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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy **Date:** March 2023

Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604031N / <i>Large Unmanned Undersea Vehicles</i>
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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	208.714	27.510	0.000	6.900	-	6.900	7.037	5.284	2.753	2.736	Continuing	Continuing
2094: <i>Unmanned Underwater Vehicle</i>	208.714	27.510	0.000	6.900	-	6.900	7.037	5.284	2.753	2.736	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Snakehead Large Displacement Unmanned Undersea Vehicle (LDUUV) is the Navy's Large UUV effort as part of the Family of UUVs, in support of maintaining the Navy's undersea superiority. It is the Navy's largest Submarine-launched UUV, providing increased endurance, depth capability, and payload capacity beyond small and medium class submarine deployed UUVs. The Snakehead LDUUV is modular in design and includes high accuracy mission sensors and communications links, as well as modular payload capabilities. Modules have well defined interfaces for the purposes of implementing cost-effective upgrades in future increments to leverage advances in technology.

The Snakehead LDUUV program is a CNO/ASN(RDA) approved Accelerated Acquisition, featuring a phased approach to grow capabilities at a manageable level of risk. Phase 1 is a Government developed prototype with significant Industry involvement to develop Techniques, Tactics, and Procedures (TTPs), Concepts of Operation (CONOPS), and risk reductions for submarine and surface ship integration. One Phase 1 vehicle, with sufficient test spares, was fabricated and commenced subsystem testing in FY21 and vehicle in-water testing in FY22. Future LDUUV requirements include increased capabilities and integration onto Modernized DDS, as well as integration onto surface ships. Phase 2 efforts were stopped in FY22.

B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	65.672	0.000	0.000	-	0.000
Current President's Budget	27.510	0.000	6.900	-	6.900
Total Adjustments	-38.162	0.000	6.900	-	6.900
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-36.000	0.000			
• SBIR/STTR Transfer	-2.162	0.000			
• Program Adjustments	0.000	0.000	6.839	-	6.839
• Rate/Misc Adjustments	0.000	0.000	0.061	-	0.061

Change Summary Explanation

Technical: Not applicable.

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Schedule: Not applicable.		
Cost: FY 2022: -\$2.162M Small Business Innovative Research (SBIR), -\$36.0M Above Threshold Reprogramming (ATR) FY 2023: No Change FY 2024: +6.839M Program adjustment: Continue LDUUV Phase I Testing and Experimentation; +\$0.061M Miscellaneous Adjustment		

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604031N / Large Unmanned Undersea Vehicles				Project (Number/Name) 2094 / Unmanned Underwater Vehicle			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
2094: Unmanned Underwater Vehicle	208.714	27.510	0.000	6.900	-	6.900	7.037	5.284	2.753	2.736	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

FY22 Funding - \$36.0M Above Threshold Reprogramming (ATR) completed

A. Mission Description and Budget Item Justification

The Snakehead Large Displacement Unmanned Undersea Vehicle (LDUUV) is the Navy's Large UUV effort as part of the Family of UUVs, in support of maintaining the Navy's undersea superiority. It is the Navy's largest Submarine-launched UUV, providing increased endurance, depth capability, and payload capacity beyond small and medium class submarine deployed UUVs. The Snakehead LDUUV is modular in design and includes high accuracy mission sensors and communications links, as well as modular payload capabilities. Modules have well defined interfaces for the purposes of implementing cost-effective upgrades in future increments to leverage advances in technology. The Snakehead program is a CNO/ASN(RDA) approved Accelerated Acquisition, featuring a phased approach to build capabilities at a manageable level of risk in the Navy's class of Large Displacement Unmanned Undersea Vehicles.

