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 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604214N *I AV-8B Aircraft - Engine Dev*							
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	411.590	41.261	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	452.851
0652: *AV-8B*	411.590	41.261	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	452.851

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 Operational Flight Programs (OFPs) to include JMPS integration, avionics and communications systems, navigation equipment, weapons carriage and countermeasures, studies and analyses of future capability expansion and unique flight testing, and the Obsolescence Replacement (OR)/Readiness Management Plan (RMP) including structural, hydraulic, electrical, environmental, and mechanical systems. 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: H6.2 and follow-on block upgrades, to include a H7.0 block upgrade that will be required to implement full Link 16 capability, provide weapon improvements and integrate AIM-9X and Joint Standoff Weapon (JSOW). An H6.2 update, included the Common Avionics Program, provided AV-8B a self-contained Global Positioning System navigation capability that is required to access preferred airspaces, and included a Litening OFP V3, and initial Link 16 Precise Participant Location and Identification capability, which provided interoperability, digital combat identification and increased situational awareness on the battlefield. Link 16 is a Top 10 item in the Operational Advisory and Systems Safety Groups. 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 J-series 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, but not limited to, AIM-9X, JSOW and Litening OFP V4, and will integrate required Display Computer processing improvements to enable H7.0 functionality. Integration of these weapons is vital to the Harrier's continued combat relevance to the Marine Expeditionary Unit and Global Response Force Combatant Commanders particularly as obsolete AIM-9M inventory dwindles. Additionally, software integration and stores expansion testing will be required for systems to include a Helmet Mounted Cueing System (HMCS), Unique Weapons, survivability and Countermeasures, Advanced Precision Kill Weapons System (APKWS), AIM-9X, ALE-43, survivability upgrades, standoff weapons such as JSOW, Joint Air-to-Ground Missile (JAGM) and AIM-120 unique platform flight test which will be required to utilize updated AIM-120C variants on the AV-8B as well as test of emergent tactical requirements. AV-8B funding also supports peculiar flight test requirements to include weapons integration/carriage and avionics and software/firmware upgrades. Studies and analyses will be conducted on systems such as survivability systems, HMCS and Beyond Line of Sight (BLOS) to assess feasibility of integrating on the AV-8B. 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

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 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604214N *I AV-8B Aircraft - Engine Dev*

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, 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.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	48.780	0.000	0.000	-	0.000
Current President's Budget	41.261	0.000	0.000	-	0.000
Total Adjustments	-7.519	0.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.837	0.000			
• Congressional Directed Reductions Adjustments	-6.682	-	-	-	-

Change Summary Explanation

Funds decrease from FY 2018 to FY 2019 due to transfer of effort to new PE 0604214M beginning in FY 2019.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604214N / *AV-8B Aircraft - Engine Dev*	Project (Number/Name) 0652 / *AV-8B*	

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
0652: *AV-8B*	411.590	41.261	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	452.851
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: Engine Life Management Program (ELMP), Operational Flight Programs (OFPs) 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 (GTS), as well as other critical engine components. The Program Office will accomplish this mission through the Component Improvement Program (CIP), which entails Engineering Project Description investigations to derive safety and reliability improvements to the engine and engine components. H6.2 provided 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 and cryptographic modernization. H7.0 OFP will integrate full Harrier Link 16 capability, provide software updates, integrate AIM-9X, a Litening Common OFP update, provide Advanced Precision Kill Weapons System (APKWS) integration improvements, Joint Standoff Weapon (JSOW) integration, 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 efforts include peculiar integration and flight test requirements such as AIM-120C flight test, as AIM-120A/B will become obsolete, unique weapons, sensors, and countermeasures integration and stores expansion to include APKWS, Helmet Mounted Cueing System (HMCS), Beyond-Line-of-Sight (BLOS) communications, AIM-9X, ALE-43, standoff weapons such as JSOW, and unique flight test and study efforts 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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Development of RMP Engineering Change Proposals	9.837	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: Develop obsolescence solutions to improve safety, structural integrity, and systems reliability of the AV-8B aircraft.					
FY 2019 Plans: N/A					
FY 2020 Base Plans: N/A					
FY 2020 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604214N / *AV-8B Aircraft - Engine Dev*	**Project (Number/Name)** 0652 / *AV-8B*

