrical power systems. ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** No significant change from FY 2019 to FY 2020					
Title: E2/C2/C130/P3 (Props)	1.500	3.600	3.500	0.000	3.500
Articles:	-	-	-	-	-
FY 2019 Plans: Develop, design and test 54H60 and NP2000 Propeller system improvements including control, pitch actuation, hydraulics, blades, pumps, housings, seals and static structure projects to improve safety, reliability, maintainability, affordability, durability and Readiness including efforts on repair and reliability engineering,					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1355 / *Propulsion and Power Component Improvement Program*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
universal closed loop bench test system, database development and management. For the NP2000 perform analysis, design and testing on the modern pump housing and onboard propeller balance monitoring system. ***FY 2020 Base Plans:*** Perform engineering analysis, design and test efforts to address Service Revealed Deficiencies and safety, readiness and cost drivers on system components for the 54H60 and NP2000 propeller systems. Develop, design and test 54H60 and NP2000 Propeller system improvements to the control, pitch actuation and hydraulic systems, blades, pumps, housings, seals and static structure to improve safety, reliability, maintainability, affordability, durability and Readiness. Execute engineering efforts on repair and reliability engineering, universal closed loop bench test system, fleet metric database development and management and perform analysis, design and testing on the NP200 modern pump housing and onboard propeller balance monitoring systems. ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** No significant change from FY 2019 to FY 2020					
Title: SH-60B/F, HH-60H, MH-60R/S (T700)	5.678	5.700	5.200	0.000	5.200
Articles:	-	-	-	-	-
FY 2019 Plans: Develop, design and test improvements to system components including compressors, combustors, turbines, controls, diagnostics, static structures, gearboxes, bearings, seals, drives, fuels, lubricants, auxiliary power, electrical power systems. Perform analysis, design and testing on projects to improve the compression system and static structures tolerance to sand ingestion, engine performance modeling and engine build optimization. Perform analysis, modeling design and testing on projects related to air vehicle drive system damage tolerance and reparability. Conduct lithium battery qualification testing. Perform engine testing to develop and qualify design improvements. ***FY 2020 Base Plans:*** Perform engineering analysis, design and test efforts to address Service Revealed Deficiencies and safety, readiness and cost drivers on the T700 propulsion and power system components including the compressor, combustor, turbines, control and diagnostic systems, static structures, gearboxes, bearings, seals, drives, engine fuel and lubrication systems, auxiliary power and electrical power systems, and main and tail rotor					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1355 / *Propulsion and Power Component Improvement Program*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
drives systems. Perform analysis, design and testing on projects to improve the compression system and static structures tolerance to sand ingestion, update engine performance modeling and engine build optimization. Perform analysis, modeling design and testing on projects related to air vehicle drive system damage tolerance and reparability. Conduct lithium battery qualification testing. Perform engine and component testing to develop and qualify design improvements. ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease requirement for engineering support of the T700-GE-401/401C Engine and Propulsion System.					
Title: H-1 (T400/T700) ***Articles:*** ***FY 2019 Plans:*** N/A ***FY 2020 Base Plans:*** Perform engineering analysis, design and test efforts to address Service Revealed Deficiencies and safety readiness and cost drivers on the T700 propulsion and power system components including the compressor, combustor, turbines, controls, diagnostics, static structures, gearboxes, bearings, seals, drives, fuel and lubrication systems, auxiliary power, electrical power systems and main and tail rotor drives systems. ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase provides funding for service revealed deficiencies.	0.431 -	0.000 -	0.500 -	0.000 -	0.500 -
Title: AV-8B (F402) ***Articles:*** ***FY 2019 Plans:*** Continue working on risk management plan of supplying critical parts and refinement of life limit determinations and identification of critical parts constraints. Perform analysis, design and testing related to improvements to system components including compressors, combustors, turbines, controls, diagnostics, static structures, gearboxes, bearings, seals, drives, fuels, lubricants, auxiliary power, electrical power systems, Hydro	3.849 -	3.430 -	3.450 -	0.000 -	3.450 -