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

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: LDUUV Product Development	24.260	0.000	5.800	0.000	5.800
Articles:	-	-	-	-	-
FY 2023 Plans: N/A					
FY 2024 Base Plans: Re-start LDUUV Program with demonstrations and experimentation of the prototype system. Provide technical and systems engineering for execution of demos, testing, and system refurbishment, and upgrades as required.					
FY 2024 OCO Plans: N/A					
FY 2023 to FY 2024 Increase/Decrease Statement: Increase from FY23 to FY24 is for continuation of the LDUUV program with demonstrations and experimentation of the prototype system.					
Title: LDUUV Support	2.250	0.000	0.525	0.000	0.525
Articles:	-	-	-	-	-

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Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604031N / Large Unmanned Undersea Vehicles	Project (Number/Name) 2094 / Unmanned Underwater Vehicle

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>FY 2023 Plans: N/A</p> <p>FY 2024 Base Plans: Support re-start of LDUUV ILS efforts.</p> <p>FY 2024 OCO Plans: N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Increase due to FY2023 being zeroed out.</p>					
<p>Title: LDUUV Management Services</p> <p align="right">Articles:</p>	1.000 -	0.000 -	0.575 -	0.000 -	0.575 -
<p>FY 2023 Plans: N/A</p> <p>FY 2024 Base Plans: Provide program management support and travel for Phase 1 in-water test execution and fleet demonstrations.</p> <p>FY 2024 OCO Plans: N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Increase from FY23 to FY24 is for the continuation of management of the demonstrations, experimentation, engineering and integration of the prototype system.</p>					
Accomplishments/Planned Programs Subtotals	27.510	0.000	6.900	0.000	6.900

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

N/A

Remarks

D. Acquisition Strategy

Snakehead LDUUV Phase 1 is a single Government developed prototype with significant Industry involvement to develop Techniques, Tactics, and Procedures (TTP) and Concepts of Operation (CONOPS) and reduce risk for submarine and surface ship integration. The Navy shared a Phase 1 Technical Data Package with Industry. Due to the lack of funds in FY23 and out, Phase 2 efforts were stopped in FY22.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
1319 / 4				PE 0604031N / Large Unmanned Undersea Vehicles				2094 / Unmanned Underwater Vehicle							
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
LDUUV Industry Prototypes and Demos	Various	Various : Various	0.000	2.670	Apr 2022	0.000		0.000		-		0.000	0.000	2.670	-
LDUUV Vehicles, Hardware, Design, & Demos	WR	NUWC Newport : Newport, RI	57.760	7.000	Nov 2021	0.000		4.000	Nov 2023	-		4.000	Continuing	Continuing	Continuing
LDUUV Vehicles, Hardware, Design, & Demos	C/CPFF	Various : Various	46.369	0.200	Oct 2021	0.000		0.500	Jan 2024	-		0.500	Continuing	Continuing	Continuing
LDUUV Vehicles, Hardware, Design, & Demos	WR	NSWC Carderock : West Bethesda, MD	21.113	2.500	Nov 2021	0.000		0.800	Nov 2023	-		0.800	0.000	24.413	-
LDUUV Vehicles, Hardware, & Design	WR	NSWC Panama City : Panama City, FL	0.166	0.000		0.000		0.000		-		0.000	0.000	0.166	-
LDUUV Vehicles, Hardware, Design, & Demos	SS/CPFF	ARL PSU : State College, PA	30.977	1.000	Dec 2021	0.000		0.500	Jan 2024	-		0.500	0.000	32.477	-
LDUUV Vehicles, Hardware, Design, & Demos	WR	SSC Pacific : San Diego, CA	1.989	0.150	Oct 2021	0.000		0.000		-		0.000	0.000	2.139	-
LDUUV Vehicles, Hardware, Design, & Demos	WR	NUWC Keyport : Keyport, WA	16.706	3.000	Nov 2021	0.000		0.000		-		0.000	0.000	19.706	-
LDUUV Experimentation and Risk Reduction - Battery Certification	WR	NSWC Crane : Crane, IN	2.353	0.340	Nov 2021	0.000		0.000		-		0.000	0.000	2.693	-
LDUUV Platform Integration	Various	Various : Various	6.515	0.100	Feb 2022	0.000		0.000		-		0.000	0.000	6.615	-
LDUUV Risk Reduction Sonar	SS/CPFF	ARL UT : Austin, TX	0.551	0.000		0.000		0.000		-		0.000	0.000	0.551	-
FLEET Expiration	WR	NUWC NPT : Newport, RI	4.092	6.000	Dec 2021	0.000		0.000		-		0.000	0.000	10.092	-

