Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Navy											Date: May 2021	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0207161N *I Tactical Aim Missiles*							
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	549.258	19.136	5.859	23.881	-	23.881	-	-	-	-	-	-
0457: *AIM-9X*	549.258	19.136	5.859	23.881	-	23.881	-	-	-	-	-	-
Program MDAP/MAIS Code: **Project MDAP/MAIS Code(s):** 442												

A. Mission Description and Budget Item Justification

The AIM-9X Block II/II+ Sidewinder (AIM-9X Blk II/II+) continues the evolution of the AIM-9 series of missiles. This missile program delivers a launch and leave, air combat munition that uses passive Infrared (IR) energy to acquire and track enemy air targets and complements the radar guided Advanced Medium Range Air-to-Air Missile (AMRAAM). F/A-18 first shot, first kill opportunities while conducting air combat maneuvering Within Visual Range (WVR) are essential for aircrew survival. The AIM-9X provides these opportunities with unmatched offensive and defensive capabilities against threats WVR, even when IR countermeasures are employed. The AIM-9X also provides limited short range capability in the Beyond Visual Range air-to-air battle. Anti-tamper features have been incorporated to protect improvements inherent in this design. The AIM-9X Block II missile is critical for completing fighter aircraft loadout in order to enable engagement of threats identified in the National Defense Strategy and the Chief of Naval Operations Guidance.

AIM-9X is a Post Milestone C, Acquisition Category IC joint service program led by the Department of the Navy. The Block II program has completed independent operational testing and found to be operationally effective and operational/suitable. The program achieved Navy Initial Operational Capability (IOC) in March 2015 and received Full Rate Production decision in August 2015. The first Full Rate Production Lot contract was awarded in September 2015. This budget line will continue technical refresh of critical obsolete components, implement cost reduction initiatives, improve insensitive munitions performance, correct deficiencies, increase capabilities through software enhancements, and conduct testing to ensure platform integration onto threshold US Navy aircraft.

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 2022 Navy					Date: May 2021
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development*		R-1 Program Element (Number/Name) PE 0207161N *I Tactical Aim Missiles*			
B. Program Change Summary ($ in Millions)	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**
Previous President's Budget	19.488	5.859	6.015	-	6.015
Current President's Budget	19.136	5.859	23.881	-	23.881
Total Adjustments	-0.352	0.000	17.866	-	17.866
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.002	0.000			
• SBIR/STTR Transfer	-0.350	0.000			
• Program Adjustments	0.000	0.000	18.100	-	18.100
• Rate/Misc Adjustments	0.000	0.000	-0.234	-	-0.234

Change Summary Explanation

Financial: The program increased in FY 2022 by $17.866 million for Systems Improvement Program (SIP) requirements. $18.100 million was realigned from the Weapons Procurement, Navy budget to support SIP IV hardware and software upgrades that are essential to reduce risk of obsolescence and provide improved capability against advanced threats.

Technical: AIM-9X SIP IV efforts will transition from risk reduction activities to hardware design and development of an improved sensor and electronics unit as well as corresponding software updates. The AIM-9X insensitive munitions warhead design effort concluded in 2021.

Schedule: The timeline for risk reduction trade studies for SIP IV was reduced to reflect a transition from risk reduction efforts to the formal SIP IV requirement which was funded and commences in FY22. Production delivery start dates were updated to align with the contract delivery requirements; all deliveries are required to be complete by the date shown. The schedule slides associated with the SIP III program (Hardware Obsolescence, Phase 2 ECP, Software v10.4 testing and release) are due to delays in the co-development effort of the Application Specific Integrated Circuit (ASIC) processor. Delay in delivery of production representative ASIC chips to the SIP III program has delayed dependent hardware obsolescence development and software v10.4 development. The insensitive munitions warhead effort concluded and will be briefed to Joint Requirements Oversight Council in May 2021.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy											Date: May 2021	
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0207161N / *Tactical Aim Missiles*				Project (Number/Name) 0457 / *AIM-9X*			
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
0457: *AIM-9X*	549.258	19.136	5.859	23.881	-	23.881	-	-	-	-	-	-
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 442

