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**Department of Defense  
Fiscal Year (FY) 2021 Budget Estimates**

February 2020



**Navy**

*Justification Book Volume 4 of 5*

***Research, Development, Test & Evaluation, Navy***

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The estimated cost of this report for the Department of the Navy (DON) is \$20,107.

The estimated total cost for supporting the DON budget justification material is approximately \$2,970,459 for the 2020 fiscal year. This includes \$82,977 in supplies and \$2,887,482 in labor.

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Navy • Budget Estimates FY 2021 • RDT&E Program

**Table of Volumes**

<b>Budget Activities 1, 2, and 3.....</b>	<b>Volume 1</b>
<b>Budget Activity 4.....</b>	<b>Volume 2</b>
<b>Budget Activity 5.....</b>	<b>Volume 3</b>
<b>Budget Activity 6.....</b>	<b>Volume 4</b>
<b>Budget Activities 7 and 8.....</b>	<b>Volume 5</b>

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Navy • Budget Estimates FY 2021 • RDT&E Program

**Volume 4 Table of Contents**

Introduction and Explanation of Contents.....	Volume 4 - v
Comptroller Exhibit R-1.....	Volume 4 - vii
Master Program Element Table of Contents (by Budget Activity then Line Item Number).....	Volume 4 - xlvi
Master Program Element Table of Contents (Alphabetically by Program Element Title).....	Volume 4 - Ixiii
Program Element Table of Contents (by Budget Activity then Line Item Number).....	Volume 4 - Ixxvii
Program Element Table of Contents (Alphabetically by Program Element Title).....	Volume 4 - Ixxix
Exhibit R-2s.....	Volume 4 - 1

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## **Department of Defense Appropriations Act, 2021**

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### **Research, Development, Test and Evaluation, Navy**

For expenses necessary for basic and applied scientific research, development, test and evaluation, including maintenance, rehabilitation, lease, and operation of facilities and equipment, \$21,486,610 to remain available for obligation until September 30, 2022.

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FY 2021 Overseas Contingency Operations funding can be separated into the following categories:

OCO for Direct War Costs (\$42,500): OCO for Direct War costs are those combat or direct combat support costs that will not continue to be expended once combat operations end at major contingency locations.

OCO for Enduring Requirements (\$17,062): OCO for Enduring Requirements are enduring in-theater and in-CONUS costs that will likely remain after combat operations cease, and have previously been funded in OCO.

OCO for Base Requirements (\$0): OCO for Base Requirements is OCO funding for base budget requirements in support of the National Defense Strategy. The Budget requests these funds in OCO to comply with the base budget defense caps included in the Budget Control Act of 2011.

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## UNCLASSIFIED

Department of Defense  
 FY 2021 President's Budget  
 Exhibit R-1 FY 2021 President's Budget  
 Total Obligational Authority  
 (Dollars in Thousands)

Appropriation	FY 2019 (Base + OCO)	FY 2020 Base Enacted	FY 2020 Emergency	FY 2020 OCO Enacted	FY 2020 Total Enacted (Base+Emerg+ OCO)
	-----	-----	-----	-----	-----
Research, Development, Test & Eval, Navy	18,738,363	20,155,115	130,444	164,410	20,449,969
Total Research, Development, Test & Evaluation	18,738,363	20,155,115	130,444	164,410	20,449,969

UNCLASSIFIED

## UNCLASSIFIED

Department of Defense  
 FY 2021 President's Budget  
 Exhibit R-1 FY 2021 President's Budget  
 Total Obligational Authority  
 (Dollars in Thousands)

Appropriation	FY 2021 Base	FY 2021 OCO for Base Requirements	Direct War and Enduring Costs	FY 2021 Total OCO	FY 2021 Total (Base + OCO)
	Research, Development, Test & Eval, Navy	21,427,048		59,562	59,562
Total Research, Development, Test & Evaluation	21,427,048		59,562	59,562	21,486,610

UNCLASSIFIED

## UNCLASSIFIED

Department of Defense  
 FY 2021 President's Budget  
 Exhibit R-1 FY 2021 President's Budget  
 Total Obligational Authority  
 (Dollars in Thousands)

Summary Recap of Budget Activities	FY 2019 (Base + OCO)	FY 2020 Base Enacted	FY 2020 Emergency	FY 2020 OCO Enacted	FY 2020 Total Enacted (Base+Emerg+ OCO)
Basic Research	662,024	650,800			650,800
Applied Research	1,002,162	1,159,739			1,159,739
Advanced Technology Development	831,351	807,280			807,280
Advanced Component Development & Prototypes	4,033,262	5,329,143		40,006	5,369,149
System Development & Demonstration	5,840,606	6,112,602		1,122	6,113,724
Management Support	1,437,664	999,165	130,444		1,129,609
Operational Systems Development	4,931,294	5,096,386		123,282	5,219,668
Software and Digital Technology Pilot Programs					
Total Research, Development, Test & Evaluation	18,738,363	20,155,115	130,444	164,410	20,449,969
Summary Recap of FYDP Programs					
Strategic Forces	234,760	204,609			204,609
General Purpose Forces	1,866,214	1,770,467		15,000	1,785,467
Intelligence and Communications	707,765	692,955			692,955
Research and Development	14,039,673	15,652,568	130,444	41,128	15,824,140
Central Supply and Maintenance	63,255	74,961			74,961
Administration and Associated Activities	2,376	1,460			1,460
Space	40,735	15,868			15,868
Classified Programs	1,783,585	1,742,227		108,282	1,850,509
Total Research, Development, Test & Evaluation	18,738,363	20,155,115	130,444	164,410	20,449,969

UNCLASSIFIED

## UNCLASSIFIED

Department of Defense  
 FY 2021 President's Budget  
 Exhibit R-1 FY 2021 President's Budget  
 Total Obligational Authority  
 (Dollars in Thousands)

Summary Recap of Budget Activities	FY 2021 Base	FY 2021 OCO for Base Requirements	FY 2021 OCO for Direct War and Enduring Costs	FY 2021 Total OCO	FY 2021 Total (Base + OCO)
Basic Research	603,087				603,087
Applied Research	953,175				953,175
Advanced Technology Development	760,396				760,396
Advanced Component Development & Prototypes	6,503,074		55,418	55,418	6,558,492
System Development & Demonstration	6,263,883		1,144	1,144	6,265,027
Management Support	991,222				991,222
Operational Systems Development	5,327,043		3,000	3,000	5,330,043
Software and Digital Technology Pilot Programs	25,168				25,168
Total Research, Development, Test & Evaluation	21,427,048		59,562	59,562	21,486,610
Summary Recap of FYDP Programs					
Strategic Forces	330,493				330,493
General Purpose Forces	1,792,408		3,000	3,000	1,795,408
Intelligence and Communications	730,315				730,315
Research and Development	16,655,343		56,562	56,562	16,711,905
Central Supply and Maintenance	51,865				51,865
Administration and Associated Activities	1,536				1,536
Space	70,056				70,056
Classified Programs	1,795,032				1,795,032
Total Research, Development, Test & Evaluation	21,427,048		59,562	59,562	21,486,610

UNCLASSIFIED

## UNCLASSIFIED

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 FY 2021 President's Budget  
 Exhibit R-1 FY 2021 President's Budget  
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Advanced Component Development & Prototypes	4,033,262	5,329,143		40,006	5,369,149
System Development & Demonstration	5,840,606	6,112,602		1,122	6,113,724
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General Purpose Forces	1,866,214	1,770,467		15,000	1,785,467
Intelligence and Communications	707,765	692,955			692,955
Research and Development	14,039,673	15,652,568	130,444	41,128	15,824,140
Central Supply and Maintenance	63,255	74,961			74,961
Administration and Associated Activities	2,376	1,460			1,460
Space	40,735	15,868			15,868
Classified Programs	1,783,585	1,742,227		108,282	1,850,509
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UNCLASSIFIED

## UNCLASSIFIED

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 FY 2021 President's Budget  
 Exhibit R-1 FY 2021 President's Budget  
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 (Dollars in Thousands)

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Applied Research	953,175				953,175
Advanced Technology Development	760,396				760,396
Advanced Component Development & Prototypes	6,503,074		55,418	55,418	6,558,492
System Development & Demonstration	6,263,883		1,144	1,144	6,265,027
Management Support	991,222				991,222
Operational Systems Development	5,327,043		3,000	3,000	5,330,043
Software and Digital Technology Pilot Programs	25,168				25,168
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Summary Recap of FYDP Programs					
Strategic Forces	330,493				330,493
General Purpose Forces	1,792,408		3,000	3,000	1,795,408
Intelligence and Communications	730,315				730,315
Research and Development	16,655,343		56,562	56,562	16,711,905
Central Supply and Maintenance	51,865				51,865
Administration and Associated Activities	1,536				1,536
Space	70,056				70,056
Classified Programs	1,795,032				1,795,032
Total Research, Development, Test & Evaluation	21,427,048		59,562	59,562	21,486,610

UNCLASSIFIED

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Department of the Navy  
 FY 2021 President's Budget  
 Exhibit R-1 FY 2021 President's Budget  
 Total Obligational Authority  
 (Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

Program Line Element No	Item	Act	FY 2019	FY 2020	FY 2020	FY 2020	FY 2020	Total Enacted S
			(Base + OCO)	Base Enacted	Emergency	OCO Enacted	(Base+Emerg+ e OCO)	c
1 0601103N	University Research Initiatives	01	155,539	167,850			167,850	U
2 0601152N	In-House Laboratory Independent Research	01	19,123	19,121			19,121	U
3 0601153N	Defense Research Sciences	01	487,362	463,829			463,829	U
	Basic Research		662,024	650,800			650,800	
4 0602114N	Power Projection Applied Research	02	26,903	28,546			28,546	U
5 0602123N	Force Protection Applied Research	02	175,857	215,517			215,517	U
6 0602131M	Marine Corps Landing Force Technology	02	61,593	69,104			69,104	U
7 0602235N	Common Picture Applied Research	02	40,559	42,846			42,846	U
8 0602236N	Warfighter Sustainment Applied Research	02	64,010	95,825			95,825	U
9 0602271N	Electromagnetic Systems Applied Research	02	74,934	88,497			88,497	U
10 0602435N	Ocean Warfighting Environment Applied Research	02	87,715	82,582			82,582	U
11 0602651M	Joint Non-Lethal Weapons Applied Research	02	6,137	6,346			6,346	U
12 0602747N	Undersea Warfare Applied Research	02	75,998	98,075			98,075	U
13 0602750N	Future Naval Capabilities Applied Research	02	135,523	152,012			152,012	U
14 0602782N	Mine and Expeditionary Warfare Applied Research	02	37,399	54,074			54,074	U
15 0602792N	Innovative Naval Prototypes (INP) Applied Research	02	151,176	152,354			152,354	U

UNCLASSIFIED

## UNCLASSIFIED

Department of the Navy  
 FY 2021 President's Budget  
 Exhibit R-1 FY 2021 President's Budget  
 Total Obligational Authority  
 (Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

Program Line Element No	Item	Act	FY 2021 Base	FY 2021 OCO for Base Requirements	FY 2021 Direct War and Enduring Costs	FY 2021 Total OCO	FY 2021 Total (Base + OCO)	S e c
1 0601103N	University Research Initiatives	01	116,816				116,816	U
2 0601152N	In-House Laboratory Independent Research	01	19,113				19,113	U
3 0601153N	Defense Research Sciences	01	467,158				467,158	U
	Basic Research		603,087				603,087	
4 0602114N	Power Projection Applied Research	02	17,792				17,792	U
5 0602123N	Force Protection Applied Research	02	122,281				122,281	U
6 0602131M	Marine Corps Landing Force Technology	02	50,623				50,623	U
7 0602235N	Common Picture Applied Research	02	48,001				48,001	U
8 0602236N	Warfighter Sustainment Applied Research	02	67,765				67,765	U
9 0602271N	Electromagnetic Systems Applied Research	02	84,994				84,994	U
10 0602435N	Ocean Warfighting Environment Applied Research	02	63,392				63,392	U
11 0602651M	Joint Non-Lethal Weapons Applied Research	02	6,343				6,343	U
12 0602747N	Undersea Warfare Applied Research	02	56,397				56,397	U
13 0602750N	Future Naval Capabilities Applied Research	02	167,590				167,590	U
14 0602782N	Mine and Expeditionary Warfare Applied Research	02	30,715				30,715	U
15 0602792N	Innovative Naval Prototypes (INP) Applied Research	02	160,537				160,537	U

UNCLASSIFIED

## UNCLASSIFIED

Department of the Navy  
 FY 2021 President's Budget  
 Exhibit R-1 FY 2021 President's Budget  
 Total Obligational Authority  
 (Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

Program Line Element No Number	Item	Act	FY 2019	FY 2020	FY 2020	FY 2020	FY 2020	Total Enacted S
			(Base + OCO)	Base Enacted	Emergency	OCO Enacted	(Base+Emerg+ e OCO)	c
16 0602861N	Science and Technology Management - ONR Field Activities	02	64,358	73,961			73,961	U
	Applied Research		-----	-----	-----	-----	-----	-----
			1,002,162	1,159,739			1,159,739	
17 0603123N	Force Protection Advanced Technology	03	32,140	40,286			40,286	U
18 0603271N	Electromagnetic Systems Advanced Technology	03	8,639	9,499			9,499	U
19 0603640M	USMC Advanced Technology Demonstration (ATD)	03	170,659	212,347			212,347	U
20 0603651M	Joint Non-Lethal Weapons Technology Development	03	12,956	13,307			13,307	U
21 0603673N	Future Naval Capabilities Advanced Technology Development	03	210,631	222,477			222,477	U
22 0603680N	Manufacturing Technology Program	03	57,322	65,138			65,138	U
23 0603729N	Warfighter Protection Advanced Technology	03	39,949	34,149			34,149	U
24 0603758N	Navy Warfighting Experiments and Demonstrations	03	64,422	67,739			67,739	U
25 0603782N	Mine and Expeditionary Warfare Advanced Technology	03	38,541	13,335			13,335	U
26 0603801N	Innovative Naval Prototypes (INP) Advanced Technology Development	03	196,092	129,003			129,003	U
	Advanced Technology Development		-----	-----	-----	-----	-----	-----
			831,351	807,280			807,280	
27 0603178N	Medium and Large Unmanned Surface Vehicles (USVs)	04						U
28 0603207N	Air/Ocean Tactical Applications	04	29,136	40,643		2,400	43,043	U

UNCLASSIFIED

## UNCLASSIFIED

Department of the Navy  
 FY 2021 President's Budget  
 Exhibit R-1 FY 2021 President's Budget  
 Total Obligational Authority  
 (Dollars in Thousands)

Appropriation: 1319N Research, Development, Test &amp; Eval, Navy

Program Line Element No	Item	Act	FY 2021 Base	FY 2021 OCO for Base Requirements	FY 2021 OCO for Direct War and Enduring Costs	FY 2021 Total OCO	FY 2021 Total (Base + OCO)	S e c
16 0602861N	Science and Technology Management - ONR Field Activities	02	76,745				76,745	U
	Applied Research			953,175			953,175	
17 0603123N	Force Protection Advanced Technology	03	24,410				24,410	U
18 0603271N	Electromagnetic Systems Advanced Technology	03	8,008				8,008	U
19 0603640M	USMC Advanced Technology Demonstration (ATD)	03	219,045				219,045	U
20 0603651M	Joint Non-Lethal Weapons Technology Development	03	13,301				13,301	U
21 0603673N	Future Naval Capabilities Advanced Technology Development	03	246,054				246,054	U
22 0603680N	Manufacturing Technology Program	03	60,122				60,122	U
23 0603729N	Warfighter Protection Advanced Technology	03	4,851				4,851	U
24 0603758N	Navy Warfighting Experiments and Demonstrations	03	40,709				40,709	U
25 0603782N	Mine and Expeditionary Warfare Advanced Technology	03	1,948				1,948	U
26 0603801N	Innovative Naval Prototypes (INP) Advanced Technology Development	03	141,948				141,948	U
	Advanced Technology Development			760,396			760,396	
27 0603178N	Medium and Large Unmanned Surface Vehicles (USVs)	04	464,042				464,042	U
28 0603207N	Air/Ocean Tactical Applications	04	35,386				35,386	U

UNCLASSIFIED

## UNCLASSIFIED

Department of the Navy  
 FY 2021 President's Budget  
 Exhibit R-1 FY 2021 President's Budget  
 Total Obligational Authority  
 (Dollars in Thousands)

Appropriation: 1319N Research, Development, Test &amp; Eval, Navy

Program Line Element No Number	Item	Act	FY 2019	FY 2020	FY 2020	FY 2020	FY 2020
			(Base + OCO)	Base Enacted	Emergency	OCO Enacted	Total Enacted S (Base+Emerg+ e OCO)
29 0603216N	Aviation Survivability	04	7,618	11,919			11,919 U
30 0603239N	ISO Naval Construction Forces	04					U
31 0603251N	Aircraft Systems	04	790	1,473			1,473 U
32 0603254N	ASW Systems Development	04	6,877	7,172			7,172 U
33 0603261N	Tactical Airborne Reconnaissance	04	3,537	3,419			3,419 U
34 0603382N	Advanced Combat Systems Technology	04	38,674	57,947			57,947 U
35 0603502N	Surface and Shallow Water Mine Countermeasures	04	116,113	407,800			407,800 U
36 0603506N	Surface Ship Torpedo Defense	04	6,822	7,242			7,242 U
37 0603512N	Carrier Systems Development	04	5,388	4,997			4,997 U
38 0603525N	PILOT FISH	04	140,354	196,648			196,648 U
39 0603527N	RETRACT LARCH	04	28,653	11,980		22,000	33,980 U
40 0603536N	RETRACT JUNIPER	04	109,958	129,163			129,163 U
41 0603542N	Radiological Control	04	735	689			689 U
42 0603553N	Surface ASW	04	1,078	1,137			1,137 U
43 0603561N	Advanced Submarine System Development	04	103,267	115,717			115,717 U
44 0603562N	Submarine Tactical Warfare Systems	04	12,180	11,192			11,192 U
45 0603563N	Ship Concept Advanced Design	04	73,750	96,846			96,846 U
46 0603564N	Ship Preliminary Design & Feasibility Studies	04	12,839	22,534			22,534 U
47 0603570N	Advanced Nuclear Power Systems	04	256,137	181,652			181,652 U

