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Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Navy **Date:** May 2021

Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604530N / <i>Advanced Arresting Gear (AAG)</i>
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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	168.427	115.912	65.834	0.147	-	0.147	-	-	-	-	-	-
2367: <i>Advanced Arresting Gear</i>	168.427	115.912	65.834	0.147	-	0.147	-	-	-	-	-	-

Program MDAP/MAIS Code:
Project MDAP/MAIS Code(s): 529

Note
FY18 and prior year funding for Advanced Arresting Gear (AAG) is funded under Shipboard Aviation Systems program element 0604512N, CV/CVN Launch and Recover project unit 2232.

A. Mission Description and Budget Item Justification
The Advanced Arresting Gear (AAG) program designs, develops, tests and fields an aircraft arrestment system to replace the legacy Mark 7 arresting gear. AAG systems will be installed on all new construction aircraft carriers. AAG will provide the U.S. Navy with improved operational capability, while reducing operating and support costs. The AAG system will recover all existing and projected carrier based tail hook-equipped air vehicles well into the 21st century.

This program is funded under SYSTEM DEVELOPMENT AND DEMONSTRATION because it includes those projects that have passed Milestone B approval and are conducting engineering and manufacturing development tasks aimed at meeting validated requirement prior to full-rate production decision.

B. Program Change Summary (\$ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	122.495	65.834	22.759	-	22.759
Current President's Budget	115.912	65.834	0.147	-	0.147
Total Adjustments	-6.583	0.000	-22.612	-	-22.612
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-3.400	0.000			
• SBIR/STTR Transfer	-3.183	0.000			
• Program Adjustments	0.000	0.000	-22.531	-	-22.531
• Rate/Misc Adjustments	0.000	0.000	-0.081	-	-0.081

Change Summary Explanation

Technical: N/A

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<p>Cost: The decrease in FY2021 - FY2022 is due to the completion of System Design and Development (SDD) and Integrated Test and Evaluation to support correction of deficiencies and continue reliability improvements on the Advanced Arresting Gear (AAG) system.</p> <p>Schedule: Updates include the following:</p> <ul style="list-style-type: none">- CVN78/CVN79: Events were updated to reflect the most current Post Delivery Test & Trials (PDT&T) ship schedule. <p>AAG Milestone: - MS C was removed from the schedule. IOC was removed from the schedule.</p> <p>Correction of Deficiency (COD) NRE/Software Development:</p> <ul style="list-style-type: none">- K was updated to commence after FY2022- L was removed- M was removed <p>JCTS (Deadload Recoveries)</p> <ul style="list-style-type: none">-- Water Twister Mod II moved from 4Q FY2020 to start in 1Q FY2022 thru 2Q FY2022- SV3/Half Bridge moved from 4Q FY2020 to 1Q FY2022- L Regression renamed to J2 Regression- Hi-Cycle Test in 1Q FY2020 <p>RALS (Aircraft Recoveries)</p> <ul style="list-style-type: none">- Removed Hi Cycle test- J1 was added in 2Q FY2020- Correction of Deficiency Test end date moved from 1Q FY2021 to 1Q FY2022- Removed Reliability Growth Testing <p>Component Shock</p> <ul style="list-style-type: none">- Removed Hi/Lo Non-Operating and RS 105. Not required. <p>Software Support Activity (SSA) Standup</p> <ul style="list-style-type: none">- Removed SSL #2 Lab Transfer- SSL Installed Certified shifted from 1Q FY2021 to 2Q FY2022 <p>Training System Development and Install end date moved from 2Q FY2022 to 4Q FY2022</p>		

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Schoolhouse Training Curriculum Development CNATT Approval end date moved from 2Q FY2022 to 4Q FY2022		
Depot Planning Depot Facility Standup start date moved from 1Q FY 2021 to 1Q FY 2022		
Included AAG production schedules and Builds plan		

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy **Date:** May 2021

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604530N / <i>Advanced Arresting Gear (AAG)</i>	Project (Number/Name) 2367 / <i>Advanced Arresting Gear</i>
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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
2367: <i>Advanced Arresting Gear</i>	168.427	115.912	65.834	0.147	-	0.147	-	-	-	-	-	-
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 529

Note
Advanced Arresting Gear (AAG) was previously funded under Shipboard Aviation Systems program element 0604512N, CV/CVN Launch and Recovery project unit 2232 in FY 2018 and prior.