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1355 / *Propulsion and Power Component Improvement Program*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
mechanical unit PMA gear, FOD detection system, brake seal redesign to improve safety, reliability, maintainability, affordability, durability and Readiness. ***FY 2020 Base Plans:*** Perform engineering analysis, design and test efforts to address Service Revealed Deficiencies and safety readiness and cost drivers on the F402 propulsion and power system components including the fan, compressor, combustor, turbines, control and diagnostic systems, static structures, gearboxes, bearings, seals, drives, engine fuel and lubrication systems, auxiliary power, electrical power and FOD detection systems. Continue working on risk management plan of supplying critical parts and refinement of life limit determinations and identification of critical parts constraints to improve safety, reliability, maintainability, affordability, durability and Readiness. ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** No significant change from FY 2019 to FY 2020					
Title: H-53/H-46/H-3 (T58/T64)	4.530	3.800	3.800	0.000	3.800
Articles:	-	-	-	-	-
FY 2019 Plans: Perform analysis, design and testing related to projects to develop inspection and repair criteria and optimized depot-level engine build specification practices and procedures, data reduction program implementation, compressor case coating improvements and remote idle cable interface system. Update engine mission usage and hardware life management plans. Evaluate engine fuel nozzle anti-coking coatings. Develop, design and test improvements to system components including compressors, combustors, turbines, controls, diagnostics, static structures, gearboxes, bearings, seals, drives, fuels, lubricants, auxiliary power, electrical power systems to improve safety, reliability, maintainability, affordability, durability and Readiness. ***FY 2020 Base Plans:*** Perform engineering analysis, design and test efforts to address Service Revealed Deficiencies and Safety Readiness. Analyze cost drivers on the T64 propulsion and power system components including the compressor, combustor, turbines, control and diagnostic systems, static structures, gearboxes, bearings, seals, drives, fuel and lubrication systems, auxiliary power and electrical power systems and air vehicle drive system components. Improve safety, reliability, maintainability, affordability, durability and Readiness.					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1355 / *Propulsion and Power Component Improvement Program*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Perform analysis, design and testing to develop inspection and repair criteria, optimized depot-level engine build specification procedures, and data reduction program implementation. Update engine mission usage and hardware life management plans. ***FY 2020 OCO Plans:*** N/A					
Title: F-18 C/D/E/F (F414/F404)	16.926	19.758	19.750	0.000	19.750
Articles:	-	-	-	-	-
FY 2019 Plans: Perform analysis, design and testing related to F404 electrical control assembly obsolescence recovery, improved engine vibration measurement system, and evaluation of fan blade dovetail coatings to improve durability. Perform rotor spin testing of engine fan to verify surface treatment life benefit. Perform analysis, design and testing related to application of data analytics tools to identify engine removal driver causes, F414 engine main fuel manifold life extension, high-pressure turbine blades redesign, oil system improvements, engine VEN hydro-mechanical failure events, composite outer bypass duct delamination, compressor discharge pressure anti-ice valve VEN position transmitter system, engine build optimization and FADEC obsolescence. Perform engine accelerated simulated mission endurance testing. Develop, design and test improvements to system components including compressors, combustors, turbines, controls, diagnostics, static structures, gearboxes, bearings, seals, drives, fuels, lubricants, auxiliary power, electrical power, augmentor and exhaust systems to improve safety, reliability, maintainability, affordability, durability and Readiness.					
FY 2020 Base Plans: Perform engineering analysis, design and test efforts to address Service Revealed Deficiencies and safety readiness and cost drivers on propulsion and power system components for the F414 and F404 turbofan engines including the fan, compressor, combustor, turbines, control and diagnostic systems, static structures, gearboxes, bearings, seals, drives, fuel and lubrication systems, auxiliary power and electrical power systems, augmenter and exhaust systems to improve reliability, maintainability, affordability, durability. Perform engine and component test programs including rotor spin tests and accelerated simulated mission endurance testing.					
FY 2020 OCO Plans: N/A					
FY 2019 to FY 2020 Increase/Decrease Statement:					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1355 / *Propulsion and Power Component Improvement Program*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
No significant change from FY 2019 to FY 2020					
Title: T-45 (F405)	3.021	2.446	2.450	0.000	2.450
Articles:	-	-	-	-	-
FY 2019 Plans: Perform analysis, design and testing on projects to verify improved blade dovetail coating, engine cyclic usage assessment to update rotating engine part lives and mitigation approaches to address propulsion and power system component obsolescence issues and engine performance degradation. Develop, design and test improvements to system components including compressors, combustors, turbines, controls, diagnostics, static structures, gearboxes, bearings, seals, drives, fuels, lubricants, auxiliary power, electrical power systems to improve safety, reliability, maintainability, affordability, durability and Readiness.					
FY 2020 Base Plans: Perform engineering analysis, design and test efforts to address Service Revealed Deficiencies and safety readiness and cost drivers on the F405 propulsion and power system components including fan, compressor, combustor, turbines, control and diagnostic systems, static structures, gearboxes, bearings, seals, drives, fuel and lubrication systems, auxiliary power and electrical power systems to improve safety, reliability, maintainability, affordability, durability and Readiness. Perform analysis, design and testing on projects to update rotating engine part lives and mitigation approaches to address propulsion and power system component obsolescence issues and engine performance degradation.					
FY 2020 OCO Plans: N/A					
FY 2019 to FY 2020 Increase/Decrease Statement: No significant change from FY 2019 to FY 2020					
Title: V-22 Propulsion	4.236	5.200	6.100	0.000	6.100
Articles:	-	-	-	-	-
FY 2019 Plans: Perform analysis, design and testing on projects to mitigate rapid power loss and engine surge, update engine part lives and management plan with updated mission mix, prop rotor input quill clutch system redesign and improved power assurance check accuracy to improve mission planning. Develop, design and test improvements to system components including compressors, combustors, turbines, controls, diagnostics, static structures, gearboxes, bearings, seals, drives, fuels, lubricants, auxiliary power, electrical power systems to					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1355 / *Propulsion and Power Component Improvement Program*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
improve safety, reliability, maintainability, affordability, durability and Readiness. Perform engine analytical condition inspections, air vehicle drive system damage tolerance assessment and turbine rig and full scale engine testing. ***FY 2020 Base Plans:*** Perform engineering analysis, design and test efforts to address Service Revealed Deficiencies and Readiness and cost drivers on the AE1107C propulsion and power system components the compressor, combustor, turbines, control and diagnostic systems, static structures, gearboxes, bearings, seals, drives, fuel and lubrication systems, auxiliary power and electrical power systems and prop rotor drive systems to improve safety, reliability, maintainability, affordability, durability and Readiness. Perform analysis, design and testing on projects to mitigate rapid power loss and engine surge, and improve engine durability and operability, update engine part lives and management plan with updated mission mix, execute prop rotor input quill clutch system redesign and improve power assurance check accuracy to improve mission planning. Perform engine analytical condition inspections, air vehicle drive system damage tolerance assessment and turbine rig and full scale engine testing. ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase in funding supports RDT&E uninstalled engine testing to mitigate fleet safety risks.					
Title: Adversary (J85) (F100)	2.660	2.200	2.240	0.000	2.240
Articles:	-	-	-	-	-
