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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Navy										Date: March 2019		
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy I BA 7: Operational Systems Development					R-1 Program Element (Number/Name) PE 0207161N I Tactical Aim Missiles							
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	478.751	34.063	40.121	19.488	-	19.488	6.946	0.345	0.348	0.349	0.000	580.411
0457: AIM-9X	478.751	34.063	40.121	19.488	-	19.488	6.946	0.345	0.348	0.349	0.000	580.411
Program MDAP/MAIS Code: Project MDAP/MAIS Code(s): 442												
A. Mission Description and Budget Item Justification												
<p>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.</p>												
<p>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, and increase capabilities through software enhancements, and conduct testing to ensure platform integration onto threshold US Navy aircraft.</p>												
<p>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.</p>												
<p>The USN & USAF require additional quantities beyond the approved APB (Change 1: 31 Aug 2015); an update is in staffing for approval.</p>												

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Appropriation/Budget Activity		R-1 Program Element (Number/Name)			
1319: Research, Development, Test & Evaluation, Navy I BA 7: Operational Systems Development		PE 0207161N I Tactical Aim Missiles			
B. Program Change Summary (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	42.884	40.121	20.053	-	20.053
Current President's Budget	34.063	40.121	19.488	-	19.488
Total Adjustments	-8.821	0.000	-0.565	-	-0.565
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-1.778	0.000			
• SBIR/STTR Transfer	-1.123	0.000			
• Program Adjustments	0.000	0.000	-0.567	-	-0.567
• Rate/Misc Adjustments	0.000	0.000	0.002	-	0.002
• Congressional Directed Reductions Adjustments	-5.920	-	-	-	-
Change Summary Explanation					
In March 2018, the prime System Improvement Program contract with Raytheon was modified to add scope to mitigate Missile Processor obsolescence. The program schedule has been updated to incorporate the additional scope for the processor upgrade and the accompanying v10.4 software which will complete in first quarter FY22. Consequently, the Critical Design Review is now planned for second quarter FY20 and the Lot 20 Engineering Change Proposal in second quarter FY21.					

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy										Date: March 2019		
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0207161N / Tactical Aim Missiles				Project (Number/Name) 0457 / AIM-9X			
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
0457: AIM-9X	478.751	34.063	40.121	19.488	-	19.488	6.946	0.345	0.348	0.349	0.000	580.411
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
Project MDAP/MAIS Code: 442												
A. Mission Description and Budget Item Justification												
<p>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.</p>												
<p>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.</p>												
<p>The program strategy is to redesign the control actuation system (CAS) battery, and incorporate it into the Lot 18 (FY 2018) production missile. Next, the program will complete missile software improvements (software version 9.4) and release it into Lot 19 (FY 2019) and prior 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.</p>												
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)								FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Product Development								26.945	27.049	8.611	0.000	8.611
								Articles: -	-	-	-	-
Description: Continuation of Primary Hardware Development/Pre-Planned Product Improvement (Tech Refresh) efforts for the AIM-9X weapon system. This includes Systems Engineering / 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 20. Incorporate anti-tamper and cyber security												

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
technology improvements, and implement cost reduction initiatives, and to comply with the Insensitive Munitions (IM) requirements as established by Joint Requirements Oversight Council memo dated 11 February 2009. FY 2019 Plans: Complete v9.317 software release to resolve aircraft employment deficiencies discovered during Block II integration testing. Continue Engineering Manufacturing Development required to redesign, integrate, test and qualify components due to obsolescence and implement cost reduction initiatives. Incorporate anti-tamper and cyber security technology improvements. Continue to develop v9.4 Block II software improvements to pace the threat and fully utilize the capabilities of the missile. Continue to develop missile hardware design improvements necessary to enhance IM performance. FY 2020 Base Plans: Continue Engineering Manufacturing Development required to redesign, integrate, test and qualify components due to obsolescence and implement cost reduction initiatives. Continue to develop v9.4 Block II software improvements 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. FY 2020 OCO Plans: N/A FY 2019 to FY 2020 Increase/Decrease Statement: Decrease in FY 2020 reflects the 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 <div>Articles:</div> 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 2019 Plans: Continue Developmental Testing and Integrated Testing (DT/IT-D1) planning of Operational Flight Software v9.4 including improvements associated with further integrating the F/A-18 aircraft to utilize the full capabilities of the Block II missile. FY 2020 Base Plans:		6.911 -	12.865 -	10.770 -	0.000 -	10.770 -

