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 0205601N *I ANTI-RADIATION MISSILE IMPROVEMENT*

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	998.910	129.863	161.166	133.520	-	133.520	-	-	-	-	-	-
1780: *ARM Improvement*	64.340	6.076	6.335	6.238	-	6.238	-	-	-	-	-	-
2185: *AARGM*	751.369	11.437	11.191	3.837	-	3.837	-	-	-	-	-	-
2189: *AARGM ER*	183.201	112.350	128.640	123.445	-	123.445	-	-	-	-	-	-
9999: *Congressional Adds*	0.000	0.000	15.000	0.000	-	0.000	-	-	-	-	-	-

Program MDAP/MAIS Code:
Project MDAP/MAIS Code(s): 607

A. Mission Description and Budget Item Justification

Research, Development, Test and Evaluation funding for the Joint Service Anti-Radiation Missile (ARM) program, which will include near and far term performance improvements, cost reduction, and studies that establish future development requirements.

JUSTIFICATION FOR BUDGET ACTIVITY: These projects are funded under Operational Systems Development because they include 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.

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	132.371	146.166	137.899	-	137.899
Current President's Budget	129.863	161.166	133.520	-	133.520
Total Adjustments	-2.508	15.000	-4.379	-	-4.379
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	15.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-2.508	0.000			
• Program Adjustments	0.000	0.000	-0.623	-	-0.623
• Rate/Misc Adjustments	0.000	0.000	-3.756	-	-3.756

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2020	FY 2021
Project: 9999: *Congressional Adds*		

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 0205601N *I ANTI-RADIATION MISSILE IMPROVEMENT*

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2020	FY 2021
Congressional Add: *Program Increase*	0.000	15.000
Congressional Add Subtotals for Project: 9999	0.000	15.000
Congressional Add Totals for all Projects	0.000	15.000

Change Summary Explanation

Decreases in FY 2022 from the previous President's Budget submission are the following:
- Program adjustment of $0.623M due to a refinement of Marine Aviation requirements.
- Other miscellaneous rate adjustments of $3.756M.

Project Unit 1780: The funding decrease from FY2021 to FY2022 is to align FMA efforts with complex emitter software and firmware algorithm development expected to complete in time for FY2022 testing.

Project Unit 2185: The funding decrease from FY2021 to FY2022 is due to planned phasing with completion of the M-code Development and E2 development contracts.

Project Unit 2189: The funding decrease from FY2021 to FY2022 of $5.195M reflects program transition into production and deployment following a Knowledge Point 4 decision (Milestone C equivalent) in 3RD QTR FY2021. The program will carry out Developmental Test and Evaluation and operational testing with production-representative missiles in FY2022.

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 0205601N / *ANTI-RADIATION MISSILE IMPROVEMENT*	Project (Number/Name) 1780 / *ARM Improvement*	

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
1780: *ARM Improvement*	64.340	6.076	6.335	6.238	-	6.238	-	-	-	-	-	-
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Anti-Radiation Missile (ARM) Improvement is a combination of the Navy-led High Speed Anti-Radiation Missile (HARM) program, the Advanced Anti-Radiation Guide Missile (AARGM) program and the Advanced Anti Radiation Guided Missile Extended Range (AARGM-ER). HARM is a Navy led joint service program with the United States Air Force. AARGM is a program derived from a Small Business Innovative Research (SBIR) program that developed a dual mode guidance section, incorporating a Millimeter Wave (MMW) radar with an advanced anti-radiation homing seeker. This provides the capability to counter shutdown of emitters. Additional capability for AARGM consists of Global Positioning System (GPS) capability, MMW terminal guidance, Weapon Impact Assessment (WIA), GPS point-to-point weapon engagement and impact avoidance zone/missile impact zones. AARGM-ER is a derivative of the AARGM program that utilizes the seeker electronics and repackages them into a new missile shape with a new rocket motor to achieve greater speed, range and survivability.

ARM Improvement efforts require periodic updates to the user database based on changing threat parameters, enhanced air defense engagement tactics and modern complex emerging systems. These funds provide the opportunity to conduct ground and flight testing against foreign systems, to build MMW radar shapes and modern complex emitters and systems, called Foreign Material Assessment (FMA). The result of FMA is an analytical report on findings, updates to fleet tactics manuals, curriculum changes to the Suppression of Enemy Air Defenses / Destruction of Enemy Air Defenses lead Air Combat Training Curriculum course work and weapon school tactics/training and procedure briefs. FMA is focused on air defense weapon system exploitation, analysis and subsequent integration and response to ensure that the AGM-88 ARM weapon systems family remains relevant in the planned operational environment.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: ARM Foreign Material Assessment (FMA)	6.076	6.335	6.238	0.000	6.238
Articles:	-	-	-	-	-
FY 2021 Plans: The FMA team will continue to conduct FMA testing (both ground-based and captive flight testing), data analysis, and systems engineering to maximize ARM family of weapons effectiveness against threat air defense systems in FY 2021. The expanded capabilities of the AARGM and AARGM -ER from the legacy HARM will take advantage of the additional lab capabilities to compliment already existing HARM lab capabilities. This will enable digital Anti-Radiation Homing (ARH) seeker and Millimeter Wave (MMW) terminal seeker assessment which are unique capabilities to AARGM and AARGM-ER. FMA assessments will remain focused on new modern complex threat systems as they become available for evaluation as well as theater/country-specific systems of interest. Priorities are coordinated through the Fleet ARM Steering Committee. Expect continued					

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 0205601N / *ANTI-RADIATION MISSILE IMPROVEMENT*	**Project (Number/Name)** 1780 / *ARM Improvement*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
testing and evaluation on advanced Surface-to-Air weapons and related IADS, jammers, ARM countermeasures, and non-traditional ARM targets. Fleet engagement will continue as a key element of testing, engineering, and analytical efforts, which includes funding for threat assessment, operational updates, and integration efforts. Additional test priorities include characterizing new modern complex systems in the field, so that FMA assessments can directly populate missile threat data libraries with updated attributes to enhance track quality for ARM family of weapons along with continued assessment of special projects developmental improvements against foreign material. ***FY 2022 Base Plans:*** The FMA team will continue to conduct FMA testing (both ground-based and captive flight testing), data analysis, and systems engineering to maximize ARM family of weapons effectiveness against threat air defense systems in FY 2022. The expanded capabilities of the AARGM and AARGM-ER from the legacy HARM will take advantage of the additional lab capabilities to compliment already existing HARM lab capabilities. This will enable digital Anti-Radiation Homing (ARH) seeker and Millimeter Wave (MMW) terminal seeker assessment which are unique capabilities to AARGM and AARGM-ER. FMA assessments will remain focused on new modern complex threat systems as they become available for evaluation as well as theater/country-specific systems of interest. FMA HW procurements will continue as an important element to support threat system evaluations. Priorities are coordinated through the Fleet ARM Steering Committee. Expect continued testing and evaluation on advanced Surface-to-Air weapons and related IADS, jammers, and ARM countermeasures. Fleet engagement will continue as a key element of testing, engineering, and analytical efforts, which includes funding for threat assessment, algorithm update recommendations, operational updates, and integration efforts. Additional test priorities include characterizing new modern complex systems in the field, so that FMA assessments can directly populate missile threat data libraries with updated attributes to enhance track quality for ARM family of weapons along with continued assessment of special projects developmental improvements against foreign material. ***FY 2022 OCO Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 is to align FMA efforts with complex emitter software and firmware algorithm development expected to complete in time for FY 2022 testing.					
Accomplishments/Planned Programs Subtotals	6.076	6.335	6.238	0.000	6.238