FY 2019 Plans: Continue joint projects with the USAF to perform analysis, design and testing on projects to validate the life assessment of J85 critical rotating compressor hardware, address parts obsolescence issues, evaluate hardware inspection data, and perform stress modeling to update life limits, implement upgraded engine performance monitoring system, and implement improved turbine thermocouple probe and harness redesign. Develop, design and test improvements to system components including compressors, combustors, turbines, controls, diagnostics, static structures, gearboxes, bearings, seals, drives, fuels, lubricants, auxiliary power, electrical power, augmenter and exhaust systems to improve safety, reliability, maintainability, affordability, durability and Readiness. ***FY 2020 Base Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1355 / *Propulsion and Power Component Improvement Program*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Perform engineering analysis, design and test efforts to address Service Revealed Deficiencies and Readiness and cost drivers on the J85 and F100 propulsion and power system components including the fan, compressor, combustor, turbines, control and diagnostic systems, static structures, gearboxes, bearings, seals, drives, fuel and lubrication systems, auxiliary power and electrical power systems, augmenter and exhaust systems to improve safety, reliability, maintainability, affordability, durability. Continue joint projects with the USAF to perform analysis, design and testing on projects to validate the life assessment of J85 critical rotating hardware, address parts obsolescence issues, evaluate hardware inspection data, and perform stress modeling to update life limits, implement upgraded engine performance monitoring system, and implement improved turbine thermocouple probe and harness redesign. ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** No significant change from FY 2019 to FY 2020					
Title: Joint Strike Fighter (F135 Engine)	30.388	33.526	24.524	0.000	24.524
Articles:	-	-	-	-	-
FY 2019 Plans: Continue to work with Joint Program Office, USAF, international partners, and foreign military sales customers to develop engineering project descriptions to resolve service revealed deficiencies. Develop, design and test improvements to system components including compressors, combustors, turbines, controls, diagnostics, static structures, gearboxes, bearings, seals, drives, fuels, lubricants, auxiliary power, electrical power, augmenter, exhaust and STOVL Lift system to improve safety, reliability, maintainability, affordability, durability and Readiness. Perform engine testing and STOVL propulsion system testing ant government and contractor test facilities. ***FY 2020 Base Plans:*** Perform engineering analysis, design and test efforts to address Service Revealed Deficiencies and safety readiness and cost and reliability drivers on propulsion and power system components of the F135 engine and STOVL lift system in accordance with F-35 Program Instruction 1540.05 F135 CIP Management Guide for the F135 Propulsion System Component Improvement Program. Develop, design and test improvements to system components including the fan, compressor, combustor, turbines, control and diagnostic systems, static structures, gearboxes, bearings, seals, drives, fuel and lubrication systems, auxiliary power and electrical power systems, augmenter, exhaust and STOVL Lift system to improve safety, reliability, maintainability, affordability,					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1355 / *Propulsion and Power Component Improvement Program*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
durability and Readiness. Perform engine testing and STOVL propulsion system testing at government and contractor test facilities. ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** The FY 2020 funding request was reduced to account for the availability of prior year execution balances.					
Title: P-8A (CFM56 Engine)	0.500	0.600	0.600	0.000	0.600
Articles:	-	-	-	-	-
FY 2019 Plans: Develop, design and test improvements to system components including compressors, combustors, turbines, controls, diagnostics, static structures, gearboxes, bearings, seals, drives, fuels, lubricants, auxiliary power, electrical power systems to improve safety, reliability, maintainability, affordability, durability and Readiness. ***FY 2020 Base Plans:*** Perform engineering analysis, design and test efforts to address Service Revealed Deficiencies and safety readiness and cost and reliability drivers on propulsion and power system components of the CFM56 system including the fan, compressor, combustors, turbines, control and diagnostic systems, static structures, gearboxes, bearings, seals, drives, fuel and lubrication systems, auxiliary power and electrical power systems to improve safety, reliability, maintainability, affordability, and durability. ***FY 2020 OCO Plans:*** N/A					
Title: H-53K Propulsion (T408)	0.000	7.700	7.850	0.000	7.850
Articles:	-	-	-	-	-
FY 2019 Plans: Develop, design and test improvements to Propulsion & Power system components including compressors, combustors, turbines, controls, diagnostics, static structures, gearboxes, bearings, seals, drives, fuels, lubricants, auxiliary power, electrical power systems to improve safety, reliability, maintainability, affordability, durability and Readiness. Acquire an engine test vehicle to qualify design changes developed under the component improvement program. ***FY 2020 Base Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1355 / *Propulsion and Power Component Improvement Program*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Perform engineering analysis, design and test efforts to address identified deficiencies and safety readiness and cost and reliability drivers on the T408 propulsion and power system components including the compressor, combustor, turbines, control and diagnostic systems, static structures, gearboxes, bearings, seals, drives, fuel and lubrication systems, auxiliary power and electrical power systems and main and tail rotor drive systems to improve safety, reliability, maintainability, affordability, durability. Acquire an engine test vehicle to qualify design changes developed under the component improvement program and perform component level and uninstalled engine testing. ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** No significant change FY 2019 to FY 2020					
Title: Multi-Platform Product Support Teams	6.809	6.963	7.158	0.000	7.158
Articles:	-	-	-	-	-
FY 2019 Plans: Continue projects to provide common support to multiple platforms in the areas of improved drive systems, secondary power, and mechanical systems; improve tools for performance analysis, modeling and simulation, diagnostics, engine reliability assessment, and structural integrity; improve products and processes for fuels, lubricants, and refueling equipment; and improve electrical system product support, wiring, and battery systems. Includes funding for Government Furnished Equipment fuel provided in support of engine developmental and qualification testing. Modernize RDTE test facilities as required to qualify component design improvements. ***FY 2020 Base Plans:*** Continue projects to provide support to multiple platforms to analyze fleet component removal driver and reliability metrics to focus CIP investments to maximize return on investment, improve performance analysis, structural integrity modeling and simulation tools, and developmental test and evaluation facilities and procedures for propulsion and power system including engines, drive systems, fuels and lubricants, auxiliary power and electrical power systems. Includes funding for Government Furnished Fuel for research and development test and evaluation programs to evaluate and qualify component design improvements to improve safety, readiness, reliability, maintainability and durability. ***FY 2020 OCO Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1355 / *Propulsion and Power Component Improvement Program*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** No significant change from FY 2019 to FY 2020.					
Title: MQ-4C (AE3007 Engine) ***Articles:*** ***FY 2019 Plans:*** N/A ***FY 2020 Base Plans:*** Perform engineering analysis, design and test efforts to address Service Revealed Deficiencies and safety readiness and cost and reliability drivers on the AE3007 propulsion and power system components including the fan, compressor, combustor, turbines, control and diagnostic systems, static structures, gearboxes, bearings, seals, drives, fuel and lubrication systems, auxiliary power and electrical power systems to improve safety, reliability, maintainability, affordability, and durability. ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase supports startup of CIP projects for the AE3007 turbofan propulsion and power system in the Triton Air Vehicle.	0.000 -	0.000 -	1.400 -	0.000 -	1.400 -
Title: UAV Programs (Various) ***Articles:*** ***FY 2019 Plans:*** N/A ***FY 2020 Base Plans:*** Perform engineering analysis, design and test efforts to address Service Revealed Deficiencies and safety readiness and cost and reliability drivers on the propulsion and power systems for small and medium size Unmanned Air Vehicles (UAVs) including the RQ-21 Small Tactical Unmanned Aerial System (STUAS). Develop, design and test improvements to system components including the engine components, control and diagnostic systems, static structures, bearings, seals, drives, fuel and lubrication systems, ignition and electrical	0.000 -	0.000 -	0.650 -	0.000 -	0.650 -