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					
Title: Operational Flight Program (OFP) and Avionics Weapons Systems Development and Integration ***Articles:*** ***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, HMCS, APKWS, BLOS Communications, Crypto Modernization activities, survivability upgrades, ALE-43, standoff weapons such as 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. ***FY 2019 Plans:*** N/A ***FY 2020 Base Plans:*** N/A ***FY 2020 OCO Plans:*** N/A	25.617 -	0.000 -	0.000 -	0.000 -	0.000 -
Title: F402-RR-408 Engine Safety and Reliability Enhancements ***Articles:*** ***Description:*** Improve Safety and Reliability of the F402-RR-408 Engine and accessories for the AV-8B Harrier. ***FY 2019 Plans:*** N/A ***FY 2020 Base Plans:*** N/A ***FY 2020 OCO Plans:*** N/A	5.807 -	0.000 -	0.000 -	0.000 -	0.000 -
Accomplishments/Planned Programs Subtotals	41.261	0.000	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604214N / *AV-8B Aircraft - Engine Dev*	**Project (Number/Name)** 0652 / *AV-8B*

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/0514: *AV-8 Series*	41.762	58.577	39.472	-	39.472	33.774	32.273	38.445	39.208	125.055	1,783.276

Remarks

D. Acquisition Strategy

The Obsolescence Replacement (OR)/RMP ensures the maximum readiness levels for the AV-8B Type/Model/Series by maintaining post production engineering and logistic support with the 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 Engineering Change Proposals (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, and structural fatigue life assessments to assure continued safe operation of the aircraft through the end of service date. Funding for the ELMP 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 OFPs. The H6.2 upgrade, accomplished in conjunction with the Common Avionics Program, provided a Global Positioning System Navigation capability for AV-8B, LITENING operational flight program update, initial Link 16 capability to include the use of APX-123 and initial Mode 5 functionality. The H7.0 OFP will provide the AV-8B integration of additional required Link 16 J-series messages, integration of AIM-9X and JSOW weapons, and APKWS integration updates. H7.0 will also be accomplished in conjunction with the Common Avionics Program and will integrate ADS-B (out), Mode 5, and Mode S capabilities. Peculiar flight test efforts to include weapons, avionics, survivability, and sensor integration such as AIM-120, AIM-9X, APKWS, ALE-43, ALR-67, HMCS, standoff weapons such as JSOW, other avionics/ weapons and sensor systems and emergent tactical requirements as they arise. Studies and analyses will be accomplished to assess future capability expansion feasibility and integration concepts to include weapons expansion, BLOS communications, survivability upgrades, and other potential avionics, weapons, or software capabilities as they arise.

E. Performance Metrics

Achieved Engine Life Management Program Rolls-Royce Component Improvement Program cost plus fixed fee contract award 1st Quarter FY 2018.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604214N / *AV-8B Aircraft - Engine Dev*	Project (Number/Name) 0652 / *AV-8B*	

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 Hardware Development - ELMP	C/CPFF	Rolls-Royce PLC : Bristol, GB	34.385	2.023	Jan 2018	0.000		0.000		-		0.000	0.000	36.408	36.408
Primary Hardware Development - ELMP	C/FFP	ONTIC (Goodrich) PS : Pitstone, GB	6.281	1.034	Jun 2018	0.000		0.000		-		0.000	0.000	7.315	7.315
Primary Hardware Development - OFP	WR	NAWCWD : China Lake, CA	57.009	8.870	Dec 2017	0.000		0.000		-		0.000	0.000	65.879	65.879
Primary Hardware Development - OFP	C/FFP	Boeing : St. Louis, MO	7.777	1.568	Apr 2018	0.000		0.000		-		0.000	0.000	9.345	9.345
Primary Hardware Development - OFP	C/CPFF	Raytheon : Waltham, MA	0.700	0.355	Jul 2018	0.000		0.000		-		0.000	0.000	1.055	1.055
Systems Engineering - RMP	C/FFP	Boeing : St. Louis, MO	31.398	3.606	Jan 2018	0.000		0.000		-		0.000	0.000	35.004	35.004
Systems Engineering - RMP	WR	NAWCWD : China Lake, CA	3.661	0.094	Nov 2017	0.000		0.000		-		0.000	0.000	3.755	-
Systems Engineering - RMP	WR	NAWCAD : Patuxent River, MD	7.788	1.450	Nov 2017	0.000		0.000		-		0.000	0.000	9.238	-
Systems Engineering - OFP	WR	NAWCWD : China Lake, CA	0.099	0.738	Nov 2017	0.000		0.000		-		0.000	0.000	0.837	-
Systems Engineering - OFP	WR	NAWCAD : Patuxent River, MD	0.000	0.051	Dec 2017	0.000		0.000		-		0.000	0.000	0.051	-
Prior year cost no longer funded in the FYDP	Various	Various : Various	43.965	0.000		0.000		0.000		-		0.000	0.000	43.965	-
		Subtotal	193.063	19.789		0.000		0.000		-		0.000	0.000	212.852	N/A

