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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Navy										Date: March 2019		
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 Program Element (Number/Name) PE 0603506N / Surface Ship Torpedo Defense							
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	749.538	24.174	7.100	15.800	-	15.800	14.400	0.900	0.000	0.000	0.000	811.912
0225: Surface Ship Torpedo Defense (SSTD)	749.538	14.523	7.100	15.800	-	15.800	14.400	0.900	0.000	0.000	0.000	802.261
9999: Congressional Adds	0.000	9.651	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	9.651

A. Mission Description and Budget Item Justification

The Surface Ship Torpedo Defense (SSTD) program provides a detect-to-engage layered torpedo defense capability. The four major efforts that comprise SSTD are the AN/SLQ-25 (NIXIE) system, Torpedo Warning System (TWS), the Countermeasure Anti-Torpedo (CAT) and Acoustic Device Countermeasure (Surface ADC MK2). CAT and TWS are development programs. The CAT program develops a canisterized Anti-Torpedo Torpedo (ATT). The TWS program develops the required torpedo detection, classification and localization (TDCL) ship systems to employ CAT. The TWS and CAT systems make up the Anti-Torpedo Torpedo Defense System (ATTDS).

The ATTDS provides a hard kill torpedo defense capability on High Value Units (HVU's). The program has developed and fielded five ATTDS Engineering Design Model (EDM) systems on CVNs. Each EDM system is one TWS with a CAT load out of a maximum of eight CATs. Starting in FY20 The ATTDS Program will commence a sundown effort to return the five CVNs to their original configuration. The AN/SLQ-25 (NIXIE) is a towed acoustic and non-acoustic countermeasure system. The AN/SLQ-25 program develops countermeasure technologies and capabilities to improve ship survivability against future torpedo threats.

Research and development of new technologies and capabilities developed under the Future Naval Capabilities (FNC), Small Business and Innovative Research (SBIR), and other Research, Development, Test & Evaluation (RDT&E) initiatives. New and emerging hardware and software are evaluated in representative acoustic environments, against projected threats through both digital and hardware-in-the-loop simulations, to determine their effectiveness and impact on improving ship survivability. The technology is then incorporated into the appropriate product line.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Navy	Date: March 2019
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Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603506N / <i>Surface Ship Torpedo Defense</i>
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B. Program Change Summary (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	14.974	8.570	0.000	-	0.000
Current President's Budget	24.174	7.100	15.800	-	15.800
Total Adjustments	9.200	-1.470	15.800	-	15.800
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-1.470			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.800	0.000			
• Program Adjustments	0.000	0.000	15.800	-	15.800
• Rate/Misc Adjustments	0.000	0.000	0.000	-	0.000
• Congressional Add Adjustments	10.000	-	-	-	-

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

Project: 9999: *Congressional Adds*

Congressional Add: *Program Increase*

Congressional Add Subtotals for Project: 9999

Congressional Add Totals for all Projects

FY 2018	FY 2019
9.651	0.000
9.651	0.000
9.651	0.000

Change Summary Explanation

The FY2020 funding increase (\$15.800M) supports removal of the Anti-Torpedo Torpedo Defense System (ATTDS) from the five CVNs and returning them to their original configuration by installing the AN/SLQ-25 (NIXIE) they were equipped with previously. The funding will also support mission readiness for ATTDS equipped ships prior to the availability that will implement the conversion to their original configuration. This entails the sundown effort of ATTDS.

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy										Date: March 2019		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603506N / Surface Ship Torpedo Defense				Project (Number/Name) 0225 / Surface Ship Torpedo Defense (SSTD)			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
0225: Surface Ship Torpedo Defense (SSTD)	749.538	14.523	7.100	15.800	-	15.800	14.400	0.900	0.000	0.000	0.000	802.261
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Countermeasure Anti- Torpedo (CAT) program developed a canisterized Anti-Torpedo Torpedo (ATT). The Torpedo Warning System (TWS) developed the required torpedo detection, classification and localization (TDCL)systems. The Countermeasure TWS and CAT systems make up the Anti-Torpedo Torpedo Defense System (ATTDS).

The ATTDS provides a hard kill torpedo defense capability on High Value Units (HVV's). The program has developed and fielded five ATTDS Engineering Design Model (EDM) systems on CVNs. Each EDM system is one TWS with a CAT load out of a maximum of eight CATs. The program delivered its first prototype system in FY13 and has delivered and installed its fifth and final system in FY17. Along with delivering and installing systems on CVN's, the ATTDS Program completed system salvo software development and a Quick Reaction Assessment (QRA) test in 1QFY18.