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1355 / *Propulsion and Power Component Improvement Program*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
power systems, exhaust system and the propeller to improve safety, reliability, maintainability, affordability, and durability. ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase funding for projects in the propulsion and power system in the RQ-21 Blackjack Air Vehicle.					
Accomplishments/Planned Programs Subtotals	91.528	105.223	99.372	0.000	99.372

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

This is a NON-ACAT program. Procurement strategy is determined by market survey and cooperative opportunities.

E. Performance Metrics

The Propulsion and Power Component (P&P) Improvement Program (CIP) will support engineering design and development efforts for 100% of the safety of flight issues on in-service propulsion and power systems covered under the Program. Over the past two years, this equated to more than 200 individual Engineering Project Descriptions (EPDs). Over the past two years P&P CIP also addressed reliability and maintainability deficiencies equating to another 100 individual EPDs. These projects have been primary contributors to significant increases in aggregate engine safety and reliability across the USN/ USMC fleet. From 2009 to 2017 P&P CIP has been a primary contributor to a 35% Reduction in propulsion and power system related Class A mishaps, an 85% increase in aggregate fleet engine reliability as measured by engine Time-On Wing (TOW) and the resultant cumulative engine repair cost avoidance of $4.2B over that time span.

Program execution will be actively managed on 100% of the projects via contractor earned value data and overall obligation and expenditure rates as reflected in the Navy Enterprise Resource Planning system. Program obligation and expenditure performance will be analyzed and measured against OSD/FMB benchmarks on a monthly basis.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205633N / *Aviation Improvements*	Project (Number/Name) 1355 / *Propulsion and Power Component Improvement Program*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Sys Eng T56 Engine Program	WR	NAWCAD : Patuxent River, MD	42.967	4.153	Nov 2017	4.100	Oct 2018	4.100	Oct 2019	-		4.100	Continuing	Continuing	Continuing
Sys Eng T56 Engine Program	SS/CPFF	Rolls Royce : Indianapolis, IN	56.368	5.973	Jan 2018	5.500	Jan 2019	5.400	Jan 2020	-		5.400	0.000	73.241	73.241
Sys Eng T56 Engine Program	WR	FRC-E : Cherry Point, NC	2.625	0.810	Nov 2017	0.500	Oct 2018	0.500	Oct 2019	-		0.500	Continuing	Continuing	Continuing
Sys Eng T56 Engine Program	WR	FRC-SE : Jacksonville, FL	0.885	0.011	Nov 2017	0.100	Oct 2018	0.100	Oct 2019	-		0.100	Continuing	Continuing	Continuing
Sys Eng T56 Engine Program	WR	FRC-SW : North Island, CA	0.125	0.053	Nov 2017	0.100	Oct 2018	0.100	Oct 2019	-		0.100	Continuing	Continuing	Continuing
Sys Eng Props Program	SS/CPFF	Hamilton Sundstrand : Windsor Locks, CT	28.433	1.500	Jan 2018	3.600	Jan 2019	3.500	Jan 2020	-		3.500	0.000	37.033	37.033
Sys Eng J52 Engine Program	WR	NAWCAD : Patuxent River, MD	14.429	0.000		0.000		0.000		-		0.000	0.000	14.429	-
Sys Eng J52 Engine Program	SS/CPFF	UTC Pratt & Whitney : East Hartford, CT	41.445	0.000		0.000		0.000		-		0.000	0.000	41.445	41.445
Sys Eng J52 Engine Program	WR	FRC-E : Cherry Point, NC	0.088	0.000		0.000		0.000		-		0.000	0.000	0.088	-
Sys Eng J52 Engine Program	WR	FRC-SE : Jacksonville, FL	0.425	0.000		0.000		0.000		-		0.000	0.000	0.425	-
Sys Eng T700 Engine Program	WR	NAWCAD : Patuxent River, MD	17.741	2.186	Nov 2017	2.500	Oct 2018	2.500	Oct 2019	-		2.500	Continuing	Continuing	Continuing
Sys Eng T700 Engine Program	SS/CPFF	General Electric : Lynn, MA	34.029	3.492	Jan 2018	3.200	Jan 2019	3.200	Jan 2020	-		3.200	0.000	43.921	43.921
Sys Eng T700 Engine Program	IA	Army Research Lab : Aberdeen Proving Ground, MD	0.150	0.000		0.000		0.000		-		0.000	0.000	0.150	-
Sys Eng T400 Engine Program	WR	NAWCAD : Patuxent River, MD	3.167	0.431	Nov 2017	0.000		0.000		-		0.000	0.000	3.598	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1355 / *Propulsion and Power Component Improvement Program*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Sys Eng T400 Engine Program	SS/CPFF	UTC Pratt & Whitney : East Hartford, CT	5.890	0.000		0.000		0.000		-		0.000	0.000	5.890	5.890
Sys Eng F402 Engine Program	WR	NAWCAD : Patuxent River, MD	21.114	1.693	Nov 2017	1.700	Oct 2018	1.700	Oct 2019	-		1.700	Continuing	Continuing	Continuing
Sys Eng F402 Engine Program	WR	NAWCWD : China Lake, CA	0.303	0.000		0.000		0.000		-		0.000	0.000	0.303	-
Sys Eng F402 Engine Program	WR	FRC-E : Cherry Point, NC	1.002	0.105	Nov 2017	0.130	Oct 2018	0.150	Oct 2019	-		0.150	Continuing	Continuing	Continuing
Sys Eng F402 Engine Program	MIPR	DTIC : Fort Belvoir, VA	0.028	0.000		0.000		0.000		-		0.000	0.000	0.028	-
Sys Eng F402 Engine Program	SS/CPFF	Rolls Royce : Bristol, England, UK	77.309	2.051	Jan 2018	1.600	Jan 2019	1.600	Jan 2020	-		1.600	0.000	82.560	82.560
Sys Eng F402 Engine Program	C/FFP	Hood Technology Corp : Hood River, OR	0.845	0.000		0.000		0.000		-		0.000	0.000	0.845	0.845
Sys Eng T58/T64 Engine Program	WR	NAWCAD : Patuxent River, MD	36.979	2.501	Nov 2017	2.100	Oct 2018	2.100	Oct 2019	-		2.100	Continuing	Continuing	Continuing
Sys Eng T58/T64 Engine Program	SS/CPFF	General Electric : Lynn, MA	87.771	2.029	Jan 2018	1.700	Jan 2019	1.700	Jan 2020	-		1.700	0.000	93.200	93.200
Sys Eng T58/T64 Engine Program	C/FFP	Danobat Machine Tool Co. : Humble, TX	0.149	0.000		0.000		0.000		-		0.000	0.000	0.149	0.149
Sys Eng F414/F404 Engine Program	WR	NAWCAD : Patuxent River, MD	47.675	6.009	Nov 2017	4.000	Oct 2018	4.000	Oct 2019	-		4.000	Continuing	Continuing	Continuing
Sys Eng F414/F404 Engine Program	SS/CPFF	General Electric : Lynn, MA	166.467	10.649	Jan 2018	15.508	Jan 2019	15.500	Jan 2020	-		15.500	0.000	208.124	208.124
Sys Eng F414/F404 Engine Program	WR	FRC-SE : Jacksonville, FL	0.955	0.268	Nov 2017	0.250	Nov 2018	0.250	Nov 2019	-		0.250	Continuing	Continuing	Continuing
Sys Eng F405 Engine Program	WR	NAWCAD : Patuxent River, MD	11.987	1.448	Nov 2017	1.400	Oct 2018	1.400	Oct 2019	-		1.400	Continuing	Continuing	Continuing
Sys Eng F405 Engine Program	SS/CPFF	Rolls Royce : Bristol, England, UK	37.360	1.573	Jan 2018	1.046	Jan 2019	1.050	Jan 2020	-		1.050	0.000	41.029	41.029

