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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy **Date:** February 2018

Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604214M / AV-8B Aircraft - Engine Dev
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	460.370	0.000	0.000	46.363	-	46.363	38.735	19.671	16.878	17.215	Continuing	Continuing
0652: AV-8B	460.370	0.000	0.000	46.363	-	46.363	38.735	19.671	16.878	17.215	Continuing	Continuing

A. Mission Description and Budget Item Justification

The program provides for AV-8B Design, Development, Integration, and Test of various platform improvements such as: Engine Life Management Program (ELMP), Escape Systems, Joint Mission Planning System (JMPS), and Block upgrades to various mission systems and software, avionics and communications systems, navigation equipment, weapons carriage and countermeasures, and unique flight testing, and the Obsolescence Replacement (OR)/Readiness Management Plan (RMP) including structural, hydraulic, electrical, environmental, and mechanical systems. The JMPS is required as part of the Department of the Navy directed migration to a common Navy and Marine Corps mission planning system. OR/RMP represents all engineering activities for development and design to support aircraft safety flight clearances, concept explorations, responses to evolving threats, and developments to support Program Objective Memorandum. The program's Evolutionary Acquisition Strategy includes Design, Development, Integration, and Test activities under the consolidated effort of Block Developments: H6.1, H6.2 and follow-on block upgrades, to include a H7.0 block upgrade that will be required to implement full Link 16 capability and integrate AIM-9X. An H6.2 update, including the Common Avionics Program, provides AV-8B a self-contained Global Positioning System navigation capability that is required to access preferred airspaces, and will include a Litening Operational Flight Program (OFP) V3, and initial Link 16 Precise Participant Location and Identification capability, which will provide interoperability, digital combat identification and increase situational awareness on the battlefield. Link 16 is a Top 10 item in the Operational Advisory and Systems Safety Groups. AV-8B funding supports peculiar flight test requirements to include weapons integration/carriage and avionics and software/firmware upgrades. The H7.0 OFP will fully implement the Harrier Link 16 integration, which will provide information sharing capabilities and integration of an increased number of Link 16 messages and the ability to act on shared target track information. Connection to the Link 16 network is vital to the AV-8B's ability to operate within some Command and Control situations and Operational Plans, as designed today, as well as provide a tactical capability for the more effective and safe prosecution of both airborne and ground targets. Continued AV-8B combat relevance and ability to respond to evolving and emergent threats through end of service is critical to the Marine Air-Ground Task Force's ability to generate aviation combat power throughout the transition to F-35B. J-series, K-series, Tactical Targeting Network Technology, and other emerging datalink technology messages are required to support current and future mission threads. Linked performance on par with current tactical platforms as well as design to communicate with F-35 is required for the AV-8B to remain tactically relevant to transition. H7.0 will also include the integration and test of weapons and sensors such as AIM-9X and Litening OFP V4, and will integrate required Radar Display Computer processing improvements to enable H7.0 functionality. Additionally, a Helmet Mounted Cueing System (HMCS), Unique Weapons and Countermeasures software integration and stores expansion testing will be required, to include Advanced Precision Kill Weapons System, AIM-9X, ALE-43, standoff weapons such as Joint Standoff Weapons (JSOW) and AIM-120 unique platform flight test which will be required to utilize updated AIM-120C variants on the AV-8B and utilize the AIM-120 in mixed stores loadouts, as well as test of emergent tactical requirements. The ELMP is a comprehensive plan to increase and maintain safety of flight and operational readiness of the AV-8B F402-RR-408 Engine and accessories. PMA-257 will accomplish this mission by conducting Engineering Project Description investigations to develop engineering solutions that address emergent safety, obsolescence, foreign object debris detection and prevention, fatigue life and maintenance issues. The OR/RMP is required to ensure the AV-8B air vehicle's sustained mission availability, and safe and reliable operational readiness until end of service. Air vehicle sustainment requires component and system analyses, technical planning, identification, prioritization, and diagnosis of emergent problems and the allocation of resources for the development, testing and flight clearance of engineering solutions in the areas of flight, crew safety, and escape systems and structural integrity, obsolescence, systems reliability and maintainability, inventory preservation, alternative mission development,

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
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or other emergent material or equipment conditions affecting AV-8B systems readiness. Activities include research/analysis for system safety deficiency corrections, fuel system safety improvements, structural analyses, monitoring and integrity analysis, component compatibility, component and materials obsolescence analyses and mitigation development, explorations for aging equipment, reliability improvement analyses and design developments. FY 2019 continues development efforts and associated obsolescence and readiness requirements for ELMP, RMP, Link 16, weapons and sensors carriage/integration, peculiar flight test and OFP updates.

