Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy												Date: February 2020
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0207161N *I Tactical Aim Missiles*							
COST ($ in Millions)	**Prior Years**	**FY 2019**	**FY 2020**	**FY 2021 Base**	**FY 2021 OCO**	**FY 2021 Total**	**FY 2022**	**FY 2023**	**FY 2024**	**FY 2025**	**Cost To Complete**	**Total Cost**
Total Program Element	512.814	36.444	19.488	5.859	-	5.859	6.015	3.948	1.637	0.445	0.000	586.650
0457: *AIM-9X*	512.814	36.444	19.488	5.859	-	5.859	6.015	3.948	1.637	0.445	0.000	586.650
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 basic fighter maneuvering (dogfighting) 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 (BVR) 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 (NDS) and the Chief of Naval Operations Guidance (CNOG).

AIM-9X is a Post Milestone C, Acquisition Category IC (ACAT-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 2021 Navy					Date: February 2020
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development*		R-1 Program Element (Number/Name) PE 0207161N *I Tactical Aim Missiles*			
B. Program Change Summary ($ in Millions)	**FY 2019**	**FY 2020**	**FY 2021 Base**	**FY 2021 OCO**	**FY 2021 Total**
Previous President's Budget	40.121	19.488	6.946	-	6.946
Current President's Budget	36.444	19.488	5.859	-	5.859
Total Adjustments	-3.677	0.000	-1.087	-	-1.087
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-2.799	0.000			
• SBIR/STTR Transfer	-0.878	0.000			
• Program Adjustments	0.000	0.000	-1.188	-	-1.188
• Rate/Misc Adjustments	0.000	0.000	0.101	-	0.101

Change Summary Explanation

Financial: The program decreased in FY 2021 by $1.087 million due to program adjustments and rate/miscellaneous adjustments. FY 2021 funding in the amount of $2.288 million was realigned to FY 2022 and FY2023 to account for the availability of prior year execution balances. Program adjustments in FY 2021 also include an increase of $0.825 million for Bock II hardware and software follow-on technical refresh efforts, and a $0.275 million realignment from Weapons Procurement, Navy (WPN) to support technical refresh and obsolescence efforts.

Schedule: Insensitive Munition improvements will be incorporated with the follow-on AIM-9X technical increment.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020	
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0207161N / *Tactical Aim Missiles*				Project (Number/Name) 0457 / *AIM-9X*			
COST ($ in Millions)	**Prior Years**	**FY 2019**	**FY 2020**	**FY 2021 Base**	**FY 2021 OCO**	**FY 2021 Total**	**FY 2022**	**FY 2023**	**FY 2024**	**FY 2025**	**Cost To Complete**	**Total Cost**
0457: *AIM-9X*	512.814	36.444	19.488	5.859	-	5.859	6.015	3.948	1.637	0.445	0.000	586.650
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 basic fighter maneuvering (dogfighting) 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 air superiority in the Beyond Visual Range (BVR) 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 projecting power and winning decisively against threats identified in Defense Planning Guidance and the Navy's Navigation Plan.

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 improvements in 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, improve small target acquisition (cruise missile and UAV), 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 2019**	**FY 2020**	**FY 2021 Base**	**FY 2021 OCO**	**FY 2021 Total**
Title: Product Development	24.658	9.253	3.259	0.000	3.259
Articles:	-	-	-	-	-
Description: Continuation of Primary Hardware Development/Pre-Planned Product Improvement (Tech 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 missile components in order to resolve Block II component obsolescence to ensure missile producibility and increase reliability beyond Lot 21. It will incorporate anti-tamper and cyber					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0207161N / *Tactical Aim Missiles*	**Project (Number/Name)** 0457 / *AIM-9X*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
security technology improvements, implement cost reduction initiatives, and comply with the Insensitive Munitions (IM) requirements as established by Joint Requirements Oversight Council memo dated 11 February 2009. 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 2020 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 System Improvement Program (SIP) III Inertial Measurement Unit and processor hardware Critical Design Review (CDR). 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. Evaluate and begin risk reduction efforts that will address hardware and software improvements to facilitate follow-on capability and mitigate obsolescence. ***FY 2021 Base 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 Critical Design Review (CDR). It 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 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** The decrease in FY 2021 funding reflects the incremental completion of the development activities associated with the obsolescence redesign of missile components and v9.4 software improvements.					
Title: Test and Evaluation Activities and Support	11.579	10.028	2.392	0.000	2.392
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0207161N / *Tactical Aim Missiles*	**Project (Number/Name)** 0457 / *AIM-9X*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Description: Test and Evaluation (T&E) and associated governmental support required to ensure the AIM-9X missile integration with threshold US Navy aircraft platforms (F/A-18A+/C/D/E/F). Developmental and Operational testing of Operation Flight Software v9.4. ***FY 2020 Plans:*** Complete Developmental Testing and Integrated Testing (DT/IT-D1) of Operational Flight Software v9.4 to pace the threat and fully utilize the capabilities of the missile. Begin Operational Testing (OT-D1) of Operational Flight Software v9.4. ***FY 2021 Base 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 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** The decrease in FY 2021 funding reflects the completion of v9.4 Developmental Test (DT) and Integrated Test activities					
Title: Management Services	0.207	0.207	0.208	0.000	0.208
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 2020 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 2021 Base Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0207161N / *Tactical Aim Missiles*	**Project (Number/Name)** 0457 / *AIM-9X*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
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 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** The increase from FY2020 to FY2021 is due to inflation.					
Accomplishments/Planned Programs Subtotals	36.444	19.488	5.859	0.000	5.859