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Complete Developmental Testing and Integrated Testing (DT/IT-D1) of Operational Flight Software v9.4 including improvements associated with further integrating the F/A-18 aircraft to utilize the full capabilities of the Block II missile. FY 2020 OCO Plans: N/A FY 2019 to FY 2020 Increase/Decrease Statement: Decrease in FY 2020 reflects planned Developmental and Integrated Testing to be conducted at the Naval Air Warfare Center and at Commander Operational Test Force to incorporate software v9.4 improvements into the missile.						
Title: Management Services Articles: Description: Transportation / Travel for AIM-9X efforts in supporting the major test events and program decisions identified in the Product Development and Test and Evaluation sections above. FY 2019 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 2020 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 2020 OCO Plans: N/A FY 2019 to FY 2020 Increase/Decrease Statement: AIM-9X transportation and travel costs decrease from FY2019 to FY2020 as Product Development and Test and Evaluation activities ramp down in accordance with the program schedule.		0.207 -	0.207 -	0.107 -	0.000 -	0.107 -
Accomplishments/Planned Programs Subtotals		34.063	40.121	19.488	0.000	19.488

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C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2018	FY 2019	FY 2020	FY 2020	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	Cost To	
			Base	OCO	Total					Complete	Total Cost
• WPN 2209: <i>Sidewinder</i>	76.915	121.481	119.456	-	119.456	127.446	114.784	99.749	101.745	52.484	1,670.954
• MPAF 3479: <i>Sidewinder</i>	125.350	121.253	160.408	-	160.408	164.987	117.621	121.983	120.545	1,630.835	3,829.885
• RDTE, AF 41: <i>Sidewinder</i>	36.303	37.230	10.314	-	10.314	19.452	26.801	21.226	14.281	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 the FRP-3 contract option in March 2017. The program awarded FRP-4 in December 2018 with an option for FRP-5 in February 2019.

E. Performance Metrics

AIM-9X Block II:

1. Complete v9.317 software release to resolve aircraft employment deficiencies found during Block II integration testing (4Q FY 2018).

AIM-9X Block II Tech Refresh:

1. Complete Lot 18 Cut In Engineering Change Proposal to incorporate redesigned control actuation system battery into production (3Q FY 2019).

2. Complete Development Testing (DT-D1) for software v9.4 improvements (1Q FY 2019).

3. Complete (DT/IT-D1) for software v9.4 improvements (4Q FY 2019).

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy												Date: March 2019			
Appropriation/Budget Activity 1319 / 7						R-1 Program Element (Number/Name) PE 0207161N / <i>Tactical Aim Missiles</i>				Project (Number/Name) 0457 / AIM-9X					
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware & Software Development	SS/CPFF	Raytheon Missile Systems : Tucson, AZ	103.543	22.255	Mar 2018	22.594	Feb 2019	8.236	Feb 2020	-		8.236	4.097	160.725	160.725
Aircraft Integration - USG	WR	NAWCWD : China Lake, CA	23.724	0.372	Nov 2017	0.000		0.000		-		0.000	0.000	24.096	-
USG Systems Engineering & Project Managment Support	WR	NAWC AD : Patuxent River, MD	1.277	0.361	Jan 2018	0.368	Feb 2019	0.375	Feb 2020	-		0.375	0.000	2.381	-
USG Systems Engineering & Project Managment Support	WR	NAWCWD : China Lake, CA	7.703	3.957	Dec 2017	4.087	Feb 2019	0.000		-		0.000	0.000	15.747	-
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			403.731	26.945		27.049		8.611		-		8.611	4.097	470.433	N/A
Remarks															
1. Total prior years - FY95 and prior under PE 0603715D. 2. The decrease in Primary Hardware & Software Development in FY 2020 reflects curtailing the development activities associated with the obsolescence redesign of missile components and v9.4 software upgrade. 3. The decrease in USG Systems Engineering & Project Management from FY 2019 to FY 2020 reflects completion of tech refresh improvements into the final hardware and software design, and Insensitive Munitions development activities at China Lake.															
Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering Tech Support	Various	Various : Various	0.000	0.147	May 2018	0.000		0.000		-		0.000	0.000	0.147	-
Prior Year Support Costs	C/CPFF	Various : Various	2.374	0.000		0.000		0.000		-		0.000	0.000	2.374	-
Subtotal			2.374	0.147		0.000		0.000		-		0.000	0.000	2.521	N/A
Remarks															
Provides one-time engineering and management services in support of air to air weapons development, testing, and integration support.															

