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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy **Date:** February 2020

Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy / BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0604227N / <i>Harpoon Modifications</i>
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COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
Total Program Element	0.000	5.016	2.302	0.697	-	0.697	0.000	0.000	0.000	0.000	0.000	8.015
1843: <i>Harpoon Block II+</i>	0.000	5.016	2.302	0.697	-	0.697	0.000	0.000	0.000	0.000	0.000	8.015

Note

FY 2019 funding does not reflect the enacted rescission amount of \$5.197 Million. Funding in the amount of \$181k transferred back into the program via Below Threshold Reprogramming (BTR) to enable the full rescission.

A. Mission Description and Budget Item Justification

The Encapsulated (ENCAP) Harpoon Block IC (HIC) missiles provides Navy Los Angeles-class nuclear attack submarines (SSN) a sub-launched, all-weather, long-range Anti-Surface Warfare (ASuW) missile to attack enemy warships at stand-off ranges, to include Surface and Amphibious Action Groups. The ENCAP Reconstitution Program will refurbish and recertify 60 ENCAP HIC all-up rounds from deep storage to an "as-new" war-ready material condition (ENCAP Harpoons were placed in deep storage in 1996). The controlled storage conditions achieved by the missile capsule have preserved the material condition of the weapon system, allowing for relatively quick recertification and reissue. Due to the ease and speed of missile recertification's the ENCAP HIC Reconstitution Program will fill a critical, time sensitive ASuW capability gap and meet Speed to the Fleet requirements.

This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate funding in the current or subsequent fiscal year.

<u>B. Program Change Summary (\$ in Millions)</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021 Base</u>	<u>FY 2021 OCO</u>	<u>FY 2021 Total</u>
Previous President's Budget	5.197	2.302	0.600	-	0.600
Current President's Budget	5.016	2.302	0.697	-	0.697
Total Adjustments	-0.181	0.000	0.097	-	0.097
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.181	0.000			
• Rate/Misc Adjustments	0.000	0.000	0.097	-	0.097

Change Summary Explanation

FY 2021 funding was increased from \$0.600 million by \$0.097 million to \$0.697 million due to rate/miscellaneous adjustments.

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Appropriation/Budget Activity
1319: *Research, Development, Test & Evaluation, Navy / BA 7: Operational Systems Development*

R-1 Program Element (Number/Name)
PE 0604227N / *Harpoon Modifications*

Technical: Not applicable.

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy										Date: February 2020		
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0604227N / Harpoon Modifications				Project (Number/Name) 1843 / Harpoon Block II+			
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
1843: Harpoon Block II+	0.000	5.016	2.302	0.697	-	0.697	0.000	0.000	0.000	0.000	0.000	8.015
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Encapsulated (ENCAP) Harpoon Block IC (HIC) missiles provides Navy Los Angeles-class nuclear attack submarines (SSN) a sub-launched, all-weather, long-range Anti-Surface Warfare (ASuW) missile to attack enemy warships at stand-off ranges, to include Surface and Amphibious Action Groups. The ENCAP Reconstitution Program will refurbish and recertify 60 ENCAP HIC all-up rounds from deep storage to an "as-new" war-ready material condition (ENCAP Harpoons were placed in deep storage in 1996). The controlled storage conditions achieved by the missile capsule have preserved the material condition of the weapon system, allowing for relatively quick recertification and reissue. Due the ease and speed of missile recertifications the ENCAP HIC Reconstitution Program will fill a critical, time sensitive ASuW capability gap and meet Speed to the Fleet requirements.

This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate funding in the current or subsequent fiscal year.