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	0.000	0.000	46.363	-	46.363
Total Adjustments	0.000	0.000	46.363	-	46.363
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Program Adjustments	0.000	0.000	43.524	-	43.524
• Rate/Misc Adjustments	0.000	0.000	2.839	-	2.839

Change Summary Explanation

Funds increase from FY 2018 to FY 2019 due to transfer of effort from PE 0604245N beginning in FY 2019.

The FY 2019 funding request was reduced by \$1.800 million to account for the availability of prior year execution balances.

Schedule:

H7.0 IOC, H7.0 DT/IT, H7.0 Software Delivery completion and AIM-9X Integration and H7.0 Development adjusted two quarters due to completion of H7.0 system requirement review and gaining greater understanding of software coding and test requirements.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy										Date: February 2018		
Appropriation/Budget Activity 1319 / 5					R-1 Program Element (Number/Name) PE 0604214M / AV-8B Aircraft - Engine Dev				Project (Number/Name) 0652 / AV-8B			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
0652: AV-8B	460.370	0.000	0.000	46.363	-	46.363	38.735	19.671	16.878	17.215	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program provides for AV-8B Design, Development, Integration and Test of the following improvements: The Engine Life Management Program (ELMP), Operational Flight Program (OFP) and Avionics/Weapons Integration, Escape System, and Readiness Management Plan (RMP). The ELMP is a comprehensive plan to increase safety of flight and operational readiness of the AV-8B F402-RR-408 Engine and Gas Turbine Starter, as well as other critical engine components. The Program Office will accomplish this mission through the Component Improvement Program, which entails Engineering Project Description investigations to derive safety and reliability improvements to the engine and engine components. The Joint Mission Planning System is required as part of the Department of Navy directed migration to a common Navy and Marine Corps mission planning system. H6.2 provides Global Positioning System navigation capabilities, a Litening common OFP update and initial Link 16 capability to include use of the APX-123, initial Mode 5 capability, as well as software updates. H7.0 OFP will integrate full Harrier Link 16 capability and provide software updates. H7.0 will also integrate AIM-9X, a Litening Common OFP update, provide Advanced Precision Kill Weapon System (APKWS) integration improvements, Joint Standoff Weapons (JSOW), and common avionics ADS-B (out), Mode 5, and Mode S Identification Friend or Foe capabilities as well as integrate required Radar Display Computer processing improvements to enable H7.0 functionality. Other specific efforts include peculiar integration and flight test requirements such as AIM-120C flight test, as AIM-120A/B will become obsolete, as well as AIM-120 mixed stores flight test, unique weapons, sensors, and countermeasures integration and stores expansion to include APKWS, Helmet Mounted Cueing System (HMCS), AIM-9X, ALE-43, standoff weapons such as Joint Standoff Weapons (JSOW) and unique flight test of other avionics, sensors, or weapons systems, or emergent tactical requirements, as they arise. The program is working closely with the Common Avionics Program and the Allies (Spain and Italy) on all efforts. RMP represents all engineering activities for development, design and test to support aircraft safety, flight clearance and concept exploration for resolution of emergent safety, service life, escape systems, compatibility, obsolescence, and readiness issues as well as response to fleet urgent operational requirements.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Development of RMP Engineering Change Proposals	0.000	0.000	8.043	0.000	8.043
Articles:	-	-	-	-	-
Description: Develop obsolescence solutions to improve safety, structural integrity, and systems reliability of the AV-8B aircraft.					
FY 2018 Plans: N/A					
FY 2019 Base Plans: Extension to AV-8B End of Service date requires continued obsolescence mitigation efforts to maintain aircraft readiness. The program will continue to address known, predicted, and emergent obsolescence					