UNCLASSIFIED

## UNCLASSIFIED

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 FY 2021 President's Budget  
 Exhibit R-1 FY 2021 President's Budget  
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Program Line Element No Number	Item	Act	FY 2021	FY 2021	FY 2021	FY 2021	FY 2021	S
			Base	OCO for Base Requirements	Direct War and Enduring Costs	Total OCO	(Base + OCO)	e
29 0603216N	Aviation Survivability	04	13,428				13,428	U
30 0603239N	ISO Naval Construction Forces	04	2,350				2,350	U
31 0603251N	Aircraft Systems	04	418				418	U
32 0603254N	ASW Systems Development	04	15,719				15,719	U
33 0603261N	Tactical Airborne Reconnaissance	04	3,411				3,411	U
34 0603382N	Advanced Combat Systems Technology	04	70,218				70,218	U
35 0603502N	Surface and Shallow Water Mine Countermeasures	04	52,358				52,358	U
36 0603506N	Surface Ship Torpedo Defense	04	12,816				12,816	U
37 0603512N	Carrier Systems Development	04	7,559				7,559	U
38 0603525N	PILOT FISH	04	358,757				358,757	U
39 0603527N	RETRACT LARCH	04	12,562		36,500	36,500	49,062	U
40 0603536N	RETRACT JUNIPER	04	148,000				148,000	U
41 0603542N	Radiological Control	04	778				778	U
42 0603553N	Surface ASW	04	1,161				1,161	U
43 0603561N	Advanced Submarine System Development	04	185,356				185,356	U
44 0603562N	Submarine Tactical Warfare Systems	04	10,528				10,528	U
45 0603563N	Ship Concept Advanced Design	04	126,396				126,396	U
46 0603564N	Ship Preliminary Design & Feasibility Studies	04	70,270				70,270	U
47 0603570N	Advanced Nuclear Power Systems	04	149,188				149,188	U

UNCLASSIFIED

## UNCLASSIFIED

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 FY 2021 President's Budget  
 Exhibit R-1 FY 2021 President's Budget  
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Program Line Element No Number	Item	Act	FY 2019	FY 2020	FY 2020	FY 2020	FY 2020
			(Base + OCO)	Base Enacted	Emergency	OCO Enacted	Total Enacted S (Base+Emerg+ e OCO)
48 0603573N	Advanced Surface Machinery Systems	04	26,272	87,408			87,408 U
49 0603576N	CHALK EAGLE	04	33,943	54,877			54,877 U
50 0603581N	Littoral Combat Ship (LCS)	04	36,864	16,934			16,934 U
51 0603582N	Combat System Integration	04	15,710	17,251			17,251 U
52 0603595N	Ohio Replacement	04	528,146	427,051			427,051 U
53 0603596N	LCS Mission Modules	04	99,728	108,505			108,505 U
54 0603597N	Automated Test and Analysis	04	36,563	42,653			42,653 U
55 0603599N	Frigate Development	04	119,821	59,007			59,007 U
56 0603609N	Conventional Munitions	04	8,942	9,988			9,988 U
57 0603635M	Marine Corps Ground Combat/Support System	04		51,997			51,997 U
58 0603654N	Joint Service Explosive Ordnance Development	04	60,316	33,478		14,178	47,656 U
59 0603713N	Ocean Engineering Technology Development	04	5,697	5,619			5,619 U
60 0603721N	Environmental Protection	04	19,629	20,564			20,564 U
61 0603724N	Navy Energy Program	04	31,726	58,014			58,014 U
62 0603725N	Facilities Improvement	04	5,177	3,440			3,440 U
63 0603734N	CHALK CORAL	04	254,023	307,392			307,392 U
64 0603739N	Navy Logistic Productivity	04	2,803	3,857			3,857 U
65 0603746N	RETRACT MAPLE	04	307,563	242,144			242,144 U
66 0603748N	LINK PLUMERIA	04	347,395	396,509			396,509 U

UNCLASSIFIED

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 Exhibit R-1 FY 2021 President's Budget  
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48 0603573N	Advanced Surface Machinery Systems	04	38,449				38,449	U
49 0603576N	CHALK EAGLE	04	71,181				71,181	U
50 0603581N	Littoral Combat Ship (LCS)	04	32,178				32,178	U
51 0603582N	Combat System Integration	04	17,843				17,843	U
52 0603595N	Ohio Replacement	04	317,196				317,196	U
53 0603596N	LCS Mission Modules	04	67,875				67,875	U
54 0603597N	Automated Test and Analysis	04	4,797				4,797	U
55 0603599N	Frigate Development	04	82,309				82,309	U
56 0603609N	Conventional Munitions	04	9,922				9,922	U
57 0603635M	Marine Corps Ground Combat/Support System	04	189,603				189,603	U
58 0603654N	Joint Service Explosive Ordnance Development	04	43,084		14,461	14,461	57,545	U
59 0603713N	Ocean Engineering Technology Development	04	6,346				6,346	U
60 0603721N	Environmental Protection	04	20,601				20,601	U
61 0603724N	Navy Energy Program	04	23,422				23,422	U
62 0603725N	Facilities Improvement	04	4,664				4,664	U
63 0603734N	CHALK CORAL	04	545,763		3,000	3,000	548,763	U
64 0603739N	Navy Logistic Productivity	04	3,884				3,884	U
65 0603746N	RETRACT MAPLE	04	353,226				353,226	U
66 0603748N	LINK PLUMERIA	04	544,388				544,388	U

UNCLASSIFIED

## UNCLASSIFIED

Department of the Navy  
 FY 2021 President's Budget  
 Exhibit R-1 FY 2021 President's Budget  
 Total Obligational Authority  
 (Dollars in Thousands)

Appropriation: 1319N Research, Development, Test &amp; Eval, Navy

Program Line Element No Number	Item	Act	FY 2019	FY 2020	FY 2020	FY 2020	FY 2020
			(Base + OCO)	Base Enacted	Emergency	OCO Enacted	Total Enacted S (Base+Emerg+ e OCO)
67 0603751N	RETRACT ELM	04	49,869	63,434			63,434 U
68 0603764M	LINK EVERGREEN	04		30,000			30,000 U
69 0603764N	LINK EVERGREEN	04		167,735			167,735 U
70 0603790N	NATO Research and Development	04	9,280	7,697			7,697 U
71 0603795N	Land Attack Technology	04	6,924	5,900		1,428	7,328 U
72 0603851M	Joint Non-Lethal Weapons Testing	04	26,695	28,466			28,466 U
73 0603860N	Joint Precision Approach and Landing Systems - Dem/Val	04	99,123	51,341			51,341 U
74 0603925N	Directed Energy and Electric Weapon Systems	04	138,988	135,919			135,919 U
75 0604014N	F/A -18 Infrared Search and Track (IRST)	04	104,505	112,416			112,416 U
76 0604027N	Digital Warfare Office	04	19,217	37,000			37,000 U
77 0604028N	Small and Medium Unmanned Undersea Vehicles	04	16,062	47,261			47,261 U
78 0604029N	Unmanned Undersea Vehicle Core Technologies	04	26,406	41,910			41,910 U
79 0604030N	Rapid Prototyping, Experimentation and Demonstration.	04	27,495	31,000			31,000 U
80 0604031N	Large Unmanned Undersea Vehicles	04	57,942	68,310			68,310 U
81 0604112N	Gerald R. Ford Class Nuclear Aircraft Carrier (CVN 78 - 80)	04	81,021	105,756			105,756 U
82 0604126N	Littoral Airborne MCM	04	14,052	20,248			20,248 U
83 0604127N	Surface Mine Countermeasures	04	14,764	18,735			18,735 U

UNCLASSIFIED

## UNCLASSIFIED

Department of the Navy  
 FY 2021 President's Budget  
 Exhibit R-1 FY 2021 President's Budget  
 Total Obligational Authority  
 (Dollars in Thousands)

Appropriation: 1319N Research, Development, Test &amp; Eval, Navy

Program Line Element No	Item	Act	FY 2021 Base	FY 2021 OCO for Base Requirements	FY 2021 OCO for Direct War and Enduring Costs	FY 2021 Total OCO	FY 2021 Total (Base + OCO)	S e c
67 0603751N	RETRACT ELM	04	86,730				86,730	U
68 0603764M	LINK EVERGREEN	04	236,234				236,234	U
69 0603764N	LINK EVERGREEN	04						U
70 0603790N	NATO Research and Development	04	6,880				6,880	U
71 0603795N	Land Attack Technology	04	10,578		1,457	1,457	12,035	U
72 0603851M	Joint Non-Lethal Weapons Testing	04	28,435				28,435	U
73 0603860N	Joint Precision Approach and Landing Systems - Dem/Val	04	33,612				33,612	U
74 0603925N	Directed Energy and Electric Weapon Systems	04	128,845				128,845	U
75 0604014N	F/A -18 Infrared Search and Track (IRST)	04	84,190				84,190	U
76 0604027N	Digital Warfare Office	04	54,699				54,699	U
77 0604028N	Small and Medium Unmanned Undersea Vehicles	04	53,942				53,942	U
78 0604029N	Unmanned Undersea Vehicle Core Technologies	04	40,060				40,060	U
79 0604030N	Rapid Prototyping, Experimentation and Demonstration.	04	12,100				12,100	U
80 0604031N	Large Unmanned Undersea Vehicles	04	78,122				78,122	U
81 0604112N	Gerald R. Ford Class Nuclear Aircraft Carrier (CVN 78 - 80)	04	107,895				107,895	U
82 0604126N	Littoral Airborne MCM	04	17,366				17,366	U
83 0604127N	Surface Mine Countermeasures	04	18,754				18,754	U

UNCLASSIFIED

## UNCLASSIFIED

Department of the Navy  
 FY 2021 President's Budget  
 Exhibit R-1 FY 2021 President's Budget  
 Total Obligational Authority  
 (Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

Program Line Element No Number	Item	Act	FY 2019	FY 2020	FY 2020	FY 2020	FY 2020
			(Base + OCO)	Base Enacted	Emergency	OCO Enacted	Total Enacted S (Base+Emerg+ e OCO)
84 0604272N	Tactical Air Directional Infrared Countermeasures (TADIRCM)	04	45,853	58,449			58,449 U
85 0604289M	Next Generation Logistics	04	5,890	19,420			19,420 U
86 0604292N	Future Vertical Lift (Maritime Strike)	04					U
87 0604320M	Rapid Technology Capability Prototype	04	6,986	4,558			4,558 U
88 0604454N	LX (R)	04	5,463	12,500			12,500 U
89 0604536N	Advanced Undersea Prototyping	04	108,482	187,187			187,187 U
90 0604636N	Counter Unmanned Aircraft Systems (C-UAS)	04		3,100			3,100 U
91 0604659N	Precision Strike Weapons Development Program	04	89,477	637,254			637,254 U
92 0604707N	Space and Electronic Warfare (SEW) Architecture/Engineering Support	04	6,952	5,263			5,263 U
93 0604786N	Offensive Anti-Surface Warfare Weapon Development	04	141,383	115,419			115,419 U
94 0303354N	ASW Systems Development - MIP	04	8,889	9,991			9,991 U
95 0304240M	Advanced Tactical Unmanned Aircraft System	04	17,554	45,407			45,407 U
96 0304240N	Advanced Tactical Unmanned Aircraft System	04	9,300				U
97 0304270N	Electronic Warfare Development - MIP	04	466	609			609 U
	Advanced Component Development & Prototypes		4,033,262	5,329,143		40,006	5,369,149
98 0603208N	Training System Aircraft	05	14,345	15,514			15,514 U

UNCLASSIFIED

## UNCLASSIFIED

Department of the Navy  
 FY 2021 President's Budget  
 Exhibit R-1 FY 2021 President's Budget  
 Total Obligational Authority  
 (Dollars in Thousands)

Appropriation: 1319N Research, Development, Test &amp; Eval, Navy

Program Line Element No	Item	Act	FY 2021 Base	FY 2021 OCO for Base Requirements	FY 2021 OCO for Direct War and Enduring Costs	FY 2021 Total OCO	FY 2021 Total (Base + OCO)	S e c
84 0604272N	Tactical Air Directional Infrared Countermeasures (TADIRCM)	04	59,776				59,776	U
85 0604289M	Next Generation Logistics	04						U
86 0604292N	Future Vertical Lift (Maritime Strike)	04	5,097				5,097	U
87 0604320M	Rapid Technology Capability Prototype	04	3,664				3,664	U
88 0604454N	LX (R)	04	10,203				10,203	U
89 0604536N	Advanced Undersea Prototyping	04	115,858				115,858	U
90 0604636N	Counter Unmanned Aircraft Systems (C-UAS)	04	14,259				14,259	U
91 0604659N	Precision Strike Weapons Development Program	04	1,102,387				1,102,387	U
92 0604707N	Space and Electronic Warfare (SEW) Architecture/Engineering Support	04	7,657				7,657	U
93 0604786N	Offensive Anti-Surface Warfare Weapon Development	04	35,750				35,750	U
94 0303354N	ASW Systems Development - MIP	04	9,151				9,151	U
95 0304240M	Advanced Tactical Unmanned Aircraft System	04	22,589				22,589	U
96 0304240N	Advanced Tactical Unmanned Aircraft System	04						U
97 0304270N	Electronic Warfare Development - MIP	04	809				809	U
	Advanced Component Development & Prototypes		6,503,074		55,418	55,418	6,558,492	
98 0603208N	Training System Aircraft	05	4,332				4,332	U

UNCLASSIFIED

## UNCLASSIFIED

Department of the Navy  
 FY 2021 President's Budget  
 Exhibit R-1 FY 2021 President's Budget  
 Total Obligational Authority  
 (Dollars in Thousands)

Appropriation: 1319N Research, Development, Test &amp; Eval, Navy

Program Line Element No Number	Item	Act	FY 2019	FY 2020	FY 2020	FY 2020	FY 2020
			(Base + OCO)	Base Enacted	Emergency	OCO Enacted	Total (Base+Emergency OCO)
99 0604212N	Other Helo Development	05	23,307	38,835			38,835 U
100 0604214M	AV-8B Aircraft - Eng Dev	05	45,639	27,441			27,441 U
101 0604215N	Standards Development	05	3,624	3,642			3,642 U
102 0604216N	Multi-Mission Helicopter Upgrade Development	05	16,178	19,196			19,196 U
103 0604218N	Air/Ocean Equipment Engineering	05	15,212				U
104 0604221N	P-3 Modernization Program	05	2,074				U
105 0604230N	Warfare Support System	05	9,401	8,601			8,601 U
106 0604231N	Tactical Command System	05	53,110	73,920			73,920 U
107 0604234N	Advanced Hawkeye	05	205,612	226,596			226,596 U
108 0604245M	H-1 Upgrades	05	53,083	60,991			60,991 U
109 0604261N	Acoustic Search Sensors	05	41,395	47,013			47,013 U
110 0604262N	V-22A	05	131,363	191,235			191,235 U
111 0604264N	Air Crew Systems Development	05	30,005	19,172			19,172 U
112 0604269N	EA-18	05	235,963	123,637			123,637 U
113 0604270N	Electronic Warfare Development	05	86,719	114,349			114,349 U
114 0604273M	Executive Helo Development	05	237,300	176,211			176,211 U
115 0604274N	Next Generation Jammer (NGJ)	05	426,729	491,884			491,884 U
116 0604280N	Joint Tactical Radio System - Navy (JTRS-Navy)	05	3,178	190,689			190,689 U
117 0604282N	Next Generation Jammer (NGJ) Increment II	05	91,216	90,922			90,922 U

UNCLASSIFIED

## UNCLASSIFIED

Department of the Navy  
 FY 2021 President's Budget  
 Exhibit R-1 FY 2021 President's Budget  
 Total Obligational Authority  
 (Dollars in Thousands)

Appropriation: 1319N Research, Development, Test &amp; Eval, Navy

Program Line Element No	Item	Act	FY 2021 Base	FY 2021 OCO for Base Requirements	FY 2021 OCO for Direct War and Enduring Costs	FY 2021 Total OCO	FY 2021 Total (Base + OCO)	S e c
99 0604212N	Other Helo Development	05	18,133				18,133	U
100 0604214M	AV-8B Aircraft - Eng Dev	05	20,054				20,054	U
101 0604215N	Standards Development	05	4,237				4,237	U
102 0604216N	Multi-Mission Helicopter Upgrade Development	05	27,340				27,340	U
103 0604218N	Air/Ocean Equipment Engineering	05						U
104 0604221N	P-3 Modernization Program	05	606				606	U
105 0604230N	Warfare Support System	05	9,065				9,065	U
106 0604231N	Tactical Command System	05	97,968				97,968	U
107 0604234N	Advanced Hawkeye	05	309,373				309,373	U
108 0604245M	H-1 Upgrades	05	62,310				62,310	U
109 0604261N	Acoustic Search Sensors	05	47,182				47,182	U
110 0604262N	V-22A	05	132,624				132,624	U
111 0604264N	Air Crew Systems Development	05	21,445				21,445	U
112 0604269N	EA-18	05	106,134				106,134	U
113 0604270N	Electronic Warfare Development	05	134,194				134,194	U
114 0604273M	Executive Helo Development	05	99,321				99,321	U
115 0604274N	Next Generation Jammer (NGJ)	05	477,680				477,680	U
116 0604280N	Joint Tactical Radio System - Navy (JTRS-Navy)	05	232,818				232,818	U
117 0604282N	Next Generation Jammer (NGJ) Increment II	05	170,039				170,039	U

UNCLASSIFIED

## UNCLASSIFIED

Department of the Navy  
 FY 2021 President's Budget  
 Exhibit R-1 FY 2021 President's Budget  
 Total Obligational Authority  
 (Dollars in Thousands)