In FY19, software support, material system changes, and system reliability enhancements will remain the program's top priorities to ensure the highest operational availability and performance of the systems. CVN Installation and/or removal will occur in FY20 through FY23.

Research and development of new technologies and capabilities developed under the Future Naval Capabilities (FNC), Small Business and Innovative Research (SBIR), and other Research, Development, Test & Evaluation (RDT&E) initiatives. New and emerging hardware and software are evaluated in representative acoustic environments, against projected threats through both digital and hardware-in-the-loop simulations, to determine their effectiveness and impact on improving ship survivability. The technology is then incorporated into the appropriate product line.

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

	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Countermeasure Anti-Torpedo (CAT)	6.549	2.130	5.500	0.000	5.500
Articles:	-	-	-	-	-
FY 2019 Plans: Continue land based reliability Data collection on returning deployed CATs and ATTs. Continue engineering changes on CAT materials and CAT software upgrades. Support software resolution through Program Trouble Reports (PTRs). Continue Development of the EX-819 container.					

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy				Date: March 2019		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603506N / Surface Ship Torpedo Defense		Project (Number/Name) 0225 / Surface Ship Torpedo Defense (SSTD)		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Initiate System Sundown Plan. FY 2020 Base Plans: Continue CVN System Sundown Plan. Continued engineering changes on CAT materials and CAT software upgrades. FY 2020 OCO Plans: N/A FY 2019 to FY 2020 Increase/Decrease Statement: The FY2020 funding increase supports removal of the Anti-Torpedo Torpedo Defense System (ATTDS) from the five CVNs and returning them to their original configuration by installing the AN/SLQ-25 (NIXIE) they were equipped with previously. The funding will also support mission readiness for ATTDS equipped ships prior to the availability that will implement the conversion to their original configuration.						
Title: Torpedo Warning System (TWS) Articles:		7.974 -	4.970 -	10.300 -	0.000 -	10.300 -
FY 2019 Plans: Continue land based reliability Data collection on returning deployed TWS systems. Continue engineering changes on TWS software upgrades. Support software resolution through Program Trouble Reports (PTRs). Initiate System Sundown Plan. FY 2020 Base Plans: Continue CVN System Sundown plan according to sponsor direction. Continued engineering changes on TWS software upgrades. FY 2020 OCO Plans: N/A FY 2019 to FY 2020 Increase/Decrease Statement: The FY2020 funding increase supports removal of the Anti-Torpedo Torpedo Defense System (ATTDS) from the five CVNs and returning them to their original configuration by installing the AN/SLQ-25 (NIXIE) they were equipped with previously. The funding will also support mission readiness for ATTDS equipped ships prior to the availability that will implement the conversion to their original configuration.						
Accomplishments/Planned Programs Subtotals		14.523	7.100	15.800	0.000	15.800

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603506N / <i>Surface Ship Torpedo Defense</i>	Project (Number/Name) 0225 / <i>Surface Ship Torpedo Defense (SSTD)</i>	

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

<u>Line Item</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u> <u>Base</u>	<u>FY 2020</u> <u>OCO</u>	<u>FY 2020</u> <u>Total</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• OPN/2213: <i>Surface Ship Torpedo Def (SSTD)</i>	12.867	4.777	12.439	-	12.439	13.149	13.372	13.532	13.800	Continuing	Continuing
• WPN/3113: <i>Surface Ship Torpedo Def (SSTD)</i>	5.240	6.353	0.000	5.561	5.561	5.671	5.597	5.446	5.552	Continuing	Continuing

Remarks

OPN/2213 funds the AN/SLQ-25 System. No ATTDS OPN funding in FY18 and out.

WPN/3113 funds the Surface Acoustic Device Countermeasure, ADC MK2 Mod 6 and Surface ADC Ready Stowage Lockers. No WPN ATTDS funding in FY18 and out.

D. Acquisition Strategy

CAT Program: The Program completed a Systems Requirements Review (SRR) and Preliminary Design Review (PDR) on the Engineering Development Model (EDM) design. ARL Penn State (ARL/PSU) has completed a Technical Data Package (TDP) that can be used in the future system builds. CAT system SALVO Software has been tested and is currently in fleet use. Funding in FY19 is for EDM support and ATT post deployment EDM maintenance.

TWS Program: Development and production of the new sensors was conducted by ULTRA/3Phoenix. Five complete sensor sets have been delivered. Ready-stowage racks, and fire control systems have been developed by Pacific Engineering Incorporated (PEI) and In-Depth Engineering, respectively. System integration supported fabrication and fielding of the five complete systems. TWS SALVO software has been tested and is currently in fleet use. Funding in FY19 is for EDM support and TWS post deployment software and hardware engineering review.