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 0205601N / *ANTI-RADIATION MISSILE IMPROVEMENT*	**Project (Number/Name)** 1780 / *ARM Improvement*

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

ARM system updates are provided through the System Support Activity (SSA) at Naval Air Warfare Center - Weapons Division (NAWCWD), China Lake, CA. ARM fleet priorities are set by the Fleet ARM Steering Committee.

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 0205601N / *ANTI-RADIATION MISSILE IMPROVEMENT*	**Project (Number/Name)** 1780 / *ARM Improvement*	

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
Systems Engineering	WR	NAWCWD : China Lake, CA	9.899	2.518	Nov 2019	2.932	Nov 2020	1.802	Nov 2021	-		1.802	-	-	-
Systems Engineering	Various	Various : Various	0.652	0.287	Jul 2020	0.294	Jul 2021	0.300	Jul 2022	-		0.300	-	-	-
Hardware Procurement	C/IDIQ	DTIC : FT Belvoir, VA	0.345	2.550	Aug 2020	2.300	May 2021	2.095	Nov 2021	-		2.095	-	-	-
Algorithm Development	C/IDIQ	Northrop Grumman Defense Systems : Northridge, CA	0.000	0.000		0.000		0.889	Nov 2021	-		0.889	-	-	-
Prior Year Prod Dev no longer funded in FYDP	Various	Various : Various	24.732	0.000		0.000		0.000		-		0.000	-	-	-
		Subtotal	35.628	5.355		5.526		5.086		-		5.086	-	-	N/A

Remarks

FY2022 funding supports hardware procurement as well as manpower, system engineering, analysis and software development updates resulting from the evaluation of foreign material assessment data. Vendor software updates are required when threat library or user data file updates are unable to provide critical missile improvements. Fleet engagement will continue as a key element of testing, engineering, and analytical efforts, which includes funding for threat assessment, algorithm update recommendations, operational updates, and integration efforts.

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
Developmental Test & Eval	WR	NAWCWD : China Lake, CA	9.210	0.430	Nov 2019	0.700	Nov 2020	0.877	Nov 2021	-		0.877	-	-	-
Prior Year Dev T&E no longer funded in FYDP	Various	Various : Various	18.701	0.000		0.000		0.000		-		0.000	-	-	-
		Subtotal	27.911	0.430		0.700		0.877		-		0.877	-	-	N/A

Remarks

FY 2022 funding supports field testing and increased laboratory testing enabled by previous investments in AARGM laboratory capabilities.

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 0205601N / *ANTI-RADIATION MISSILE IMPROVEMENT*	**Project (Number/Name)** 1780 / *ARM Improvement*

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
Program Management Support	WR	NAWCAD : Patuxent River, MD	0.370	0.276	Nov 2019	0.095	Nov 2020	0.260	Nov 2021	-		0.260	-	-	-
Travel	WR	Various : Various	0.431	0.015	Oct 2019	0.014	Oct 2020	0.015	Oct 2021	-		0.015	-	-	-
		Subtotal	0.801	0.291		0.109		0.275		-		0.275	-	-	N/A

Remarks

Contract Type for Travel is Travel Order (TO).

	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	64.340	6.076		6.335		6.238		-		6.238	-	-	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 0205601N / *ANTI-RADIATION MISSILE IMPROVEMENT*	**Project (Number/Name)** 1780 / *ARM Improvement*