Appropriation: 1319N Research, Development, Test &amp; Eval, Navy

Program Line Element No Number	Item	Act	FY 2019	FY 2020	FY 2020	FY 2020	FY 2020
			(Base + OCO)	Base Enacted	Emergency	OCO Enacted	Total Enacted S (Base+Emerg+ e OCO)
118 0604307N	Surface Combatant Combat System Engineering	05	367,189	375,681			375,681 U
119 0604311N	LPD-17 Class Systems Integration	05	902	640			640 U
120 0604329N	Small Diameter Bomb (SDB)	05	84,029	50,096			50,096 U
121 0604366N	Standard Missile Improvements	05	199,499	195,296			195,296 U
122 0604373N	Airborne MCM	05	8,024	10,916			10,916 U
123 0604378N	Naval Integrated Fire Control - Counter Air Systems Engineering	05	32,512	30,084			30,084 U
124 0604419N	Advanced Sensors Application Program (ASAP)	05					U
125 0604501N	Advanced Above Water Sensors	05	30,551	30,179			30,179 U
126 0604503N	SSN-688 and Trident Modernization	05	119,911	78,625			78,625 U
127 0604504N	Air Control	05	60,323	44,923			44,923 U
128 0604512N	Shipboard Aviation Systems	05	13,530	14,632			14,632 U
129 0604518N	Combat Information Center Conversion	05	18,626	16,094			16,094 U
130 0604522N	Air and Missile Defense Radar (AMDR) System	05	26,079	38,349			38,349 U
131 0604530N	Advanced Arresting Gear (AAG)	05	168,427	122,495			122,495 U
132 0604558N	New Design SSN	05	174,351	321,010			321,010 U
133 0604562N	Submarine Tactical Warfare System	05	77,529	62,426			62,426 U
134 0604567N	Ship Contract Design/ Live Fire T&E	05	69,337	46,809			46,809 U
135 0604574N	Navy Tactical Computer Resources	05	4,460	3,692			3,692 U

UNCLASSIFIED

## UNCLASSIFIED

Department of the Navy  
 FY 2021 President's Budget  
 Exhibit R-1 FY 2021 President's Budget  
 Total Obligational Authority  
 (Dollars in Thousands)

Appropriation: 1319N Research, Development, Test &amp; Eval, Navy

Program Line Element No	Item	Act	FY 2021 Base	FY 2021 OCO for Base Requirements	FY 2021 OCO for Direct War and Enduring Costs	FY 2021 Total OCO	FY 2021 Total (Base + OCO)	S e c
118 0604307N	Surface Combatant Combat System Engineering	05	403,712				403,712	U
119 0604311N	LPD-17 Class Systems Integration	05	945				945	U
120 0604329N	Small Diameter Bomb (SDB)	05	62,488				62,488	U
121 0604366N	Standard Missile Improvements	05	386,225				386,225	U
122 0604373N	Airborne MCM	05	10,909				10,909	U
123 0604378N	Naval Integrated Fire Control - Counter Air Systems Engineering	05	44,548				44,548	U
124 0604419N	Advanced Sensors Application Program (ASAP)	05	13,673				13,673	U
125 0604501N	Advanced Above Water Sensors	05	87,809				87,809	U
126 0604503N	SSN-688 and Trident Modernization	05	93,097				93,097	U
127 0604504N	Air Control	05	38,863				38,863	U
128 0604512N	Shipboard Aviation Systems	05	9,593				9,593	U
129 0604518N	Combat Information Center Conversion	05	12,718				12,718	U
130 0604522N	Air and Missile Defense Radar (AMDR) System	05	78,319				78,319	U
131 0604530N	Advanced Arresting Gear (AAG)	05	65,834				65,834	U
132 0604558N	New Design SSN	05	259,443				259,443	U
133 0604562N	Submarine Tactical Warfare System	05	63,878				63,878	U
134 0604567N	Ship Contract Design/ Live Fire T&E	05	51,853				51,853	U
135 0604574N	Navy Tactical Computer Resources	05	3,853				3,853	U

UNCLASSIFIED

## UNCLASSIFIED

Department of the Navy  
 FY 2021 President's Budget  
 Exhibit R-1 FY 2021 President's Budget  
 Total Obligational Authority  
 (Dollars in Thousands)

Appropriation: 1319N Research, Development, Test &amp; Eval, Navy

Program Line Element No Number	Item	Act	FY 2019	FY 2020	FY 2020	FY 2020	FY 2020
			(Base + OCO)	Base Enacted	Emergency	OCO Enacted	Total Enacted S (Base+Emerg+ e OCO)
136 0604601N	Mine Development	05	22,105	56,464			56,464 U
137 0604610N	Lightweight Torpedo Development	05	62,448	109,349			109,349 U
138 0604654N	Joint Service Explosive Ordnance Development	05	6,829	8,237			8,237 U
139 0604657M	USMC Ground Combat/Supporting Arms Systems - Eng Dev	05		20,085			20,085 U
140 0604703N	Personnel, Training, Simulation, and Human Factors	05	6,287	5,500			5,500 U
141 0604727N	Joint Standoff Weapon Systems	05	424	16,225			16,225 U
142 0604755N	Ship Self Defense (Detect & Control)	05	175,129	178,603		1,122	179,725 U
143 0604756N	Ship Self Defense (Engage: Hard Kill)	05	185,971	115,130			115,130 U
144 0604757N	Ship Self Defense (Engage: Soft Kill/EW)	05	124,769	95,282			95,282 U
145 0604761N	Intelligence Engineering	05	25,965	45,610			45,610 U
146 0604771N	Medical Development	05	36,761	33,181			33,181 U
147 0604777N	Navigation/ID System	05	99,650	45,755			45,755 U
148 0604800M	Joint Strike Fighter (JSF) - EMD	05	64,692	1,710			1,710 U
149 0604800N	Joint Strike Fighter (JSF) - EMD	05	63,535	1,490			1,490 U
150 0604850N	SSN(X)	05					U
151 0605013M	Information Technology Development	05	12,545	1,494			1,494 U
152 0605013N	Information Technology Development	05	233,521	268,547			268,547 U
153 0605024N	Anti-Tamper Technology Support	05	6,049	4,882			4,882 U

UNCLASSIFIED

## UNCLASSIFIED

Department of the Navy  
 FY 2021 President's Budget  
 Exhibit R-1 FY 2021 President's Budget  
 Total Obligational Authority  
 (Dollars in Thousands)

Appropriation: 1319N Research, Development, Test &amp; Eval, Navy

Program Line Element No Number	Item	Act	FY 2021	FY 2021	FY 2021	FY 2021	FY 2021	S
			Base	OCO for Base Requirements	Direct War and Enduring Costs	Total OCO	(Base + OCO)	c
136 0604601N	Mine Development	05	92,607				92,607	U
137 0604610N	Lightweight Torpedo Development	05	146,012				146,012	U
138 0604654N	Joint Service Explosive Ordnance Development	05	8,383				8,383	U
139 0604657M	USMC Ground Combat/Supporting Arms Systems - Eng Dev	05	33,784				33,784	U
140 0604703N	Personnel, Training, Simulation, and Human Factors	05	8,599				8,599	U
141 0604727N	Joint Standoff Weapon Systems	05	73,744				73,744	U
142 0604755N	Ship Self Defense (Detect & Control)	05	157,490		1,144	1,144	158,634	U
143 0604756N	Ship Self Defense (Engage: Hard Kill)	05	121,761				121,761	U
144 0604757N	Ship Self Defense (Engage: Soft Kill/EW)	05	89,373				89,373	U
145 0604761N	Intelligence Engineering	05	15,716				15,716	U
146 0604771N	Medical Development	05	2,120				2,120	U
147 0604777N	Navigation/ID System	05	50,180				50,180	U
148 0604800M	Joint Strike Fighter (JSF) - EMD	05	561				561	U
149 0604800N	Joint Strike Fighter (JSF) - EMD	05	250				250	U
150 0604850N	SSN(X)	05	1,000				1,000	U
151 0605013M	Information Technology Development	05	974				974	U
152 0605013N	Information Technology Development	05	356,173				356,173	U
153 0605024N	Anti-Tamper Technology Support	05	7,810				7,810	U

UNCLASSIFIED

## UNCLASSIFIED

Department of the Navy  
 FY 2021 President's Budget  
 Exhibit R-1 FY 2021 President's Budget  
 Total Obligational Authority  
 (Dollars in Thousands)

Appropriation: 1319N Research, Development, Test &amp; Eval, Navy

Program Line Element No Number	Item	Act	FY 2019	FY 2020	FY 2020	FY 2020	FY 2020
			(Base + OCO)	Base Enacted	Emergency	OCO Enacted	Total Enacted S (Base+Emerg+ OCO)
154 0605212M	CH-53K RDTE	05	383,558	506,955			506,955 U
155 0605215N	Mission Planning	05	32,032	72,566			72,566 U
156 0605217N	Common Avionics	05	49,316	37,055			37,055 U
157 0605220N	Ship to Shore Connector (SSC)	05	1,425	19,909			19,909 U
158 0605327N	T-AO 205 Class	05	1,253	1,682			1,682 U
159 0605414N	Unmanned Carrier Aviation (UCA)	05	503,989	649,055			649,055 U
160 0605450M	Joint Air-to-Ground Missile (JAGM)	05	16,031	18,393			18,393 U
161 0605500N	Multi-mission Maritime Aircraft (MMA)	05	32,998	21,472			21,472 U
162 0605504N	Multi-Mission Maritime (MMA) Increment III	05	159,572	141,534			141,534 U
163 0605611M	Marine Corps Assault Vehicles System Development & Demonstration	05	64,311	50,137			50,137 U
164 0605813M	Joint Light Tactical Vehicle (JLTV) System Development & Demonstration	05		2,105			2,105 U
165 0204202N	DDG-1000	05	137,004	111,435			111,435 U
166 0303267N	Auctioned Spectrum Relocation Fund*	05	102,762				U
167 0303467N	SENSR Spectrum Pipeline SRF**	05	1,012				U
168 0303567N	Non-SENSR Spectrum Pipeline SRF***	05	2,000				U
169 0304785N	Tactical Cryptologic Systems	05	39,385	91,091			91,091 U
170 0306250M	Cyber Operations Technology Development	05	6,546	19,874			19,874 U
System Development & Demonstration			5,840,606	6,112,602		1,122	6,113,724

UNCLASSIFIED

## UNCLASSIFIED

Department of the Navy  
 FY 2021 President's Budget  
 Exhibit R-1 FY 2021 President's Budget  
 Total Obligational Authority  
 (Dollars in Thousands)

Appropriation: 1319N Research, Development, Test &amp; Eval, Navy

Program Line Element No Number	Item	Act	FY 2021	FY 2021	FY 2021	FY 2021	FY 2021	S
			Base	OCO for Base Requirements	OCO for Direct War and Enduring Costs	Total OCO	(Base + OCO)	e
154 0605212M	CH-53K RDTE	05	406,406				406,406	U
155 0605215N	Mission Planning	05	86,134				86,134	U
156 0605217N	Common Avionics	05	54,540				54,540	U
157 0605220N	Ship to Shore Connector (SSC)	05	5,155				5,155	U
158 0605327N	T-AO 205 Class	05	5,148				5,148	U
159 0605414N	Unmanned Carrier Aviation (UCA)	05	266,970				266,970	U
160 0605450M	Joint Air-to-Ground Missile (JAGM)	05	12,713				12,713	U
161 0605500N	Multi-mission Maritime Aircraft (MMA)	05	24,424				24,424	U
162 0605504N	Multi-Mission Maritime (MMA) Increment III	05	182,870				182,870	U
163 0605611M	Marine Corps Assault Vehicles System Development & Demonstration	05	41,775				41,775	U
164 0605813M	Joint Light Tactical Vehicle (JLTV) System Development & Demonstration	05	2,541				2,541	U
165 0204202N	DDG-1000	05	208,448				208,448	U
166 0303267N	Auctioned Spectrum Relocation Fund	05						U
167 0303467N	SENSR Spectrum Pipeline SRF	05						U
168 0303567N	Non-SENSR Spectrum Pipeline SRF	05						U
169 0304785N	Tactical Cryptologic Systems	05	111,434				111,434	U
170 0306250M	Cyber Operations Technology Development	05	26,173				26,173	U
System Development & Demonstration			6,263,883		1,144	1,144	6,265,027	

UNCLASSIFIED

## UNCLASSIFIED

Department of the Navy  
 FY 2021 President's Budget  
 Exhibit R-1 FY 2021 President's Budget  
 Total Obligational Authority  
 (Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

Program Line Element No Number	Item	Act	FY 2019	FY 2020	FY 2020	FY 2020	FY 2020	Total Enacted S
			(Base + OCO)	Base Enacted	Emergency	OCO Enacted	(Base+Emerg+ OCO)	e c
171 0604256N	Threat Simulator Development	06	91,921	62,678			62,678	U
172 0604258N	Target Systems Development	06	10,686	12,027			12,027	U
173 0604759N	Major T&E Investment	06	86,967	107,348			107,348	U
174 0605126N	Joint Theater Air and Missile Defense Organization	06	46					U
175 0605152N	Studies and Analysis Support - Navy	06	3,870	3,908			3,908	U
176 0605154N	Center for Naval Analyses	06	42,361	47,669			47,669	U
177 0605285N	Next Generation Fighter	06	4,981	7,100			7,100	U
178 0605502N	Small Business Innovative Research	06	433,656					U
179 0605804N	Technical Information Services	06	1,465	988			988	U
180 0605853N	Management, Technical & International Support	06	84,378	113,844			113,844	U
181 0605856N	Strategic Technical Support	06	4,068	3,742			3,742	U
182 0605861N	RDT&E Science and Technology Management	06	1,041					U
183 0605863N	RDT&E Ship and Aircraft Support	06	100,950	93,872			93,872	U
184 0605864N	Test and Evaluation Support	06	370,229	392,528	130,444		522,972	U
185 0605865N	Operational Test and Evaluation Capability	06	21,218	25,145			25,145	U
186 0605866N	Navy Space and Electronic Warfare (SEW) Support	06	16,032	12,652			12,652	U
187 0605867N	SEW Surveillance/Reconnaissance Support	06		8,402			8,402	U

UNCLASSIFIED

## UNCLASSIFIED

Department of the Navy  
 FY 2021 President's Budget  
 Exhibit R-1 FY 2021 President's Budget  
 Total Obligational Authority  
 (Dollars in Thousands)

Appropriation: 1319N Research, Development, Test &amp; Eval, Navy

Program Line Element No	Item	Act	FY 2021 Base	FY 2021 OCO for Base Requirements	FY 2021 OCO for Direct War and Enduring Costs	FY 2021 Total OCO	FY 2021 Total (Base + OCO)	S e c
171 0604256N	Threat Simulator Development	06	22,075				22,075	U
172 0604258N	Target Systems Development	06	10,224				10,224	U
173 0604759N	Major T&E Investment	06	85,195				85,195	U
174 0605126N	Joint Theater Air and Missile Defense Organization	06						U
175 0605152N	Studies and Analysis Support - Navy	06	3,089				3,089	U
176 0605154N	Center for Naval Analyses	06	43,517				43,517	U
177 0605285N	Next Generation Fighter	06						U
178 0605502N	Small Business Innovative Research	06						U
179 0605804N	Technical Information Services	06	932				932	U
180 0605853N	Management, Technical & International Support	06	94,297				94,297	U
181 0605856N	Strategic Technical Support	06	3,813				3,813	U
182 0605861N	RDT&E Science and Technology Management	06						U
183 0605863N	RDT&E Ship and Aircraft Support	06	104,822				104,822	U
184 0605864N	Test and Evaluation Support	06	446,960				446,960	U
185 0605865N	Operational Test and Evaluation Capability	06	27,241				27,241	U
186 0605866N	Navy Space and Electronic Warfare (SEW) Support	06	15,787				15,787	U
187 0605867N	SEW Surveillance/Reconnaissance Support	06	8,559				8,559	U

UNCLASSIFIED

## UNCLASSIFIED

Department of the Navy  
 FY 2021 President's Budget  
 Exhibit R-1 FY 2021 President's Budget  
 Total Obligational Authority  
 (Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

Program Line Element No Number	Item	Act	FY 2019	FY 2020	FY 2020	FY 2020	FY 2020
			(Base + OCO)	Base Enacted	Emergency	OCO Enacted	Total Enacted S (Base+Emerg+ e OCO)
188 0605873M	Marine Corps Program Wide Support	06	21,158	34,734			34,734 U
189 0605898N	Management HQ - R&D	06	40,165	39,673			39,673 U
190 0606355N	Warfare Innovation Management	06	40,722	28,750			28,750 U
191 0606942M	Assessments and Evaluations Cyber Vulnerabilities	06	6,731				U
192 0606942N	Assessments and Evaluations Cyber Vulnerabilities	06	42,285				U
193 0305327N	Insider Threat	06	1,682	2,645			2,645 U
194 0902498N	Management Headquarters (Departmental Support Activities)	06	1,568	1,460			1,460 U
195 0909980N	Judgment Fund Reimbursement	06	49				U
196 0909999N	Financing for Cancelled Account Adjustments	06	759				U
197 1206867N	SEW Surveillance/Reconnaissance Support	06	8,676				U
Management Support			-----	-----	-----	-----	-----
			1,437,664	999,165	130,444		1,129,609
199 0604227N	HARPOON Modifications	07	5,016	2,302			2,302 U
200 0604840M	F-35 C2D2	07	222,644	391,165			391,165 U
201 0604840N	F-35 C2D2	07	215,366	354,960			354,960 U
202 0607658N	Cooperative Engagement Capability (CEC)	07	124,413	127,924			127,924 U
203 0607700N	Deployable Joint Command and Control	07	2,817				U
204 0101221N	Strategic Sub & Weapons System Support	07	145,670	125,766			125,766 U

UNCLASSIFIED

## UNCLASSIFIED

Department of the Navy  
 FY 2021 President's Budget  
 Exhibit R-1 FY 2021 President's Budget  
 Total Obligational Authority  
 (Dollars in Thousands)

Appropriation: 1319N Research, Development, Test &amp; Eval, Navy

Program Line Element No	Item	Act	FY 2021 Base	FY 2021 OCO for Base Requirements	FY 2021 OCO for Direct War and Enduring Costs	FY 2021 Total OCO	FY 2021 Total (Base + OCO)	S e c
188 0605873M	Marine Corps Program Wide Support	06	42,749				42,749	U
189 0605898N	Management HQ - R&D	06	41,094				41,094	U
190 0606355N	Warfare Innovation Management	06	37,022				37,022	U
191 0606942M	Assessments and Evaluations Cyber Vulnerabilities	06						U
192 0606942N	Assessments and Evaluations Cyber Vulnerabilities	06						U
193 0305327N	Insider Threat	06	2,310				2,310	U
194 0902498N	Management Headquarters (Departmental Support Activities)	06	1,536				1,536	U
195 0909980N	Judgment Fund Reimbursement	06						U
196 0909999N	Financing for Cancelled Account Adjustments	06						U
197 1206867N	SEW Surveillance/Reconnaissance Support	06						U
Management Support			991,222				991,222	
199 0604227N	HARPOON Modifications	07	697				697	U
200 0604840M	F-35 C2D2	07	379,549				379,549	U
201 0604840N	F-35 C2D2	07	413,875				413,875	U
202 0607658N	Cooperative Engagement Capability (CEC)	07	143,667				143,667	U
203 0607700N	Deployable Joint Command and Control	07						U
204 0101221N	Strategic Sub & Weapons System Support	07	173,056				173,056	U