E. Performance Metrics

Torpedo Effectiveness for the CAT

Torpedo Reliability and Availability for the CAT

Torpedo Detection Classification and Localization (TDCL)

False Alert Rate TDCL probability of correct classification

TWS System Reliability and Availability

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy												Date: March 2019			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603506N / Surface Ship Torpedo Defense				Project (Number/Name) 0225 / Surface Ship Torpedo Defense (SSTD)					
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Systems Engineering	WR	NUWC : Newport, RI	47.931	2.400	Nov 2017	1.100	Nov 2018	7.500	Nov 2019	-		7.500	0.000	58.931	-
Systems Engineering ATT Dev.	C/CPFF	PSU/ARL : State College, PA	302.243	3.549	Dec 2017	1.100	Dec 2018	2.000	Dec 2019	-		2.000	0.000	308.892	-
Systems Engineering	C/CPFF	JHU/APL : Baltimore , MD	1.740	0.000		0.000		0.000		-		0.000	0.000	1.740	-
Systems Engineering Warhead Dev.	WR	NSWC : Indian Head, MD	79.190	1.100	Nov 2017	0.900	Nov 2018	1.100	Nov 2019	-		1.100	0.000	82.290	-
Systems Engineering	WR	NUWC : Keyport,WA	59.631	1.000	Nov 2017	0.900	Nov 2018	1.500	Nov 2019	-		1.500	0.000	63.031	-
Systems Engineering TDCL	C/CPFF	Ultra : Braintree, MA	11.640	0.000		0.000		0.000		-		0.000	0.000	11.640	Continuing
Systems Engineering ATT	WR	ONR : Arlington, VA	1.680	0.000		0.000		0.000		-		0.000	0.000	1.680	-
Systems Engineering TDCL	C/CPFF	AAC : Hauppauge, NY	4.480	0.000		0.000		0.000		-		0.000	0.000	4.480	Continuing
Systems Engineering	WR	OPTEVFOR : Norfolk, VA	2.430	0.000		0.000		0.000		-		0.000	0.000	2.430	-
Systems Engineering	C/CPFF	ArgonST : Manassas, VA	0.800	0.000		0.000		0.000		-		0.000	0.000	0.800	Continuing
Systems Engineering TDCL	WR	NSWC : Dahlgren, VA	10.032	0.000		0.000		0.000		-		0.000	0.000	10.032	Continuing
Systems Engineering TDCL	WR	SPAWAR : San Diego, CA	11.118	0.000		0.000		0.000		-		0.000	0.000	11.118	Continuing
Systems Engineering	C/CPFF	UT/ARL : Arlington, TX	0.600	0.000		0.000		0.000		-		0.000	0.000	0.600	Continuing
Systems Engineering	C/CPFF	Alion : Bridgeport, CT	14.858	0.000		0.000		0.000		-		0.000	0.000	14.858	Continuing
Systems Engineering	WR	NUWC DET : Norfolk, VA	41.781	0.000		0.000		0.000		-		0.000	0.000	41.781	-
Systems Development	C/CPFF	3 Phoenix : Fairfax, VA	122.545	3.974	Dec 2017	1.100	Dec 2018	1.600	Dec 2019	-		1.600	0.000	129.219	Continuing
Integrated Logistic Spt	WR	NSWC Crane : Crane, IN	1.113	0.000		0.000		0.000		-		0.000	0.000	1.113	Continuing
Systems Engineering	C/CPFF	PEI : Roca, NE	4.745	0.000		0.000		0.000		-		0.000	0.000	4.745	-