Remarks

Line 1: FY18 increase from PB19 is due to increase in Foreign Object Damage (FOD) mitigation analysis effort.
Line 2: FY18 increase from PB19 is due to additional testing required for bearing redesign, repairs required on the test set and ONTIC overhead costs higher than the IGCE.
Line 3: FY18 decrease from PB19 is due to accomplishment of H7.0 detail planning and refinement of estimates.
Line 4: FY18 decrease from PB19 is due to completion of contract negotiations with Boeing.
Line 5: FY18 decrease from PB19 is due to completion of an engineering analysis which determined that AIM-9X integration requires a lower than planned level of Raytheon involvement due to Government decision to conduct post flight analysis in-house instead of at Raytheon.
Line 6: FY18 decrease from PB19 is due to final contract awards for various efforts lower than government estimates.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604214N / *AV-8B Aircraft - Engine Dev*	Project (Number/Name) 0652 / *AV-8B*	

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 - OFP	WR	FST Cherry Pt : Cherry Point, NC	0.000	0.080	Nov 2017	0.000		0.000		-		0.000	0.000	0.080	-
Software Development - RMP	C/CPFF	Boeing : St. Louis, MO	1.650	1.298	Jun 2018	0.000		0.000		-		0.000	0.000	2.948	2.948
Studies and Analysis - OFP	WR	NAWCWD : China Lake, CA	0.649	0.232	Nov 2017	0.000		0.000		-		0.000	0.000	0.881	-
Studies and Analysis - RMP	C/FFP	Boeing : St. Louis, MO	3.222	2.133	Jul 2018	0.000		0.000		-		0.000	0.000	5.355	5.355
Studies and Analysis - OFP	C/FFP	Boeing : St. Louis, MO	3.519	2.520	Jan 2018	0.000		0.000		-		0.000	0.000	6.039	6.039
Prior year spt 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	64.412	6.263		0.000		0.000		-		0.000	0.000	70.675	N/A

Remarks

Line 2: FY18 increase from PB19 is due to increased development cost of the Fatigue Life Expended tracking system which is an integral part of the AV-8B Service Life Assessment Program (SLAP).
Line 5: FY18 increase from PB19 is due to continuation of the Fuselage Fatigue Life Assessment effort including planning for a Destructive Teardown Assessment necessary to assure continued safe operation of the aircraft through the end of service date.
Line 6: FY18 increase from PB19 is due to increased requirement for feasibility study to implement BLOS capability to maintain operational relevance of the AV-8B through its remaining service life, to assess feasibility of future survivability upgrades and to assess feasibility of integrating a HMCS safely to achieve final fit capabilities designated for the AV-8B by the Deputy Commandant for Aviation.