UNCLASSIFIED

## UNCLASSIFIED

Department of the Navy  
 FY 2021 President's Budget  
 Exhibit R-1 FY 2021 President's Budget  
 Total Obligational Authority  
 (Dollars in Thousands)

Appropriation: 1319N Research, Development, Test &amp; Eval, Navy

Program Line Element No Number	Item	Act	FY 2019	FY 2020	FY 2020	FY 2020	FY 2020
			(Base + OCO)	Base Enacted	Emergency	OCO Enacted	Total (Base+Emergency OCO)
205 0101224N	SSBN Security Technology Program	07	40,804	43,354			43,354 U
206 0101226N	Submarine Acoustic Warfare Development	07	11,102	6,815			6,815 U
207 0101402N	Navy Strategic Communications	07	37,184	28,674			28,674 U
208 0204136N	F/A-18 Squadrons	07	199,881	187,911			187,911 U
209 0204163N	Fleet Telecommunications (Tactical)	07	1,613				U
210 0204228N	Surface Support	07	9,328	34,602			34,602 U
211 0204229N	Tomahawk and Tomahawk Mission Planning Center (TMPC)	07	233,913	273,036			273,036 U
212 0204311N	Integrated Surveillance System	07	68,326	103,382			103,382 U
213 0204313N	Ship-Towed Array Surveillance Systems	07	15,250	14,449			14,449 U
214 0204413N	Amphibious Tactical Support Units (Displacement Craft)	07	4,840	6,931			6,931 U
215 0204460M	Ground/Air Task Oriented Radar (G/ATOR)	07	43,184	28,891			28,891 U
216 0204571N	Consolidated Training Systems Development	07	101,451	128,673			128,673 U
217 0204574N	Cryptologic Direct Support	07	4,244				U
218 0204575N	Electronic Warfare (EW) Readiness Support	07	64,264	71,143			71,143 U
219 0205601N	HARM Improvement	07	116,881	132,371			132,371 U
220 0205604N	Tactical Data Links	07	96,542				U

UNCLASSIFIED

## UNCLASSIFIED

Department of the Navy  
 FY 2021 President's Budget  
 Exhibit R-1 FY 2021 President's Budget  
 Total Obligational Authority  
 (Dollars in Thousands)

Appropriation: 1319N Research, Development, Test &amp; Eval, Navy

Program Line Element No Number	Item	Act	FY 2021 Base	FY 2021 OCO for Base Requirements	FY 2021 OCO for Direct War and Enduring Costs	FY 2021 Total OCO	FY 2021 Total (Base + OCO)	S e c
205 0101224N	SSBN Security Technology Program	07	45,970				45,970	U
206 0101226N	Submarine Acoustic Warfare Development	07	69,190				69,190	U
207 0101402N	Navy Strategic Communications	07	42,277				42,277	U
208 0204136N	F/A-18 Squadrons	07	171,030				171,030	U
209 0204163N	Fleet Telecommunications (Tactical)	07						U
210 0204228N	Surface Support	07	33,482				33,482	U
211 0204229N	Tomahawk and Tomahawk Mission Planning Center (TMPC)	07	200,308				200,308	U
212 0204311N	Integrated Surveillance System	07	102,975				102,975	U
213 0204313N	Ship-Towed Array Surveillance Systems	07	10,873				10,873	U
214 0204413N	Amphibious Tactical Support Units (Displacement Craft)	07	1,713				1,713	U
215 0204460M	Ground/Air Task Oriented Radar (G/ATOR)	07	22,205				22,205	U
216 0204571N	Consolidated Training Systems Development	07	83,956				83,956	U
217 0204574N	Cryptologic Direct Support	07						U
218 0204575N	Electronic Warfare (EW) Readiness Support	07	56,791				56,791	U
219 0205601N	HARM Improvement	07	146,166				146,166	U
220 0205604N	Tactical Data Links	07						U

UNCLASSIFIED

## UNCLASSIFIED

Department of the Navy  
 FY 2021 President's Budget  
 Exhibit R-1 FY 2021 President's Budget  
 Total Obligational Authority  
 (Dollars in Thousands)

Appropriation: 1319N Research, Development, Test &amp; Eval, Navy

Program Line Element No Number	Item	Act	FY 2019	FY 2020	FY 2020	FY 2020	FY 2020
			(Base + OCO)	Base Enacted	Emergency	OCO Enacted	Total Enacted S (Base+Emerg+ e OCO)
221 0205620N	Surface ASW Combat System Integration	07	25,478	29,572			29,572 U
222 0205632N	MK-48 ADCAP	07	66,934	72,265			72,265 U
223 0205633N	Aviation Improvements	07	130,986	125,461			125,461 U
224 0205675N	Operational Nuclear Power Systems	07	117,028	106,192			106,192 U
225 0206313M	Marine Corps Communications Systems	07	180,758	156,307		15,000	171,307 U
226 0206335M	Common Aviation Command and Control System (CAC2S)	07	4,628	4,489			4,489 U
227 0206623M	Marine Corps Ground Combat/ Supporting Arms Systems	07	95,319	51,788			51,788 U
228 0206624M	Marine Corps Combat Services Support	07	27,642	44,528			44,528 U
229 0206625M	USMC Intelligence/Electronic Warfare Systems (MIP)	07	37,821	27,886			27,886 U
230 0206629M	Amphibious Assault Vehicle	07	18,757	5,476			5,476 U
231 0207161N	Tactical AIM Missiles	07	36,444	19,488			19,488 U
232 0207163N	Advanced Medium Range Air-to-Air Missile (AMRAAM)	07	27,698	34,191			34,191 U
236 0303109N	Satellite Communications (SPACE)	07		34,344			34,344 U
237 0303138N	Consolidated Afloat Network Enterprise Services (CANES)	07	23,322	22,873			22,873 U
238 0303140N	Information Systems Security Program	07	43,348	44,853			44,853 U
239 0305192N	Military Intelligence Program (MIP) Activities	07	6,081	8,913			8,913 U
240 0305204N	Tactical Unmanned Aerial Vehicles	07	8,529	9,451			9,451 U

UNCLASSIFIED

## UNCLASSIFIED

Department of the Navy  
 FY 2021 President's Budget  
 Exhibit R-1 FY 2021 President's Budget  
 Total Obligational Authority  
 (Dollars in Thousands)

Appropriation: 1319N Research, Development, Test &amp; Eval, Navy

Program Line Element No	Item	Act	FY 2021 Base	FY 2021 OCO for Base Requirements	FY 2021 OCO for Direct War and Enduring Costs	FY 2021 Total OCO	FY 2021 Total (Base + OCO)	S e c
221 0205620N	Surface ASW Combat System Integration	07	29,348				29,348	U
222 0205632N	MK-48 ADCAP	07	110,349				110,349	U
223 0205633N	Aviation Improvements	07	133,953				133,953	U
224 0205675N	Operational Nuclear Power Systems	07	110,313				110,313	U
225 0206313M	Marine Corps Communications Systems	07	207,662				207,662	U
226 0206335M	Common Aviation Command and Control System (CAC2S)	07	4,406				4,406	U
227 0206623M	Marine Corps Ground Combat/ Supporting Arms Systems	07	61,381				61,381	U
228 0206624M	Marine Corps Combat Services Support	07	10,421				10,421	U
229 0206625M	USMC Intelligence/Electronic Warfare Systems (MIP)	07	29,977		3,000	3,000	32,977	U
230 0206629M	Amphibious Assault Vehicle	07	6,469				6,469	U
231 0207161N	Tactical AIM Missiles	07	5,859				5,859	U
232 0207163N	Advanced Medium Range Air-to-Air Missile (AMRAAM)	07	44,323				44,323	U
236 0303109N	Satellite Communications (SPACE)	07	41,978				41,978	U
237 0303138N	Consolidated Afloat Network Enterprise Services (CANES)	07	29,684				29,684	U
238 0303140N	Information Systems Security Program	07	39,094				39,094	U
239 0305192N	Military Intelligence Program (MIP) Activities	07	6,154				6,154	U
240 0305204N	Tactical Unmanned Aerial Vehicles	07	7,108				7,108	U

UNCLASSIFIED

## UNCLASSIFIED

Department of the Navy  
 FY 2021 President's Budget  
 Exhibit R-1 FY 2021 President's Budget  
 Total Obligational Authority  
 (Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

Program Line Element No Number	Item	Act	FY 2019	FY 2020	FY 2020	FY 2020	FY 2020	Total Enacted S
			(Base + OCO)	Base Enacted	Emergency	OCO Enacted	(Base+Emerg+ e OCO)	c
241 0305205N	UAS Integration and Interoperability	07	24,235	40,446			40,446	U
242 0305208M	Distributed Common Ground/Surface Systems	07	7,610	22,042			22,042	U
243 0305208N	Distributed Common Ground/Surface Systems	07	45,338					U
244 0305220N	MQ-4C Triton	07	13,395	11,784			11,784	U
245 0305231N	MQ-8 UAV	07	23,144	29,618			29,618	U
246 0305232M	RQ-11 UAV	07	524	509			509	U
247 0305234N	Small (Level 0) Tactical UAS (STUASL0)	07	5,265	9,410			9,410	U
248 0305239M	RQ-21A	07	6,000	10,914			10,914	U
249 0305241N	Multi-Intelligence Sensor Development	07	80,232	70,612			70,612	U
250 0305242M	Unmanned Aerial Systems (UAS) Payloads (MIP)	07	5,956	10,004			10,004	U
251 0305251N	Cyberspace Operations Forces and Force Support	07						U
252 0305421N	RQ-4 Modernization	07	218,366	185,446			185,446	U
253 0307577N	Intelligence Mission Data (IMD)	07						U
254 0308601N	Modeling and Simulation Support	07	6,824	12,119			12,119	U
255 0702207N	Depot Maintenance (Non-IF)	07	36,961	48,182			48,182	U
256 0708730N	Maritime Technology (MARITECH)	07	26,294	26,779			26,779	U

UNCLASSIFIED

## UNCLASSIFIED

Department of the Navy  
 FY 2021 President's Budget  
 Exhibit R-1 FY 2021 President's Budget  
 Total Obligational Authority  
 (Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

Program Line Element No	Item	Act	FY 2021 Base	FY 2021 OCO for Base Requirements	FY 2021 OCO for Direct War and Enduring Costs	FY 2021 Total OCO	FY 2021 Total (Base + OCO)	S e c
241 0305205N	UAS Integration and Interoperability	07	62,098				62,098	U
242 0305208M	Distributed Common Ground/Surface Systems	07	21,500				21,500	U
243 0305208N	Distributed Common Ground/Surface Systems	07						U
244 0305220N	MQ-4C Triton	07	11,120				11,120	U
245 0305231N	MQ-8 UAV	07	28,968				28,968	U
246 0305232M	RQ-11 UAV	07	537				537	U
247 0305234N	Small (Level 0) Tactical UAS (STUASL0)	07	8,773				8,773	U
248 0305239M	RQ-21A	07	10,853				10,853	U
249 0305241N	Multi-Intelligence Sensor Development	07	60,413				60,413	U
250 0305242M	Unmanned Aerial Systems (UAS) Payloads (MIP)	07	5,000				5,000	U
251 0305251N	Cyberspace Operations Forces and Force Support	07	34,967				34,967	U
252 0305421N	RQ-4 Modernization	07	178,799				178,799	U
253 0307577N	Intelligence Mission Data (IMD)	07	2,120				2,120	U
254 0308601N	Modeling and Simulation Support	07	8,683				8,683	U
255 0702207N	Depot Maintenance (Non-IF)	07	45,168				45,168	U
256 0708730N	Maritime Technology (MARITECH)	07	6,697				6,697	U

UNCLASSIFIED

## UNCLASSIFIED

Department of the Navy  
 FY 2021 President's Budget  
 Exhibit R-1 FY 2021 President's Budget  
 Total Obligational Authority  
 (Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

Program Line Element No Number	Item	Act	FY 2019	FY 2020	FY 2020	FY 2020	FY 2020	Total Enacted S
			(Base + OCO)	Base Enacted	Emergency	OCO Enacted	(Base+Emerg+ e OCO)	c
257 1203109N	Satellite Communications (SPACE)	07	32,059	15,868				15,868 U
9999 999999999	Classified Programs		1,783,585	1,742,227		108,282	1,850,509	U
	Operational Systems Development		4,931,294	5,096,386		123,282	5,219,668	
258 0608013N	Risk management Information - Software Pilot Program	08						U
259 0608231N	Maritime Tactical Command and Control (MTC2) - Software Pilot Program	08						U
	Software and Digital Technology Pilot Program							
Total Research, Development, Test & Eval, Navy			18,738,363	20,155,115	130,444	164,410	20,449,969	

UNCLASSIFIED

## UNCLASSIFIED

Department of the Navy  
 FY 2021 President's Budget  
 Exhibit R-1 FY 2021 President's Budget  
 Total Obligational Authority  
 (Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

Program Line Element No	Item	Act	FY 2021 Base	FY 2021 OCO for Base Requirements	Direct War and Enduring Costs	FY 2021 Total OCO	FY 2021 Total (Base + OCO)	S e c
257 1203109N	Satellite Communications (SPACE)	07	70,056				70,056	U
9999 999999999	Classified Programs		1,795,032				1,795,032	U
	Operational Systems Development		5,327,043		3,000	3,000	5,330,043	
258 0608013N	Risk management Information - Software Pilot Program	08	14,300				14,300	U
259 0608231N	Maritime Tactical Command and Control (MTC2) - Software Pilot Program	08	10,868				10,868	U
	Software and Digital Technology Pilot Program		25,168				25,168	
Total Research, Development, Test & Eval, Navy			21,427,048		59,562	59,562	21,486,610	

\*Funding in this Program Element was transferred during the year of execution from the Spectrum Relocation Fund (SRF) in support of the Advanced Wireless Services 3 (AWS-3) auction and is associated with the reallocation or sharing of the 1755-1780 MHz and 1695-1710 MHz bands. The SRF is administered by the Office of Management and Budget (OMB), which approves SRF transfers to federal agencies on an annual basis in consultation with the National Telecommunications and Information Administration (NTIA).

\*\*Funding in this Program Element was transferred during the year of execution from the Spectrum Relocation Fund (SRF) in support of the Joint Spectrum Efficient National Surveillance Radar (SENSR) Pipeline Plan to determine the feasibility and impacts of the proposed spectrum reallocation of the 1300-1350 MHz band. The SRF is administered by the Office of Management and Budget (OMB), which approves SRF transfers to federal agencies on an annual basis in consultation with the National Telecommunications and Information Administration (NTIA).

\*\*\*Funding in this Program Element was transferred during the year of execution from the Spectrum Relocation Fund (SRF) in support of the proposed reallocation of the 1300-1350 MHz band and adjacent bands. Funds in this Program Element are to be used for activities and costs associated with the study of systems or operations not included in the Joint Spectrum Efficient National Surveillance Radar (SENSR) Pipeline Plan. The SRF is administered by the Office of Management and Budget (OMB), which approves SRF transfers to federal agencies on an annual basis in consultation with the National Telecommunications and Information Administration (NTIA).