A. Mission Description and Budget Item Justification
The Advanced Arresting Gear (AAG) program will design, develop, test and field an aircraft arrestment system to replace the legacy Mark 7 arresting gear. AAG systems will be installed on all new construction aircraft carriers. AAG will provide the U.S. Navy with improved operational capability, while reducing operating and support costs. The AAG system will recover all existing and projected carrier based tail hook-equipped air vehicles well into the 21st century.

The AAG Program's SDD phase test article consists of a single wire configured aircraft arresting system, which includes associated hardware and software needed to conduct system integrated testing by arresting both dead-loads and aircraft.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: Advanced Arresting Gear (AAG) Primary Hardware Development	78.140	16.482	0.147	0.000	0.147
Articles:	-	-	-	-	-
FY 2021 Plans: Complete AAG System Development and Demonstration efforts including hardware and software analysis and design for system controls, electrical and mechanical components to meet the requirements of the AAG performance specification. Complete development of AAG logistics products including the Logistics Management Information database, Maintenance Requirements Cards and Final Interactive Electronic Technical Manual. Transition to development of correction of deficiencies, ensuring corrections comply with specification in Integrated Test and Evaluation. Continue AAG system refinement and improvement efforts.					
FY 2022 Base Plans: Continue the AAG system refinement and improvement efforts.					
FY 2022 OCO Plans:					

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
N/A					
<i>FY 2021 to FY 2022 Increase/Decrease Statement:</i> The decrease from FY 2021 to FY 2022 is due to the completion of AAG System Development and Demonstration efforts.					
<i>Title:</i> Advanced Arresting Gear Test & Evaluation	15.262	35.676	0.000	0.000	0.000
<i>Articles:</i>	-	-	-	-	-
<i>FY 2021 Plans:</i> Complete AAG testing at JCTS and RALS in support of correction of system deficiencies; develop detailed test plans and produce test reports. Conduct regression deadload testing required to verify/validate software and AAG system performance with incremental software releases prior to shipboard use. Perform test site preparations, recurring maintenance, software loads, charge and dump tests, purchase cable state change pullout and retract tests, energy absorber spin tests, and deadload tests to verify system functionality performance and compatibility. Plan and begin Reliability Growth Testing at RALS with Fleet Aircraft. Conduct Environmental Qualification Testing (EQT) for Hi/Low Non-Operating Temperature and Radiated Susceptibility 105 (RS105) Electromagnetic Pulse (EMP) test. Efforts will complete in FY 2022.					
<i>FY 2022 Base Plans:</i> N/A					
<i>FY 2022 OCO Plans:</i> N/A					
<i>FY 2021 to FY 2022 Increase/Decrease Statement:</i> The decrease from FY2021 to FY 2022 is due to the completion of AAG testing events.					
<i>Title:</i> Advanced Arresting Gear Depot Planning	7.887	8.500	0.000	0.000	0.000
<i>Articles:</i>	-	-	-	-	-
<i>FY 2021 Plans:</i> Complete the development of the required processes and procedures to plan for Depot level activities to include completion of depot technical manual and Business Case Analysis (BCA). Complete final updates to logistics product information and maintenance task analysis. Complete the planning and stand up the AAG Depot Facility to perform Depot Level maintenance, overhaul and repair facility/facilities for AAG components.					
<i>FY 2022 Base Plans:</i>					