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1355 / *Propulsion and Power Component Improvement Program*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Sys Eng V-22 Propulsion Program	WR	NAWCAD : Patuxent River, MD	1.677	0.961	Nov 2017	1.100	Oct 2018	2.000	Oct 2019	-		2.000	Continuing	Continuing	Continuing
Sys Eng V-22 Propulsion Program	SS/FFP	Bell- Boeing : Ft. Worth, TX	7.269	1.775	Jan 2018	2.100	Jan 2019	2.100	Jan 2020	-		2.100	0.000	13.244	13.244
Sys Eng V-22 Propulsion Program	SS/CPFF	Rolls Royce : Indianapolis, IN	3.085	2.000	Jan 2018	2.000	Jan 2019	2.000	Jan 2020	-		2.000	0.000	9.085	9.085
Sys Eng V-22 Propulsion Program	C/FFP	Nat'l Center for Manuf'g Sciences : Ann Arbor, MI	0.166	0.000		0.000		0.000		-		0.000	0.000	0.166	0.166
Sys Eng V-22 Propulsion Program	C/FFP	Univ of Dayton Research Inst. : Dayton, OH	0.040	0.000		0.000		0.000		-		0.000	0.000	0.040	0.040
Sys Eng V-22 Propulsion Program	MIPR	Army Research Lab : Aberdeen Proving Ground, MD	0.299	0.000		0.000		0.000		-		0.000	0.000	0.299	-
Sys Eng V-22 Propulsion Program	C/CPFF	UTC Pratt & Whitney : East Hartford, CT	0.138	0.000		0.000		0.000		-		0.000	0.000	0.138	0.138
Sys Eng Adversary J85 Engine Program	WR	FRC-SE : Jacksonville, FL	0.083	0.000		0.100	Nov 2018	0.100	Nov 2019	-		0.100	Continuing	Continuing	Continuing
Sys Eng Adversary J85 Engine Program	WR	NAWCAD : Patuxent River, MD	3.630	1.430	Nov 2017	1.500	Oct 2018	1.500	Oct 2019	-		1.500	Continuing	Continuing	Continuing
Sys Eng Adversary J85 Engine Program	SS/CPFF	General Electric : Lynn, MA	2.426	1.230	Jan 2018	0.600	Jan 2019	0.640	Jan 2020	-		0.640	0.000	4.896	4.896
Sys Eng Adversary J85 Engine Program	C/FFP	UTC Military Engines : East Hartford, CT	0.083	0.000		0.000		0.000		-		0.000	0.000	0.083	0.083
Sys Eng JSF Engine Program	WR	NAWCAD : Patuxent River, MD	6.977	1.000	Nov 2017	1.283	Oct 2018	1.300	Oct 2019	-		1.300	Continuing	Continuing	Continuing
Sys Eng JSF Engine Program	SS/FFP	UTC Pratt & Whitney : East Hartford, CT	48.479	29.187	Jan 2018	32.243	Jan 2019	23.224	Jan 2020	-		23.224	0.000	133.133	133.133

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1355 / *Propulsion and Power Component Improvement Program*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Sys Eng JSF Engine Program	WR	FRC-E : Cherry Point, NC	0.003	0.201	Nov 2017	0.000		0.000		-		0.000	0.000	0.204	0.204
Sys Eng P-8A Engine Program	WR	NAWCAD : Patuxent River, MD	2.300	0.000		0.600	Oct 2018	0.600	Oct 2019	-		0.600	Continuing	Continuing	Continuing
Sys Eng Lab Fld Activity-1.0 or more	WR	NAWCAD : Patuxent River, MD	214.811	6.448	Nov 2017	4.689	Oct 2018	4.748	Oct 2019	-		4.748	Continuing	Continuing	Continuing
Sys Eng Other In-House Spt	Various	Various : Various	20.617	0.210	Nov 2017	0.220	Nov 2018	0.250	Nov 2019	-		0.250	Continuing	Continuing	Continuing
GFE*	Reqn	DES/DLA : Various	13.894	0.000		1.500	Jan 2019	1.600	Jan 2020	-		1.600	Continuing	Continuing	Continuing
Prior Year Prod Dev costs no longer funded in the FYDP	Various	Various : Various	62.882	0.000		0.000		0.000		-		0.000	0.000	62.882	-
Sys Eng H-53K Propulsion	WR	NAWCAD : Patuxent River, MD	0.000	0.000		1.700	Oct 2018	1.850	Oct 2019	-		1.850	0.000	3.550	-
Sys Eng H-53K Propulsion	SS/CPFF	General Electric : Lynn, MA	0.000	0.000		6.000	Jan 2019	6.000	Jan 2020	-		6.000	0.000	12.000	12.000
MQ-4C	WR	NAWCAD : Patuxent River, MD	0.000	0.000		0.000		0.400	Oct 2019	-		0.400	Continuing	Continuing	Continuing
MQ-4C	SS/CPFF	Rolls Royce : Indianapolis, IN	0.000	0.000		0.000		1.000	Mar 2020	-		1.000	0.000	1.000	1.000
Sys Eng UAV Engine Program	SS/FFP	Bell-Boeing : Bingen, WA	0.000	0.000		0.000		0.400	Mar 2020	-		0.400	0.000	0.400	0.400
Sys Eng UAV Engine Program	WR	NAWCAD : Patuxent River, MD	0.000	0.000		0.000		0.250	Oct 2019	-		0.250	Continuing	Continuing	Continuing
		Subtotal	1,127.570	91.377		104.669		98.812		-		98.812	Continuing	Continuing	N/A

Remarks

GFE includes expected cost of fuel necessary to support engine development and qualification testing.
Total may be off due to rounding.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205633N / *Aviation Improvements*	Project (Number/Name) 1355 / *Propulsion and Power Component Improvement Program*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support	Various	Various : Various	8.300	0.000		0.100	Oct 2018	0.100	Oct 2019	-		0.100	Continuing	Continuing	Continuing
Development Support	WR	FRC-SW : North Island, CA	0.823	0.000		0.000		0.000		-		0.000	0.000	0.823	-
Development Support	WR	FRC-E : Cherry Point, NC	0.455	0.000		0.000		0.000		-		0.000	0.000	0.455	-
Development Support	WR	NSWC : Crane, IN	0.160	0.100	Nov 2017	0.200	Oct 2018	0.200	Oct 2019	-		0.200	0.000	0.660	-
		Subtotal	9.738	0.100		0.300		0.300		-		0.300	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Test & Evaluation	Various	Various : Various	3.442	0.000		0.100	Oct 2018	0.100	Oct 2019	-		0.100	Continuing	Continuing	Continuing
Development Test & Evaluation	WR	NSWC : Crane, IN	0.548	0.000		0.100	Oct 2018	0.100	Oct 2019	-		0.100	Continuing	Continuing	Continuing
		Subtotal	3.990	0.000		0.200		0.200		-		0.200	Continuing	Continuing	N/A