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
Developmental Test & Evaluation - RMP	WR	NAWCWD : China Lake, CA	40.242	0.592	Jan 2018	0.000		0.000		-		0.000	0.000	40.834	-
Developmental Test & Evaluation - OFP	WR	NAWCWD : China Lake, CA	19.899	6.545	Jan 2018	0.000		0.000		-		0.000	0.000	26.444	-
Developmental Test & Evaluation - OFP	C/CPFF	Boeing : St. Louis, MO	1.439	0.360	Apr 2018	0.000		0.000		-		0.000	0.000	1.799	1.799

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604214N / *AV-8B Aircraft - Engine Dev*	Project (Number/Name) 0652 / *AV-8B*	

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
Developmental Test & Evaluation - OFP	C/CPFF	Raytheon : Waltham, MA	1.266	1.500	Sep 2018	0.000		0.000		-		0.000	0.000	2.766	2.766
Developmental Test & Evaluation - RMP	WR	FRC-E : Cherry Point, NC	0.193	0.100	Dec 2017	0.000		0.000		-		0.000	0.000	0.293	-
Developmental Test & Evaluation - RMP/OFP	Various	Various : Various	0.000	0.100	Jan 2018	0.000		0.000		-		0.000	0.000	0.100	-
Operational Test & Evaluation - OFP	WR	COMOPTEVFOR : Norfolk, VA	24.250	0.762	Jan 2018	0.000		0.000		-		0.000	0.000	25.012	-
Operational Test & Evaluation - OFP	WR	NAWCAD : Patuxent River, MD	0.000	0.130	Dec 2017	0.000		0.000		-		0.000	0.000	0.130	-
Prior year cost no longer funded in the FYDP	Various	Various : Various	10.929	0.000		0.000		0.000		-		0.000	0.000	10.929	-
		Subtotal	98.218	10.089		0.000		0.000		-		0.000	0.000	108.307	N/A

Remarks

Line 4: FY18 increase from PB19 is due to the requirement to procure HMCS systems to support peculiar testing to determine if a HMCS can be integrated safely and effectively on the AV-8B.

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
Engineering & Tec SRVC (Non-FFRDC) - RMP	C/CPFF	Amelex : California, MD	1.031	0.270	Dec 2017	0.000		0.000		-		0.000	0.000	1.301	1.301
Engineering & Tec SRVC (Non-FFRDC) - ELMP	C/CPFF	LTM, Inc : Havelock, NC	4.069	1.162	Jun 2018	0.000		0.000		-		0.000	0.000	5.231	5.231
Engineering & Tec SRVC (Non-FFRDC)	C/CPFF	Various : Various	9.688	1.041	Dec 2017	0.000		0.000		-		0.000	0.000	10.729	10.729
Government Engineering Support - ELMP	WR	NAWCAD : Patuxent River, MD	9.003	1.052	Nov 2017	0.000		0.000		-		0.000	0.000	10.055	-
Government Engineering Support - OFP	WR	NAWCAD : Patuxent River, MD	3.130	0.974	Nov 2017	0.000		0.000		-		0.000	0.000	4.104	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604214N / *AV-8B Aircraft - Engine Dev*	Project (Number/Name) 0652 / *AV-8B*

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
Government Engineering Support - ELMP	WR	NAWCWD : China Lake, CA	1.348	0.028	Dec 2017	0.000		0.000		-		0.000	0.000	1.376	-
Government Engineering Support - OFP	Various	Various : Various	0.200	0.204	Jan 2018	0.000		0.000		-		0.000	0.000	0.404	-
MGT & PROF SUPPT SRVC (NON-FFRDC)	C/CPFF	Various : Various	9.039	0.209	Dec 2017	0.000		0.000		-		0.000	0.000	9.248	9.248
Travel	WR	Various : Various	1.620	0.180	Oct 2017	0.000		0.000		-		0.000	0.000	1.800	-
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	55.897	5.120		0.000		0.000		-		0.000	0.000	61.017	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	411.590	41.261		0.000		0.000		-		0.000	0.000	452.851	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604214N / *AV-8B Aircraft - Engine Dev*	**Project (Number/Name)** 0652 / *AV-8B*