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Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603506N / Surface Ship Torpedo Defense				Project (Number/Name) 0225 / Surface Ship Torpedo Defense (SSTD)					
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Systems Engineering	WR	CARDEROCK : Bethesda, MD	1.630	0.000		0.000		0.000		-		0.000	0.000	1.630	-
Systems Engineering	C/CPFF	CGI : Washington, DC	0.200	0.000		0.000		0.000		-		0.000	0.000	0.200	-
Systems Engineering	C/BA	Dam Neck : Virginia Beach, VA	0.022	0.000		0.000		0.000		-		0.000	0.000	0.022	-
Systems Engineering	C/BA	NSWC Panama City : Panama City, FL	0.255	0.000		0.000		0.000		-		0.000	0.000	0.255	-
Systems Engineering	C/BA	Devron 26 : Not Specified	0.139	0.000		0.000		0.000		-		0.000	0.000	0.139	-
Systems Engineering	WR	Puget Sounds : Norfolk, VA	0.200	0.000		0.000		0.000		-		0.000	0.000	0.200	-
Systems Engineering	WR	NAVAIR (NAWC WD) : Patuxent River, MD	0.140	0.000		0.000		0.000		-		0.000	0.000	0.140	-
Systems Engineering	WR	NORFOLK SHIPYARD : Norfolk, VA	0.150	0.000		0.000		0.000		-		0.000	0.000	0.150	-
Systems Engineering	WR	NORFOLK PLANNING YARD : Norfolk, VA	0.090	0.000		0.000		0.000		-		0.000	0.000	0.090	-
Subtotal			721.383	12.023		5.100		13.700		-		13.700	0.000	752.206	N/A
Remarks															
Increase between FY19 to FY10 is to sundown the ATTDs Program.															
Management Services (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Earned Value Mgmt Spt	C/CPAF	Pioneer : Virigina	0.050	0.000		0.000		0.000		-		0.000	0.000	0.050	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy												Date: March 2019			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603506N / Surface Ship Torpedo Defense				Project (Number/Name) 0225 / Surface Ship Torpedo Defense (SSTD)					
Management Services (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Program Management Support	C/FFP	EG&G : Gaithersburg, Md.	2.846	0.000		0.000		0.000		-		0.000	0.000	2.846	Continuing
DAWDF	Various	Not Specified : Not Specified	0.237	0.000		0.000		0.000		-		0.000	0.000	0.237	Continuing
Program Management Support	C/CPAF	Tech-Marine : Washington, DC	9.930	0.000		0.000		0.000		-		0.000	0.000	9.930	Continuing
Travel	Various	PMS 415 : Not Specified	1.144	0.100	Sep 2018	0.100	Sep 2019	0.100	Sep 2020	-		0.100	0.000	1.444	Continuing
Program Management Support	C/CPFF	SPA : Alexandria, VA	0.575	0.000		0.000		0.000		-		0.000	0.000	0.575	Continuing
Program Management Support	C/CPAF	Booz Allen : Washington, DC	12.973	2.400	Feb 2018	1.900	Feb 2019	2.000	Feb 2020	-		2.000	0.000	19.273	-
Program Management Support	C/CPAF	Alion : Washington, DC	0.400	0.000		0.000		0.000		-		0.000	0.000	0.400	-
Subtotal			28.155	2.500		2.000		2.100		-		2.100	0.000	34.755	N/A
Remarks															
Increase between FY19 to FY10 is to sundown the ATTDs Program.															
			Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			749.538	14.523		7.100		15.800		-		15.800	0.000	786.961	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy																Date: March 2019												
Appropriation/Budget Activity 1319 / 4												R-1 Program Element (Number/Name) PE 0603506N / Surface Ship Torpedo Defense								Project (Number/Name) 0225 / Surface Ship Torpedo Defense (SSTD)								
Proj 0225	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	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
	EX-819 CONTAINER																											
					CAT - Integration ECP																							
					TWS - Integration ECP																							
									SUNDOWN																			
	2020PB - 0603506N - 0225																											

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603506N / <i>Surface Ship Torpedo Defense</i>	Project (Number/Name) 0225 / <i>Surface Ship Torpedo Defense (SSTD)</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 0225				
EX-819 CONTAINER	1	2018	2	2019
CAT - Integration ECP	1	2018	4	2020
TWS - Integration ECP	1	2018	4	2020
SUNDOWN	1	2020	4	2022

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Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603506N / Surface Ship Torpedo Defense				Project (Number/Name) 9999 / Congressional Adds			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
9999: Congressional Adds	0.000	9.651	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	9.651
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
<p>The Surface Ship Torpedo Defense (SSTD) program provides a detect-to-engage layered torpedo defense capability. The four major efforts that comprise SSTD are the AN/SLQ-25 (NIXIE) system, Torpedo Warning System (TWS), the Countermeasure Anti-Torpedo (CAT) and Acoustic Device Countermeasure (Surface ADC MK2). CAT and TWS are development programs. The CAT program develops a canisterized Anti-Torpedo Torpedo (ATT). The TWS program develops the required torpedo detection, classification and localization (TDCL) ship systems to employ CAT. The TWS and CAT systems make up the Anti-Torpedo Torpedo Defense System (ATTDS).</p> <p>The ATTDS provides a hard kill torpedo defense capability on High Value Units (HVV's). The program has developed and fielded five ATTDS Engineering Design Model (EDM) systems on CVNs. Each EDM system is one TWS with a CAT load out of a maximum of eight CATs. The AN/SLQ-25 (NIXIE) is a towed acoustic and non-acoustic countermeasure system. The AN/SLQ-25 program develops countermeasure technologies and capabilities to improve ship survivability against future torpedo threats.</p> <p>Research and development of new technologies and capabilities developed under the Future Naval Capabilities (FNC), Small Business and Innovative Research (SBIR), and other Research, Development, Test & Evaluation (RDT&E) initiatives. New and emerging hardware and software are evaluated in representative acoustic environments, against projected threats through both digital and hardware-in-the-loop simulations, to determine their effectiveness and impact on improving ship survivability. The technology is then incorporated into the appropriate product line.</p>												
B. Accomplishments/Planned Programs (\$ in Millions)								FY 2018	FY 2019			
Congressional Add: Program Increase								9.651	0.000			
FY 2018 Accomplishments: - Continued engineering changes on both CAT and TWS Systems. - Software support resolution on both CAT and TWS Systems. - Procurement of Integration Hardware for the five CVNs Equipped with the SALVO Capable Systems. - Conduct Theater Anti Submarine Warfare (TASW) Concept of Operations (CONOPS) Integration. - Conduct study on harvesting ATTDS Technology for cruiser (CG Class) and destroyer (DDG 51 Class) ships. - Tested ATTDS in the TASW Environment. - Test SSTD Initiatives in a TASW Environment.												
FY 2019 Plans: N/A												
Congressional Adds Subtotals								9.651	0.000			