Management Services ($ in Millions)

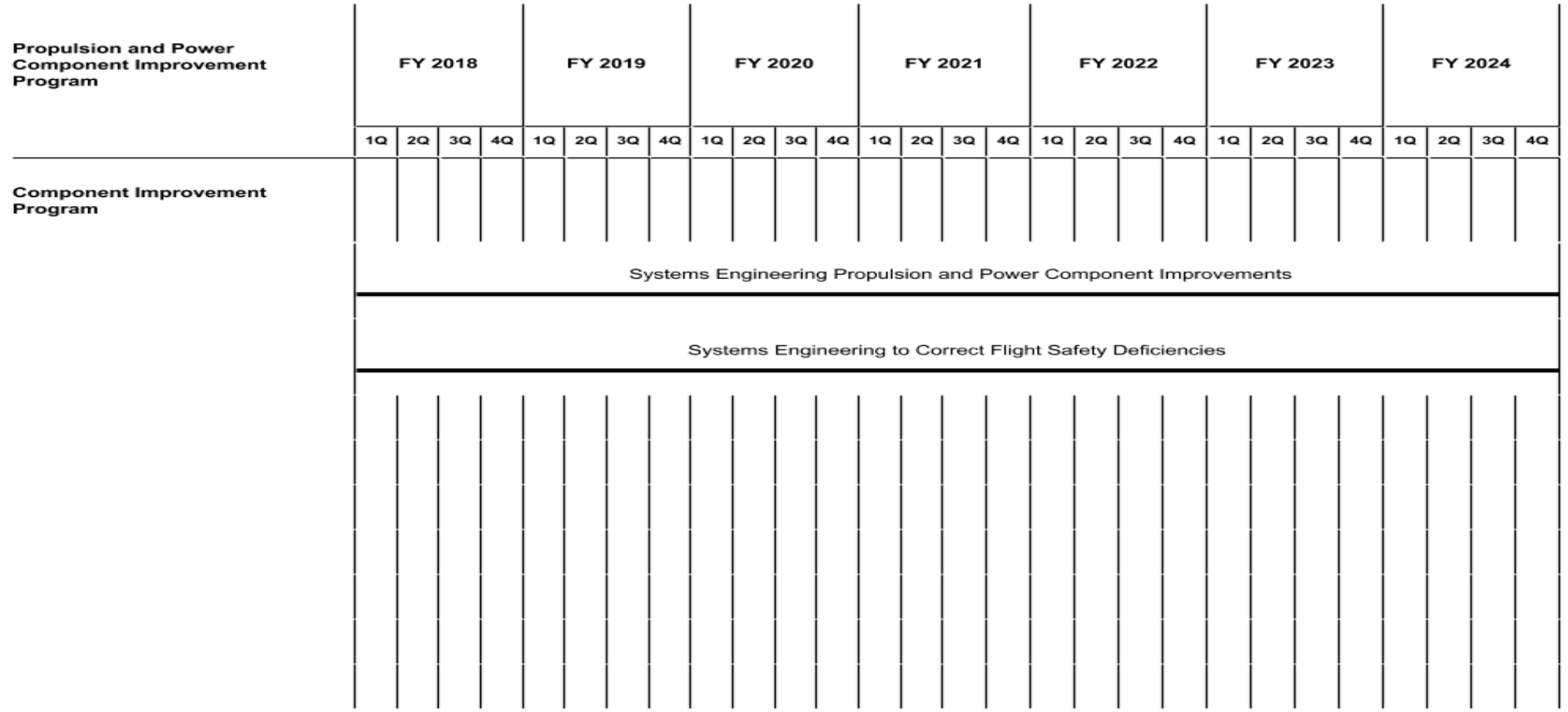
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Travel	Various	NAVAIR : Patuxent River, MD	0.781	0.051	Oct 2017	0.054	Oct 2018	0.060	Oct 2019	-		0.060	Continuing	Continuing	Continuing
Prior Year Mgmt cost no longer funded in the FYDP	Various	Various : Various	1.447	0.000		0.000		0.000		-		0.000	0.000	1.447	-
		Subtotal	2.228	0.051		0.054		0.060		-		0.060	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205633N / *Aviation Improvements*	Project (Number/Name) 1355 / *Propulsion and Power Component Improvement Program*	

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1,143.526	91.528		105.223		99.372		-		99.372	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1355 / *Propulsion and Power Component Improvement Program*



2020DON - 0205633N - 1355

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1355 / *Propulsion and Power Component Improvement Program*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Propulsion and Power Component Improvement Program				
Component Improvement Program: Engine Improvements	1	2018	4	2024
Component Improvement Program: Power & Propulsion	1	2018	4	2024

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205633N / *Aviation Improvements*	Project (Number/Name) 2269 / *Expeditionary Airfield Improvements*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
2269: *Expeditionary Airfield Improvements*	56.580	12.139	1.611	2.068	-	2.068	0.841	0.000	0.000	0.000	0.000	73.239
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Expeditionary Airfields (EAF) program designs, develops and tests a Sustainment Lighting System (SLS); specifically the LED CAT I Instrumented Flight Rules (IFR)/Visual Flight Rules (VFR) Approach Light System, to replace the obsolete legacy EAF lighting system. This system will support EAF Marine Aircraft Wing Support Squadrons with the required EAF Approach Light System equipment to install Forward Operating Bases and Forward Arming and Refueling Points. With the deployment of this equipment, the Marine Aircraft Wing Support Squadrons can support all United States Marine Corps (USMC) aircraft allowing the Combatant Commanders the flexibility to deploy Aircraft Combat Elements to meet anticipated threats.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Expeditionary Airfield Improvements	12.139	1.611	2.068	0.000	2.068
Articles:	-	-	-	-	-
Description: The EAF program designs, develops and tests a Sustainment Lighting System (SLS); specifically the LED CAT I Instrumented Flight Rules (IFR)/Visual Flight Rules (VFR) Approach Light System, to replace the obsolete legacy EAF lighting system. This system This system will provide EAF Marine Aircraft Wing Support Squadrons with the required EAF equipment to install Forward Operating Bases and Forward Arming and Refueling Points. With the deployment of this equipment the Marine Aircraft Wing Support Squadron can support all USMC aircraft allowing the Combatant Commanders the flexibility to deploy Aircraft Combat Elements to meet anticipated threats. This system will provide EAF Marine Aircraft Wing support Squadrons.					
FY 2019 Plans: Continue systems engineering efforts in support of the Sustainment Lighting System (SLS). Continue the design, development, and integration of the SLS program. Conduct Critical Design Review (CDR), Test Readiness Review (TRR), begin Developmental Testing (DT) and Integration/Operational Testing.					
FY 2020 Base Plans: Continue systems engineering efforts in support of the Sustainment Lighting System (SLS). Complete Developmental Testing (DT) and Integration/Operational Testing and conduct Production Readiness Review (PRR)					
FY 2020 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 2269 / *Expeditionary Airfield Improvements*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** The increase from FY2019 to FY2020 is to continue Systems Engineering in support of the production readiness review.					
Accomplishments/Planned Programs Subtotals	12.139	1.611	2.068	0.000	2.068

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• OPN/4213: *ASE-Expeditionary Airfields*	4.450	8.484	12.474	13.420	25.894	8.698	8.864	9.044	9.225	Continuing	Continuing

Remarks

OPN 4213 includes a portion of line item funding for Expeditionary Airfields.