UNCLASSIFIED

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
N/A					
FY 2022 OCO Plans: N/A					
FY 2021 to FY 2022 Increase/Decrease Statement: The decrease in FY 2021 to FY 2022 is due to the completion of Depot Planning and the stand up of the AAG Depot Facility.					
Title: Advanced Arresting Gear Software Support Activity (SSA)	6.700	3.320	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2021 Plans: Complete the design and development of the laboratory hardware. Complete the delivery of Software Support Activity (SSA) Sub-Scale Lab (SSL) to initiate the installation and setup of the Software Support Activity (SSA) Sub-Scale Lab (SSL) to support the SSL #2 Lab Transfer. Efforts will complete in FY 2022.					
FY 2022 Base Plans: N/A					
FY 2022 OCO Plans: N/A					
FY 2021 to FY 2022 Increase/Decrease Statement: The decrease from FY 2021 to FY 2022 is due to the completion of the design and development of the SSA lab hardware and actual standup up of the Software Support Activity(SSA).					
Title: Advanced Arresting Gear Training	7.923	1.856	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2021 Plans: Finalize the development and begin the installation of the AAG Formal Training System (Multipurpose Reconfigurable Training System (MRTS)) necessary for the Center for Naval Aviation Technical Training (CNATT) approval to declare Ready For Training (RFT) in FY 2022. Complete the schoolhouse training curriculum development necessary for CNATT instructors to deliver training to the fleet sailors along with the MRTS training system. Begin the preparation for Pilot Course of formal AAG Operator and Maintenance course. Efforts will complete in FY 2022.					
FY 2022 Base Plans:					

UNCLASSIFIED

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Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604530N / <i>Advanced Arresting Gear (AAG)</i>	Project (Number/Name) 2367 / <i>Advanced Arresting Gear</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
N/A					
FY 2022 OCO Plans: N/A					
FY 2021 to FY 2022 Increase/Decrease Statement: The decrease from FY 2021 to FY 2022 is due to the completion of the AAG Schoolhouse Training facility and the declaration of Ready for Training (RFT) in FY 2022.					
Accomplishments/Planned Programs Subtotals	115.912	65.834	0.147	0.000	0.147

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022 Base</u>	<u>FY 2022 OCO</u>	<u>FY 2022 Total</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• OPN/4217: <i>Advanced Arresting Gear (AAG)</i>	4.725	16.059	22.265	-	22.265	-	-	-	-	-	-
• SCN/2001: <i>Carrier Replacement Program</i>	1,062.000	1,029.933	1,359.705	-	1,359.705	-	-	-	-	-	-
• SCN/2004: <i>Enter Other Funding Description.</i>	1,214.500	1,606.432	1,299.764	-	1,299.764	-	-	-	-	-	-

Remarks

D. Acquisition Strategy
The Navy competitively awarded two Cost Plus Fixed Fee Technical Development phase contracts to develop the Advanced Arresting Gear (AAG) system. Upon completion of the Preliminary Design and Integrated Baseline reviews, the Navy awarded a single Cost Plus Award Fee option to General Atomics for the System Development and Demonstration (SDD) phase to develop and demonstrate a production representative AAG at the NAVAIR Lakehurst Jet Car Track Site and Runway Arrested Landing Site. The AAG program is transitioning from System Design and Development (SDD) to Integrated Test and Evaluation.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy **Date:** May 2021

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604530N / <i>Advanced Arresting Gear (AAG)</i>	Project (Number/Name) 2367 / <i>Advanced Arresting Gear</i>
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Product Development (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Primary HW Development	C/CPAF	General Atomics : San Diego, CA	95.797	67.000	Nov 2019	7.824	Nov 2020	0.000		-		0.000	-	-	-
Primary HW Development	WR	NAWCAD : Lakehurst, NJ	25.226	12.088	Nov 2019	4.993	Nov 2020	0.090	Nov 2021	-		0.090	-	-	-
Systems Engineering	WR	NAWCAD : Lakehurst, NJ	6.995	3.085	Nov 2019	2.627	Nov 2020	0.057	Nov 2021	-		0.057	-	-	-
Training Development	C/CPFF	Carley Corporation : Orlando, FL	3.640	6.037	Aug 2020	1.556	Nov 2020	0.000		-		0.000	-	-	-
Subtotal			131.658	88.210		17.000		0.147		-		0.147	-	-	N/A

Remarks
The decrease in FY 2021 to FY 2022 is due to the completion of the Advanced Arresting Gear (AAG) System Design and Development (SDD) efforts.