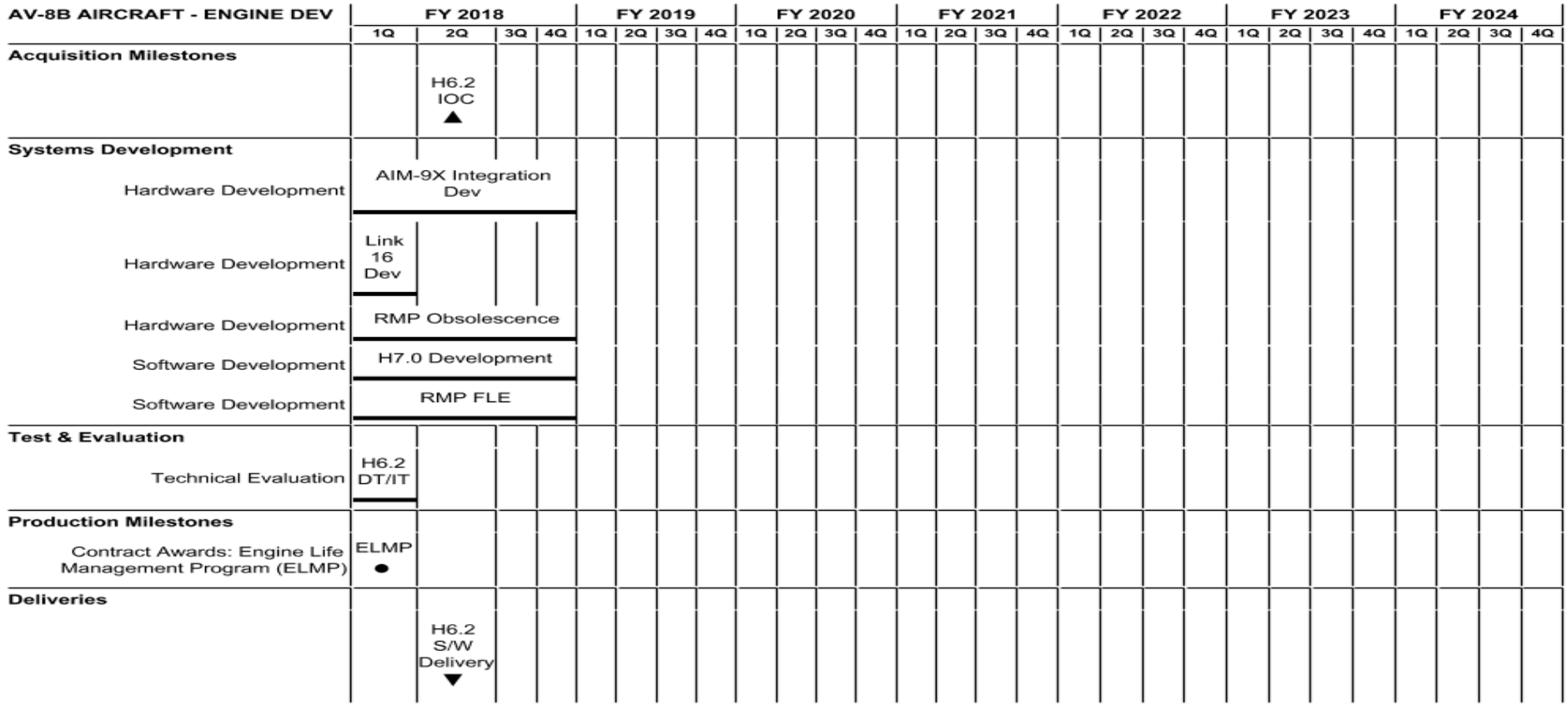

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604214N / *AV-8B Aircraft - Engine Dev*	**Project (Number/Name)** 0652 / *AV-8B*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
AV-8B AIRCRAFT - ENGINE DEV				
Acquisition Milestones: H6.2 IOC	2	2018	2	2018
Systems Development: Hardware Development: AIM-9X Integration Development	1	2018	4	2018
Systems Development: Hardware Development: Link 16 Development	1	2018	1	2018
Systems Development: Hardware Development: RMP Obsolescence Development	1	2018	4	2018
Systems Development: Software Development: H7.0 Development	1	2018	4	2018
Systems Development: Software Development: RMP Fatigue Life Expended Development	1	2018	4	2018
Test & Evaluation: Technical Evaluation: H6.2 DT/IT	1	2018	1	2018
Production Milestones: Contract Awards: Engine Life Management Program (ELMP): ELMP Contract Award FY18	1	2018	1	2018
Deliveries: H6.2 S/W Delivery	2	2018	2	2018