A. Mission Description and Budget Item Justification

The AIM-9X Block II/II+ Sidewinder (AIM-9X Blk II/II+) continues the evolution of the AIM-9 series of missiles. This missile program delivers a launch and leave, air combat munition that uses passive Infrared (IR) energy to acquire and track enemy air targets and complements the radar guided Advanced Medium Range Air-to-Air Missile (AMRAAM). F/A-18 first shot, first kill opportunities while conducting air combat maneuvering Within Visual Range (WVR) are essential for aircrew survival. The AIM-9X provides these opportunities with unmatched offensive and defensive capabilities against threats WVR, even when IR countermeasures are employed. The AIM-9X also provides limited short range capability in the Beyond Visual Range air-to-air battle. Anti-tamper features have been incorporated to protect improvements inherent in this design. The AIM-9X Block II missile is critical for completing fighter aircraft loadout in order to enable engagement of threats identified in the National Defense Strategy and the Chief of Naval Operations Guidance.

This line item continues technical refresh of components and software, as well as incorporates advanced development products and capabilities, to meet threshold requirements of the capabilities production document. Specifically, the program will redesign, develop and integrate components facing obsolescence, implement cost reduction initiatives, enhance insensitive munitions performance, incrementally improve operational flight software to fully utilize capabilities of the missile, and improve anti-tamper and cyber security technology. In addition, the program will evaluate and begin risk reduction efforts that will address hardware and software improvements to facilitate follow-on capability and mitigate obsolescence.

The program strategy is to complete missile software improvements (software version 9.4) and release it into all production and fielded missiles. The software will provide improved enemy flare rejection (infrared counter-countermeasures), partial and degraded cueing, beyond visual range engagement capabilities, small target acquisition cruise missile and Unmanned Air Vehicle, and provide surface attack capability over land and sea. The program will also continue development of an improved processor, an improved Inertial Measurement Unit (IMU), and a version 10.4 software rehost.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**
Title: Product Development	9.253	3.259	21.235	0.000	21.235
Articles:	-	-	-	-	-
Description: Continuation of Primary Hardware Development/Pre-Planned Product Improvement (technical refresh) efforts for the AIM-9X weapon system. This includes systems engineering and program management, as well as support required to ensure AIM-9X missile integration with threshold US Navy aircraft platforms. This also includes efforts to redesign Block II missile components to resolve obsolescence, ensure producibility and increase reliability beyond Lot 21. It will incorporate anti-tamper and cyber security technology improvements,					

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0207161N / *Tactical Aim Missiles*	**Project (Number/Name)** 0457 / *AIM-9X*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
implement cost reduction initiatives, and develop Insensitive Munitions (IM) technology improvements. In addition, the program will evaluate and begin risk reduction efforts that will address hardware and software improvements to facilitate follow-on capability and mitigate obsolescence. ***FY 2021 Plans:*** Continue Engineering Manufacturing Development required to redesign, integrate, test and qualify components due to obsolescence and implement cost reduction initiatives to include execution of SIP III Inertial Measurement Unit and processor hardware efforts. In addition, continue development of the version 10.4 software rehost, as well as continue to support v9.4 Block II software testing to pace the threat and fully utilize the capabilities of the missile. Incorporate anti-tamper and cyber security technology improvements. Continue to develop missile hardware design improvements necessary to enhance IM performance. Continue evaluation and risk reduction efforts to address hardware and software improvements to facilitate follow-on capability and obsolescence mitigation. ***FY 2022 Base Plans:*** AIM-9X SIP III 10.4 Software (SW) Engineering Change Proposal (ECP) and Phase 2 Hardware (HW) (IMU/ dome/ processor) ECP is planned to be completed in FY2022. Hardware and software risk reduction activities will continue in order to facilitate follow-on capability and obsolescence mitigation. In addition, the AIM-9X SIP-IV contract will be awarded in FY2022 to address technical obsolescence in several missile sub-systems and maintain required performance against increasingly challenging threat platforms. In addition, software will be developed to facilitate the use of the updated hardware. In particular, FY2022 SIP-IV RDT&E funding will focus on the development of an advanced sensor replacement and electronic unit upgrades to address hardware obsolescence and processing improvement for the missile guidance system. ***FY 2022 OCO Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding increases in FY2022 due to the ramp up of SIP IV development efforts. In particular, software development efforts for Operational Flight Software 9.X will increase as the software risk reduction activities complete. In addition, prototype development of the advanced sensor as well as preliminary design efforts for the advanced sensor and electronics unit upgrade will be the primary focus as SIP IV transitions from risk reduction to full execution upon SIP IV contract award.					
Title: Test and Evaluation Activities and Support	9.676	2.392	2.434	0.000	2.434
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0207161N / *Tactical Aim Missiles*	**Project (Number/Name)** 0457 / *AIM-9X*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Description: Test and Evaluation (T&E) and associated governmental support required to ensure the AIM-9X missile integration with threshold US Naval aircraft platforms (F/A-18A+/C/D/E/F). Conduct developmental and Operational Testing (OT) of OFS. ***FY 2021 Plans:*** Complete Operational Testing (OT-D1) of Operational Flight Software v9.4 and field v9.4 Block II software to pace the threat and fully utilize the capabilities of the missile. Conduct flight testing of Software v10.4 to confirm re-host of software on SIP III processor hardware. ***FY 2022 Base Plans:*** Flight test in FY2022 will focus on completion of SIP-III hardware, to include verification of the Phase 2 HW (IMU/ dome/ processor) as well as 10.4 SW. In addition, as part of the SIP IV effort testing of follow-on 9.X and 10.X SW builds will commence. ***FY 2022 OCO Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding increases in FY2022 due to inflation					
Title: Management Services	0.207	0.208	0.212	0.000	0.212
Articles:	-	-	-	-	-
Description: Transportation and travel for AIM-9X efforts in support of the major test events and program decisions identified in the Product Development and Test and Evaluation sections above. ***FY 2021 Plans:*** Continue funding transportation and travel costs associated with AIM-9X missile program efforts supporting the major test events and program decisions identified in the Product Development and Test and Evaluation sections above. ***FY 2022 Base Plans:*** Continue funding transportation and travel costs associated with AIM-9X missile program efforts supporting the major test events and program decisions identified in the Product Development and Test and Evaluation sections above. ***FY 2022 OCO Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0207161N / *Tactical Aim Missiles*	**Project (Number/Name)** 0457 / *AIM-9X*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding increases in FY2022 due to inflation.					
Accomplishments/Planned Programs Subtotals	19.136	5.859	23.881	0.000	23.881