Support (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Integrated Logistics Support	WR	NAWCAD : Lakehurst, NJ	4.483	2.048	Nov 2019	1.100	Nov 2020	0.000		-		0.000	-	-	-
Government Engineering Support	WR	Various : Various	0.425	0.412	Nov 2019	0.173	Nov 2020	0.000		-		0.000	-	-	-
Training Support	WR	NAWCAD : Orlando, FL	0.338	0.338	Nov 2019	0.300	Nov 2020	0.000		-		0.000	-	-	-
Government Engineering Support	WR	NAWCAD : Lakehurst, NJ	5.951	6.862	Nov 2019	4.170	Nov 2020	0.000		-		0.000	-	-	-
Depot Planning	TBD	General Atomics : San Diego, CA	4.950	5.725	Nov 2019	7.250	Nov 2020	0.000		-		0.000	-	-	-
Engineering Support	C/CPFF	ARL/PSU : State College, PA	1.097	0.000		0.000		0.000		-		0.000	-	-	-
SW Engineering	C/CPIF	ESL : Cranston, RI	0.848	0.815	Dec 2019	0.000		0.000		-		0.000	-	-	-
Subtotal			18.092	16.200		12.993		0.000		-		0.000	-	-	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy **Date:** May 2021

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604530N / <i>Advanced Arresting Gear (AAG)</i>	Project (Number/Name) 2367 / <i>Advanced Arresting Gear</i>
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Support (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			

Remarks
The decrease in FY 2021 to FY 2022 is due to the completion of the Advanced Arresting Gear (AAG) System Design and Development (SDD) efforts.

Test and Evaluation (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Developmental T&E	WR	NAWCAD : Lakehurst, NJ	17.349	10.957	Nov 2019	10.626	Nov 2020	0.000		-		0.000	-	-	-
Operational T&E	WR	Various : Various	0.312	0.305	Nov 2019	0.279	Nov 2020	0.000		-		0.000	-	-	-
T-45 Test and Evaluation	MIPR	DCMA : Birmingham, AL	0.668	0.000		0.000		0.000		-		0.000	-	-	-
Integrated Test & Evaluation	WR	NAWCAD : Lakehurst, NJ	0.000	0.000		4.243	Nov 2020	0.000		-		0.000	-	-	-
Intgrated Test & Evaluation	TBD	General Atomics : San Diego, CA	0.000	0.000		20.528	Nov 2020	0.000		-		0.000	-	-	-
Subtotal			18.329	11.262		35.676		0.000		-		0.000	-	-	N/A

Remarks
The decrease in FY 2021 to FY 2022 is the completion of the Integrated Test and Evaluation to support of the Advanced Arresting Gear (AAG) system.

Management Services (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Mgmt Support	C/CPFF	Sierra Management & Technologies : California, MD	0.306	0.215	Nov 2019	0.150	Nov 2020	0.000		-		0.000	-	-	-
Travel	Various	Various : Various	0.042	0.025	Oct 2019	0.015	Oct 2020	0.000		-		0.000	-	-	-
Subtotal			0.348	0.240		0.165		0.000		-		0.000	-	-	N/A