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy **Date:** February 2018

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604214M / AV-8B Aircraft - Engine Dev	Project (Number/Name) 0652 / AV-8B
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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>equipment issues, continuing efforts from prior years. Continue fatigue life tracking analyses and algorithm update development. Continue Fuselage Fatigue Life Assessment to assure continued safe operation of the aircraft through the end of service date. Continue the development and flight tests of Outrigger Landing Gear improvements. Systems engineering will support ongoing and emergent analysis and design/ development/ test efforts required to identify Engineering Change Proposal requirements to correct systems safety, structural integrity, compatibility, and readiness issues including efforts required to respond to evolving and emergent threats, mission systems, communications systems, navigation equipment, weapons carriage and countermeasures, structural, hydraulic, electrical, environmental, and mechanical systems.</p> <p>FY 2019 OCO Plans: N/A</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Increase of \$8.348M from FY 2018 to FY 2019 a result of the realignment of 100% Blue In Support of Green (BISOG) accounts to "M" coded Program Elements.</p>					
<p>Title: Operational Flight Program (OFP) and Avionics Weapons Systems Development and Integration</p> <p align="right">Articles:</p> <p>Description: Develop, integrate, and test aircraft OFP updates, mission planning updates, Litening Pod software updates/capability expansions, support aircraft avionics development efforts, integrate and test unique weapons systems, sensors, and countermeasures such as AIM-120C, AIM-9X, Helmet Mounted Cueing System (HMCS), Advanced Precision Kill Weapon System, ALE-43, standoff weapons such as Joint Standoff Weapons (JSOW) and other weapons/avionics and sensor systems and emergent tactical requirements as they arise, perform stores expansion testing, and conduct Digital Interoperability (to include Link 16) development, integration, and test efforts. Evaluate future capability expansions via studies and analyses.</p> <p>FY 2018 Plans: N/A</p> <p>FY 2019 Base Plans: Funds will provide for future capability expansion studies and analyses efforts, efforts required to respond to evolving and emerging threats, peculiar flight test requirements to include various required weapons/sensors/ countermeasures/stores expansion integration and testing such as AIM-120, AIM-9X, ALE-43, JSOW, and other</p>	0.000 -	0.000 -	32.388 -	0.000 -	32.388 -

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604214M / AV-8B Aircraft - Engine Dev	Project (Number/Name) 0652 / AV-8B

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
weapons/avionics systems as they arise. Continue H7.0 OFP/Link 16/ AIM-9X software integration and begin test efforts. FY 2019 OCO Plans: N/A FY 2018 to FY 2019 Increase/Decrease Statement: Increase of \$32.388M from FY 2018 to FY 2019 a result of the realignment of 100% Blue In Support of Green (BISOG) accounts to "M" coded Program Elements.					
Title: F402-RR-408 Engine Safety and Reliability Enhancements Description: Improve Safety and Reliability of the F402-RR-408 Engine for the AV-8B Harrier. FY 2018 Plans: N/A FY 2019 Base Plans: The engineering CIP will conduct engineering investigations to develop ECPs for improvements and design solutions to correct deficiencies resulting from safety, obsolescence, FOD detection and prevention and structural fatigue for the engine and engine accessories, to maintain readiness and to meet mission requirements. FY 2019 OCO Plans: N/A FY 2018 to FY 2019 Increase/Decrease Statement: Increase of \$5.932M from FY 2018 to FY 2019 a result of the realignment of 100% Blue In Support of Green (BISOG) accounts to "M" coded Program Elements.	0.000	0.000	5.932	0.000	5.932
Articles:	-	-	-	-	-
Accomplishments/Planned Programs Subtotals	0.000	0.000	46.363	0.000	46.363

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• APN/0514: AV-8 Series	56.275	43.555	58.577	-	58.577	42.082	33.948	37.866	38.647	91.978	1,721.898
Remarks											

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy	Date: February 2018
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Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604214M / AV-8B Aircraft - Engine Dev	Project (Number/Name) 0652 / AV-8B
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D. Acquisition Strategy

