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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 0604512N / <i>Shipboard Aviation Systems</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	1,086.687	14.478	11.593	8.924	-	8.924	-	-	-	-	-	-
2232: <i>CV/CVN Launch and Recover</i>	1,082.826	10.617	9.593	8.924	-	8.924	-	-	-	-	-	-
9999: <i>Congressional Adds</i>	3.861	3.861	2.000	0.000	-	0.000	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

The FY 2022 funding request was reduced by \$0.051 million to account for the availability of prior year execution balances.

CV Launch & Recover System - This Navy unique project addresses the System Development and Demonstration (SDD) of systems required to recover and launch Navy/Marine Corps Aircraft (Fixed/Rotary Wing and Vertical/Short Take Off and Landing) operating aboard aircraft carriers, amphibious assault ships, and air capable ships. This program element includes the following:

- (1) Aircraft Launch & Recovery Equipment Modernization
- (2) Aircraft Launch and Recovery Equipment Service Life Management program

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	14.632	9.593	12.963	-	12.963
Current President's Budget	14.478	11.593	8.924	-	8.924
Total Adjustments	-0.154	2.000	-4.039	-	-4.039
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	2.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.154	0.000			
• Program Adjustments	0.000	0.000	-3.925	-	-3.925
• Rate/Misc Adjustments	0.000	0.000	-0.114	-	-0.114

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Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 9999: *Congressional Adds*

Congressional Add: *Aircraft launch and recovery equipment software improvements*

Congressional Add: *Fleet Strike Group Aviation Management*

Congressional Add Subtotals for Project: 9999

Congressional Add Totals for all Projects

	FY 2020	FY 2021
	3.861	0.000
	0.000	2.000
	3.861	2.000
	3.861	2.000

Change Summary Explanation

Cost: AAG funding included under 0604512N in FY 2018 and prior. All costs FY 2019 and later are captured under PE: 0604530N, PU: 2367.

Schedule: Schedule updated to support the FY21 Congressional Add C692: Fleet Strike Group Aviation Management.

Technical: Not Applicable.

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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 0604512N / Shipboard Aviation Systems				Project (Number/Name) 2232 / CV/CVN Launch and Recover			
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
2232: CV/CVN Launch and Recover	1,082.826	10.617	9.593	8.924	-	8.924	-	-	-	-	-	-
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

PY article includes Advanced Arresting Gear (AAG) Jet Car Track Site and two Improved Manually Operated Visual Landing Aid System (IMOVLAS) production representative models. Service Life Management Program (SLMP) test articles refer to actual units (two units per ship set).

A. Mission Description and Budget Item Justification

This Navy unique project addresses the System Development and Demonstration (SDD) of systems required to recover and launch Navy/Marine Corps Aircraft (Fixed/Rotary Wing and Vertical/Short Take-Off and Landing) operating aboard aircraft carriers (CVN), amphibious assault ships and air capable ships. This program includes the following systems under Project 2232, including the funding of production representative models for:

(1) Aircraft Launch & Recovery Equipment (ALRE) Modernization: ALRE Modernization encompasses efforts required to ensure continued functional performance, operational relevance, and cybersecurity accreditation for all product lines across the ALRE program. This includes efforts required to resolve emerging obsolescence issues (both hardware and software), implement fleet driven operational capability upgrades, and comply with cybersecurity requirements and computer task order requirements for security threat mitigation. Major categories include Visual Landing Aids (VLA), Information Systems, Launcher, Recovery and Aviation Data Management and Control System (ADMACS). There are 48 fielded subsystems that are included in the major categories.

(2) Aircraft Launch & Recovery Equipment (ALRE) Service Life Management Program (SLMP): The ALRE SLMP for Launcher and Recovery is required to sustain carrier aviation operations of higher energy aircraft launch and recoveries that are increasing loads on the ALRE systems, and that are affecting availability, maintainability and cost. This program will consist of service life assessment and extension initiatives and will establish the design foundation (structural, reliability, and maintainability analyses), permit appropriate assessment, track and focus design changes where most needed. Two SLMP prototypes were procured in FY 2018.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: Aircraft Launch & Recovery Equipment Modernization	0.000	0.742	0.727	0.000	0.727
Articles:	-	-	-	-	-
Description: ALRE Modernization encompasses efforts required to ensure continued functional performance, operational relevance, and cybersecurity accreditation for all product lines across the ALRE program. This includes efforts required to resolve emerging obsolescence issues (both hardware and software), implement fleet driven operational capability upgrades, and comply with cybersecurity requirements and computer task order requirements for security threat mitigation. Major categories include Visual Landing Aids (VLA),					