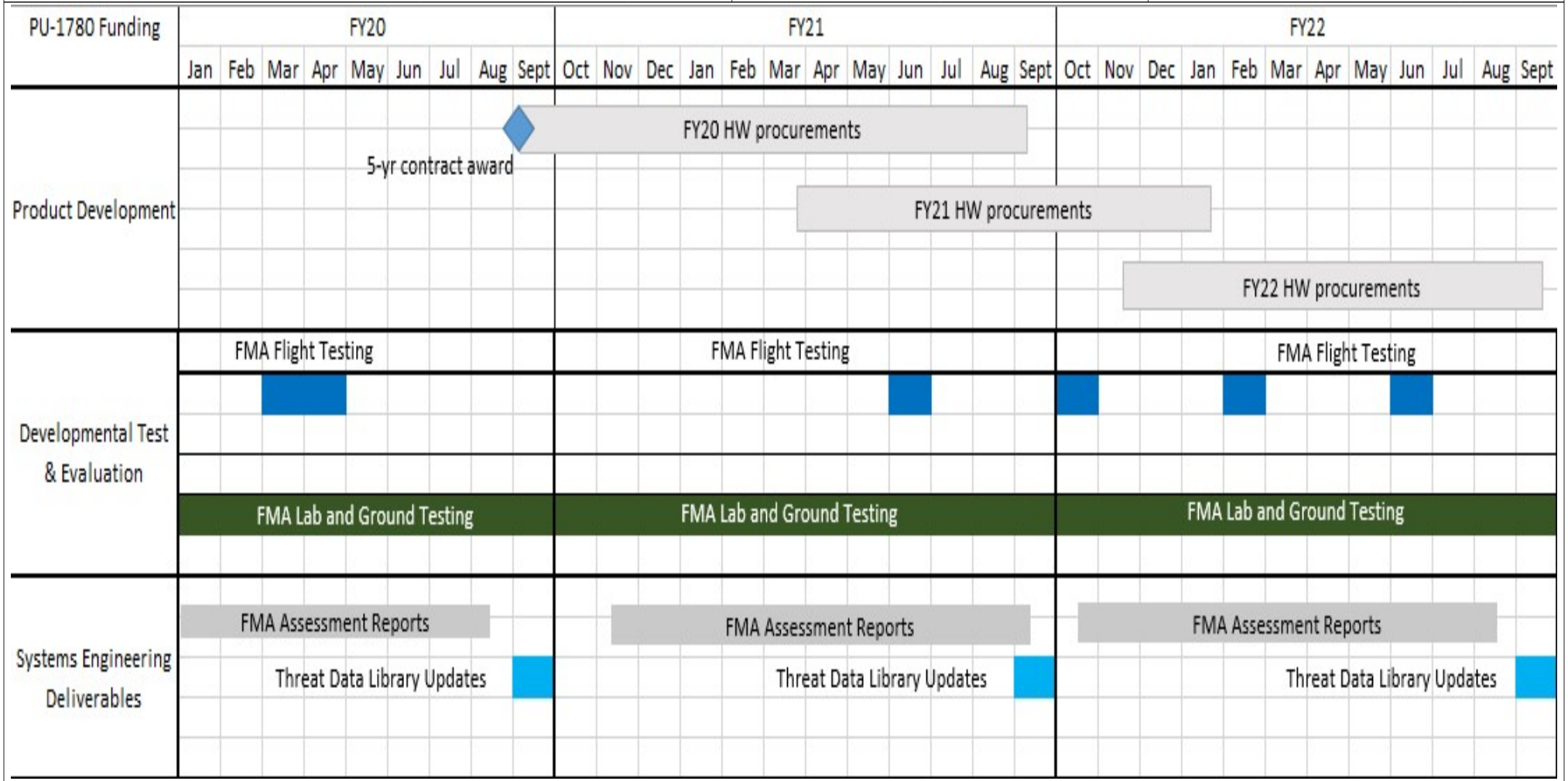

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205601N / *ANTI-RADIATION MISSILE IMPROVEMENT*	**Project (Number/Name)** 1780 / *ARM Improvement*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
ARM IMPROVEMENT				
Product Development: Shape and Transmitter procurements: Hardware procurements FY20	4	2020	4	2021
Product Development: Shape and Transmitter procurements: Hardware procurements FY21	2	2021	2	2022
Product Development: Shape and Transmitter procurements: Hardware procurements FY22	1	2022	4	2022
Test & Evaluation: FMA Flight Testing: FMA Flight Testing	1	2020	4	2022
Test & Evaluation: FMA Lab & Ground Testing: FMA Lab & Ground Testing	1	2020	4	2022
Systems Engineering Deliveries: Threat Data Library Update: Threat Data Library Update FY 2020	4	2020	4	2020
Systems Engineering Deliveries: Threat Data Library Update: Threat Data Library Update FY 2021	4	2021	4	2021
Systems Engineering Deliveries: Threat Data Library Update: Threat Data Library Update FY 2022	4	2022	4	2022

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 0205601N / *ANTI-RADIATION MISSILE IMPROVEMENT*				Project (Number/Name) 2185 / *AARGM*			
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**
2185: *AARGM*	751.369	11.437	11.191	3.837	-	3.837	-	-	-	-	-	-
Quantity of RDT&E Articles	40	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Advanced Anti-Radiation Guided Missile (AARGM) transitioned a Phase III Small Business Innovation Research (SBIR) program to develop and demonstrate a multi-mode guidance section on a High Speed Anti-Radiation Missile (HARM) airframe to System Development and Demonstration (SD&D) in FY 2003. The AARGM SD&D program was designed to integrate multi-mode guidance (passive Anti-Radiation Homing (ARH)/active Millimeter Wave (MMW) Radar/Global Positioning System (GPS)/Inertial Navigation System) on the HARM Air-to-Ground Missile (AGM)-88. Planned AARGM weapon system capabilities include: active MMW terminal guidance to counter shutdown, expanded threat coverage, enhanced ARH, Weapon Impact Assessment (WIA) transmitted prior to detonation, GPS/point-to-point weapon navigation, enhanced navigational performance in denied environments and weapon employment with impact avoidance zone/missile impact zones.

The AARGM program includes 40 SD&D test articles with follow on production modification kits. Milestone C was achieved 4Q FY 2008, followed by a combined FY 2008/FY 2009 Low Rate Initial Production (LRIP) contract award in 1Q FY 2009. Developmental testing was completed in 2009. Initial Operational Test and Evaluation (IOT&E) was completed in 3Q FY 2012. Full-Rate Production (FRP) decision was received 4 September 2012 with FRP contract award on 10 September 2012, and deliveries began in January 2014.

The AARGM Block 1 Upgrade program began in FY 2012 and consists of a software only upgrade to implement deferred Key Performance Parameter 3 and to correct IOT&E deficiencies in the AGM-88E All-Up-Round as well as the Common Munitions Built-in Test (BIT) Reprogramming Equipment (CMBRE).

Follow-on Operational Test and Evaluation/Integrated Test (FOT&E/IT) of the Block 1 Upgrade completed with Fleet Release approval in July 2017 and fielding complete in January 2018.

In FY 2022 - FY 2026, the AARGM program plans to continue to develop and demonstrate the capability to engage and destroy Enemy Integrated Air Defense Systems (IADS). Over this same time frame, the AARGM program will develop software, continue efforts to upgrade Electronic Intelligence (ELINT) files for missile updates and testing against advanced IADS.

FY 2022 funding continues to support AARGM software and firmware development, ELINT file upgrades and conduct lab ground and flight tests.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**
Title: Threat Data Library / System Updates	1.224	1.246	0.494	0.000	0.494
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 0205601N / *ANTI-RADIATION MISSILE IMPROVEMENT*	**Project (Number/Name)** 2185 / *AARGM*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
FY 2021 Plans: AGM-88E will continue efforts to upgrade and prioritize Electronic Intelligence files. Continue test and assessment of threat systems that impact already fielded weapons and to develop threat data for new target sets. Plans also include continued development or enhancement of navigational capability, integration of modernized Anti-Radiation Homing processor, expect continued testing and evaluation on advanced Surface-to-Air weapons and related IADS, jammers, and ARM countermeasures, and special targets ARM targets and human system interface improvements to mission planning. ***FY 2022 Base Plans:*** AGM-88E will continue efforts to upgrade and prioritize Electronic Intelligence files. Continue test and assessment of threat systems that impact already fielded weapons and to develop threat data for new target sets. Plans also include continued testing and evaluation on advanced Surface-to-Air weapons and related IADS, jammers, ARM countermeasures, and human system interface improvements to mission planning. ***FY 2022 OCO Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The decrease from FY 2021 to FY 2022 is because of planned phasing for the program due to the completion of the M-code Development contract.					
Title: Follow-on Test and Evaluation and Correction of Deficiencies	0.494	0.504	0.206	0.000	0.206
Articles:	-	-	-	-	-
FY 2021 Plans: Continue to upgrade the system with test results to include developmental activity assessing software and hardware anomalies. Testing for those efforts in System Updates includes navigational T&E, processor performance evaluations, and includes verification and validation of E2 Hardware and Block 1A testing. ***FY 2022 Base Plans:*** Continue to upgrade the system with test results to include developmental activity assessing software and hardware anomalies. Testing includes verification and validation of E2 Hardware algorithms and software. ***FY 2022 OCO Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:***					