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

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Harpoon Block II+ Seeker Development	5.016	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: FY 2019 funding does not reflect the enacted rescission amount of \$5.197M. Funding in the amount of \$181k transferred back into the program via Below Threshold Reprogramming (BTR) to enable the full rescission.					
FY 2020 Plans: N/A					
FY 2021 Base Plans: N/A					
FY 2021 OCO Plans: N/A					
Title: ENCAP Reconstitution Program	0.000	2.302	0.697	0.000	0.697
Articles:	-	-	-	-	-
FY 2020 Plans:					

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<p>The ENCAP Reconstitution Program involves collective, cooperative NAVAIR and NAVSEA effort to re-integrate ENCAP AURs and capability back into USN LA-class nuclear-powered attack submarines. Navy efforts within NAVSEA and NAVAIR include the refurbishment, preparation, and test firing of several Encapsulated Harpoon Certification and Training Vehicles (EHCVTs) at-sea from several LA-class SSNs as well as shock and implosion safety studies and analysis with supporting tests, reports, and engineering documents.</p> <p>FY 2021 Base Plans: The ENCAP Reconstitution Program will require a collective, cooperative NAVAIR and NAVSEA effort to re-integrate ENCAP AURs and capability back into USN LA-class nuclear-powered attack submarines. Navy efforts within NAVSEA and NAVAIR will include: finalization of refurbishment, conclude shock and implosion safety studies and analysis with supporting tests, reports, and engineering documents.</p> <p>FY 2021 OCO Plans: N/A</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement: The FY 2020 to FY 2021 decrease of \$1.605 million is due to progression in development efforts.</p>					
Accomplishments/Planned Programs Subtotals	5.016	2.302	0.697	0.000	0.697

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

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• WPN/2326: Harpoon Mods	26.840	23.585	0.091	-	0.091	4.255	3.538	3.524	3.587	0.000	80.720
• OPN/5227: Harpoon Support Equipment	0.000	0.000	0.208	-	0.208	0.209	0.211	0.215	0.219	0.000	1.062

Remarks

D. Acquisition Strategy

The Encapsulated Harpoon Block IC (ENCAP HIC) Reconstitution Program will refurbish and recertify 60 ENCAP HICs to an as-new war-ready material condition. Coordinated contracting efforts between NAVAIR and NAVSEA offices will reintegrate and supply ENCAP HICs. Vendor support for all associated activities will leverage existing vendor relationships, and exiting contracts when able. All required manufacturing processes, support facilities, and tooling currently exist and are in current use for this program.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy **Date:** February 2020

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0604227N / Harpoon Modifications	Project (Number/Name) 1843 / Harpoon Block II+
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Product Development (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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 Hardware Development	SS/CPPIF	Mustang/L3 : Plano, TX	0.000	4.787	Sep 2019	0.000		0.000		-		0.000	0.000	4.787	-
Missile Support- Encap	C/CPFF	BSC : Chantilly, VA	0.000	0.000		0.300	Mar 2020	0.000		-		0.000	0.000	0.300	0.502
Subtotal			0.000	4.787		0.300		0.000		-		0.000	0.000	5.087	N/A

Remarks
FY 2019 funding does not reflect the enacted rescission amount.

Support (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
Government Support	WR	NAWCAD : Patuxent River, MD	0.000	0.229	Sep 2019	0.000		0.000		-		0.000	0.000	0.229	-
Subtotal			0.000	0.229		0.000		0.000		-		0.000	0.000	0.229	N/A

Remarks
FY 2019 funding does not reflect the enacted rescission amount.

Test and Evaluation (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
T&E - Encap	WR	NUWC Naval Undersea Warfare Center : Newport, RI	0.000	0.000		2.002	Dec 2019	0.697	Nov 2020	-		0.697	0.000	2.699	-
Subtotal			0.000	0.000		2.002		0.697		-		0.697	0.000	2.699	N/A

Remarks
Test and Evaluation cost for the Harpoon HIC ENCAP reconstitution efforts include system safety analysis and reporting, required sea trial activities with analysis and reporting, and safety/shock/implosion analysis.

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Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy **Date:** February 2020

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HARPOON MODIFICATION	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Program Milestones											◆																	
Test and Evaluation Activities											◆																	
Support													ENCAP Refurbishment and Maintenance															

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Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy **Date:** February 2020

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0604227N / <i>Harpoon Modifications</i>	Project (Number/Name) 1843 / <i>Harpoon Block II+</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Harpoon Modifications</i>				
Program Milestones: Fielding	3	2021	3	2021
Test and Evaluation: Developmental Tests	2	2020	1	2021
Test and Evaluation: Sea Trials	2	2021	2	2021
Support: ENCAP Refurbishment and Maintenance	2	2020	4	2024