**UNCLASSIFIED**

Navy • Budget Estimates FY 2021 • RDT&E Program

**Master Program Element Table of Contents (by Budget Activity then Line Item Number)**

***Appropriation 1319: Research, Development, Test & Evaluation, Navy***

Line #	Budget Activity	Program Element Number	Program Element Title	Page
1	01	0601103N	University Research Initiatives.....	Volume 1 - 1
2	01	0601152N	In-House Lab Independent Res.....	Volume 1 - 11
3	01	0601153N	Defense Research Sciences.....	Volume 1 - 17

***Appropriation 1319: Research, Development, Test & Evaluation, Navy***

Line #	Budget Activity	Program Element Number	Program Element Title	Page
4	02	0602114N	Power Proj Applied Research.....	Volume 1 - 77
5	02	0602123N	Force Protection Applied Res.....	Volume 1 - 87
6	02	0602131M	Marine Corps Lndg Force Tech.....	Volume 1 - 113
7	02	0602235N	Common Picture Applied Research.....	Volume 1 - 131
8	02	0602236N	Warfighter Sustainment Applied Res.....	Volume 1 - 147
9	02	0602271N	Electromagnetic Systems Applied Research.....	Volume 1 - 167
10	02	0602435N	Ocean Wrfghtg Env Applied Res.....	Volume 1 - 187

**UNCLASSIFIED**

**UNCLASSIFIED**

Navy • Budget Estimates FY 2021 • RDT&E Program

***Appropriation 1319: Research, Development, Test & Evaluation, Navy***

---

Line #	Budget Activity	Program Element Number	Program Element Title	Page
11	02	0602651M	JT Non-Lethal Wpns Applied Res.....	Volume 1 - 205
12	02	0602747N	Undersea Warfare Applied Res.....	Volume 1 - 211
13	02	0602750N	Future Naval Capabilities Applied Research.....	Volume 1 - 225
14	02	0602782N	Mine and Expeditionary Warfare Applied Research.....	Volume 1 - 239
15	02	0602792N	Innovative Naval Prototypes (INP) Applied Res.....	Volume 1 - 251
16	02	0602861N	Science & Tech Management - ONR Field Acts.....	Volume 1 - 293

***Appropriation 1319: Research, Development, Test & Evaluation, Navy***

---

Line #	Budget Activity	Program Element Number	Program Element Title	Page
17	03	0603123N	Force Protection Advanced Technology.....	Volume 1 - 299
18	03	0603271N	Electromagnetic Systems Advanced Technology.....	Volume 1 - 309
19	03	0603640M	MC Advanced Technology Demo.....	Volume 1 - 315
20	03	0603651M	JT Non-Lethal Wpns Tech Dev.....	Volume 1 - 353
21	03	0603673N	Future Naval Capabilities Advanced Tech Dev.....	Volume 1 - 357
22	03	0603680N	Manufacturing Technology Program.....	Volume 1 - 375
23	03	0603729N	Warfighter Protection Adv Tech.....	Volume 1 - 385

**UNCLASSIFIED**

**UNCLASSIFIED**

Navy • Budget Estimates FY 2021 • RDT&E Program

**Appropriation 1319: Research, Development, Test & Evaluation, Navy**

Line #	Budget Activity	Program Element Number	Program Element Title	Page
24	03	0603758N	Navy Warfighting Exp & Demo.....	Volume 1 - 391
25	03	0603782N	Mine and Expeditionary Warfare Advanced Technology.....	Volume 1 - 399
26	03	0603801N	Innovative Naval Prototypes (INP) Adv Tec Dev.....	Volume 1 - 407

**Appropriation 1319: Research, Development, Test & Evaluation, Navy**

Line #	Budget Activity	Program Element Number	Program Element Title	Page
27	04	0603178N	Medium and Large Unmanned Surface Vehicles (USVs).....	Volume 2 - 1
28	04	0603207N	Air/Ocean Tactical Applications.....	Volume 2 - 35
29	04	0603216N	Aviation Survivability.....	Volume 2 - 113
30	04	0603239N	(U)NAVAL CONSTRUCTION FORCES.....	Volume 2 - 143
31	04	0603251N	Aircraft Systems.....	Volume 2 - 151
32	04	0603254N	ASW Systems Development.....	Volume 2 - 159
33	04	0603261N	Tactical Airborne Reconnaissance.....	Volume 2 - 167
34	04	0603382N	Advanced Combat Systems Tech.....	Volume 2 - 175
35	04	0603502N	Surface & Shallow Water MCM.....	Volume 2 - 235
36	04	0603506N	Surface Ship Torpedo Defense.....	Volume 2 - 297

**UNCLASSIFIED**

**UNCLASSIFIED**

Navy • Budget Estimates FY 2021 • RDT&E Program

***Appropriation 1319: Research, Development, Test & Evaluation, Navy***

---

Line #	Budget Activity	Program Element Number	Program Element Title	Page
37	04	0603512N	Carrier Systems Development.....	Volume 2 - 307
38	04	0603525N	PILOT FISH.....	Volume 2 - 325
39	04	0603527N	RETRACT LARCH.....	Volume 2 - 327
40	04	0603536N	RETRACT JUNIPER.....	Volume 2 - 329
41	04	0603542N	Radiological Control.....	Volume 2 - 331
42	04	0603553N	Surface ASW.....	Volume 2 - 349
43	04	0603561N	Advanced Submarine System Development.....	Volume 2 - 357
44	04	0603562N	Submarine Tactical Warfare Sys.....	Volume 2 - 425
45	04	0603563N	Ship Concept Advanced Design.....	Volume 2 - 451
46	04	0603564N	Ship Prel Design & Feasibility Studies.....	Volume 2 - 511
47	04	0603570N	Advanced Nuclear Power Systems.....	Volume 2 - 539
48	04	0603573N	Advanced Surface Machinery Sys.....	Volume 2 - 543
49	04	0603576N	CHALK EAGLE.....	Volume 2 - 565
50	04	0603581N	Littoral Combat Ship.....	Volume 2 - 567
51	04	0603582N	Combat System Integration.....	Volume 2 - 593
52	04	0603595N	SSBN New Design.....	Volume 2 - 615
53	04	0603596N	LCS Mission Modules.....	Volume 2 - 641
54	04	0603597N	Automated Test & Analysis.....	Volume 2 - 681

**UNCLASSIFIED**

**UNCLASSIFIED**

Navy • Budget Estimates FY 2021 • RDT&E Program

***Appropriation 1319: Research, Development, Test & Evaluation, Navy***

---

Line #	Budget Activity	Program Element Number	Program Element Title	Page
55	04	0603599N	FRIGATE Development.....	Volume 2 - 699
56	04	0603609N	Conventional Munitions.....	Volume 2 - 713
57	04	0603635M	Marine Corps Grnd Cmbt/Supt Sys.....	Volume 2 - 727
58	04	0603654N	JNT Service EOD Development.....	Volume 2 - 759
59	04	0603713N	Ocean Engineering Tech Dev.....	Volume 2 - 801
60	04	0603721N	Environmental Protection.....	Volume 2 - 827
61	04	0603724N	Navy Energy Program.....	Volume 2 - 869
62	04	0603725N	Facilities Improvement.....	Volume 2 - 903
63	04	0603734N	CHALK CORAL.....	Volume 2 - 921
64	04	0603739N	Navy Logistic Productivity.....	Volume 2 - 923
65	04	0603746N	RETRACT MAPLE.....	Volume 2 - 945
66	04	0603748N	LINK PLUMERIA.....	Volume 2 - 947
67	04	0603751N	RETRACT ELM.....	Volume 2 - 949
68	04	0603764M	LINK EVERGREEN.....	Volume 2 - 951
69	04	0603764N	LINK EVERGREEN.....	Volume 2 - 953
70	04	0603790N	NATO Research and Deve.....	Volume 2 - 955
71	04	0603795N	Land Attack Tech.....	Volume 2 - 965
72	04	0603851M	Joint Non-Lethal Weapons Testing.....	Volume 2 - 983

**UNCLASSIFIED**

**UNCLASSIFIED**

Navy • Budget Estimates FY 2021 • RDT&amp;E Program

**Appropriation 1319: Research, Development, Test & Evaluation, Navy**

Line #	Budget Activity	Program Element Number	Program Element Title	Page
73	04	0603860N	JNT Precision Approach & Ldg Sys.....	Volume 2 - 995
74	04	0603925N	Directed Energy and Electric Weapon System.....	Volume 2 - 1007
75	04	0604014N	F/A-18 Infrared Search and Track (IRST).....	Volume 2 - 1049
76	04	0604027N	Digital Warfare.....	Volume 2 - 1059
77	04	0604028N	Small/Medium Unmanned Undersea Vehicles.....	Volume 2 - 1081
78	04	0604029N	UUV Core Technologies.....	Volume 2 - 1111
79	04	0604030N	Rapid Prototyping, Experimentation & Dem.....	Volume 2 - 1147
80	04	0604031N	Large Unmanned Undersea Vehicles.....	Volume 2 - 1165
81	04	0604112N	GERALD R FORD CI NUC AIRCRAFT CARRIER CVN 78-80.....	Volume 2 - 1177
82	04	0604126N	Airborne Mine Countermeasures.....	Volume 2 - 1201
83	04	0604127N	Surface Mine Countermeasures.....	Volume 2 - 1215
84	04	0604272N	Tact Air Dir Infrared CM (TADIRCM).....	Volume 2 - 1247
85	04	0604289M	(U)Expeditionary Logistics.....	Volume 2 - 1259
86	04	0604292N	Future Vertical Lift (Maritime Strike).....	Volume 2 - 1281
87	04	0604320M	(U)Rapid Technology Capability Prototype.....	Volume 2 - 1289
88	04	0604454N	LX (R).....	Volume 2 - 1299
89	04	0604536N	Advanced Undersea Prototyping.....	Volume 2 - 1307
90	04	0604636N	Counter Unmanned Aircraft System (C-UAS).....	Volume 2 - 1323

**UNCLASSIFIED**

**UNCLASSIFIED**

Navy • Budget Estimates FY 2021 • RDT&E Program

***Appropriation 1319: Research, Development, Test & Evaluation, Navy***

---

Line #	Budget Activity	Program Element Number	Program Element Title	Page
91	04	0604659N	Precision Strike Weapons Development Program.....	Volume 2 - 1331
92	04	0604707N	SEW Architecture/Eng Support.....	Volume 2 - 1371
93	04	0604786N	Offensive Anti-Surface Warfare Weapon Dev.....	Volume 2 - 1385
94	04	0303354N	ASW Systems Development - MIP.....	Volume 2 - 1403
95	04	0304240M	(U)Advanced Tactical Unmanned Aircraft System.....	Volume 2 - 1415
96	04	0304240N	(U)Advanced Tactical Unmanned Aircraft System.....	Volume 2 - 1435
97	04	0304270N	Electronic Warfare Development - MIP.....	Volume 2 - 1443

***Appropriation 1319: Research, Development, Test & Evaluation, Navy***

---

Line #	Budget Activity	Program Element Number	Program Element Title	Page
98	05	0603208N	Training System Aircraft.....	Volume 3 - 1
99	05	0604212N	Other Helicopter Development.....	Volume 3 - 25
100	05	0604214M	AV-8B Aircraft - Engine Dev.....	Volume 3 - 55
101	05	0604215N	Standards Development.....	Volume 3 - 67
102	05	0604216N	Multi-Mission Helicopter Upgrade Dev.....	Volume 3 - 77
103	05	0604218N	Air/Ocean Equipment Engineering.....	Volume 3 - 89

**UNCLASSIFIED**

**UNCLASSIFIED**

Navy • Budget Estimates FY 2021 • RDT&E Program

***Appropriation 1319: Research, Development, Test & Evaluation, Navy***

---

Line #	Budget Activity	Program Element Number	Program Element Title	Page
104	05	0604221N	P-3 Modernization Program.....	Volume 3 - 111
105	05	0604230N	Warfare Support System.....	Volume 3 - 117
106	05	0604231N	Tactical Command System.....	Volume 3 - 141
107	05	0604234N	Advanced Hawkeye.....	Volume 3 - 219
108	05	0604245M	H-1 Upgrades.....	Volume 3 - 245
109	05	0604261N	Acoustic Search Sensors.....	Volume 3 - 259
110	05	0604262N	V-22A.....	Volume 3 - 275
111	05	0604264N	Air Crew Systems Development.....	Volume 3 - 315
112	05	0604269N	EA-18 Squadrons.....	Volume 3 - 337
113	05	0604270N	Electronic Warfare (EW) Dev.....	Volume 3 - 357
114	05	0604273M	(U)Executive Helo Development.....	Volume 3 - 419
115	05	0604274N	Next Generation Jammer (NGJ).....	Volume 3 - 441
116	05	0604280N	JNT Tactical Radio System - Maritime/Fixed Station.....	Volume 3 - 455
117	05	0604282N	(U)NEXT GENERATION JAMMER (NGJ) INC II.....	Volume 3 - 557
118	05	0604307N	Surface Combatant Cmbt Sys Eng.....	Volume 3 - 569
119	05	0604311N	LPD-17 Class Systems Integration.....	Volume 3 - 619
120	05	0604329N	Small Diameter Bomb (SDB).....	Volume 3 - 627
121	05	0604366N	Standard Missile Improvements.....	Volume 3 - 645

**UNCLASSIFIED**

**UNCLASSIFIED**

Navy • Budget Estimates FY 2021 • RDT&E Program

***Appropriation 1319: Research, Development, Test & Evaluation, Navy***

---

Line #	Budget Activity	Program Element Number	Program Element Title	Page
122	05	0604373N	Airborne Mine Countermeasures.....	Volume 3 - 681
123	05	0604378N	Nav Integrated Fire Control - Counter Air Sys E.....	Volume 3 - 699
124	05	0604419N	Advanced Sensors Application Program (ASAP).....	Volume 3 - 719
125	05	0604501N	Advanced Above Water Sensors.....	Volume 3 - 725
126	05	0604503N	SSN-688 & Trident Modernization.....	Volume 3 - 763
127	05	0604504N	Air Control.....	Volume 3 - 809
128	05	0604512N	Shipboard Aviation Systems.....	Volume 3 - 845
129	05	0604518N	Combat Information Center Conv.....	Volume 3 - 859
130	05	0604522N	Air & Missile Defense Radar (AMDR) System.....	Volume 3 - 879
131	05	0604530N	Advanced Arresting Gear (AAG).....	Volume 3 - 895
132	05	0604558N	New Design SSN.....	Volume 3 - 909
133	05	0604562N	Submarine Tactical Warfare System.....	Volume 3 - 939
134	05	0604567N	Ship Contract Design/ Live Fire T&E.....	Volume 3 - 965
135	05	0604574N	Navy Tactical Computer Resources.....	Volume 3 - 1007
136	05	0604601N	Mine Development.....	Volume 3 - 1019
137	05	0604610N	Lightweight Torpedo Development.....	Volume 3 - 1045
138	05	0604654N	JNT Service EOD.....	Volume 3 - 1071
139	05	0604657M	(U)MARINE CORPS GROUND COMBAT/SUPPORTING ARMS SYST.....	Volume 3 - 1079

**UNCLASSIFIED**

**UNCLASSIFIED**

Navy • Budget Estimates FY 2021 • RDT&E Program

***Appropriation 1319: Research, Development, Test & Evaluation, Navy***

---

Line #	Budget Activity	Program Element Number	Program Element Title	Page
140	05	0604703N	Personnel, Trng, Sim, & Human Factors.....	Volume 3 - 1087
141	05	0604727N	JNT Standoff Weapon Systems.....	Volume 3 - 1103
142	05	0604755N	Ship Self Def (Detect & Cntrl).....	Volume 3 - 1113
143	05	0604756N	Ship Self Def (Engage: Hard Kill).....	Volume 3 - 1159
144	05	0604757N	Ship Self Def (Engage: Soft Kill/EW).....	Volume 3 - 1207
145	05	0604761N	Intelligence Engineering.....	Volume 3 - 1245
146	05	0604771N	Medical Development.....	Volume 3 - 1263
147	05	0604777N	Navigation/Id System.....	Volume 3 - 1279
148	05	0604800M	(U)Joint Strike Fighter (JSF) - EMD.....	Volume 3 - 1329
149	05	0604800N	JNT Strike Fighter (JSF) - EMD.....	Volume 3 - 1343
150	05	0604850N	SSN(X).....	Volume 3 - 1365
151	05	0605013M	Marine Corps IT Dev/Mod.....	Volume 3 - 1373
152	05	0605013N	Information Technology Development.....	Volume 3 - 1389
153	05	0605024N	Anti-Tamper Technology Support.....	Volume 3 - 1543
154	05	0605212M	CH-53K.....	Volume 3 - 1555
155	05	0605215N	Mission Planning.....	Volume 3 - 1571
156	05	0605217N	Common Avionics.....	Volume 3 - 1599
157	05	0605220N	Ship-to-Shore Connector (SSC).....	Volume 3 - 1627

**UNCLASSIFIED**

**UNCLASSIFIED**

Navy • Budget Estimates FY 2021 • RDT&E Program

***Appropriation 1319: Research, Development, Test & Evaluation, Navy***

---

Line #	Budget Activity	Program Element Number	Program Element Title	Page
158	05	0605327N	T-AO 205 Class.....	Volume 3 - 1647
159	05	0605414N	Unmanned Carrier Aviation (UCA).....	Volume 3 - 1653
160	05	0605450M	Joint Air-to-ground Missile (JAGM).....	Volume 3 - 1677
161	05	0605500N	Multi-Mission Maritime Aircraft (MMA) (P-8A).....	Volume 3 - 1691
162	05	0605504N	Multi-Mission Maritime (MMA) Inc III.....	Volume 3 - 1709
163	05	0605611M	(U) MC AVS Development & Demonstration.....	Volume 3 - 1727
164	05	0605813M	(U)Joint Light Tactical Veh (JLTV) Sys Dev & Dem.....	Volume 3 - 1747
165	05	0204202N	DDG-1000.....	Volume 3 - 1755
169	05	0304785N	Tactical Cryptologic Systems.....	Volume 3 - 1765
170	05	0306250M	(U)Cyber Operations Technology Development.....	Volume 3 - 1831

***Appropriation 1319: Research, Development, Test & Evaluation, Navy***

---

Line #	Budget Activity	Program Element Number	Program Element Title	Page
171	06	0604256N	Threat Simulator Development.....	Volume 4 - 1
172	06	0604258N	Target Systems Development.....	Volume 4 - 15
173	06	0604759N	Major T&E Investment.....	Volume 4 - 27

**UNCLASSIFIED**

**UNCLASSIFIED**

Navy • Budget Estimates FY 2021 • RDT&E Program

***Appropriation 1319: Research, Development, Test & Evaluation, Navy***

---

Line #	Budget Activity	Program Element Number	Program Element Title	Page
174	06	0605126N	(U)Joint Theater Air and Missile Defense Org.....	Volume 4 - 39
175	06	0605152N	Studies & Analysis Supt - Navy.....	Volume 4 - 43
176	06	0605154N	Center For Naval Analyses.....	Volume 4 - 51
177	06	0605285N	Next Generation Fighter.....	Volume 4 - 57
178	06	0605502N	Small Business Innovative Research.....	Volume 4 - 61
179	06	0605804N	Technical Information Services.....	Volume 4 - 87
180	06	0605853N	Management, Technical & Intl Supt.....	Volume 4 - 95
181	06	0605856N	Strategic Technical Support.....	Volume 4 - 147
182	06	0605861N	RDT&E Science & Tech Mgmt.....	Volume 4 - 155
183	06	0605863N	RDT&E Ship & Aircraft Support.....	Volume 4 - 159
184	06	0605864N	Test & Evaluation Support.....	Volume 4 - 175
185	06	0605865N	Operational Test & Eval Capability.....	Volume 4 - 205
186	06	0605866N	Navy Space & Electr Warfare Supt.....	Volume 4 - 213
187	06	0605867N	(U)SEW SURVEILLANCE/RECONNAISSANCE SUPPORT.....	Volume 4 - 225
188	06	0605873M	Marine Corps Program Wide Supt.....	Volume 4 - 231
189	06	0605898N	Management HQ - R&D.....	Volume 4 - 249
190	06	0606355N	Warfare Innovation Management.....	Volume 4 - 265
191	06	0606942M	(U)Assessments and Evals Cyber Vulnerabilities.....	Volume 4 - 293

**UNCLASSIFIED**

**UNCLASSIFIED**

Navy • Budget Estimates FY 2021 • RDT&E Program

**Appropriation 1319: Research, Development, Test & Evaluation, Navy**

Line #	Budget Activity	Program Element Number	Program Element Title	Page
192	06	0606942N	Assessments & Evals Cyber Vulnerabilities.....	Volume 4 - 297
193	06	0305327N	Insider Threat.....	Volume 4 - 305
194	06	0902498N	Management HQ - Departmental Spt Acts.....	Volume 4 - 309
195	06	0909980N	Judgment Fund Reimbursement.....	Volume 4 - 313
196	06	0909999N	Cancelled Account Adjustments.....	Volume 4 - 315
197	06	1206867N	(U)SEW Surveillance/Reconnaissance Support.....	Volume 4 - 317