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 0205601N / *ANTI-RADIATION MISSILE IMPROVEMENT*	**Project (Number/Name)** 2185 / *AARGM*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
The decrease from FY 2021 to 2022 is because of planned phasing and completion of E2 and M-Code testing events.					
Title: Advanced Development	9.719	9.441	3.137	0.000	3.137
Articles:	-	-	-	-	-
FY 2021 Plans: Enhance navigational capability to comply with requirement to implement GPS M-Code to comply with U.S. Statute. Completed M Code Missile Integration & Testing and begin platform integration. Funds will support upgrades to radio frequency data processing to meet emerging requirements by updating AARGM missile software to add advanced threat capability, M-Code, and delivery additional program protection and Reprogramming capability. Funding supports the continued transition of receiver technology upgrades in coordination with the Office of Naval Research (ONR). Efforts specifically include testing, configuration control board reviews, test plan reviews, requirements analysis and weapons integration analysis. Efforts in support of this requirement includes weapon system developmental activities, range and laboratory support and analysis.					
FY 2022 Base Plans: Funds will continue to support upgrades to radio frequency data processing to meet emerging requirements by updating AARGM missile software to refine detection of advanced threats by updating algorithms and firmware as part of the new E2 configuration.					
FY 2022 OCO Plans: N/A					
FY 2021 to FY 2022 Increase/Decrease Statement: Project Unit 2185: Decrease of funding from FY 2021 to FY 2022 is due to program phasing.					
Accomplishments/Planned Programs Subtotals	11.437	11.191	3.837	0.000	3.837

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/2327: *AARGM*	183.740	78.992	0.000	-	0.000	-	-	-	-	-	-

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
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D. Acquisition Strategy

The AARGM program started as a Phase I Small Business Innovative Research (SBIR), Advanced Technology Program, evolved into a Phase III SBIR program, and transitioned into a System Development and Demonstration (SD&D) Acquisition Category 1C program in June 2003. The AARGM SD&D met most U.S. Navy operational requirements. AARGM Block 1 fulfills the rest of the operational requirements. Block 1 Fleet Release was approved in 4Q FY 2017. The AARGM program added GPS M-code in FY 2018 - FY 2021, and will correct any anomalies found in any component of the E2 configuration and M-Code in FY 2022 and out.

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 0205601N / *ANTI-RADIATION MISSILE IMPROVEMENT*	Project (Number/Name) 2185 / *AARGM*	

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 Development	SS/CPFF	Northrop Grumman Defense Systems : Northridge, CA	9.049	0.000		0.000		0.000		-		0.000	-	-	-
Systems Engineering	WR	NAWCWD : China Lake, CA	87.877	2.164	Nov 2019	0.360	Nov 2020	0.376	Nov 2021	-		0.376	-	-	-
M Code	SS/IDIQ	Northrop Grumman Defense Systems : Northridge, CA	1.930	0.798	Nov 2019	0.000		0.000		-		0.000	-	-	-
Software Development (Block 1A)	SS/IDIQ	Northrop Grumman Defense Systems : Northridge, CA	5.364	4.679	Dec 2019	0.000		0.000		-		0.000	-	-	-
Software Development (Block 1A)	WR	NAWCWD : China Lake, CA	6.000	0.000		0.000		0.000		-		0.000	-	-	-
Mission Planning	WR	Various : Various	0.933	0.100	Mar 2020	0.100	Mar 2021	0.000		-		0.000	-	-	-
ADP Development	SS/IDIQ	Northrop Grumman Defense Systems : Northridge, CA	0.000	1.150	Apr 2021	3.500	Apr 2021	0.000		-		0.000	-	-	-
Advanced Threats Development	SS/CPIF	Northrop Grumman Defense Systems : Northridge, CA	0.000	0.000		6.000	Apr 2021	0.000		-		0.000	-	-	-
Software Efforts & Advanced Development	SS/IDIQ	Northrop Grumman Defense Systems : Northridge, CA	0.000	0.000		0.000		1.500	Jun 2022	-		1.500	-	-	-
Software Efforts & Advanced Development	WR	NAWCWD : China Lake, CA	0.000	0.000		0.000		0.598	Nov 2021	-		0.598	-	-	-
Prior year Prod Dev no longer funded in the FYDP	Various	Various : Various	544.279	0.000		0.000		0.000		-		0.000	-	-	-
		Subtotal	655.432	8.891		9.960		2.474		-		2.474	-	-	N/A

Remarks

FY 2022 Software Efforts and Advanced Development funding is planned to continue the support of the new E2 configuration to refine detection of advanced threats.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy			Date: May 2021
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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
Prior year Support no longer funded in the FYDP	Various	Various : Various	7.147	0.000		0.000		0.000		-		0.000	-	-	-
		Subtotal	7.147	0.000		0.000		0.000		-		0.000	-	-	N/A

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
Development Test & Evaluation	WR	NAWCWD : China Lake, CA	26.961	0.200	Nov 2019	0.498	Dec 2020	0.800	Dec 2021	-		0.800	-	-	-
Operational and Integrated Test & Evaluation (IT&OT)	WR	NAWCWD : China Lake, CA	12.814	0.849	Nov 2019	0.100	Nov 2020	0.000		-		0.000	-	-	-
Operational and Integrated Test & Evaluation (IT&OT)	SS/IDIQ	Northrop Grumman Defense Systems : Northridge, CA	1.348	0.000		0.000		0.000		-		0.000	-	-	-
Test Support and Planning	WR	COTF : Norfolk, VA	0.150	0.120	Jan 2020	0.000		0.000		-		0.000	-	-	-
Prior year T&E no longer funded in the FYDP	Various	Various : Various	24.929	0.000		0.000		0.000		-		0.000	-	-	-
		Subtotal	66.202	1.169		0.598		0.800		-		0.800	-	-	N/A

Remarks

FY2022 funding is to support ADP Threat Data Library testing, missile software and firmware efforts.

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
Program Management Support	Various	Various : Various	6.131	1.329	Feb 2020	0.369	Apr 2021	0.299	Feb 2022	-		0.299	-	-	-
Travel	WR	NAVAIR HQ : Patuxent River, MD	1.793	0.005	Oct 2019	0.007	Oct 2020	0.007	Oct 2021	-		0.007	-	-	-

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 0205601N / *ANTI-RADIATION MISSILE IMPROVEMENT*	Project (Number/Name) 2185 / *AARGM*	

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
Government Engineering Support	WR	NAWCAD : Patuxent River, MD	3.214	0.043	Nov 2019	0.257	Nov 2020	0.257	Nov 2021	-		0.257	-	-	-
Prior year Mgmt no longer funded in the FYDP	Various	Various : Various	11.450	0.000		0.000		0.000		-		0.000	-	-	-
		Subtotal	22.588	1.377		0.633		0.563		-		0.563	-	-	N/A

Remarks

Contract Type for Travel is TO.