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• WPN 2209: *Sidewinder*	149.239	113.651	86.366	-	86.366	-	-	-	-	-	-
• MPAF 3479: *Sidewinder*	155.289	164.769	109.158	-	109.158	-	-	-	-	-	-
• RDTE, AF 41: *Sidewinder*	10.314	19.417	35.048	-	35.048	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

Milestone C decision for LRIP was held June 24, 2011. The program received DON Initial Operational Capability (IOC) in March 2015 and Full Rate Production (FRP) approval in August 2015. The program awarded FRP-5 contract option in April 2019 and FRP-6, Lot 20, was awarded in March 2020 with FRP-7 expected to award third quarter 2021.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0207161N / *Tactical Aim Missiles*	**Project (Number/Name)** 0457 / *AIM-9X*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware & Software Development	SS/CPFF	Raytheon Missile Systems : Tucson, AZ	149.281	8.354	Feb 2020	2.045	Feb 2021	19.443	Feb 2022	-		19.443	-	-	-
Aircraft Integration - USG	WR	NAWCWD : China Lake, CA	24.528	0.440	Feb 2020	0.213	Feb 2021	0.256	Feb 2022	-		0.256	-	-	-
USG Systems Engineering & Project Management Support	WR	NAWC AD : Patuxent River, MD	2.003	0.430	Feb 2020	0.439	Feb 2021	0.526	Feb 2022	-		0.526	-	-	-
USG Systems Engineering & Project Management Support	WR	NAWCWD : China Lake, CA	18.779	4.813	Feb 2020	0.562	Feb 2021	1.006	Feb 2022	-		1.006	-	-	-
Prior Year Prod Dev cost no longer funded in the FYDP	Various	Various : Various	267.484	0.000		0.000		0.000		-		0.000	-	-	-
		Subtotal	462.075	14.037		3.259		21.231		-		21.231	-	-	N/A

Remarks

The increase in Primary Hardware & Software Development in FY 2022 funding reflects the reprograming of procurement funding to incrementally fund the AIM-9X development activities associated with Systems Improvement Program (SIP) IV. Software development efforts for OFS 9.X will increase as the software risk reduction activities complete. In addition, prototype development of the advanced sensor as well as preliminary design efforts for the advanced sensor and electronics unit upgrade will be the primary focus as SIP IV transitions from risk reduction to full execution upon SIP IV contract award. The increase in USG Systems Engineering & Project Management Support (NAWC WD : China Lake, CA) in FY 2022 funding reflects the required support from the subject matter experts at the technical program office and modeling & simulation efforts associated with the SIP IV requirement.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering Tech Support	Various	Various : Various	0.297	0.153	May 2020	0.156	May 2021	0.159	May 2022	-		0.159	-	-	-
Prior Year Support Costs	C/CPFF	Various : Various	2.374	0.000		0.000		0.000		-		0.000	-	-	-
		Subtotal	2.671	0.153		0.156		0.159		-		0.159	-	-	N/A