D. Acquisition Strategy

Expeditionary Airfields (EAF) Sustainment Lighting System was initially an ACAT III program. As a result of the re-scope it has been re-designated as an ACAT IV M program in January 2018. The program is focused on a combination of a required capability to conduct operations in an expeditionary environment and the industrial base for airfield lighting.

E. Performance Metrics

Milestone Reviews

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205633N / *Aviation Improvements*	Project (Number/Name) 2269 / *Expeditionary Airfield Improvements*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	WR	NAWCAD : Lakehurst, NJ	23.980	9.561	Nov 2017	0.497	Jan 2019	1.402	Nov 2019	-		1.402	0.524	35.964	-
Prior year Prod Dev no longer funded in the FYDP	Various	Various : Various	22.016	0.000		0.000		0.000		-		0.000	0.000	22.016	-
		Subtotal	45.996	9.561		0.497		1.402		-		1.402	0.524	57.980	N/A

Remarks

The increase from FY2019 to FY2020 is to continue Systems Engineering in support of the Production Readiness Review (PRR).

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated Logistics	WR	NAWCAD : Lakehurst, NJ	2.615	0.600	Nov 2017	0.297	Jan 2019	0.455	Nov 2019	-		0.455	0.300	4.267	-
Prior Year Support no longer funded in the FYDP	Various	Various : Various	3.637	0.000		0.000		0.000		-		0.000	0.000	3.637	-
		Subtotal	6.252	0.600		0.297		0.455		-		0.455	0.300	7.904	N/A

Remarks

The increase from FY2019 to FY2020 is to support logistics efforts for the Production Readiness Review (PRR)

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation	WR	NAWCAD : Lakehurst, NJ	2.726	1.750	Nov 2017	0.568	Jan 2019	0.116	Nov 2019	-		0.116	0.000	5.160	-
Opeval Test Support	WR	COMOPTEVFOR : Norfolk, VA	0.239	0.000		0.166	Apr 2019	0.053	Nov 2019	-		0.053	0.000	0.458	-
		Subtotal	2.965	1.750		0.734		0.169		-		0.169	0.000	5.618	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205633N / *Aviation Improvements*	Project (Number/Name) 2269 / *Expeditionary Airfield Improvements*	

Management Services ($ in Millions)

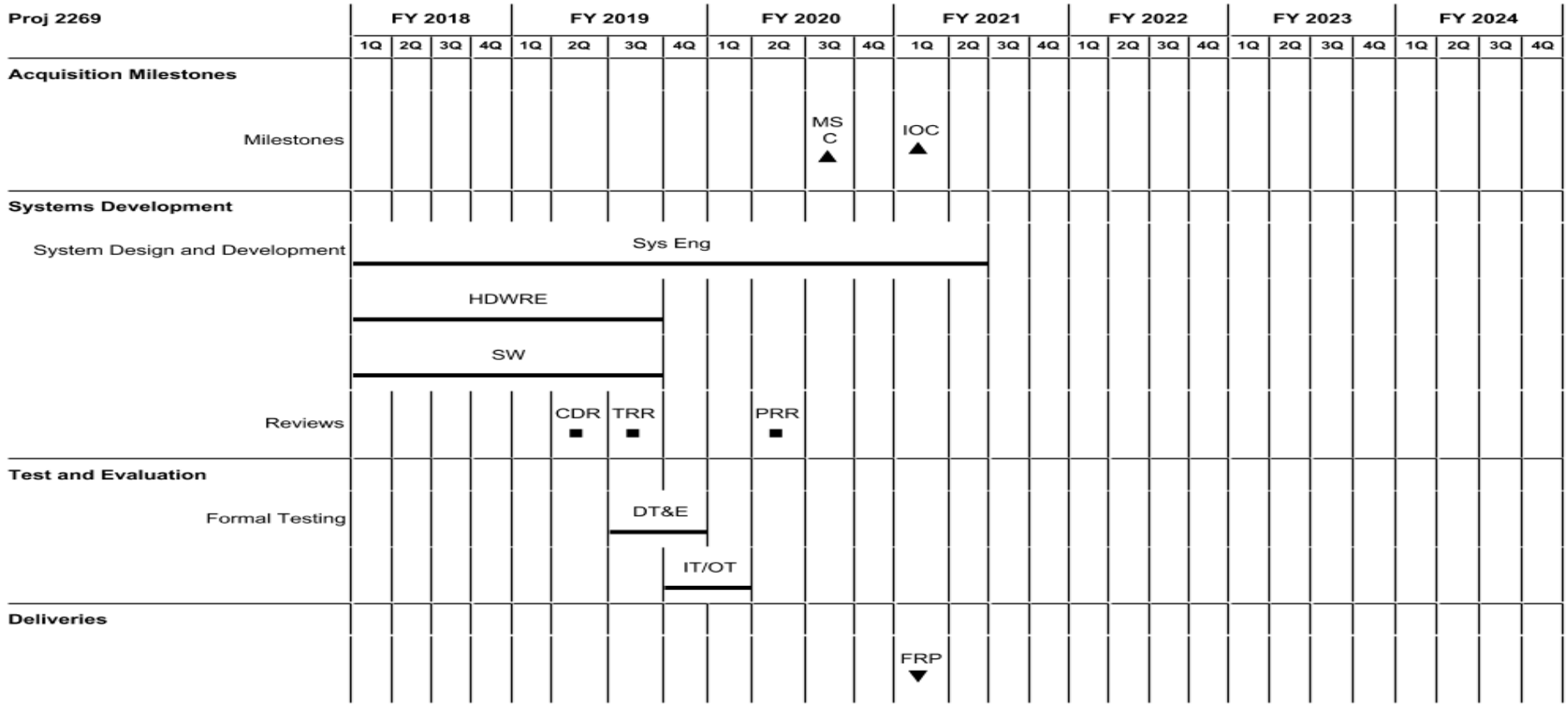
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Management Support Services	C/CPFF	Various : Various	1.367	0.228	Dec 2017	0.083	Dec 2018	0.042	Dec 2019	-		0.042	0.017	1.737	1.737
		Subtotal	1.367	0.228		0.083		0.042		-		0.042	0.017	1.737	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	56.580	12.139		1.611		2.068		-		2.068	0.841	73.239	N/A

Remarks

Prior Year includes $4.9 million of Congressional Add funding.