The Obsolescence Replacement (OR)/Readiness Management Plan (RMP) ensures the maximum readiness levels for the AV-8B Type/Model/Series by maintaining post production engineering and logistic support with the two Original Equipment Manufacturers (OEMs). RMP tracks readiness degraders, identifies and addresses obsolescence for non avionics systems, and identifies and addresses emerging in-service material developments related to ease of maintenance, safety, airframe life management and improved performance. The multi-disciplined team of program management, engineering, logistics, and financial personnel develop ECPs, Rapid Action Minor Engineering Changes, Interim Rapid Action Changes to publications, trainer and support equipment modifications necessary to maintain aircraft reliability and safety. The RMP additionally supports the constant improvement and analysis of fleet Fatigue Life Expended data to maximize aircraft structural life and to support the NAVAIR annual Structural Appraisal of Fatigue Effects report required by OPNAV. Funding for the Engine Life Management Program will be placed on a cost-type contract to Rolls-Royce to address safety of flight issues, top readiness degraders, engine removal and mission failure drivers in order to improve Fleet readiness and reduce cost of ownership of the F402-RR-408 and accessories. It is also developed to assess life management program issues and design fixes for any service revealed deficiencies. The program's Evolutionary Acquisition Strategy includes Design, Development, Integration and Test activity under the consolidated effort of Block Developments: H2.0, H4.0, H5.0, H6.0, H6.1, H6.2, H7.0 and following Operational Flight Programs. The development and integration of Joint Mission Planning System occurred concurrently with H2.0. H4.0 Block improvements included the Tactical Aircraft Moving Map Capability. H5.0 Block Upgrade provided Dual Mode Laser Guided Bomb, Litening Centerline/Station 4 (improvement of current weapons carriage capability). The H6.2 update is being accomplished in conjunction with the Common Avionics Program and provides a Global Positioning System Navigation capability for AV-8B, a Litening Common Operational Flight Program update, initial Link 16 capability to include the use of APX-123 and initial Mode 5 functionality. Full Harrier Link 16 integration will require an H7.0 Operational Flight Program subsequent to H6.2 and will provide the AV-8B the Link 16 capability. H7.0 will also be accomplished in conjunction with Common Avionics Program and will integrate AIM-9X, ADS-B (out), Mode 5, Mode S and Advanced Precision Kill Weapon System (APKWS) integration improvements. Peculiar flight test efforts to include weapons, avionics, and sensors integration such as AIM-120, AIM-9X, APKWS, ALE-43, HMCS, standoff weapons such as Joint Standoff Weapons (JSOW), other avionics/weapons and sensors systems and emergent tactical requirements as they arise. Stores expansion efforts will be conducted by NAWCWD and AV-8B flight test squadrons in FY18.

E. Performance Metrics

Achieve Engine Life Management Program Rolls-Royce Component Improvement Program cost plus fixed fee contract award 1st Quarter FY 2019.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy **Date:** February 2018

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604214M / AV-8B Aircraft - Engine Dev	Project (Number/Name) 0652 / AV-8B
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Primary Hardware Development - ELMP	C/CPFF	Rolls-Royce PLC : Bristol, GB	36.187	0.000		0.000		1.856	Dec 2018	-		1.856	6.018	44.061	44.061
Primary Hardware Development - ELMP	C/FFP	ONTIC (Goodrich) PS : Pitstone, GB	6.881	0.000		0.000		0.600	Mar 2019	-		0.600	1.380	8.861	8.861
Primary Hardware Development - OFP	WR	NAWCWD : China Lake, CA	71.061	0.000		0.000		12.107	Dec 2018	-		12.107	Continuing	Continuing	Continuing
Primary Hardware Development - OFP	C/FFP	Boeing : St. Louis, MO	10.777	0.000		0.000		3.100	Dec 2018	-		3.100	3.319	17.196	17.196
Primary Hardware Development - OFP	C/CPFF	Raytheon : Waltham, MA	4.450	0.000		0.000		2.802	Dec 2018	-		2.802	4.596	11.848	11.848
Systems Engineering - RMP	C/FFP	Boeing : St. Louis, MO	36.570	0.000		0.000		4.431	Jan 2019	-		4.431	14.326	55.327	55.327
Systems Engineering - RMP	WR	NAWCWD : China Lake, CA	3.755	0.000		0.000		0.096	Nov 2018	-		0.096	Continuing	Continuing	Continuing
Systems Engineering - RMP	WR	NAWCAD : Patuxent River, MD	9.238	0.000		0.000		1.451	Nov 2018	-		1.451	Continuing	Continuing	Continuing
Systems Engineering - OFP	WR	NAWCWD : China Lake, CA	0.837	0.000		0.000		1.571	Nov 2018	-		1.571	Continuing	Continuing	Continuing
Systems Engineering - OFP	TBD	TBD : TBD	0.000	0.000		0.000		0.052	Dec 2018	-		0.052	Continuing	Continuing	Continuing
Prior year cost no longer funded in the FYDP	Various	Various : Various	44.016	0.000		0.000		0.000		-		0.000	0.000	44.016	-
Subtotal			223.772	0.000		0.000		28.066		-		28.066	Continuing	Continuing	N/A