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<p>C. Other Program Funding Summary (\$ in Millions) N/A</p> <p>Remarks</p> <p>D. Acquisition Strategy CAT Program: The Program completed a Systems Requirements Review (SRR) and Preliminary Design Review (PDR) on the Engineering Development Model (EDM) design. ARL Penn State (ARL/PSU) has completed a Technical Data Package (TDP) that can be used in the future system builds. CAT system SALVO Software has been tested and is currently in fleet use. Funding in FY19 is for EDM support and ATT post deployment EDM maintenance.</p> <p>TWS Program: Development and production of the new sensors was conducted by ULTRA/3Phoenix. Five complete sensor sets have been delivered. Ready-stowage racks, and fire control systems have been developed by Pacific Engineering Incorporated (PEI) and In-Depth Engineering, respectively. System integration supported fabrication and fielding of the five complete systems. TWS SALVO software has been tested and is currently in fleet use. Funding in FY19 is for EDM support and TWS post deployment software and hardware engineering review.</p> <p>E. Performance Metrics Torpedo Effectiveness for the CAT Torpedo Reliability and Availability for the CAT Torpedo Detection Classification and Localization (TDCL) False Alert Rate TDCL probability of correct classification TWS System Reliability and Availability</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy												Date: March 2019			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603506N / Surface Ship Torpedo Defense				Project (Number/Name) 9999 / Congressional Adds					
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
CAT/TWS Engineering/ Software Support for SALVO Integration	C/CPFF	ARL/PSU : State College, PA	0.000	1.700	Dec 2018	0.000		0.000		-		0.000	0.000	1.700	-
CAT/TWS Engineering/ Software Support for SALVO Integration	C/CPFF	ULTRA : Braintree, MA	0.000	4.700	Dec 2018	0.000		0.000		-		0.000	0.000	4.700	-
CAT/TWS Engineering/ Software Support for SALVO Integration	WR	NEWPORT : Newport, RI	0.000	1.000	Dec 2018	0.000		0.000		-		0.000	0.000	1.000	-
CAT/TWS Engineering/ Software Support for SALVO Integration	WR	KEYPORT : Keyport, WA	0.000	1.151	Dec 2018	0.000		0.000		-		0.000	0.000	1.151	-
CAT/TWS Engineering/ Software Support for SALVO Integration	WR	INDIAN HEAD : Indian Head, MD	0.000	0.400	Dec 2018	0.000		0.000		-		0.000	0.000	0.400	-
ATTDS Technology Harvesting Integration on Hardware	TBD	TBD : TBD	0.000	0.700	Sep 2018	0.000		0.000		-		0.000	0.000	0.700	-
Subtotal			0.000	9.651		0.000		0.000		-		0.000	0.000	9.651	N/A
			Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	9.651		0.000		0.000		-		0.000	0.000	9.651	N/A
Remarks															

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Appropriation/Budget Activity
1319 / 4

R-1 Program Element (Number/Name)
PE 0603506N / *Surface Ship Torpedo Defense*

Project (Number/Name)	9999 / Congressional Adds

[illegible]

2020DON - 0603506N - 9999

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603506N / Surface Ship Torpedo Defense	Project (Number/Name) 9999 / Congressional Adds

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Proj 9999</i>				
CAT/TWS Engineering/Software Support for SALVO Integration	3	2018	4	2019
Harvesting of Technology	4	2018	1	2019