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Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604031N / Large Unmanned Undersea Vehicles	Project (Number/Name) 2094 / Unmanned Underwater Vehicle
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Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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			
FLEET Expiration	SS/CPFF	ARL PSU : State College, PA	0.000	0.300	Jan 2022	0.000		0.000		-		0.000	0.000	0.300	-
FLEET Expiration	Various	Various : Various	0.950	1.000	Oct 2021	0.000		0.000		-		0.000	0.000	1.950	-
Subtotal			189.541	24.260		0.000		5.800		-		5.800	Continuing	Continuing	N/A

Remarks
FY22 - \$36.0M Above Threshold Reprogramming (ATR)

Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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			
LDUUV Engineering Support	WR	NUWC Newport : Newport, RI	2.636	1.100	Nov 2021	0.000		0.000		-		0.000	0.000	3.736	-
LDUUV Launch and Recovery Engineering Support	WR	NSWC Panama City : Panama City, FL	0.306	0.000		0.000		0.000		-		0.000	0.000	0.306	-
LDUUV Hydrodynamics and Propulsion Engineering Support	C/CPFF	Various : Various	0.846	0.500	Nov 2021	0.000		0.000		-		0.000	0.000	1.346	-
LDUUV Hull and Propulsion Engineering Support	WR	NSWC Carderock : West Bethesda, MD	3.121	0.200	Nov 2021	0.000		0.000		-		0.000	0.000	3.321	-
LDUUV Command and Control Engineering Support	WR	SSC Pacific : San Diego, CA	1.380	0.150	Dec 2021	0.000		0.000		-		0.000	0.000	1.530	-
LDUUV Engineering Support	SS/CPFF	APL/JHU : Laurel, MD	1.635	0.000	Jan 2022	0.000		0.000		-		0.000	0.000	1.635	-
LDUUV ILS and Engineering Support	WR	NUWC Keyport : Keyport, WA	0.658	0.300	Nov 2021	0.000		0.525	Nov 2023	-		0.525	0.000	1.483	-
Subtotal			10.582	2.250		0.000		0.525		-		0.525	0.000	13.357	N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy **Date:** March 2023

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604031N / <i>Large Unmanned Undersea Vehicles</i>	Project (Number/Name) 2094 / <i>Unmanned Underwater Vehicle</i>
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LDUUV	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	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
LDUUV Development																												
Experimentation Risk Reduction	Experimentation Risk Reduction and TRL Maturation																											
Vehicle Refurbishment									Vehicle Refurbishment																			
Restart Battery Certification Efforts									Restart Battery Certification Efforts																			
VOO Demo													VOO Demo															
Continue Capability Demos																	Continue Capability Demos											
Fleet Demos																					Fleet Demos							
Design Reviews																												
Phase 1																												
Government Testing	Testing																											

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
LDUUV				
LDUUV Development: Experimentation Risk Reduction:	1	2022	4	2022
LDUUV Development: Vehicle Refurbishment: Schedule Detail	1	2024	3	2024
LDUUV Development: Restart Battery Certification Efforts: Schedule Detail	1	2024	4	2024
LDUUV Development: VOO Demo: Schedule Detail	1	2025	1	2025
LDUUV Development: Continue Capability Demos: Schedule Detail	1	2025	4	2026
LDUUV Development: Fleet Demos: Schedule Detail	1	2027	4	2028
Design Reviews: Phase 1 Test Readiness Review	1	2022	1	2022
Phase 1: Government Testing:	1	2022	4	2022