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• WPN 2209: *Sidewinder*	121.481	149.239	126.485	-	126.485	110.636	97.194	124.508	126.523	1,319.646	3,112.999
• MPAF 3479: *Sidewinder*	118.253	155.289	164.769	-	164.769	117.514	121.816	120.381	122.537	1,377.143	3,689.955
• RDTE, AF 41: *Sidewinder*	29.042	10.314	19.417	-	19.417	26.760	21.187	14.254	14.515	Continuing	Continuing

Remarks

D. Acquisition Strategy

Milestone C decision for LRIP was held June 24, 2011. The program received USN Initial Operational Capability (IOC) in March 2015 and Full Rate Production (FRP) Approval in August 2015. The program awarded FRP-4 in December 2018 and awarded the FRP-5 contract option in April 2019.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 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 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware & Software Development	SS/CPFF	Raytheon Missile Systems : Tucson, AZ	125.798	23.483	May 2019	8.354	Feb 2020	2.045	Feb 2021	-		2.045	5.482	165.162	160.725
Aircraft Integration - USG	WR	NAWCWD : China Lake, CA	24.096	0.432	Feb 2019	0.440	Feb 2020	0.213	Feb 2021	-		0.213	0.000	25.181	-
USG Systems Engineering & Project Management Support	WR	NAWC AD : Patuxent River, MD	1.638	0.365	Feb 2019	0.430	Feb 2020	0.439	Feb 2021	-		0.439	0.450	3.322	-
USG Systems Engineering & Project Management Support	WR	NAWCWD : China Lake, CA	11.660	7.119	Feb 2019	4.813	Feb 2020	0.562	Feb 2021	-		0.562	0.800	24.954	-
Prior Year Prod Dev cost no longer funded in the FYDP	Various	Various : Various	267.484	0.000		0.000		0.000		-		0.000	0.000	267.484	-
		Subtotal	430.676	31.399		14.037		3.259		-		3.259	6.732	486.103	N/A

Remarks

The decrease in Primary Hardware & Software Development in FY 2021 funding reflects the incremental completion of the development activities associated with the obsolescence redesign of missile components and v9.4 software improvements.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering Tech Support	Various	Various : Various	0.147	0.150	May 2019	0.153	May 2020	0.156	May 2021	-		0.156	0.636	1.242	-
Prior Year Support Costs	C/CPFF	Various : Various	2.374	0.000		0.000		0.000		-		0.000	0.000	2.374	-
		Subtotal	2.521	0.150		0.153		0.156		-		0.156	0.636	3.616	N/A

Remarks

Provides recurring engineering and management services in support of air to air weapons development, testing, and integration support.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 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 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Oper Test & Eval	WR	COMOPTEVFOR : Norfolk, VA	9.813	2.674	Mar 2019	3.174	Mar 2020	0.436	Mar 2021	-		0.436	0.511	16.608	-
Oper Test & Eval (NAWC CL) (GOVT)	WR	NAWCWD : China Lake, CA	17.333	2.014	Mar 2019	1.917	Mar 2020	1.800	Mar 2021	-		1.800	3.251	26.315	-
Prior year T&E cost no longer funded in the FYDP	Various	Various : Various	40.382	0.000		0.000		0.000		-		0.000	0.000	40.382	-
		Subtotal	67.528	4.688		5.091		2.236		-		2.236	3.762	83.305	N/A