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 2269 / *Expeditionary Airfield Improvements*



2020DON - 0205633N - 2269

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 2269 / *Expeditionary Airfield Improvements*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2269				
Acquisition Milestones: Milestones: Milestone C	3	2020	3	2020
Acquisition Milestones: Milestones: IOC	1	2021	1	2021
Systems Development: System Design and Development: Systems Engineering	1	2018	2	2021
Systems Development: System Design and Development: Hardware Development	1	2018	3	2019
Systems Development: System Design and Development: Software Development	1	2018	3	2019
Systems Development: Reviews: Critical Design Review	2	2019	2	2019
Systems Development: Reviews: Test Readiness Review	3	2019	3	2019
Systems Development: Reviews: Production Readiness Review	2	2020	2	2020
Test and Evaluation: Formal Testing: Tech Eval/Dev T&E	3	2019	4	2019
Test and Evaluation: Formal Testing: IntegrationTesting/Operational Testing	4	2019	1	2020
Deliveries: Delivery: Lot 1	1	2021	1	2021

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205633N / *Aviation Improvements*	Project (Number/Name) 9999 / *Congressional Adds*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
9999: *Congressional Adds*	0.000	4.828	15.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	19.828
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Funding will support F/A-18 E/F and E/A-18G Engine Enhancements, Technology Maturation and Risk Reduction planning and analysis.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019
Congressional Add: Program Increase ***FY 2018 Accomplishments:*** Congressional Add ***FY 2019 Plans:*** N/A	4.828	0.000
Congressional Add: F/A-18 E/F and E/A-18G Engine Enhancements ***FY 2018 Accomplishments:*** N/A ***FY 2019 Plans:*** Funding will support F/A-18 E/F and E/A-18G Engine Enhancements, Technology Maturation and Risk Reduction planning and analysis.	0.000	15.000
Congressional Adds Subtotals	4.828	15.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Not required for congressional adds

E. Performance Metrics

Not required for congressional adds

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205633N / *Aviation Improvements*	Project (Number/Name) 9999 / *Congressional Adds*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	C/CPFF	Various : Various	0.000	0.000		12.000	Feb 2019	0.000		-		0.000	0.000	12.000	12.000
		Subtotal	0.000	0.000		12.000		0.000		-		0.000	0.000	12.000	N/A

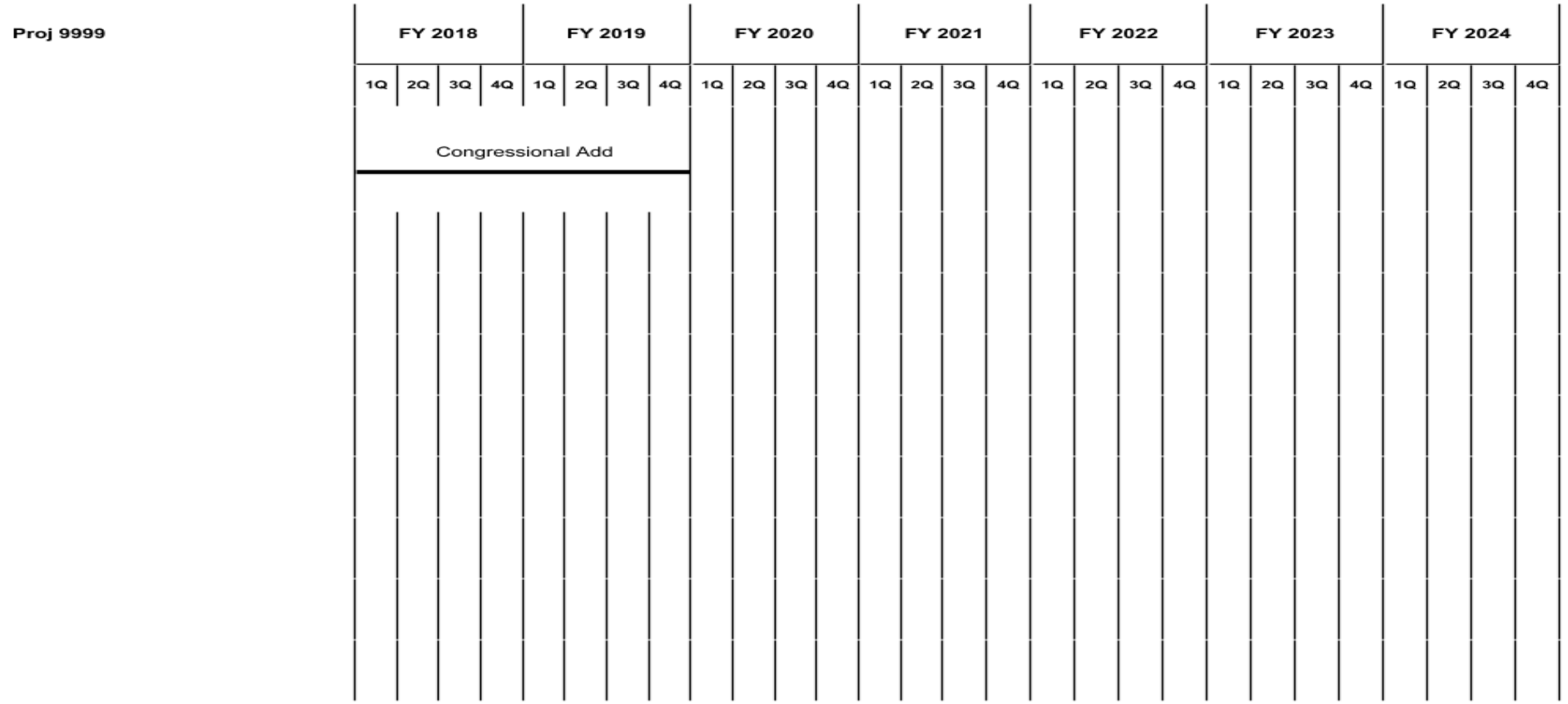
Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Support	WR	NAWCAD : Patuxent River, MD	0.000	4.828	Jul 2018	3.000	Dec 2018	0.000		-		0.000	0.000	7.828	-
		Subtotal	0.000	4.828		3.000		0.000		-		0.000	0.000	7.828	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	4.828		15.000		0.000		-		0.000	0.000	19.828	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 9999 / *Congressional Adds*



2020PB - 0205633N - 9999

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 9999 / *Congressional Adds*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 9999				
Congressional Add	1	2018	4	2019