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy **Date:** March 2019

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0207161N / <i>Tactical Aim Missiles</i>	Project (Number/Name) 0457 / AIM-9X
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Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Oper Test & Eval	WR	COMOPTEVFOR : Norfolk, VA	8.968	0.845	Feb 2018	3.933	Mar 2019	3.973	Mar 2020	-		3.973	0.511	18.230	-
Oper Test & Eval (NAWC CL) (GOVT)	WR	NAWCWD : China Lake, CA	11.414	5.919	Dec 2017	8.932	Mar 2019	6.797	Mar 2020	-		6.797	3.251	36.313	-
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			60.764	6.764		12.865		10.770		-		10.770	3.762	94.925	N/A

Remarks

Decrease in Development Test at China Lake between FY 2019 and FY 2020 reflects the remaining DT/IT-D1 efforts to test software v9.4 improvements in accordance with the test and evaluation master plan (TEMP) revision after Block II.

Management Services (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Transportation - Material	WR	NAVAIR : Patuxent River, MD	0.603	0.075	Oct 2017	0.075	Oct 2018	0.075	Oct 2019	-		0.075	0.000	0.828	-
Travel - Obligation throughout the year	WR	NAWCAD : Patuxent River, MD	3.246	0.132	Oct 2017	0.132	Oct 2018	0.032	Oct 2019	-		0.032	0.129	3.671	-
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			11.882	0.207		0.207		0.107		-		0.107	0.129	12.532	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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	478.751	34.063	40.121	19.488	-	19.488	7.988	580.411	N/A

Remarks

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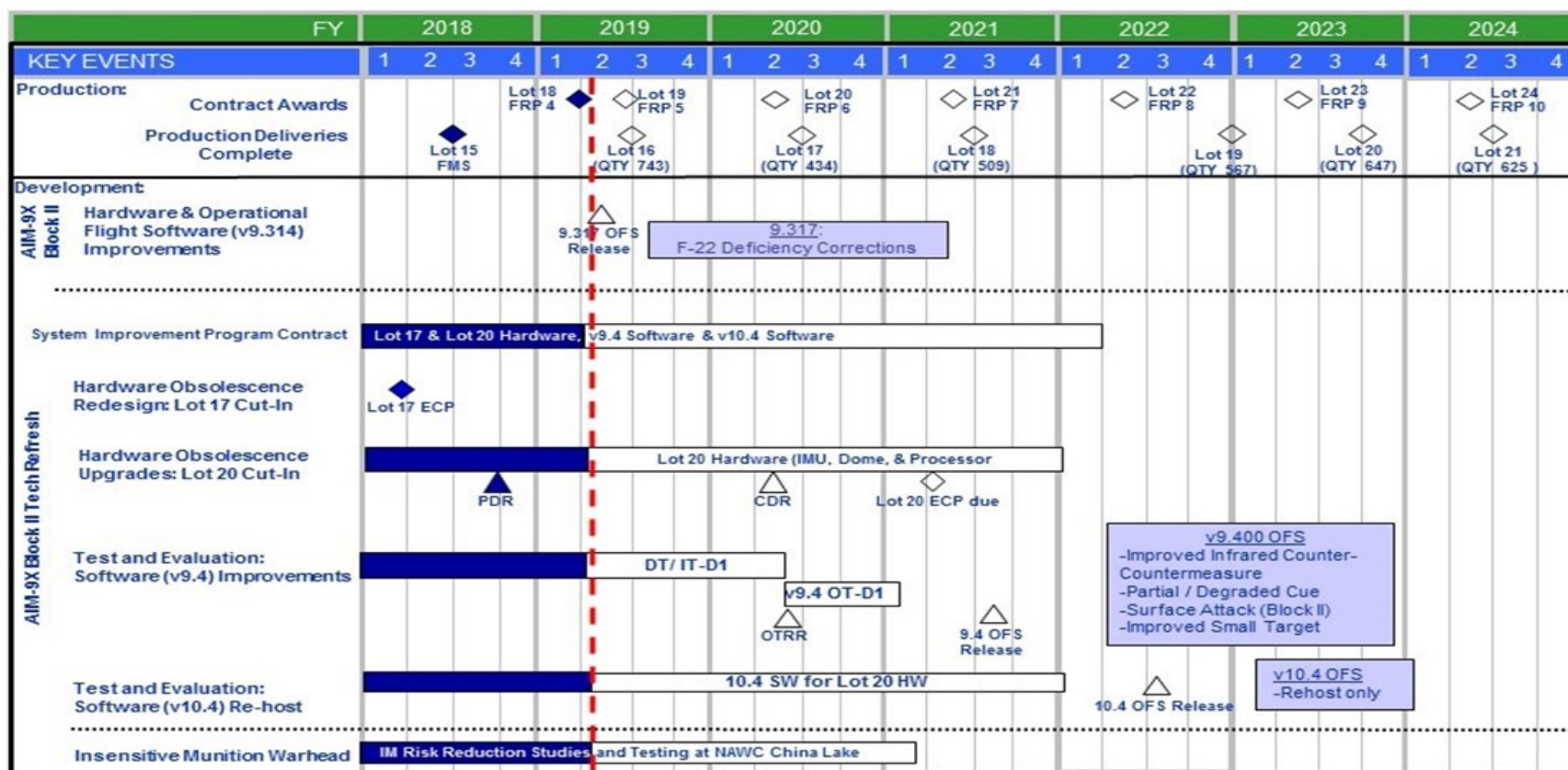
Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy

Date: March 2019

Appropriation/Budget Activity
1319 / 7

R-1 Program Element (Number/Name)
PE 0207161N / Tactical Aim Missiles

Project (Number/Name)
0457 / AIM-9X



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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0207161N / <i>Tactical Aim Missiles</i>	Project (Number/Name) 0457 / AIM-9X	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
TACTICAL AIM MISSILES				
Production Milestones - Block II: Contract Awards: Lot 18 (FRP 4)	2	2019	2	2019
Production Milestones - Block II: Contract Awards: Lot 19 (FRP 5)	2	2019	2	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 Deliveries: Lot 15 (FRP 1)	3	2018	4	2018
Production Deliveries: Lot 16 (FRP 2)	3	2019	4	2019
Production Deliveries: Lot 17 (FRP 3)	3	2020	4	2020
Production Deliveries: Lot 18 (FRP 4)	3	2021	4	2021
Production Deliveries: Lot 19 (FRP 5)	1	2023	2	2023
Production Deliveries: Lot 20 (FRP 6)	4	2023	4	2023
Production Deliveries: Lot 21 (FRP 7)	3	2024	4	2024
AIM-9X Block II: System Improvement Program Contract Award: System Improvement Program II Engineering Manufacturing Development Contract	1	2018	1	2022
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: Tech Refresh Development Contracts: System Improvement Program III Engineering Manufacturing Development Contract	4	2018	1	2022
AIM-9X Block II Tech Refresh: Hardware Obsolescence Redesign: Lot 17 Cut In: Lot 17 Hardware Cut-In Engineering Change Proposal	1	2018	1	2018

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy			Date: March 2019	
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	Start		End	
Events by Sub Project	Quarter	Year	Quarter	Year
AIM-9X Block II Tech Refresh: Hardware Obsolescence Redesign: Lot 20 Cut In: Hardware (IMU, Dome & Processor)	2	2019	1	2022
AIM-9X Block II Tech Refresh: Hardware Obsolescence Redesign: Lot 20 Cut In: Lot 20 Hardware Cut-In Preliminary Design Review	4	2018	4	2018
AIM-9X Block II Tech Refresh: Hardware Obsolescence Redesign: Lot 20 Cut In: Lot 20 Hardware Cut-In Critical Design Review	2	2020	2	2020
AIM-9X Block II Tech Refresh: Hardware Obsolescence Redesign: Lot 20 Cut In: Lot 20 Hardware Cut-In Engineering Change Proposal	2	2021	2	2021
AIM-9X Block II Tech Refresh: Test and Evaluation: Software (v9.4) Improvements: Development Testing	2	2019	1	2020
AIM-9X Block II Tech Refresh: Test and Evaluation: Software (v9.4) Improvements: Development Test / Integrated Testing	2	2019	1	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 (v10.x) Rehost: Software v10.4 Development Testing	1	2021	4	2021
AIM-9X Block II Tech Refresh: Test and Evaluation: Software (v10.x) Rehost: Software v10.4 Operational Flight Software Release	3	2022	3	2022