	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	751.369	11.437		11.191		3.837		-		3.837	-	-	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 0205601N / *ANTI-RADIATION MISSILE IMPROVEMENT*	**Project (Number/Name)** 2185 / *AARGM*

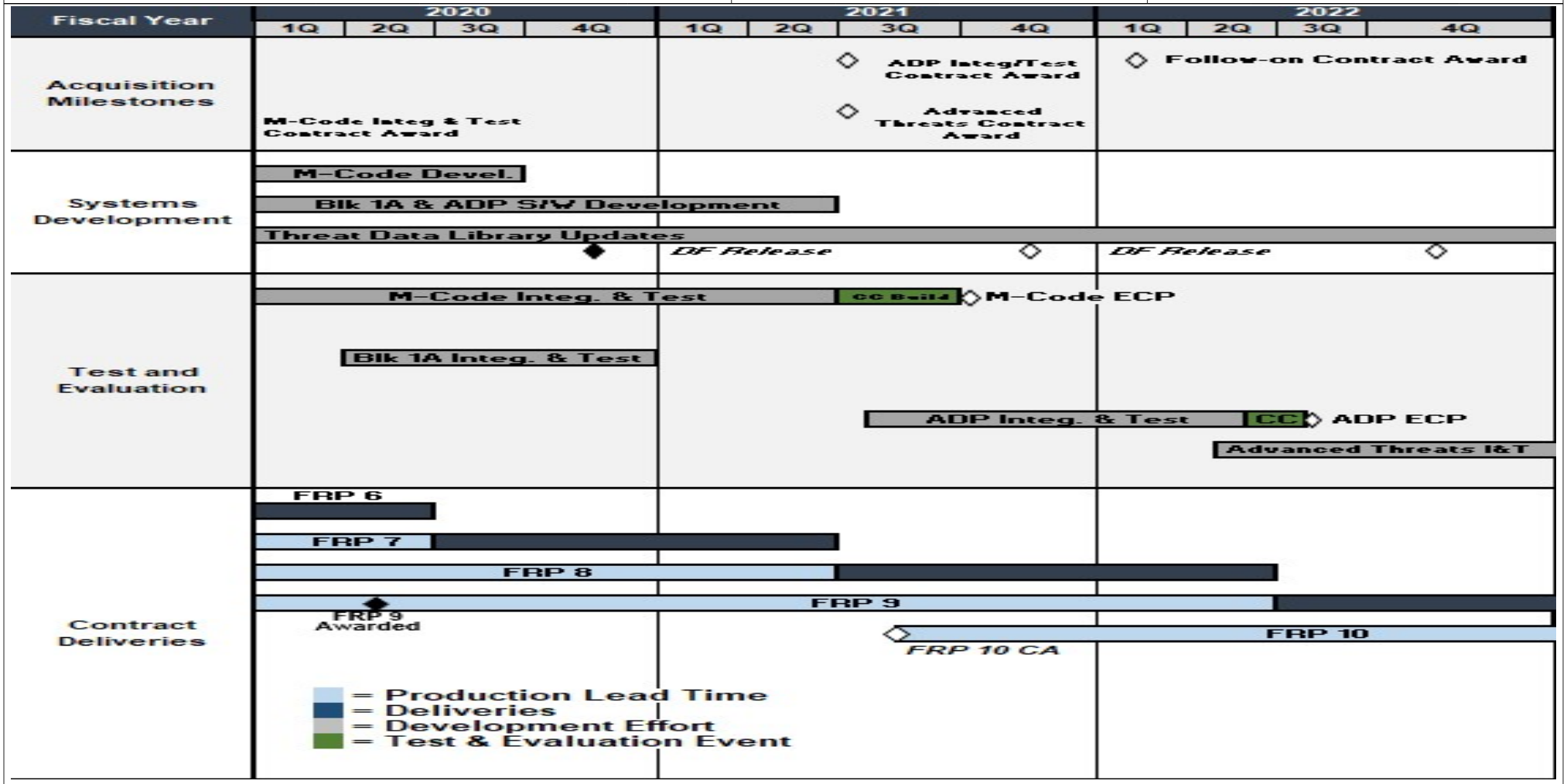

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205601N / *ANTI-RADIATION MISSILE IMPROVEMENT*	**Project (Number/Name)** 2185 / *AARGM*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
AARGM				
M-Code: M-Code Development	1	2020	3	2020
M-Code: M-Code Integration & Test	1	2020	2	2021
M-Code: M-Code Captive Carry Flight	3	2021	4	2021
M-Code: M-Code ECP	4	2021	4	2021
Software Development: BLK 1A & ADP Software Development	1	2020	2	2021
Software Development: BLK 1A Integration & Test	2	2020	4	2020
Software Development: Advanced Threats Contract Award	3	2021	3	2021
Software Development: Follow-On Software Development and Test Contract Award FY22	1	2022	1	2022
Test & Evaluation: ADP Integ & Test	3	2021	2	2022
Test & Evaluation: ADP Captive Carry Flight	2	2022	3	2022
Test & Evaluation: ADP ECP	3	2022	3	2022
Test & Evaluation: Advanced Threats I&T	2	2022	4	2022
Threat Data Library Updates: Threat Data Library Updates	1	2020	4	2022
Threat Data Library Updates: Threat Data File Release FY20	4	2020	4	2020
Threat Data Library Updates: Threat Data File Release FY21	4	2021	4	2021
Threat Data Library Updates: Threat Data File Release FY22	4	2022	4	2022
Production Milestones: Contract Award: Full-Rate Production Lot 9	2	2020	2	2020
Production Milestones: Contract Award: Full-Rate Production Lot 10	3	2021	3	2021
Full-Rate Production Deliveries: Full-Rate Production Deliveries - Lot 7 (WPN)	3	2020	2	2021
Full-Rate Production Deliveries: Full-Rate Production Deliveries - Lot 8 (WPN)	3	2021	2	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 0205601N / *ANTI-RADIATION MISSILE IMPROVEMENT*	**Project (Number/Name)** 2185 / *AARGM*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Full-Rate Production Deliveries: Full-Rate Production Deliveries - Lot 9 (WPN)	3	2022	4	2022

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 0205601N / *ANTI-RADIATION MISSILE IMPROVEMENT*	Project (Number/Name) 2189 / *AARGM ER*	

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
2189: *AARGM ER*	183.201	112.350	128.640	123.445	-	123.445	-	-	-	-	-	-
Quantity of RDT&E Articles	15	2	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 607

A. Mission Description and Budget Item Justification

The Air-to-Ground (AGM)-88G AARGM-ER Upgrade was a new start in FY 2016. The purpose of this effort is to develop hardware and software modifications to improve the Advanced Anti-Radiation Guided Missile (AARGM)'s operational capabilities, including extended range, survivability and effectiveness against complex, new, and emerging threats. This budget line item funds a new rocket motor design, system development and integration, test asset procurement, testing, and associated software updates for the AARGM-ER to ensure these capabilities perform in accordance with established requirements. FY 2022 activities include continuation of the Engineering & Manufacturing Development (EMD) phase, continuation of Developmental Test & Evaluation, the continuation of test articles delivery and commencement of operational testing. AARGM-ER retains the same guidance and sensor capabilities of the AARGM.