Remarks

The increase in FY 2022 Support funding reflects 1.9% inflation

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy			Date: May 2021
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0207161N / *Tactical Aim Missiles*	Project (Number/Name) 0457 / *AIM-9X*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Oper Test & Eval	WR	COMOPTEVFOR : Norfolk, VA	12.487	3.174	Mar 2020	0.436	Mar 2021	0.443	Mar 2022	-		0.443	-	-	-
Oper Test & Eval (NAWC CL) (GOVT)	WR	NAWCWD : China Lake, CA	19.347	1.565	Mar 2020	1.800	Mar 2021	1.836	Mar 2022	-		1.836	-	-	-
Prior year T&E cost no longer funded in the FYDP	Various	Various : Various	40.382	0.000		0.000		0.000		-		0.000	-	-	-
		Subtotal	72.216	4.739		2.236		2.279		-		2.279	-	-	N/A

Remarks

The increase in FY 2022 Test and Evaluation funding reflects 1.9% inflation

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Transportation - Material	WR	NAVAIR : Patuxent River, MD	0.753	0.075	Oct 2019	0.075	Oct 2020	0.079	Oct 2021	-		0.079	-	-	-
Travel - Obligation throughout the year	WR	NAWCAD : Patuxent River, MD	3.510	0.132	Oct 2019	0.133	Oct 2020	0.133	Oct 2021	-		0.133	-	-	-
Prior Year Mgmt cost no longer funded in the FYDP	Various	Various : Various	8.033	0.000		0.000		0.000		-		0.000	-	-	-
		Subtotal	12.296	0.207		0.208		0.212		-		0.212	-	-	N/A