**Appropriation 1319: Research, Development, Test & Evaluation, Navy**

Line #	Budget Activity	Program Element Number	Program Element Title	Page
199	07	0604227N	Harpoon Modifications.....	Volume 5 - 1
200	07	0604840M	(U)F-35B C2D2.....	Volume 5 - 9
201	07	0604840N	F-35C C2D2.....	Volume 5 - 25
202	07	0607658N	Cooperative Engagement Capability.....	Volume 5 - 41
203	07	0607700N	(U)Deployable Joint Command and Control.....	Volume 5 - 79
204	07	0101221N	Strategic Sub & Wpns Sys Supt.....	Volume 5 - 87
205	07	0101224N	SSBN Security Tech Program.....	Volume 5 - 129

**UNCLASSIFIED**

**UNCLASSIFIED**

Navy • Budget Estimates FY 2021 • RDT&E Program

**Appropriation 1319: Research, Development, Test & Evaluation, Navy**

Line #	Budget Activity	Program Element Number	Program Element Title	Page
206	07	0101226N	Submarine Acoustic War Dev.....	Volume 5 - 133
207	07	0101402N	Navy Strategic Comms.....	Volume 5 - 159
208	07	0204136N	F/A-18 Squadrons.....	Volume 5 - 179
209	07	0204163N	Fleet Tactical Development.....	Volume 5 - 229
210	07	0204228N	Surface Support.....	Volume 5 - 241
211	07	0204229N	Tomahawk Mssn Planning Ctr.....	Volume 5 - 257
212	07	0204311N	Integrated Surveillance System.....	Volume 5 - 299
213	07	0204313N	Ship-Towed Array Surveillance Systems.....	Volume 5 - 337
214	07	0204413N	Amphibious Tactical Supt Units.....	Volume 5 - 345
215	07	0204460M	(U)Ground/Air Task Oriented Radar (G/ATOR).....	Volume 5 - 365
216	07	0204571N	Consolidated Trng Sys Dev.....	Volume 5 - 385
217	07	0204574N	Cryptologic Direct Support.....	Volume 5 - 441
218	07	0204575N	Elect Warfare Readiness Supt.....	Volume 5 - 449
219	07	0205601N	Harm Improvement.....	Volume 5 - 473
220	07	0205604N	Tactical Data Links.....	Volume 5 - 501
221	07	0205620N	Surface ASW Cmbt Sys Integr.....	Volume 5 - 527
222	07	0205632N	MK-48 ADCAP.....	Volume 5 - 545
223	07	0205633N	Aviation Improvements.....	Volume 5 - 559

**UNCLASSIFIED**

**UNCLASSIFIED**

Navy • Budget Estimates FY 2021 • RDT&E Program

***Appropriation 1319: Research, Development, Test & Evaluation, Navy***

---

Line #	Budget Activity	Program Element Number	Program Element Title	Page
224	07	0205675N	Operational Nuclear Power Sys.....	Volume 5 - 625
225	07	0206313M	Marine Corps Comms Systems.....	Volume 5 - 627
226	07	0206335M	(U)Common Aviation Command and Control Sys (CAC2S).....	Volume 5 - 797
227	07	0206623M	MC Ground Cmbt Spt Arms Sys.....	Volume 5 - 807
228	07	0206624M	Marine Corps Cmbt Services Supt.....	Volume 5 - 947
229	07	0206625M	USMC Intelligence/Electronics Warfare Sys.....	Volume 5 - 991
230	07	0206629M	(U)Amphibious Assault Vehicle.....	Volume 5 - 1031
231	07	0207161N	Tactical Aim Missiles.....	Volume 5 - 1043
232	07	0207163N	AMRAAM.....	Volume 5 - 1055
236	07	0303109N	Satellite Communications (SPACE).....	Volume 5 - 1065
237	07	0303138N	Consolidated Afloat Network ENT SVS (CANES).....	Volume 5 - 1083
238	07	0303140N	Information Sys Security Program.....	Volume 5 - 1101
239	07	0305192N	Military Intelligence Program (MIP) Activities.....	Volume 5 - 1139
240	07	0305204N	Tactical Unmanned Aer Vehicles.....	Volume 5 - 1143
241	07	0305205N	UAS Integration & Interoperability.....	Volume 5 - 1153
242	07	0305208M	(U)Distributed Common Ground/Surface Systems.....	Volume 5 - 1165
243	07	0305208N	(U)DISTRIBUTED COMMON GROUND/SURFACE SYSTEMS.....	Volume 5 - 1183
244	07	0305220N	MQ-4C Triton.....	Volume 5 - 1201

**UNCLASSIFIED**

**UNCLASSIFIED**

Navy • Budget Estimates FY 2021 • RDT&E Program

**Appropriation 1319: Research, Development, Test & Evaluation, Navy**

Line #	Budget Activity	Program Element Number	Program Element Title	Page
245	07	0305231N	MQ-8 UAV.....	Volume 5 - 1211
246	07	0305232M	RQ-11 UAV.....	Volume 5 - 1231
247	07	0305234N	Small (Level 0) Tactical UAS (STUASL0).....	Volume 5 - 1243
248	07	0305239M	(U)RQ-21A.....	Volume 5 - 1253
249	07	0305241N	Multi-Intelligence Sensor Development.....	Volume 5 - 1263
250	07	0305242M	(U)Unmanned Aerial Systems (UAS) Payloads.....	Volume 5 - 1267
251	07	0305251N	CYBERSPACE OPERATIONS FORCES & FORCE SPT.....	Volume 5 - 1293
252	07	0305421N	RQ-4 Modernization.....	Volume 5 - 1303
253	07	0307577N	Intelligence Mission Data (IMD).....	Volume 5 - 1317
254	07	0308601N	Modeling & Simulation Support.....	Volume 5 - 1325
255	07	0702207N	Depot Maintenance (NON-IF).....	Volume 5 - 1345
256	07	0708730N	Maritime Tech (MARITECH).....	Volume 5 - 1373
257	07	1203109N	Satellite Communications (SPACE).....	Volume 5 - 1393

**UNCLASSIFIED**

**UNCLASSIFIED**

Navy • Budget Estimates FY 2021 • RDT&E Program

***Appropriation 1319: Research, Development, Test & Evaluation, Navy***

---

<b>Line #</b>	<b>Budget Activity</b>	<b>Program Element Number</b>	<b>Program Element Title</b>	<b>Page</b>
258	08	0608013N	(U) RISK MANAGMEMENT INFO - SOFTWARE PILOT PROGRAM.....	Volume 5 - 1415
259	08	0608231N	(U) MARITIME TACT CMD & CONTROL - SOFT PLT PRGM.....	Volume 5 - 1425

**UNCLASSIFIED**

**UNCLASSIFIED**

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**UNCLASSIFIED**

**UNCLASSIFIED**

Navy • Budget Estimates FY 2021 • RDT&E Program

**Master Program Element Table of Contents (Alphabetically by Program Element Title)**

<b>Program Element Title</b>	<b>Program Element Number</b>	<b>Line #</b>	<b>BA</b>	<b>Page</b>
(U) MARITIME TACT CMD & CONTROL - SOFT PLT PRGM	0608231N	259	08.....	Volume 5 - 1425
(U) MC AVS Development & Demonstration	0605611M	163	05.....	Volume 3 - 1727
(U) RISK MANAGMEMENT INFO - SOFTWARE PILOT PROGRAM	0608013N	258	08.....	Volume 5 - 1415
(U)Advanced Tactical Unmanned Aircraft System	0304240M	95	04.....	Volume 2 - 1415
(U)Advanced Tactical Unmanned Aircraft System	0304240N	96	04.....	Volume 2 - 1435
(U)Amphibious Assault Vehicle	0206629M	230	07.....	Volume 5 - 1031
(U)Assessments and Evals Cyber Vulnerabilities	0606942M	191	06.....	Volume 4 - 293
(U)Common Aviation Command and Control Sys (CAC2S)	0206335M	226	07.....	Volume 5 - 797
(U)Cyber Operations Technology Development	0306250M	170	05.....	Volume 3 - 1831
(U)DISTRIBUTED COMMON GROUND/SURFACE SYSTEMS	0305208N	243	07.....	Volume 5 - 1183
(U)Deployable Joint Command and Control	0607700N	203	07.....	Volume 5 - 79
(U)Distributed Common Ground/Surface Systems	0305208M	242	07.....	Volume 5 - 1165
(U)Executive Helo Development	0604273M	114	05.....	Volume 3 - 419
(U)Expeditionary Logistics	0604289M	85	04.....	Volume 2 - 1259
(U)F-35B C2D2	0604840M	200	07.....	Volume 5 - 9
(U)Ground/Air Task Oriented Radar (G/ATOR)	0204460M	215	07.....	Volume 5 - 365
(U)Joint Light Tactical Veh (JLTV) Sys Dev & Dem	0605813M	164	05.....	Volume 3 - 1747

**UNCLASSIFIED**

**UNCLASSIFIED**

Navy • Budget Estimates FY 2021 • RDT&amp;E Program

Program Element Title	Program Element Number	Line #	BA	Page
(U)Joint Strike Fighter (JSF) - EMD	0604800M	148	05.....	Volume 3 - 1329
(U)Joint Theater Air and Missile Defense Org	0605126N	174	06.....	Volume 4 - 39
(U)MARINE CORPS GROUND COMBAT/SUPPORTING ARMS SYST	0604657M	139	05.....	Volume 3 - 1079
(U)NAVAL CONSTRUCTION FORCES	0603239N	30	04.....	Volume 2 - 143
(U)NEXT GENERATION JAMMER (NGJ) INC II	0604282N	117	05.....	Volume 3 - 557
(U)RQ-21A	0305239M	248	07.....	Volume 5 - 1253
(U)Rapid Technology Capability Prototype	0604320M	87	04.....	Volume 2 - 1289
(U)SEW SURVEILLANCE/RECONNAISSANCE SUPPORT	0605867N	187	06.....	Volume 4 - 225
(U)SEW Surveillance/Reconnaissance Support	1206867N	197	06.....	Volume 4 - 317
(U)Unmanned Aerial Systems (UAS) Payloads	0305242M	250	07.....	Volume 5 - 1267
AMRAAM	0207163N	232	07.....	Volume 5 - 1055
ASW Systems Development	0603254N	32	04.....	Volume 2 - 159
ASW Systems Development - MIP	0303354N	94	04.....	Volume 2 - 1403
AV-8B Aircraft - Engine Dev	0604214M	100	05.....	Volume 3 - 55
Acoustic Search Sensors	0604261N	109	05.....	Volume 3 - 259
Advanced Above Water Sensors	0604501N	125	05.....	Volume 3 - 725
Advanced Arresting Gear (AAG)	0604530N	131	05.....	Volume 3 - 895
Advanced Combat Systems Tech	0603382N	34	04.....	Volume 2 - 175
Advanced Hawkeye	0604234N	107	05.....	Volume 3 - 219

**UNCLASSIFIED**

**UNCLASSIFIED**

Navy • Budget Estimates FY 2021 • RDT&amp;E Program

Program Element Title	Program Element Number	Line #	BA	Page
Advanced Nuclear Power Systems	0603570N	47	04.....	Volume 2 - 539
Advanced Sensors Application Program (ASAP)	0604419N	124	05.....	Volume 3 - 719
Advanced Submarine System Development	0603561N	43	04.....	Volume 2 - 357
Advanced Surface Machinery Sys	0603573N	48	04.....	Volume 2 - 543
Advanced Undersea Prototyping	0604536N	89	04.....	Volume 2 - 1307
Air & Missile Defense Radar (AMDR) System	0604522N	130	05.....	Volume 3 - 879
Air Control	0604504N	127	05.....	Volume 3 - 809
Air Crew Systems Development	0604264N	111	05.....	Volume 3 - 315
Air/Ocean Equipment Engineering	0604218N	103	05.....	Volume 3 - 89
Air/Ocean Tactical Applications	0603207N	28	04.....	Volume 2 - 35
Airborne Mine Countermeasures	0604126N	82	04.....	Volume 2 - 1201
Airborne Mine Countermeasures	0604373N	122	05.....	Volume 3 - 681
Aircraft Systems	0603251N	31	04.....	Volume 2 - 151
Amphibious Tactical Supt Units	0204413N	214	07.....	Volume 5 - 345
Anti-Tamper Technology Support	0605024N	153	05.....	Volume 3 - 1543
Assessments & Evals Cyber Vulnerabilities	0606942N	192	06.....	Volume 4 - 297
Automated Test & Analysis	0603597N	54	04.....	Volume 2 - 681
Aviation Improvements	0205633N	223	07.....	Volume 5 - 559
Aviation Survivability	0603216N	29	04.....	Volume 2 - 113

**UNCLASSIFIED**

**UNCLASSIFIED**

Navy • Budget Estimates FY 2021 • RDT&amp;E Program

Program Element Title	Program Element Number	Line #	BA	Page
CH-53K	0605212M	154	05.....	Volume 3 - 1555
CHALK CORAL	0603734N	63	04.....	Volume 2 - 921
CHALK EAGLE	0603576N	49	04.....	Volume 2 - 565
CYBERSPACE OPERATIONS FORCES & FORCE SPT	0305251N	251	07.....	Volume 5 - 1293
Cancelled Account Adjustments	0909999N	196	06.....	Volume 4 - 315
Carrier Systems Development	0603512N	37	04.....	Volume 2 - 307
Center For Naval Analyses	0605154N	176	06.....	Volume 4 - 51
Combat Information Center Conv	0604518N	129	05.....	Volume 3 - 859
Combat System Integration	0603582N	51	04.....	Volume 2 - 593
Common Avionics	0605217N	156	05.....	Volume 3 - 1599
Common Picture Applied Research	0602235N	7	02.....	Volume 1 - 131
Consolidated Afloat Network ENT SVS (CANES)	0303138N	237	07.....	Volume 5 - 1083
Consolidated Trng Sys Dev	0204571N	216	07.....	Volume 5 - 385
Conventional Munitions	0603609N	56	04.....	Volume 2 - 713
Cooperative Engagement Capability	0607658N	202	07.....	Volume 5 - 41
Counter Unmanned Aircraft System (C-UAS)	0604636N	90	04.....	Volume 2 - 1323
Cryptologic Direct Support	0204574N	217	07.....	Volume 5 - 441
DDG-1000	0204202N	165	05.....	Volume 3 - 1755
Defense Research Sciences	0601153N	3	01.....	Volume 1 - 17

**UNCLASSIFIED**

**UNCLASSIFIED**

Navy • Budget Estimates FY 2021 • RDT&amp;E Program

Program Element Title	Program Element Number	Line #	BA	Page
Depot Maintenance (NON-IF)	0702207N	255	07.....	Volume 5 - 1345
Digital Warfare	0604027N	76	04.....	Volume 2 - 1059
Directed Energy and Electric Weapon System	0603925N	74	04.....	Volume 2 - 1007
EA-18 Squadrons	0604269N	112	05.....	Volume 3 - 337
Elect Warfare Readiness Supt	0204575N	218	07.....	Volume 5 - 449
Electromagnetic Systems Advanced Technology	0603271N	18	03.....	Volume 1 - 309
Electromagnetic Systems Applied Research	0602271N	9	02.....	Volume 1 - 167
Electronic Warfare (EW) Dev	0604270N	113	05.....	Volume 3 - 357
Electronic Warfare Development - MIP	0304270N	97	04.....	Volume 2 - 1443
Environmental Protection	0603721N	60	04.....	Volume 2 - 827
F-35C C2D2	0604840N	201	07.....	Volume 5 - 25
F/A-18 Infrared Search and Track (IRST)	0604014N	75	04.....	Volume 2 - 1049
F/A-18 Squadrons	0204136N	208	07.....	Volume 5 - 179
FRIGATE Development	0603599N	55	04.....	Volume 2 - 699
Facilities Improvement	0603725N	62	04.....	Volume 2 - 903
Fleet Tactical Development	0204163N	209	07.....	Volume 5 - 229
Force Protection Advanced Technology	0603123N	17	03.....	Volume 1 - 299
Force Protection Applied Res	0602123N	5	02.....	Volume 1 - 87
Future Naval Capabilities Advanced Tech Dev	0603673N	21	03.....	Volume 1 - 357

**UNCLASSIFIED**

**UNCLASSIFIED**

Navy • Budget Estimates FY 2021 • RDT&amp;E Program

Program Element Title	Program Element Number	Line #	BA	Page
Future Naval Capabilities Applied Research	0602750N	13	02.....	Volume 1 - 225
Future Vertical Lift (Maritime Strike)	0604292N	86	04.....	Volume 2 - 1281
GERALD R FORD CI NUC AIRCRAFT CARRIER CVN 78-80	0604112N	81	04.....	Volume 2 - 1177
H-1 Upgrades	0604245M	108	05.....	Volume 3 - 245
Harm Improvement	0205601N	219	07.....	Volume 5 - 473
Harpoon Modifications	0604227N	199	07.....	Volume 5 - 1
In-House Lab Independent Res	0601152N	2	01.....	Volume 1 - 11
Information Sys Security Program	0303140N	238	07.....	Volume 5 - 1101
Information Technology Development	0605013N	152	05.....	Volume 3 - 1389
Innovative Naval Prototypes (INP) Adv Tec Dev	0603801N	26	03.....	Volume 1 - 407
Innovative Naval Prototypes (INP) Applied Res	0602792N	15	02.....	Volume 1 - 251
Insider Threat	0305327N	193	06.....	Volume 4 - 305
Integrated Surveillance System	0204311N	212	07.....	Volume 5 - 299
Intelligence Engineering	0604761N	145	05.....	Volume 3 - 1245
Intelligence Mission Data (IMD)	0307577N	253	07.....	Volume 5 - 1317
JNT Precision Approach & Ldg Sys	0603860N	73	04.....	Volume 2 - 995
JNT Service EOD	0604654N	138	05.....	Volume 3 - 1071
JNT Service EOD Development	0603654N	58	04.....	Volume 2 - 759
JNT Standoff Weapon Systems	0604727N	141	05.....	Volume 3 - 1103