The AARGM-ER program is part of the Navy's approach to address advanced threat capabilities in the Anti-Access/Area-Denial (A2/AD) environment. Solutions enable individual system capabilities to be leveraged across an effects chain, placing the full spectrum of tactical capability in the hands of the warfighter. Solutions that push engagement distances beyond the launch platform's radar horizon and allows the U.S. Navy to operate in, and control, contested battle space in littoral waters and A2/AD environments are increasingly critical as more scenarios require compressed and coordinated fire control timelines.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: AARGM ER Development	112.350	128.640	123.445	0.000	123.445
Articles:	2	-	-	-	-
FY 2021 Plans: FY 2021 activities include continuation of the Engineering and Manufacturing Development contract, and system-level developmental testing of production-representative missiles. Manufacturing of missile components and missiles will continue in support of contractor and government test plans. Testing conducted by the contractor and the government will assess component-level and system-level performance, and substantiate readiness for low rate production. Knowledge Point 4 in FY 2021 will be informed by results from an Operational Assessment, free flight developmental testing of a missile and a Production Readiness Review.					
FY 2022 Base Plans: FY 2022 activities include continuation of the Engineering and Manufacturing Development contract, system-level developmental testing, and entry into operational testing of production-representative missiles. Manufacturing of missile components and missiles will continue in support of contractor and government test					

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 0205601N / *ANTI-RADIATION MISSILE IMPROVEMENT*	**Project (Number/Name)** 2189 / *AARGM ER*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
plans. Testing conducted by the contractor and the government will assess component-level and system-level performance, and substantiate readiness for mission effectiveness and suitability. ***FY 2022 OCO Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding decrease in FY 2022 is due to program transition of design and development into system-level developmental testing and entry into operational testing of production-representative missiles.					
Accomplishments/Planned Programs Subtotals	112.350	128.640	123.445	0.000	123.445

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/2327: *AARGM*	0.000	44.658	116.345	-	116.345	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

The AARGM-ER Program will provide hardware and software modifications to improve AARGM's operational capabilities, including extended range, survivability, and effectiveness against complex, new, and emerging threats. The program's objective requirement for Initial Operational Capability is FY 2023.

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 0205601N / *ANTI-RADIATION MISSILE IMPROVEMENT*	**Project (Number/Name)** 2189 / *AARGM ER*

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
Rocket Motor Risk Initiative	WR	NAWCWD : China Lake, CA	0.947	0.000		0.000		0.000		-		0.000	-	-	-
Rocket Motor Risk Initiative	WR	NSWC : Indian Head, MD	1.000	0.000		0.000		0.000		-		0.000	-	-	-
Front End Design Analysis	SS/CPFF	Northrop Grumman Defense Systems : Northridge, CA	15.221	0.000		0.000		0.000		-		0.000	-	-	-
Missile Section Integration	SS/CPFF	Northrop Grumman Defense Systems : Northridge, CA	57.675	0.000		0.000		0.000		-		0.000	-	-	-
Engineering & Manufacturing Development	SS/CPIF	Northrop Grumman Defense Systems : Northridge, CA	29.588	65.912	Dec 2019	78.890	Oct 2020	81.403	Oct 2021	-		81.403	-	-	-
Aircraft Integration	WR	NAWCWD : China Lake, CA	3.849	6.130	Nov 2019	7.903	Nov 2020	6.059	Nov 2021	-		6.059	-	-	-
Aircraft Integration	Various	Various : Various	0.632	0.000		0.000		0.276	Nov 2021	-		0.276	-	-	-
Aircraft Integration	SS/CPIF	Boeing : St. Louis, MO	2.901	10.179	Dec 2019	4.838	Dec 2020	1.309	Oct 2021	-		1.309	-	-	-
Systems Engineering	WR	NAWCWD : China Lake, CA	21.759	6.928	Nov 2019	8.695	Dec 2020	5.788	Nov 2021	-		5.788	-	-	-
Systems Engineering	WR	NAWCAD : Patuxent River, MD	6.775	4.428	Nov 2019	4.096	Dec 2020	3.026	Nov 2021	-		3.026	-	-	-
Telemetry Section	WR	NAWCWD : China Lake, CA	2.588	0.609	Nov 2019	1.500	Dec 2020	0.000		-		0.000	-	-	-
AUR Containers	WR	NSWC : Indian Head, MD	0.355	0.729	Mar 2020	0.195	Jan 2021	0.098	Nov 2021	-		0.098	-	-	-
PSE Development	WR	NAWCAD : Lakehurst, NJ	0.000	0.230	Mar 2020	0.375	Apr 2021	0.000		-		0.000	-	-	-
		Subtotal	143.290	95.145		106.492		97.959		-		97.959	-	-	N/A

Remarks

Continuation of Engineering and Manufacturing Development is to support aircraft integration testing and weapon software development. The EMD funding increase in FY 2022 is due to flight test and operational testing support.

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 0205601N / *ANTI-RADIATION MISSILE IMPROVEMENT*	Project (Number/Name) 2189 / *AARGM ER*	

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
Aircraft Integration (NAWCWD) will continue to support the F/A-18 H-18 software build. Aircraft Integration (Boeing) will continue with physical and logical aircraft interface development and testing. Includes realignment of existing Boeing efforts previously accounted for within the Aircraft Integration (NAWCWD) cost category.															

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
Studies & Analysis	Various	Various : Various	6.188	0.183	Dec 2019	0.000		0.000		-		0.000	-	-	-
		Subtotal	6.188	0.183		0.000		0.000		-		0.000	-	-	N/A

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
Developmental Test & Evaluation	WR	NAWCAD : Patuxent River, MD	1.550	4.123	Nov 2019	11.976	Dec 2020	3.787	Nov 2021	-		3.787	-	-	-
Developmental Test & Evaluation	WR	NAWCWD : China Lake, CA	0.000	1.093	Nov 2019	3.987	Dec 2020	14.329	Nov 2021	-		14.329	-	-	-
Developmental Test & Evaluation	Various	Various : Various	0.000	0.554	Dec 2019	0.646	Dec 2020	0.928	Nov 2021	-		0.928	-	-	-
Developmental Test & Evaluation	MIPR	NASA Ames Research Center : Moffett Field, CA	0.000	1.972	Feb 2020	0.000		0.000		-		0.000	-	-	-
Developmental Test & Evaluation	MIPR	AEDC : Arnold AFB, TN	0.000	2.499	Mar 2020	0.000		0.000		-		0.000	-	-	-
ER Test Assets	SS/CPIF	Northrop Grumman Defense Systems : Northridge, CA	25.500	3.468	Nov 2019	0.000		0.000		-		0.000	-	-	-
T&E Support	WR	COTF : Norfolk, VA	0.143	0.072	Aug 2020	0.180	May 2021	0.310	Nov 2021	-		0.310	-	-	-

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 0205601N / *ANTI-RADIATION MISSILE IMPROVEMENT*	Project (Number/Name) 2189 / *AARGM ER*	

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
Operational and Integrated T&E	Various	Various : Various	0.000	0.000		0.000		3.275	Jul 2022	-		3.275	-	-	-
		Subtotal	27.193	13.781		16.789		22.629		-		22.629	-	-	N/A

Remarks

Developmental Test and Evaluation (NAWCAD) will decrease due to completion of initial aircraft load outs flight testing.