Remarks

The decrease in FY 2021 Test and Evaluation funding reflects the completion of v9.4 Developmental Test (DT) and Integrated Test activities.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Transportation - Material	WR	NAVAIR : Patuxent River, MD	0.678	0.075	Oct 2018	0.075	Oct 2019	0.075	Oct 2020	-		0.075	0.375	1.278	-
Travel - Obligation throughout the year	WR	NAWCAD : Patuxent River, MD	3.378	0.132	Oct 2018	0.132	Oct 2019	0.133	Oct 2020	-		0.133	0.540	4.315	-
Prior Year Mgmt cost no longer funded in the FYDP	Various	Various : Various	8.033	0.000		0.000		0.000		-		0.000	0.000	8.033	-
		Subtotal	12.089	0.207		0.207		0.208		-		0.208	0.915	13.626	N/A

Remarks

Provides transportation of test assets, as well as travel of persons, in support of the AIM-9X Block II System Improvement Program (SIP) III project.

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	512.814	36.444		19.488		5.859		-		5.859	12.045	586.650	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0207161N / *Tactical Aim Missiles*	**Project (Number/Name)** 0457 / *AIM-9X*

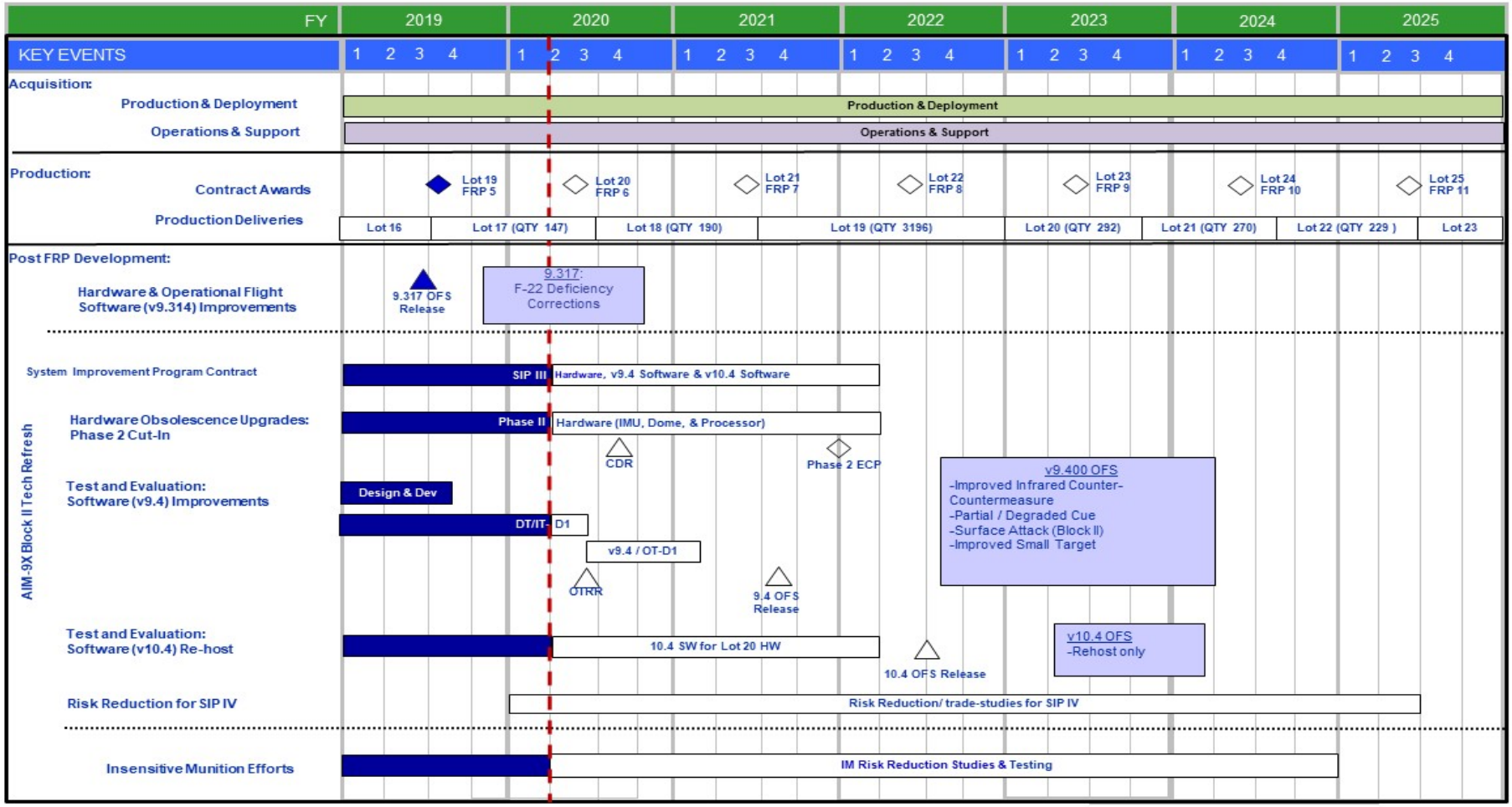

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0207161N / *Tactical Aim Missiles*	**Project (Number/Name)** 0457 / *AIM-9X*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
TACTICAL AIM MISSILES				
Production Milestones - Block II: Contract Awards: Lot 19 (FRP 5)	3	2019	3	2019
Production Milestones - Block II: Contract Awards: Lot 20 (FRP 6)	2	2020	2	2020
Production Milestones - Block II: Contract Awards: Lot 21 (FRP 7)	2	2021	2	2021
Production Milestones - Block II: Contract Awards: Lot 22 (FRP 8)	2	2022	2	2022
Production Milestones - Block II: Contract Awards: Lot 23 (FRP 9)	2	2023	2	2023
Production Milestones - Block II: Contract Awards: Lot 24 (FRP 10)	2	2024	2	2024
Production Milestones - Block II: Contract Awards: Lot 25 (FRP 11)	2	2025	2	2025
Production Deliveries: Lot 16 (FRP 2)	1	2019	3	2019