**UNCLASSIFIED**

**UNCLASSIFIED**

Navy • Budget Estimates FY 2021 • RDT&amp;E Program

<b>Program Element Title</b>	<b>Program Element Number</b>	<b>Line #</b>	<b>BA</b>	<b>Page</b>
JNT Strike Fighter (JSF) - EMD	0604800N	149	05.....	Volume 3 - 1343
JNT Tactical Radio System - Maritime/Fixed Station	0604280N	116	05.....	Volume 3 - 455
JT Non-Lethal Wpns Applied Res	0602651M	11	02.....	Volume 1 - 205
JT Non-Lethal Wpns Tech Dev	0603651M	20	03.....	Volume 1 - 353
Joint Air-to-ground Missile (JAGM)	0605450M	160	05.....	Volume 3 - 1677
Joint Non-Lethal Weapons Testing	0603851M	72	04.....	Volume 2 - 983
Judgment Fund Reimbursement	0909980N	195	06.....	Volume 4 - 313
LCS Mission Modules	0603596N	53	04.....	Volume 2 - 641
LINK EVERGREEN	0603764M	68	04.....	Volume 2 - 951
LINK EVERGREEN	0603764N	69	04.....	Volume 2 - 953
LINK PLUMERIA	0603748N	66	04.....	Volume 2 - 947
LPD-17 Class Systems Integration	0604311N	119	05.....	Volume 3 - 619
LX (R)	0604454N	88	04.....	Volume 2 - 1299
Land Attack Tech	0603795N	71	04.....	Volume 2 - 965
Large Unmanned Undersea Vehicles	0604031N	80	04.....	Volume 2 - 1165
Lightweight Torpedo Development	0604610N	137	05.....	Volume 3 - 1045
Littoral Combat Ship	0603581N	50	04.....	Volume 2 - 567
MC Advanced Technology Demo	0603640M	19	03.....	Volume 1 - 315
MC Ground Cmbt Spt Arms Sys	0206623M	227	07 .....	Volume 5 - 807

**UNCLASSIFIED**

**UNCLASSIFIED**

Navy • Budget Estimates FY 2021 • RDT&amp;E Program

Program Element Title	Program Element Number	Line #	BA	Page
MK-48 ADCAP	0205632N	222	07.....	Volume 5 - 545
MQ-4C Triton	0305220N	244	07.....	Volume 5 - 1201
MQ-8 UAV	0305231N	245	07.....	Volume 5 - 1211
Major T&E Investment	0604759N	173	06.....	Volume 4 - 27
Management HQ - Departmental Spt Acts	0902498N	194	06.....	Volume 4 - 309
Management HQ - R&D	0605898N	189	06.....	Volume 4 - 249
Management, Technical & Intl Supt	0605853N	180	06.....	Volume 4 - 95
Manufacturing Technology Program	0603680N	22	03.....	Volume 1 - 375
Marine Corps Cmbt Services Supt	0206624M	228	07.....	Volume 5 - 947
Marine Corps Comms Systems	0206313M	225	07.....	Volume 5 - 627
Marine Corps Grnd Cmbt/Supt Sys	0603635M	57	04.....	Volume 2 - 727
Marine Corps IT Dev/Mod	0605013M	151	05.....	Volume 3 - 1373
Marine Corps Lndg Force Tech	0602131M	6	02.....	Volume 1 - 113
Marine Corps Program Wide Supt	0605873M	188	06.....	Volume 4 - 231
Maritime Tech (MARITECH)	0708730N	256	07.....	Volume 5 - 1373
Medical Development	0604771N	146	05.....	Volume 3 - 1263
Medium and Large Unmanned Surface Vehicles (USVs)	0603178N	27	04.....	Volume 2 - 1
Military Intelligence Program (MIP) Activities	0305192N	239	07.....	Volume 5 - 1139
Mine Development	0604601N	136	05.....	Volume 3 - 1019

**UNCLASSIFIED**

**UNCLASSIFIED**

Navy • Budget Estimates FY 2021 • RDT&amp;E Program

<b>Program Element Title</b>	<b>Program Element Number</b>	<b>Line #</b>	<b>BA</b>	<b>Page</b>
Mine and Expeditionary Warfare Advanced Technology	0603782N	25	03.....	Volume 1 - 399
Mine and Expeditionary Warfare Applied Research	0602782N	14	02.....	Volume 1 - 239
Mission Planning	0605215N	155	05.....	Volume 3 - 1571
Modeling & Simulation Support	0308601N	254	07.....	Volume 5 - 1325
Multi-Intelligence Sensor Development	0305241N	249	07.....	Volume 5 - 1263
Multi-Mission Helicopter Upgrade Dev	0604216N	102	05.....	Volume 3 - 77
Multi-Mission Maritime (MMA) Inc III	0605504N	162	05.....	Volume 3 - 1709
Multi-Mission Maritime Aircraft (MMA) (P-8A)	0605500N	161	05.....	Volume 3 - 1691
NATO Research and Deve	0603790N	70	04.....	Volume 2 - 955
Nav Integrated Fire Control - Counter Air Sys E	0604378N	123	05.....	Volume 3 - 699
Navigation/Id System	0604777N	147	05.....	Volume 3 - 1279
Navy Energy Program	0603724N	61	04.....	Volume 2 - 869
Navy Logistic Productivity	0603739N	64	04.....	Volume 2 - 923
Navy Space & Electr Warfare Supt	0605866N	186	06.....	Volume 4 - 213
Navy Strategic Comms	0101402N	207	07.....	Volume 5 - 159
Navy Tactical Computer Resources	0604574N	135	05.....	Volume 3 - 1007
Navy Warfighting Exp & Demo	0603758N	24	03.....	Volume 1 - 391
New Design SSN	0604558N	132	05.....	Volume 3 - 909
Next Generation Fighter	0605285N	177	06.....	Volume 4 - 57

**UNCLASSIFIED**

**UNCLASSIFIED**

Navy • Budget Estimates FY 2021 • RDT&amp;E Program

<b>Program Element Title</b>	<b>Program Element Number</b>	<b>Line #</b>	<b>BA</b>	<b>Page</b>
Next Generation Jammer (NGJ)	0604274N	115	05.....	Volume 3 - 441
Ocean Engineering Tech Dev	0603713N	59	04.....	Volume 2 - 801
Ocean Wrfght Env Applied Res	0602435N	10	02.....	Volume 1 - 187
Offensive Anti-Surface Warfare Weapon Dev	0604786N	93	04.....	Volume 2 - 1385
Operational Nuclear Power Sys	0205675N	224	07.....	Volume 5 - 625
Operational Test & Eval Capability	0605865N	185	06.....	Volume 4 - 205
Other Helicopter Development	0604212N	99	05.....	Volume 3 - 25
P-3 Modernization Program	0604221N	104	05.....	Volume 3 - 111
PILOT FISH	0603525N	38	04.....	Volume 2 - 325
Personnel, Trng, Sim, & Human Factors	0604703N	140	05.....	Volume 3 - 1087
Power Proj Applied Research	0602114N	4	02.....	Volume 1 - 77
Precision Strike Weapons Development Program	0604659N	91	04.....	Volume 2 - 1331
RDT&E Science & Tech Mgmt	0605861N	182	06.....	Volume 4 - 155
RDT&E Ship & Aircraft Support	0605863N	183	06.....	Volume 4 - 159
RETRACT ELM	0603751N	67	04.....	Volume 2 - 949
RETRACT JUNIPER	0603536N	40	04.....	Volume 2 - 329
RETRACT LARCH	0603527N	39	04.....	Volume 2 - 327
RETRACT MAPLE	0603746N	65	04.....	Volume 2 - 945
RQ-11 UAV	0305232M	246	07 .....	Volume 5 - 1231

**UNCLASSIFIED**

**UNCLASSIFIED**

Navy • Budget Estimates FY 2021 • RDT&amp;E Program

Program Element Title	Program Element Number	Line #	BA	Page
RQ-4 Modernization	0305421N	252	07.....	Volume 5 - 1303
Radiological Control	0603542N	41	04.....	Volume 2 - 331
Rapid Prototyping, Experimentation & Dem	0604030N	79	04.....	Volume 2 - 1147
SEW Architecture/Eng Support	0604707N	92	04.....	Volume 2 - 1371
SSBN New Design	0603595N	52	04.....	Volume 2 - 615
SSBN Security Tech Program	0101224N	205	07.....	Volume 5 - 129
SSN(X)	0604850N	150	05.....	Volume 3 - 1365
SSN-688 & Trident Modernization	0604503N	126	05.....	Volume 3 - 763
Satellite Communications (SPACE)	0303109N	236	07.....	Volume 5 - 1065
Satellite Communications (SPACE)	1203109N	257	07.....	Volume 5 - 1393
Science & Tech Management - ONR Field Acts	0602861N	16	02.....	Volume 1 - 293
Ship Concept Advanced Design	0603563N	45	04.....	Volume 2 - 451
Ship Contract Design/ Live Fire T&E	0604567N	134	05.....	Volume 3 - 965
Ship Prel Design & Feasibility Studies	0603564N	46	04.....	Volume 2 - 511
Ship Self Def (Detect & Cntrl)	0604755N	142	05.....	Volume 3 - 1113
Ship Self Def (Engage: Hard Kill)	0604756N	143	05.....	Volume 3 - 1159
Ship Self Def (Engage: Soft Kill/EW)	0604757N	144	05.....	Volume 3 - 1207
Ship-Towed Array Surveillance Systems	0204313N	213	07.....	Volume 5 - 337
Ship-to-Shore Connector (SSC)	0605220N	157	05.....	Volume 3 - 1627

**UNCLASSIFIED**

**UNCLASSIFIED**

Navy • Budget Estimates FY 2021 • RDT&amp;E Program

<b>Program Element Title</b>	<b>Program Element Number</b>	<b>Line #</b>	<b>BA</b>	<b>Page</b>
Shipboard Aviation Systems	0604512N	128	05.....	Volume 3 - 845
Small (Level 0) Tactical UAS (STUASL0)	0305234N	247	07.....	Volume 5 - 1243
Small Business Innovative Research	0605502N	178	06.....	Volume 4 - 61
Small Diameter Bomb (SDB)	0604329N	120	05.....	Volume 3 - 627
Small/Medium Unmanned Undersea Vehicles	0604028N	77	04.....	Volume 2 - 1081
Standard Missile Improvements	0604366N	121	05.....	Volume 3 - 645
Standards Development	0604215N	101	05.....	Volume 3 - 67
Strategic Sub & Wpns Sys Supt	0101221N	204	07.....	Volume 5 - 87
Strategic Technical Support	0605856N	181	06.....	Volume 4 - 147
Studies & Analysis Supt - Navy	0605152N	175	06.....	Volume 4 - 43
Submarine Acoustic War Dev	0101226N	206	07.....	Volume 5 - 133
Submarine Tactical Warfare Sys	0603562N	44	04.....	Volume 2 - 425
Submarine Tactical Warfare System	0604562N	133	05.....	Volume 3 - 939
Surface & Shallow Water MCM	0603502N	35	04.....	Volume 2 - 235
Surface ASW	0603553N	42	04.....	Volume 2 - 349
Surface ASW Cmbt Sys Integr	0205620N	221	07.....	Volume 5 - 527
Surface Combatant Cmbt Sys Eng	0604307N	118	05.....	Volume 3 - 569
Surface Mine Countermeasures	0604127N	83	04.....	Volume 2 - 1215
Surface Ship Torpedo Defense	0603506N	36	04.....	Volume 2 - 297

**UNCLASSIFIED**

**UNCLASSIFIED**

Navy • Budget Estimates FY 2021 • RDT&amp;E Program

Program Element Title	Program Element Number	Line #	BA	Page
Surface Support	0204228N	210	07.....	Volume 5 - 241
T-AO 205 Class	0605327N	158	05.....	Volume 3 - 1647
Tact Air Dir Infrared CM (TADIRCM)	0604272N	84	04.....	Volume 2 - 1247
Tactical Aim Missiles	0207161N	231	07.....	Volume 5 - 1043
Tactical Airborne Reconnaissance	0603261N	33	04.....	Volume 2 - 167
Tactical Command System	0604231N	106	05.....	Volume 3 - 141
Tactical Cryptologic Systems	0304785N	169	05.....	Volume 3 - 1765
Tactical Data Links	0205604N	220	07.....	Volume 5 - 501
Tactical Unmanned Aer Vehicles	0305204N	240	07.....	Volume 5 - 1143
Target Systems Development	0604258N	172	06.....	Volume 4 - 15
Technical Information Services	0605804N	179	06.....	Volume 4 - 87
Test & Evaluation Support	0605864N	184	06.....	Volume 4 - 175
Threat Simulator Development	0604256N	171	06.....	Volume 4 - 1
Tomahawk Mssn Planning Ctr	0204229N	211	07.....	Volume 5 - 257
Training System Aircraft	0603208N	98	05.....	Volume 3 - 1
UAS Integration & Interoperability	0305205N	241	07.....	Volume 5 - 1153
USMC Intelligence/Electronics Warfare Sys	0206625M	229	07.....	Volume 5 - 991
UUV Core Technologies	0604029N	78	04.....	Volume 2 - 1111
Undersea Warfare Applied Res	0602747N	12	02.....	Volume 1 - 211

**UNCLASSIFIED**

**UNCLASSIFIED**

Navy • Budget Estimates FY 2021 • RDT&E Program

<b>Program Element Title</b>	<b>Program Element Number</b>	<b>Line #</b>	<b>BA</b>	<b>Page</b>
University Research Initiatives	0601103N	1	01.....	Volume 1 - 1
Unmanned Carrier Aviation (UCA)	0605414N	159	05.....	Volume 3 - 1653
V-22A	0604262N	110	05.....	Volume 3 - 275
Warfare Innovation Management	0606355N	190	06.....	Volume 4 - 265
Warfare Support System	0604230N	105	05.....	Volume 3 - 117
Warfighter Protection Adv Tech	0603729N	23	03.....	Volume 1 - 385
Warfighter Sustainment Applied Res	0602236N	8	02.....	Volume 1 - 147

**UNCLASSIFIED**

**UNCLASSIFIED**

Navy • Budget Estimates FY 2021 • RDT&E Program

**Program Element Table of Contents (by Budget Activity then Line Item Number)**

*Appropriation 1319: Research, Development, Test & Evaluation, Navy*

Line #	Budget Activity	Program Element Number	Program Element Title	Page
171	06	0604256N	Threat Simulator Development.....	Volume 4 - 1
172	06	0604258N	Target Systems Development.....	Volume 4 - 15
173	06	0604759N	Major T&E Investment.....	Volume 4 - 27
174	06	0605126N	(U)Joint Theater Air and Missile Defense Org.....	Volume 4 - 39
175	06	0605152N	Studies & Analysis Supt - Navy.....	Volume 4 - 43
176	06	0605154N	Center For Naval Analyses.....	Volume 4 - 51
177	06	0605285N	Next Generation Fighter.....	Volume 4 - 57
178	06	0605502N	Small Business Innovative Research.....	Volume 4 - 61
179	06	0605804N	Technical Information Services.....	Volume 4 - 87
180	06	0605853N	Management, Technical & Intl Supt.....	Volume 4 - 95
181	06	0605856N	Strategic Technical Support.....	Volume 4 - 147
182	06	0605861N	RDT&E Science & Tech Mgmt.....	Volume 4 - 155
183	06	0605863N	RDT&E Ship & Aircraft Support.....	Volume 4 - 159
184	06	0605864N	Test & Evaluation Support.....	Volume 4 - 175
185	06	0605865N	Operational Test & Eval Capability.....	Volume 4 - 205
186	06	0605866N	Navy Space & Electr Warfare Supt.....	Volume 4 - 213

**UNCLASSIFIED**

**UNCLASSIFIED**

Navy • Budget Estimates FY 2021 • RDT&E Program

***Appropriation 1319: Research, Development, Test & Evaluation, Navy***

---

Line #	Budget Activity	Program Element Number	Program Element Title	Page
187	06	0605867N	(U)SEW SURVEILLANCE/RECONNAISSANCE SUPPORT.....	Volume 4 - 225
188	06	0605873M	Marine Corps Program Wide Supt.....	Volume 4 - 231
189	06	0605898N	Management HQ - R&D.....	Volume 4 - 249
190	06	0606355N	Warfare Innovation Management.....	Volume 4 - 265
191	06	0606942M	(U)Assessments and Evals Cyber Vulnerabilities.....	Volume 4 - 293
192	06	0606942N	Assessments & Evals Cyber Vulnerabilities.....	Volume 4 - 297
193	06	0305327N	Insider Threat.....	Volume 4 - 305
194	06	0902498N	Management HQ - Departmental Spt Acts.....	Volume 4 - 309
195	06	0909980N	Judgment Fund Reimbursement.....	Volume 4 - 313
196	06	0909999N	Cancelled Account Adjustments.....	Volume 4 - 315
197	06	1206867N	(U)SEW Surveillance/Reconnaissance Support.....	Volume 4 - 317

**UNCLASSIFIED**

**UNCLASSIFIED**

Navy • Budget Estimates FY 2021 • RDT&E Program

**Program Element Table of Contents (Alphabetically by Program Element Title)**

<b>Program Element Title</b>	<b>Program Element Number</b>	<b>Line #</b>	<b>BA</b>	<b>Page</b>
(U)Assessments and Evals Cyber Vulnerabilities	0606942M	191	06.....	Volume 4 - 293
(U)Joint Theater Air and Missile Defense Org	0605126N	174	06.....	Volume 4 - 39
(U)SEW SURVEILLANCE/RECONNAISSANCE SUPPORT	0605867N	187	06.....	Volume 4 - 225
(U)SEW Surveillance/Reconnaissance Support	1206867N	197	06.....	Volume 4 - 317
Assessments & Evals Cyber Vulnerabilities	0606942N	192	06.....	Volume 4 - 297
Cancelled Account Adjustments	0909999N	196	06.....	Volume 4 - 315
Center For Naval Analyses	0605154N	176	06.....	Volume 4 - 51
Insider Threat	0305327N	193	06.....	Volume 4 - 305
Judgment Fund Reimbursement	0909980N	195	06.....	Volume 4 - 313
Major T&E Investment	0604759N	173	06.....	Volume 4 - 27
Management HQ - Departmental Spt Acts	0902498N	194	06.....	Volume 4 - 309
Management HQ - R&D	0605898N	189	06.....	Volume 4 - 249
Management, Technical & Intl Supt	0605853N	180	06.....	Volume 4 - 95
Marine Corps Program Wide Supt	0605873M	188	06.....	Volume 4 - 231
Navy Space & Electr Warfare Supt	0605866N	186	06.....	Volume 4 - 213
Next Generation Fighter	0605285N	177	06.....	Volume 4 - 57
Operational Test & Eval Capability	0605865N	185	06.....	Volume 4 - 205

**UNCLASSIFIED**

**UNCLASSIFIED**

Navy • Budget Estimates FY 2021 • RDT&amp;E Program

Program Element Title	Program Element Number	Line #	BA	Page
RDT&E Science & Tech Mgmt	0605861N	182	06.....	Volume 4 - 155
RDT&E Ship & Aircraft Support	0605863N	183	06.....	Volume 4 - 159
Small Business Innovative Research	0605502N	178	06.....	Volume 4 - 61
Strategic Technical Support	0605856N	181	06.....	Volume 4 - 147
Studies & Analysis Supt - Navy	0605152N	175	06.....	Volume 4 - 43
Target Systems Development	0604258N	172	06.....	Volume 4 - 15
Technical Information Services	0605804N	179	06.....	Volume 4 - 87
Test & Evaluation Support	0605864N	184	06.....	Volume 4 - 175
Threat Simulator Development	0604256N	171	06.....	Volume 4 - 1
Warfare Innovation Management	0606355N	190	06.....	Volume 4 - 265

**UNCLASSIFIED**

**UNCLASSIFIED**

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy											Date: February 2020	
Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
1319: Research, Development, Test & Evaluation, Navy / BA 6: RDT&E Management Support					PE 0604256N / Threat Simulator Development							
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	91.921	62.678	22.075	-	22.075	21.134	22.738	23.343	23.941	Continuing	Continuing
0602: Electronics W/F Env Simulation (ECHO)	0.000	78.359	54.241	14.730	-	14.730	14.201	16.339	16.626	16.919	Continuing	Continuing
0672: Effect Nav E/W (ENEWS)	0.000	13.562	8.437	7.345	-	7.345	6.933	6.399	6.717	7.022	Continuing	Continuing

**A. Mission Description and Budget Item Justification**

This is a continuing program that consolidates the design, fabrication and integration of Naval Electronic Warfare (EW) threat simulators for increased managerial emphasis and coordination. These simulator development efforts provide realistic Developmental and Operational Test and Evaluation environments to test EW systems and defensive tactics. These projects develop threat Anti-Air and Anti-Ship weapon system simulators in accordance with the Services' requirements.