Developmental Test and Evaluation (NAWCWD) will increase due to aircraft interface flight testing and free flight test events.

Operational Test and Evaluation will commence in FY 2022 to support IOC in FY 2023.

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
Program Management Support	Various	Various : Various	3.624	2.092	Nov 2019	3.822	Dec 2020	1.420	Nov 2021	-		1.420	-	-	-
Program Management Support	WR	NAWCAD : Patuxent River, MD	2.666	1.003	Nov 2019	1.449	Dec 2020	1.372	Nov 2021	-		1.372	-	-	-
Government Engineering & Information Technology Support	WR	NSWC : Dahlgren, VA	0.110	0.103	Oct 2019	0.038	Dec 2020	0.015	Oct 2021	-		0.015	-	-	-
Travel	WR	NAVAIR HQ : Patuxent River, MD	0.130	0.043	Nov 2019	0.050	Oct 2020	0.050	Nov 2021	-		0.050	-	-	-
		Subtotal	6.530	3.241		5.359		2.857		-		2.857	-	-	N/A

	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	183.201	112.350		128.640		123.445		-		123.445	-	-	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 0205601N / *ANTI-RADIATION MISSILE IMPROVEMENT*	**Project (Number/Name)** 2189 / *AARGM ER*

AARGM-ER R-4 Exhibit

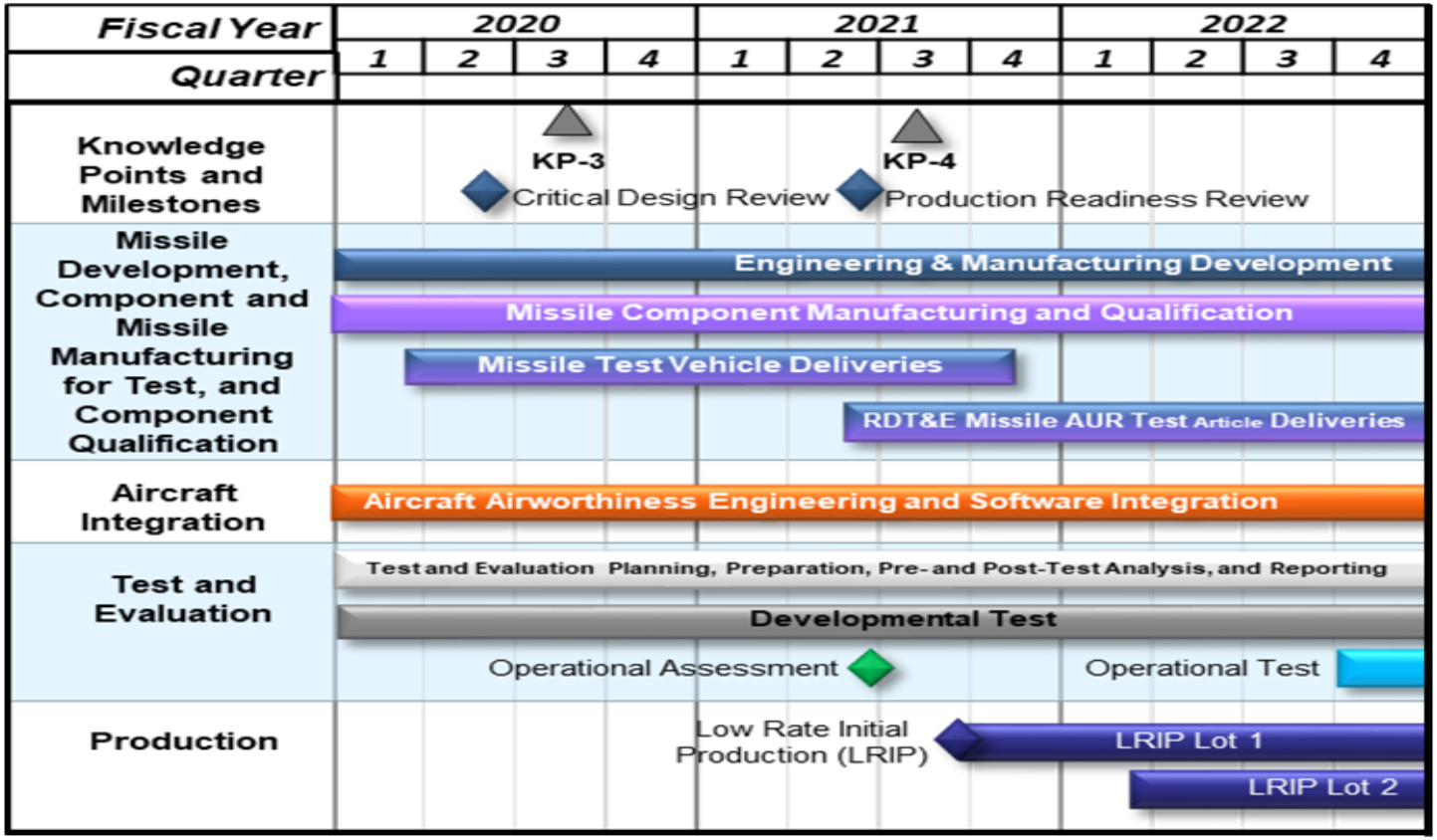

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Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205601N / *ANTI-RADIATION MISSILE IMPROVEMENT*	**Project (Number/Name)** 2189 / *AARGM ER*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
AARGM ER				
Acquisition Milestones: Milestones: Knowledge Point 3	3	2020	3	2020
Acquisition Milestones: Milestones: Knowledge Point 4	3	2021	3	2021
Systems Development: Critical Design Review (CDR)	2	2020	2	2020
Systems Development: Engineering & Manufacturing Development: Engineering & Manufacturing Development	1	2020	4	2022
Test & Evaluation: Aircraft Integration: Aircraft Integration	1	2020	4	2022
Test & Evaluation: Technical Evaluation: Developmental Test & Evaluation (DT&E)	1	2020	4	2022
Test & Evaluation: Operational Assessment: Operational Assessment	2	2021	2	2021
Test & Evaluation: Operational Evaluation: Operational Test & Evaluation (OT&E)	4	2022	4	2022
Production Milestones: Production Readiness Reviews: Production Readiness Review (PRR) 1	2	2021	2	2021
Production Milestones: Contract Awards: LRIP 1 WPN	3	2021	3	2021
Production Milestones: Contract Awards: LRIP 2 WPN	1	2022	1	2022
Deliveries: DT Test Articles	1	2020	4	2022

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 0205601N / *ANTI-RADIATION MISSILE IMPROVEMENT*	Project (Number/Name) 9999 / *Congressional Adds*	

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
9999: *Congressional Adds*	0.000	0.000	15.000	0.000	-	0.000	-	-	-	-	-	-
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Advanced Anti-Radiation Guided Missile Extended Range (AARGM-ER) integrates hardware and software upgrades to the AARGM missile guidance and control sections, a new rocket motor, and Control Actuation System (CAS) into a new outer mold line able to be launched from tactical aircraft. AARGM-ER's capabilities will add extended range, increased survivability, and improve effectiveness against complex, new, and emerging threats.