Remarks
1. FY19 increase to Systems Engineering OFP at NAWCWD China Lake due to requirement for software improvements to the APKWS integration.

Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Development Support - OFP	WR	FST Cherry Pt : Cherry Point, NC	0.080	0.000		0.000		0.100	Nov 2018	-		0.100	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy **Date:** February 2018

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604214M / AV-8B Aircraft - Engine Dev	Project (Number/Name) 0652 / AV-8B
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Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Software Development - RMP	C/CPFF	Boeing : St. Louis, MO	2.255	0.000		0.000		0.616	Jun 2019	-		0.616	2.146	5.017	5.017
Studies and Analysis - OFP	WR	NAWCWD : China Lake, CA	0.881	0.000		0.000		0.234	Nov 2018	-		0.234	Continuing	Continuing	Continuing
Studies and Analysis - RMP	C/FFP	Boeing : St. Louis, MO	4.962	0.000		0.000		0.500	Jul 2019	-		0.500	3.090	8.552	8.552
Studies and Analysis - OFP	C/FFP	Boeing : St. Louis, MO	4.519	0.000		0.000		1.020	Jan 2019	-		1.020	0.000	5.539	5.539
Prior year cost no longer funded in the FYDP	Various	Various : Various	55.372	0.000		0.000		0.000		-		0.000	0.000	55.372	-
Subtotal			68.069	0.000		0.000		2.470		-		2.470	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Developmental Test & Evaluation - RMP	WR	NAWCWD : China Lake, CA	40.834	0.000		0.000		0.200	Jan 2019	-		0.200	Continuing	Continuing	Continuing
Developmental Test & Evaluation - OFP	WR	NAWCWD : China Lake, CA	26.444	0.000		0.000		7.404	Jan 2019	-		7.404	Continuing	Continuing	Continuing
Developmental Test & Evaluation - OFP	C/CPFF	Raytheon : Waltham, MA	1.971	0.000		0.000		1.537	Apr 2019	-		1.537	0.000	3.508	3.508
Developmental Test & Evaluation - RMP	WR	FRC-E : Cherry Point, NC	0.293	0.000		0.000		0.200	Dec 2018	-		0.200	Continuing	Continuing	Continuing
Developmental Test & Evaluation - RMP/OFP	Various	Various : Various	0.100	0.000		0.000		0.100	Jan 2019	-		0.100	Continuing	Continuing	Continuing
Operational Test & Evaluation - OFP	WR	COMOPTEVFOR : Norfolk, VA	25.013	0.000		0.000		0.886	Jan 2019	-		0.886	Continuing	Continuing	Continuing
Operational Test & Evaluation - OFP	WR	NAWCAD : Patuxent River, MD	0.130	0.000		0.000		0.280	Dec 2018	-		0.280	Continuing	Continuing	Continuing
Prior year cost no longer funded in the FYDP	Various	Various : Various	12.727	0.000		0.000		0.000		-		0.000	0.000	12.727	-
Subtotal			107.512	0.000		0.000		10.607		-		10.607	Continuing	Continuing	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy **Date:** February 2018

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604214M / AV-8B Aircraft - Engine Dev	Project (Number/Name) 0652 / AV-8B
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Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			