Production Deliveries: Lot 17 (FRP 3)	3	2019	2	2020
Production Deliveries: Lot 18 (FRP 4)	2	2020	2	2021
Production Deliveries: Lot 19 (FRP 5)	2	2021	4	2022
Production Deliveries: Lot 20 (FRP 6)	1	2023	4	2023
Production Deliveries: Lot 21 (FRP 7)	4	2023	3	2024
Production Deliveries: Lot 22 (FRP 8)	3	2024	2	2025
Production Deliveries: Lot 23 (FRP 9)	3	2025	4	2025
AIM-9X Block II: Hardware & Software (v9.3) Improvements: Operational Flight Software Release v9.317	2	2019	2	2019
AIM-9X Block II Tech Refresh: Hardware Obsolescence Redesign: Lot 20 Cut In: Hardware (IMU, Dome & Processor)	1	2019	1	2022
AIM-9X Block II Tech Refresh: Hardware Obsolescence Redesign: Lot 20 Cut In: Lot 20 Hardware Cut-In Critical Design Review	3	2020	3	2020
AIM-9X Block II Tech Refresh: Hardware Obsolescence Redesign: Lot 20 Cut In: Lot 20 Phase 2 Hardware Cut-In Engineering Change Proposal	4	2021	4	2021

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 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 (v9.4) Improvements: Design and Development Testing	1	2019	3	2019
AIM-9X Block II Tech Refresh: Test and Evaluation: Software (v9.4) Improvements: Development Test / Integrated Testing	1	2019	2	2020
AIM-9X Block II Tech Refresh: Test and Evaluation: Software (v9.4) Improvements: Operational Test Readiness Review	2	2020	2	2020
AIM-9X Block II Tech Refresh: Test and Evaluation: Software (v9.4) Improvements: Operational Testing	2	2020	1	2021
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	2025
AIM-9X Block II Tech Refresh: Test and Evaluation: Software (v9.4) Improvements: Insensitive Munition Warhead Risk Reduction, Studies and Testing	1	2019	4	2024
AIM-9X Block II Tech Refresh: Test and Evaluation: Software (v10.x) Rehost: Software v10.4 Development Testing	1	2019	1	2022
AIM-9X Block II Tech Refresh: Test and Evaluation: Software (v10.x) Rehost: Software v10.4 Operational Flight Software Release	3	2022	3	2022