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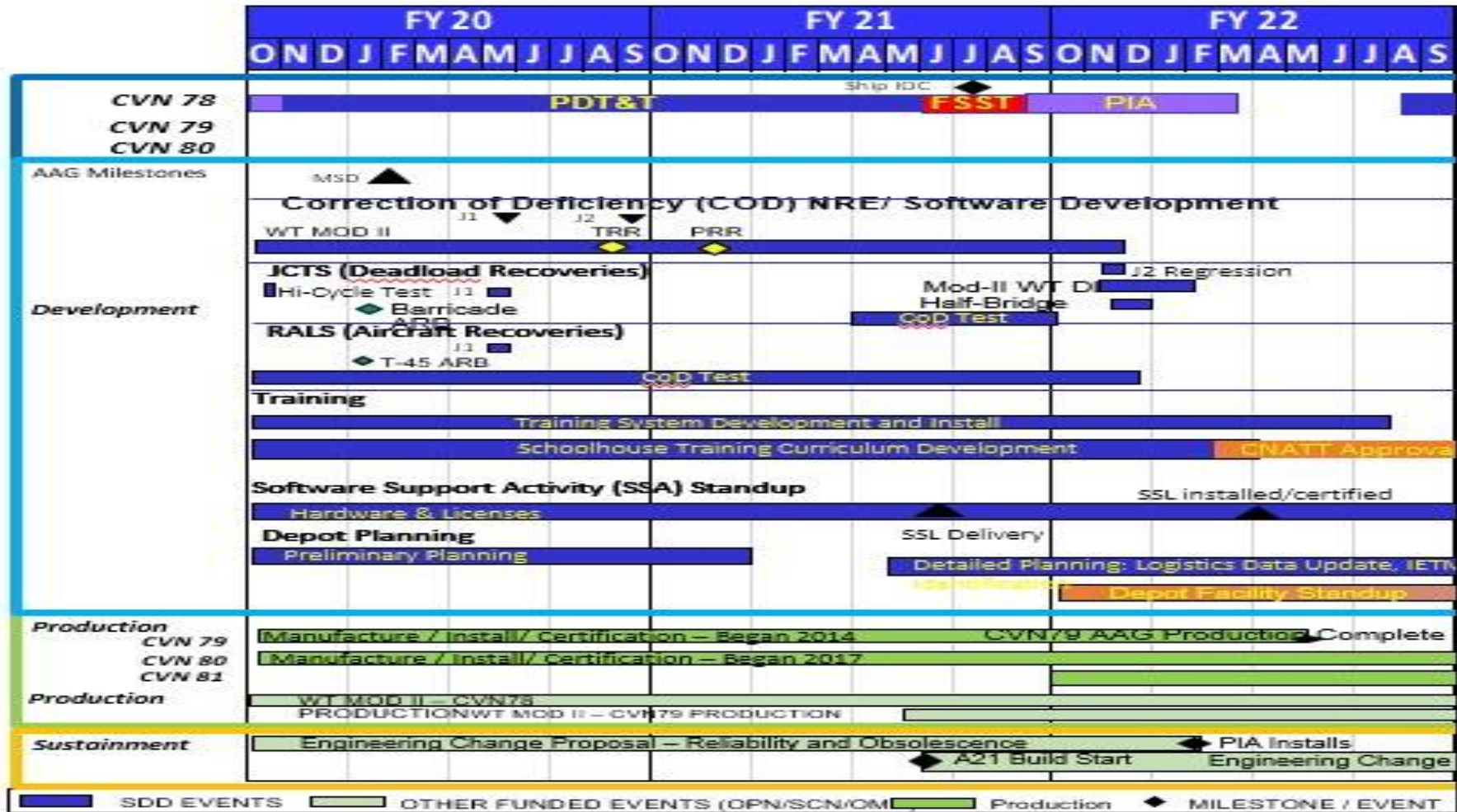
Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy

Date: May 2021

Appropriation/Budget Activity
1319 / 5

R-1 Program Element (Number/Name)
PE 0604530N / Advanced Arresting Gear (AAG)

Project (Number/Name)
2367 / Advanced Arresting Gear



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Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604530N / <i>Advanced Arresting Gear (AAG)</i>	Project (Number/Name) 2367 / <i>Advanced Arresting Gear</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
ADVANCED ARRESTING GEAR (AAG)				
System Development: Hardware Development: System Design & Development (SDD Phase)	1	2020	4	2022
System Development: Software Development: Dynamic Control System (DCS)	1	2020	4	2022
System Development: Software Development: Health Monitoring and Prognostics (HMAP)	1	2020	4	2022
System Development: Software Development: Power Conditioning Subsystem (PCS)	1	2020	4	2022
System Development: Training: Training System Development	1	2020	4	2022
System Development: Software Support Activity (SSA) Standup: Software Support Activity (SSA)	1	2020	4	2022
Depot Planning/Standup: Depot Planning/Standup	1	2020	4	2022
Test & Evaluation: Technical Evaluation: Jet Car Test Site (JCTS) Test	1	2020	2	2022
Test & Evaluation: Technical Evaluation: Runway Arrested Landing Site Test (RALS)	1	2020	1	2022