Remarks

2. FY19 increase to DT&E OFP at NAWCAD China Lake due to increase in H7.0 AIM-9X testing. H7.0 test requirements increase in FY19 as the OFP progresses.
3. FY19 increase to DT&E OFP at Raytheon due to H7.0 AIM-9X testing.
4. FY19 increase to DT&E RMP at FRC-E Cherry Point due to anticipated testing of Outrigger Landing Gear improvements.
5. FY19 increase to OT&E OFP at COMOPTEVFOR due to integrated test for H7.0 OFP.
6. FY19 increase to OT&E OFP at NAWCAD Patuxent River necessary to conduct environmental testing on AIM-9X as part of H7.0 OFP.

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Engineering & Tec SRVC (Non-FFRDC) - RMP	C/CPFF	TDA : Falls Church, VA	1.301	0.000		0.000		0.275	Dec 2018	-		0.275	0.867	2.443	2.443
Engineering & Tec SRVC (Non-FFRDC) - ELMP	C/CPFF	Zenetex : Herndon, VA	5.231	0.000		0.000		1.185	Jun 2019	-		1.185	8.845	15.261	15.261
Engineering & Tec SRVC (Non-FFRDC)	C/CPFF	Various : Various	10.729	0.000		0.000		1.061	Dec 2018	-		1.061	7.926	19.716	19.716
Government Engineering Support - ELMP	WR	NAWCAD : Patuxent River, MD	10.055	0.000		0.000		1.071	Nov 2018	-		1.071	Continuing	Continuing	Continuing
Government Engineering Support - OFP	WR	NAWCAD : Patuxent River, MD	4.104	0.000		0.000		0.993	Nov 2018	-		0.993	Continuing	Continuing	Continuing
Government Engineering Support - ELMP	WR	NAWCWD : China Lake, CA	1.376	0.000		0.000		0.028	Dec 2018	-		0.028	Continuing	Continuing	Continuing
Government Engineering Support - OFP	Various	Various : Various	0.404	0.000		0.000		0.208	Jan 2019	-		0.208	Continuing	Continuing	Continuing
MGT & PROF SUPPT SRVC (NON-FFRDC)	C/CPFF	Various : Various	9.248	0.000		0.000		0.214	Dec 2018	-		0.214	12.064	21.526	21.526
Travel	WR	Various : Various	1.800	0.000		0.000		0.185	Oct 2018	-		0.185	Continuing	Continuing	Continuing
Prior year cost no longer funded in the FYDP	Various	Various : Various	16.769	0.000		0.000		0.000		-		0.000	0.000	16.769	-
Subtotal			61.017	0.000		0.000		5.220		-		5.220	Continuing	Continuing	N/A

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy **Date:** February 2018

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604214M / AV-8B Aircraft - Engine Dev	Project (Number/Name) 0652 / AV-8B
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
AV-8B AIRCRAFT - ENGINE DEV				
Acquisition Milestones: H7.0 IOC	2	2021	2	2021
Systems Development: Hardware Development: AIM-9X Integration Development	1	2019	3	2020
Systems Development: Hardware Development: RMP Obsolescence Development	1	2019	4	2023
Systems Development: Software Development: H7.0 Development	1	2019	3	2020
Systems Development: Software Development: RMP Fatigue Life Expended Development	1	2019	4	2023
Test & Evaluation: Technical Evaluation: H7.0 Link 16 DT/IT	1	2019	2	2021
Production Milestones: Contract Awards: Engine Life Management Program (ELMP): ELMP Contract Award FY19	1	2019	1	2019
Production Milestones: Contract Awards: Engine Life Management Program (ELMP): ELMP Contract Award FY20	1	2020	1	2020
Production Milestones: Contract Awards: Engine Life Management Program (ELMP): ELMP Contract Award FY21	1	2021	1	2021
Production Milestones: Contract Awards: Engine Life Management Program (ELMP): ELMP Contract Award FY22	1	2022	1	2022
Production Milestones: Contract Awards: Engine Life Management Program (ELMP): ELMP Contract Award FY23	1	2023	1	2023
Deliveries: H7.0 S/W Delivery	2	2021	2	2021