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy	Date: May 2021
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Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604512N / <i>Shipboard Aviation Systems</i>	Project (Number/Name) 2232 / <i>CV/CVN Launch and Recover</i>
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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
<p>Information Systems, Launcher, Recovery and Aviation Data Management and Control System (ADMACS). There are 48 fielded subsystems that are included in the major categories.</p> <p>FY 2021 Plans: Provides for developmental enhancements to resolve known and emerging capability shortfalls within the major categories of ALRE to include: VLA, Information Systems, Launcher, Recovery and ADMACS. These major subsystems include 48 fielded Aircraft Launch and Recovery Systems. These efforts support various Air Capable Ships, Amphibious Assault Ships, and Aircraft Carrier Fleet.</p> <p>FY 2022 Base Plans: Continues the developmental enhancements to resolve known and emerging capability shortfalls within the major categories of ALRE to include: VLA, Information Systems, Launcher, Recovery and ADMACS. These major subsystems include 48 fielded Aircraft Launch and Recovery Systems. These efforts support various Air Capable Ships, Amphibious Assault Ships, and Aircraft Carrier Fleet.</p> <p>FY 2022 OCO Plans: N/A</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement: The decrease from FY 2021 to FY 2022 is due to the continued development of the known and emerging capability within ALRE.</p>					
<p>Title: Aircraft Launch & Recovery Equipment (ALRE) Service Life Management Program (SLMP)</p> <p align="right">Articles:</p> <p>FY 2021 Plans: Begin the development of the Replacement Purchase Cable. Conduct land-based testing of the Mk7 Main Engine Cylinder prototype. Continue analysis, design, development and testing of the Aircraft Ship Integrated Secure and Transfer (ASIST) and Recovery Assist, Securing and Traversing (RAST) components and subcomponents.</p> <p>FY 2022 Base Plans: Complete land-based testing of the Mk7 Main Engine Cylinder and begin land-based testing of the Replacement Purchase Cable prototypes. Continue analysis, design, development and testing of the Aircraft Ship Integrated Secure and Transfer (ASIST) components and subcomponents. Begin the Recovery Assist, Securing and Traversing (RAST) and Jet Blast Deflector (JBD) service life assessments.</p> <p>FY 2022 OCO Plans:</p>	10.617	8.851	8.197	0.000	8.197
	-	-	-	-	-

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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 0604512N / <i>Shipboard Aviation Systems</i>	Project (Number/Name) 2232 / <i>CV/CVN Launch and Recover</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					
<i>FY 2021 to FY 2022 Increase/Decrease Statement:</i> The decrease from FY 2021 to FY 2022 is due to the completion of the Mk7 Main Engine Cylinder (MEC) service life assessments.					
Accomplishments/Planned Programs Subtotals	10.617	9.593	8.924	0.000	8.924

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/4213: <i>Aircraft Launch & Recovery Equipment-Aircraft Launch & Recovery Equipment</i>	187.926	236.655	178.647	-	178.647	-	-	-	-	-	-

Remarks

OPN 4213 includes a portion of line item funding for ALRE.

D. Acquisition Strategy

Aircraft Launch & Recovery Equipment Modernization: This program ensure continued functional performance, operational relevance, and cybersecurity accreditation for all product lines across the ALRE program. Programs include Visual Landing Aids (VLA), Information Systems, Launcher, Recovery and Aviation Data Management and Control System (ADMACS). There are 48 fielded subsystems that are included in the major categories.

Aircraft Launch & Recovery Equipment Service Life Management Program (SLMP): This program will consist of Service Life Assessment and Extension initiatives and will establish the design foundation (structural, reliability and maintainability analyses), permit appropriate assessment, track and focus design changes where most needed.

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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 0604512N / <i>Shipboard Aviation Systems</i>	Project (Number/Name) 2232 / <i>CV/CVN Launch and Recover</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 Dev - ALRE Mod	WR	NAWCAD : Lakehurst, NJ	1.703	0.000		0.742	Nov 2020	0.727	Nov 2021	-		0.727	-	-	-
Primary HW Dev-SLMP	WR	NAWCAD : Lakehurst, NJ	17.986	2.246	Nov 2019	2.931	Nov 2020	0.735	Nov 2021	-		0.735	-	-	-
Prior Year Cost No Longer Funded in FYDP	Various	Various : Various	904.203	0.000		0.000		0.000		-		0.000	-	-	-
Subtotal			923.892	2.246		3.673		1.462		-		1.462	-	-	N/A

Remarks
The decrease from FY 2021 to FY 2022 is due to the change in Replacement Purchase Cable design within the Aircraft Launch and Recovery (ALRE) System program.

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			
Studies & Analysis-SLMP	WR	NAWCAD : Lakehurst, NJ	20.989	3.296	Nov 2019	3.885	Nov 2020	4.225	Nov 2021	-		4.225	-	-	-
Prior Year Cost No Longer Funded in FYDP	Various	Various : Various	27.231	0.000		0.000		0.000		-		0.000	-	-	-
Subtotal			48.220	3.296		3.885		4.225		-		4.225	-	-	N/A

Remarks
The increase from FY 2021 to FY 2022 is to support the continued development of the Replacement Purchase Cable for the Service Life Management Program (SLMP).