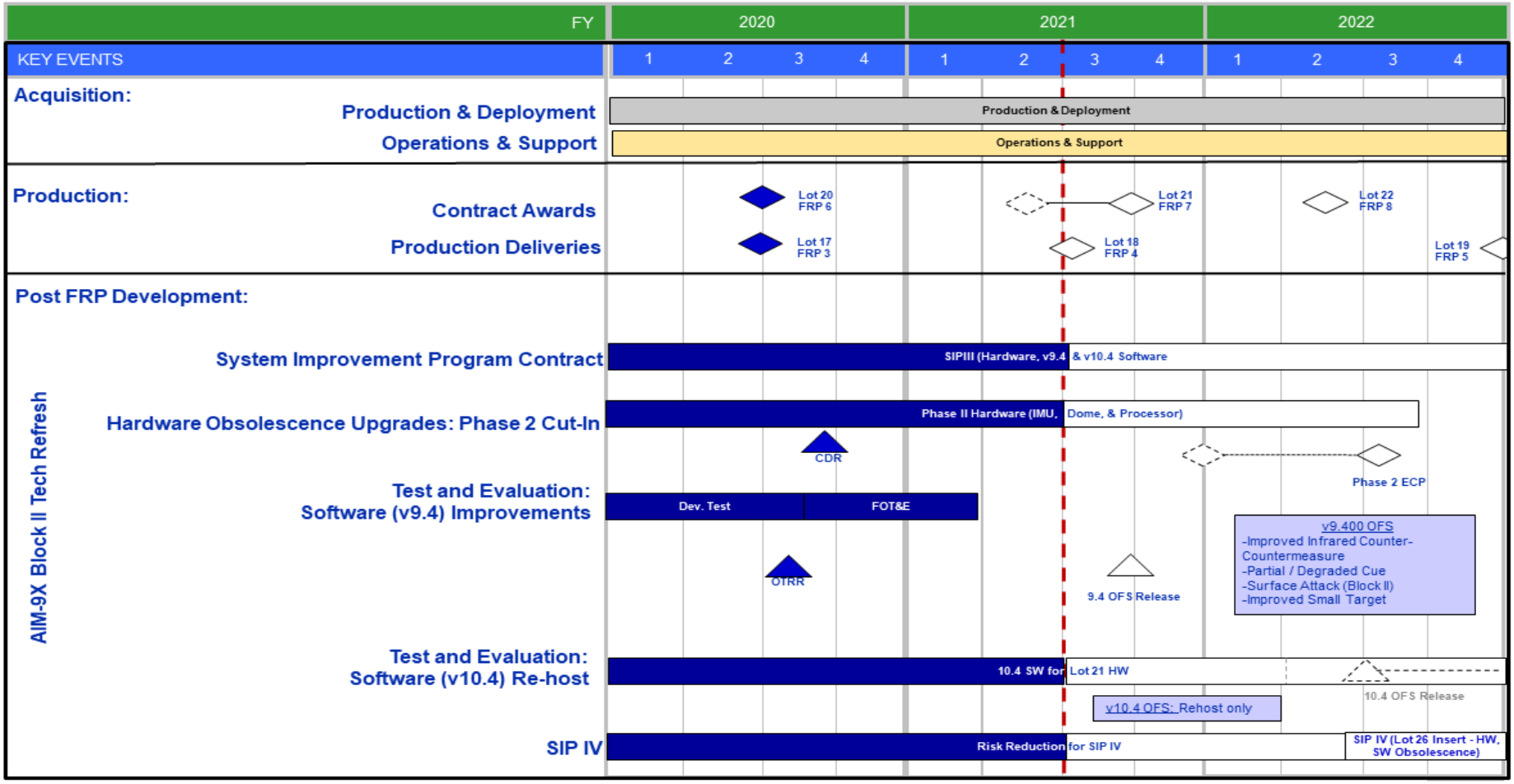
Remarks

The increase in FY 2022 Management Services funding reflects 1.9% inflation

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	549.258	19.136		5.859		23.881		-		23.881	-	-	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0207161N / *Tactical Aim Missiles*	**Project (Number/Name)** 0457 / *AIM-9X*



Last updated 27 April 2021

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0207161N / *Tactical Aim Missiles*	**Project (Number/Name)** 0457 / *AIM-9X*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
TACTICAL AIM MISSILES				
Production Milestones - Block II: Contract Awards: Lot 20 (FRP 6)	2	2020	2	2020
Production Milestones - Block II: Contract Awards: Lot 21 (FRP 7)	3	2021	3	2021
Production Milestones - Block II: Contract Awards: Lot 22 (FRP 8)	2	2022	2	2022
Production Deliveries: Lot 17 (FRP 3)	2	2020	2	2020
Production Deliveries: Lot 18 (FRP 4)	3	2021	3	2021
Production Deliveries: Lot 19 (FRP 5)	4	2022	4	2022
AIM-9X Block II Tech Refresh: System Improvement Program Contract: SIPIII (Hardware, v9.4 & v10.4 Software)	1	2020	4	2022
AIM-9X Block II Tech Refresh: Hardware Obsolescence Redesign: Lot 21 Cut In: Hardware (IMU, Dome & Processor)	1	2020	3	2022
AIM-9X Block II Tech Refresh: Hardware Obsolescence Redesign: Lot 21 Cut In: CDR	3	2020	3	2020
AIM-9X Block II Tech Refresh: Hardware Obsolescence Redesign: Lot 21 Cut In: Phase 2 ECP	3	2022	3	2022
AIM-9X Block II Tech Refresh: Test and Evaluation: Software (v9.4) Improvements: Development Test / FOT&E	1	2020	1	2021
AIM-9X Block II Tech Refresh: Test and Evaluation: Software (v9.4) Improvements: Operational Test Readiness Review	3	2020	3	2020
AIM-9X Block II Tech Refresh: Test and Evaluation: Software (v9.4) Improvements: Software v9.4 Release	3	2021	3	2021
AIM-9X Block II Tech Refresh: Test and Evaluation: Software (v9.4) Improvements: Risk Reduction Trade Studies for SIP IV	1	2020	2	2022
AIM-9X Block II Tech Refresh: Test and Evaluation: Software (v9.4) Improvements: SIP IV (Lot 26 Insert - Hardware, Software Obsolescence)	2	2022	4	2022

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0207161N / *Tactical Aim Missiles*	**Project (Number/Name)** 0457 / *AIM-9X*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
AIM-9X Block II Tech Refresh: Test and Evaluation: Software (v10.x) Rehost: Software v10.4 Development Testing	1	2020	4	2022