The program increase supports the initial development efforts for an AARGM-ER surface-launched demonstration. This project unit funds design, system development & integration, and associated software updates to modify AARGM-ER to enable compatibility with a surface-launched system. FY21 design efforts will fund updates and improvements to open system interfaces, guidance and control systems, power systems, and the associated communications hardware and software.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021
Congressional Add: Program Increase	0.000	15.000
FY 2020 Accomplishments: N/A		
FY 2021 Plans: N/A		
Congressional Adds Subtotals	0.000	15.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

This demonstration effort will leverage the AARGM-ER Program of Record to develop initial hardware and software modifications that could provide for a surface-launched variant.

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 0205601N / *ANTI-RADIATION MISSILE IMPROVEMENT*	Project (Number/Name) 9999 / *Congressional Adds*	

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
Control Design Analysis	SS/CPFF	Northrop Grumman Defense Systems : Northridge, CA	0.000	0.000		10.000	Sep 2021	0.000		-		0.000	-	-	-
Surface Launch Demonstration	SS/CPFF	Northrop Grumman Defense Systems : Northridge, CA	0.000	0.000		3.650	Mar 2022	0.000		-		0.000	-	-	-
Systems Engineering	WR	NAWCWD : China Lake, CA	0.000	0.000		0.775	Sep 2021	0.000		-		0.000	-	-	-
Systems Engineering	WR	NAWCAD : Patuxent River, MD	0.000	0.000		0.310	Sep 2021	0.000		-		0.000	-	-	-
		Subtotal	0.000	0.000		14.735		0.000		-		0.000	-	-	N/A

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
Program Management Support	WR	NAWCAD : Patuxent River, MD	0.000	0.000		0.250	Sep 2021	0.000		-		0.000	-	-	-
Travel	WR	NAVAIR HQ : Patuxent River, MD	0.000	0.000		0.015	Sep 2021	0.000		-		0.000	-	-	-
		Subtotal	0.000	0.000		0.265		0.000		-		0.000	-	-	N/A

	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	0.000	0.000		15.000		0.000		-		0.000	-	-	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 0205601N / *ANTI-RADIATION MISSILE IMPROVEMENT*	**Project (Number/Name)** 9999 / *Congressional Adds*

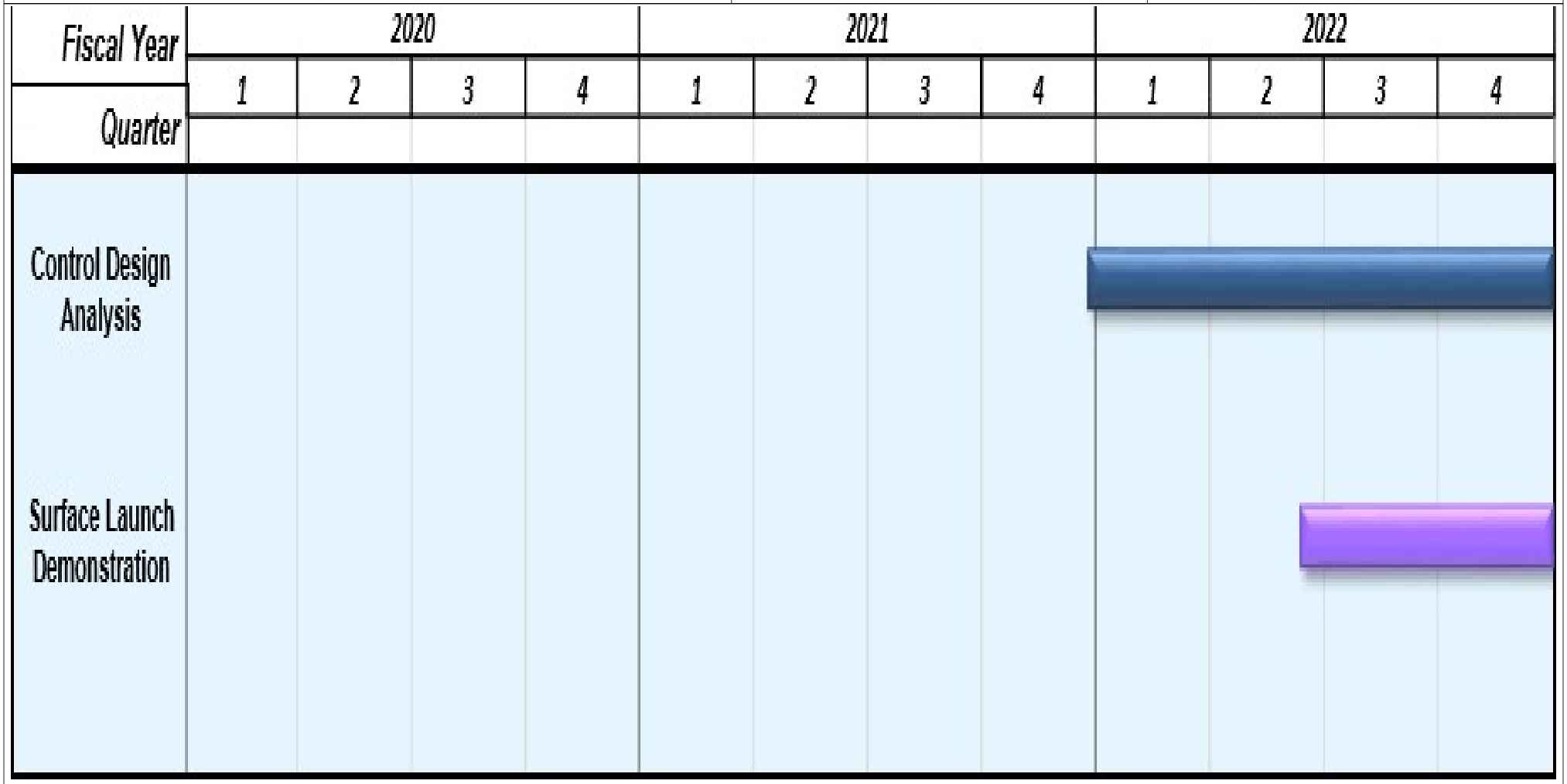

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205601N / *ANTI-RADIATION MISSILE IMPROVEMENT*	**Project (Number/Name)** 9999 / *Congressional Adds*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Congressional Adds				
Systems Development: Control Design Analysis: Control Design Analysis	4	2021	4	2022
Systems Development: Surface Launch Demonstration: Surface Launch Demonstration	2	2022	4	2022