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			
Materials/Validation Testing-SLMP	WR	NAWCAD : Lakehurst, NJ	18.485	5.075	Nov 2019	2.035	Nov 2020	3.237	Nov 2021	-		3.237	-	-	-
Prior Year Cost No Longer Funded in FYDP	Various	Various : Various	88.996	0.000		0.000		0.000		-		0.000	-	-	-
Subtotal			107.481	5.075		2.035		3.237		-		3.237	-	-	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 0604512N / <i>Shipboard Aviation Systems</i>	Project (Number/Name) 2232 / <i>CV/CVN Launch and Recover</i>
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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			

Remarks
The increase from FY 2021 to FY 2022 is to support the increased testing of the Replacement Purchase Cable for the Service Life Management Program (SLMP).

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			
Prior Year Cost No Longer Funded in FYDP	Various	Various : Various	3.233	0.000		0.000		0.000		-		0.000	-	-	-
Subtotal			3.233	0.000		0.000		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	1,082.826	10.617	9.593	8.924	-	8.924	-	-	N/A

Remarks

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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 0604512N / <i>Shipboard Aviation Systems</i>	Project (Number/Name) 2232 / <i>CV/CVN Launch and Recover</i>
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ALRE SERVICE LIFE MANAGEMENT PROGRAM (SLMP)	FY 2020				FY 2021				FY 2022			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Systems Development												
Hardware/Software Development	Engineering Analysis											
	SDD											
Test & Evaluation												
Technical Evaluation	Material/Validation Testing											

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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 0604512N / <i>Shipboard Aviation Systems</i>	Project (Number/Name) 2232 / <i>CV/CVN Launch and Recover</i>
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ALRE MODERNIZATION	FY 2020				FY 2021				FY 2022			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Systems Development												
Hardware/Software Development					ALRE							

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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 0604512N / <i>Shipboard Aviation Systems</i>	Project (Number/Name) 2232 / <i>CV/CVN Launch and Recover</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>ALRE SERVICE LIFE MANAGEMENT PROGRAM (SLMP)</i>				
Systems Development: Hardware/Software Development: HW/SW Development	1	2020	4	2022
Systems Development: Hardware/Software Development: System Development	1	2020	4	2022
Test & Evaluation: Technical Evaluation: Test & Evaluation	1	2020	4	2022
<i>ALRE MODERNIZATION</i>				
Systems Development: Hardware/Software Development: Obsolescence Redesign Development and Testing	1	2021	4	2022

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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 0604512N / Shipboard Aviation Systems				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: <i>Congressional Adds</i>	3.861	3.861	2.000	0.000	-	0.000	-	-	-	-	-	-
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

Congressional Add. Program Increase to Improve Aircraft Carrier Readiness.

A. Mission Description and Budget Item Justification

Congressional Add. Program Increase to Improve Aircraft Carrier Readiness.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2020	FY 2021
Congressional Add: Aircraft launch and recovery equipment software improvements <i>FY 2020 Accomplishments:</i> N/A <i>FY 2021 Plans:</i> N/A	3.861	0.000
Congressional Add: Fleet Strike Group Aviation Management <i>FY 2020 Accomplishments:</i> N/A <i>FY 2021 Plans:</i> Funding will support Aircraft Launch and Recovery Equipment (ALRE) software to support the Fleet Strike Group Aviation Management.	0.000	2.000
Congressional Adds Subtotals	3.861	2.000

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

N/A

Remarks

D. Acquisition Strategy

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 0604512N / <i>Shipboard Aviation Systems</i>	Project (Number/Name) 9999 / <i>Congressional Adds</i>
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	FY 2020				FY 2021				FY 2022			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Proj 9999												
C461: Improving Aircraft Carrier Readiness				Contract Award ◆								
	HW/SW Development											
	Systems Support											
C558: Aircraft Launch and Recovery Equipment Software Improvements							Contract Award ◆					
					Software Development							
					Systems Support							
C692: Fleet Strike Group Aviation Management										Contract Award ◆		
									SW Development			
									Systems Support			

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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 0604512N / <i>Shipboard Aviation Systems</i>	Project (Number/Name) 9999 / <i>Congressional Adds</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 9999				
C461: Improving Aircraft Carrier Readiness: Hardware/Software Development	4	2020	4	2020
C461: Improving Aircraft Carrier Readiness: Hardware Software Development	1	2020	4	2020
C461: Improving Aircraft Carrier Readiness: Systems Support	1	2020	4	2020
C558: Aircraft Launch and Recovery Equipment Software Improvements: SW Development	3	2021	3	2021
C558: Aircraft Launch and Recovery Equipment Software Improvements: Software Development	4	2020	4	2021
C558: Aircraft Launch and Recovery Equipment Software Improvements: Systems Support	4	2020	4	2021
C692: Fleet Strike Group Aviation Management: SW Development	2	2022	2	2022
C692: Fleet Strike Group Aviation Management: Software Development	4	2021	4	2022
C692: Fleet Strike Group Aviation Management: Systems Support	4	2021	4	2022