The 0602 Project, Electronic Warfare Environment Simulation, directly supports the Test and Evaluation resource requirements for all Naval Air EW development programs to include multi-spectral situational awareness and countermeasures. Programs in development and future programs include: Joint Strike Fighter, EA-18G, Low Band Transmitter, Next Generation Jammer, Advanced Anti-Radiation Guided Missile (AARGM), Long Range Anti-Ship Missile (LRASM), and Triton.

**JUSTIFICATION FOR BUDGET ACTIVITY:** This program is funded under RESEARCH, DEVELOPMENT, TEST and EVALUATION MANAGEMENT SUPPORT because it supports efforts directed toward sustaining or modernizing installations or operations required for general research, development, test and evaluation.

B. Program Change Summary (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	94.576	66.678	29.986	-	29.986
Current President's Budget	91.921	62.678	22.075	-	22.075
Total Adjustments	-2.655	-4.000	-7.911	-	-7.911
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-4.000			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-2.655	0.000			
• Program Adjustments	0.000	0.000	-7.911	-	-7.911
• Rate/Misc Adjustments	0.000	0.000	0.000	-	0.000

**Change Summary Explanation**

FY21 funding reduction is due to the classified program being discontinued within PU 0672.

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<b>Exhibit R-2, RDT&amp;E Budget Item Justification:</b> PB 2021 Navy	<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy / BA 6: RDT&amp;E Management Support</i>	<b>R-1 Program Element (Number/Name)</b> PE 0604256N / <i>Threat Simulator Development</i>
The funding change from FY 2020 to FY 2021 is due to the end of funding that was added for the Electronic Warfare Infrastructure Improvement Project 2.0 (EWIIP 2.0) in PU 0602. Purchase of the final equipment for EWIIP 2.0 is in FY 2020.	
Technical: Not applicable.	
Schedule: PU 0602: The open-air range version of the closed-loop threat surface to air missile system simulator at NAWC WD China Lake did not complete in FY 2019 as scheduled. Integration and site acceptance will complete in the second quarter of FY 2020. The laboratory versions of the simulator were completed in FY 2019.	

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)				
1319 / 6					PE 0604256N / Threat Simulator Development				0602 / Electronics W/F Env Simulation (ECHO)				
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	
0602: Electronics W/F Env Simulation (ECHO)	0.000	78.359	54.241	14.730	-	14.730	14.201	16.339	16.626	16.919	Continuing	Continuing	
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-			

**A. Mission Description and Budget Item Justification**

The objective of this project is development of necessary simulation facilities and approaches to allow determination of the effectiveness of Electronic Warfare (EW) in real world engagement situations and to support the introduction of modern, effective systems into Naval Aviation. The heavy use of test resources by all Services demonstrates the importance of these assets.

The Electronic Warfare Environment Simulation project is unique because it is the only program within the Department of Defense which develops and provides Naval anti-air warfare threat assets for Test and Evaluation (T&E).

This project directly supports the T&E resource requirements for all Naval Air EW development programs, to include multi-spectral situational awareness and countermeasures. Programs in development and future programs include: Joint Strike Fighter, EA-18G, Low Band Transmitter, Next Generation Jammer, Advanced Anti-Radiation Guided Missile (AARGM), Long Range Anti-Ship Missile (LRASM), and Triton.

This project provides for the development of an Integrated Air Defense T&E capability to be fielded at each of the three sites comprising the Navy's Tri-Center complex: Naval Air Warfare Center Weapons Division, China Lake and Point Mugu in CA, and Naval Air Warfare Center Aircraft Division, Patuxent River, MD.

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

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<b>Title:</b> Requirements and Validation <b>Articles:</b> <b>Description:</b> Validate and track intel updates of the threat systems necessary for the operation and continuous improvement of Navy laboratories and ranges which provide engineering support, testing and analysis to the developers, integrators, testers and users of systems and technologies that counter or penetrate air defenses. <b>FY 2020 Plans:</b> - Continue to provide program management, systems engineering, and requirements identification for the development of simulators and foreign material acquisition. - Continue to validate simulators and stimulators at the Navy tri-lab centers. <b>FY 2021 Base Plans:</b>	0.590	0.590	1.046	0.000	1.046

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy			<b>Date:</b> February 2020			
<b>Appropriation/Budget Activity</b> 1319 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0604256N / Threat Simulator Development		<b>Project (Number/Name)</b> 0602 / Electronics W/F Env Simulation (ECHO)			
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>						
		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<ul style="list-style-type: none"> <li>- Continue upgrades to the Naval Air Warfare Center ranges to support OT of the JSF by preparing sites for L-Band radar signal emulators, S-Band radar signal emulators, passive radar systems, early warning radar systems and signal detection and location systems.</li> <li>- Continue the development of two threat signal augmentation simulators for NAWCWD.</li> </ul>						
<b>FY 2021 Base Plans:</b>						
<ul style="list-style-type: none"> <li>- Complete upgrades to the Naval Air Warfare Center ranges to support OT of the JSF by preparing sites for L-Band radar signal emulators, S-Band radar signal emulators, passive radar systems, early warning radar systems and signal detection and location systems.</li> <li>- Continue the development of two threat signal augmentation simulators for NAWCWD.</li> <li>- Initiate site preparation for three radar signal emulators at NAWC WD.</li> </ul>						
<b>FY 2021 OCO Plans:</b>						
N/A						
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b>						
The funding decrease from FY 2020 to FY 2021 is due to the completion of the procurement of L-Band radar signal emulators, S-Band radar signal emulators, passive radar systems, early warning radar systems and signal detection systems in FY 2020.						
<b>Title:</b> Engagement Capabilities	<b>Articles:</b>	8.855	12.430	5.787	0.000	5.787
<b>Description:</b> Provide the test community with the modern threat engagement systems necessary for Test and Evaluation of airborne alert, Situation Awareness, targeting systems and airborne response systems.						
<b>FY 2020 Plans:</b>						
<ul style="list-style-type: none"> <li>- Complete the development of a closed-loop threat surface to air missile system simulator at NAWC WD China Lake by integrating the simulator with the range.</li> <li>- Continue the upgrade and integration of missile simulation models.</li> <li>- Continue the conversion of a threat system.</li> <li>- Continue the minor upgrades to open air and laboratory threat systems.</li> <li>- Continue the development of a naval-based threat radar closed-loop simulator for installation in laboratories at Naval Air Warfare Center Weapons Division and Naval Air Warfare Center Aircraft Division and designed for open air range</li> </ul>						

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020					
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 0604256N / Threat Simulator Development	Project (Number/Name) 0602 / Electronics W/F Env Simulation (ECHO)							
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total			
implementation. The project will move from performing trade studies to design and material purchases.									
<b>FY 2021 Base Plans:</b> - Complete the conversion of a threat system and integrate it at NAWC WD China Lake. - Continue the upgrade and integration of missile simulation models. - Continue the minor upgrades to open air and laboratory threat systems. - Complete the development of a naval-based threat radar closed-loop simulator for installation in laboratories at Naval Air Warfare Center Weapons Division and Naval Air Warfare Center Aircraft Division and designed for open air range implementation. Deliver products to the laboratories. -Initiate analysis and development of a reconfigurable closed-loop threat simulator designed for integration at laboratories and the open-air ranges.									
<b>FY 2021 OCO Plans:</b> N/A									
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> The funding decrease from FY 2020 to FY 2021 is due to the completion of manufacturing and integration of the closed-loop threat simulator, and the completion of the manufacturing portion of the conversion of a threat system.									
<b>Accomplishments/Planned Programs Subtotals</b>					78.359	54.241	14.730	0.000	14.730
<b>C. Other Program Funding Summary (\$ in Millions)</b>									
N/A									
<b>Remarks</b>									
<b>D. Acquisition Strategy</b>									
Not Applicable.									

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020	
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)			
1319 / 6					PE 0604256N / Threat Simulator Development				0672 / Effect Nav E/W (ENEWS)			
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
0672: Effect Nav E/W (ENEWS)	0.000	13.562	8.437	7.345	-	7.345	6.933	6.399	6.717	7.022	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

**Note**

Beginning in FY 2021, the Classified Program has been discontinued.

**A. Mission Description and Budget Item Justification**

The objective of the Effectiveness of Navy Electronic Warfare (EW) Systems (ENEWS) Project is the development and application of necessary simulation assets to determine the effectiveness of Electronic Warfare for Navy ships in simulated real-world engagement situations. The project primarily supports the introduction of modern, effective shipboard and off-board Electronic Warfare systems, and tactics for the Surface Navy. The heavy use of ENEWS resources by Naval Sea Systems Command, Operational Test and Evaluation (OT&E) Force, Special Operations, and other Electronic Warfare Research, Development, Test and Evaluation (T&E) agencies speaks to the overall importance of this project. The project provides support for Electronic Warfare system design, Engineering Test (ET), Development Test (DT), Operational Test (OT), and the development of utilization tactics. In the past ENEWS quick reaction capabilities have had great impact on crisis situations such as the Libyan crises, Iran threat, Persian Gulf crisis, and Operation Desert Shield/Storm. Simulation Display (SIMDIS) is an ENEWS modeling tool that was developed to support Testing and Evaluation. Simulation Display has been adopted by most Department of Defense (DoD) Testing and Evaluation and training ranges to provide visualization of Testing and Evaluation and training scenarios. One of the primary threats to surface ships is Anti-Ship Capable Missile systems. The Effectiveness of ENEWS Project is unique in that it is the only project within the Department of Defense dedicated to developing and providing realistic Anti-Ship Capable Missile assets to test and evaluate the effectiveness of shipboard Electronic Warfare systems and tactics against these type threats. The ENEWS Project is a critical part of the Office of the Secretary of Defense Test Resource Master Plan. This plan employs many of the ENEWS assets for planning, analysis, testing, and verification of shipboard and off-board Electronic Warfare systems techniques and tactics. As part of its normal activities, ENEWS provides Development Test and Evaluation (DT&E), Operational Test and Evaluation (OT&E), and Follow-on Operational Test and Evaluation (FOT&E) support to the surface Navy for all ship classes. Development Test, Operational Test and Follow-on Operational Test and Evaluation support includes AN/SLQ-32 Surface Electronic Warfare Improvement Program (SEWIP), Nulka, Rapid Anti-ship Integrated Defense System, all MK245 Giant tests, advanced InfraRed (IR) decoys, decoy placement, ship InfraRed signature and radar cross section measurement of DDG-51, LPD-17, DD-21 and Patrol Craft class ships, High Power Microwave program, and other ship self-defense initiatives, including Test and Evaluation of Future Naval Capability process. In addition, ENEWS assets are regularly employed to test the effectiveness of North Atlantic Treaty Organization (NATO) ships' Electronic Warfare systems in joint allied exercises. ENEWS assets also support Joint Electronic Warfare exercises that are conducted with Rim of the Pacific (RIMPAC) nations.

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

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<b>Title:</b> Classified Program	7.139	4.000	0.000	0.000	0.000
<b>Description:</b> Details about this program are classified.	<b>Articles:</b> -	-	-	-	-

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy					<b>Date:</b> February 2020	
<b>Appropriation/Budget Activity</b> 1319 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0604256N / Threat Simulator Development	<b>Project (Number/Name)</b> 0672 / Effect Nav E/W (ENEWS)				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
Details about this program and any changes are classified.						
<b>FY 2020 Plans:</b> - Details are of a higher classification.						
<b>FY 2021 Base Plans:</b> N/A						
<b>FY 2021 OCO Plans:</b> N/A						
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> The decrease from FY 2020 to FY 2021 is due to classified program being discontinued.						
<b>Title:</b> Hardware Simulation Systems <b>Articles:</b>		3.460	2.700	3.850	0.000	3.850
<b>Description:</b> Maintain and perform Hardware and Software Upgrades to the inventory of Effectiveness of Navy Electronic Warfare Systems (ENEWS) flyable and shore based Anti-Ship Capable Missile (ASCM) Electro-Optic/Infrared (EO/IR), Visible and Radio Frequency (RF) Simulators. Perform characterization of Infrared (IR) and Radio Frequency (RF) simulators as part of the periodic evaluation of simulation performance and collect performance data for comparison with previously recorded data. Also includes development and maintenance of all simulator control panels.		-	-	-	-	-
<b>FY 2020 Plans:</b> - Continue hardware upgrades to the SUMMIT Simulator. - Continue software upgrades to the VICTOR Standard Instrumentation Pod (SIP). - Continue hardware upgrades to the FOXTROT 3 TOWSIM(IOTA). - Continue hardware upgrades for VICTOR 1 SIP and Anti-Ship Imaging Missile (AIMS) simulators - Continue software upgrade for FOXTROT 1 Sim 1 simulator - Continue to maintain and perform hardware and software upgrades to the inventory of Effectiveness of Naval Electronic Warfare Systems (ENEWS) flyable and shore based Anti-Ship Capable Missile (ASCM) Electro-Optic/Infrared (EO/IR), Visible and Radio Frequency (RF) Simulators and simulator control panels. - Continue to maintain and perform hardware and software upgrades to the inventory of ENEWS flyable and shore based Anti-Ship Capable Missile (ASCM) Electro-Optic/Infrared (EO/IR), Visible and Radio Frequency						

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy					<b>Date:</b> February 2020	
<b>Appropriation/Budget Activity</b> 1319 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0604256N / Threat Simulator Development	<b>Project (Number/Name)</b> 0672 / Effect Nav E/W (ENEWS)				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
(RF) simulators and simulator control panels. Introduce a new simulator into the ENEWS inventory and prepare simulator for flight and field testing - Continue hardware upgrades for the NU (towed configuration) and VICTOR 1 SIP simulators - Continue and initiate flight certification of one new simulator into the ENEWS inventor - Continue software upgrades for the IOTA (towed configuration), VICTOR 1 SIP simulators - Continue software upgrades for one EO/IR simulator - Maintain and upgrade 23 hardware simulators, 5 programmable simulators and the Antenna Test Rig to support the SEWIP Block 3 and AOEW effectiveness evaluations.						
<p><b>FY 2021 Base Plans:</b></p> <ul style="list-style-type: none"> <li>- Complete hardware and software upgrades to a programmable EO/IR airborne SIP.</li> <li>- Complete software upgrade a ground based EO/IR programmable simulator.</li> <li>- Complete hardware and software upgrades to towed EO/IR simulator.</li> <li>- Continue software upgrade for flyable EO/IR simulator.</li> <li>- Introduce two new simulation assets into the ENEWS inventory and prepare them for flight and field testing.</li> <li>- Initiate hardware upgrades for two RF and one EO/IR flyable simulators.</li> <li>- Maintain and upgrade 25 hardware simulators, 5 programmable simulators, simulator control panels and the antenna test rig to support the SEWIP Block 3 and AOEW effectiveness evaluations.</li> </ul> <p><b>FY 2021 OCO Plans:</b></p> <p>N/A</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b></p> <p>The funding increase from FY 2020 to FY 2021 reflects the introduction of two new simulation assets and the upgrade of two RF hardware simulators.</p>						
<p><b>Title:</b> Simulation Characterization, Verification and Requirements</p> <p><b>Articles:</b></p> <p><b>Description:</b> Provides for the documentation of Anti-Ship Capable Missile (ASMC) threat simulators. Develops reports that contain detailed descriptions and parametric data of the Anti-Ship Capable Missile threat simulators and compares the simulator's parametric data to the actual threat's parametric data. Provide technical management functions in support of the Effectiveness of Naval Electronic Warfare Systems (ENEWS) project; engineering and technical support requirements for the Anti-Ship Capable Missile simulators and upgrades</p>		0.632	0.300	0.745	0.000	0.745

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy			<b>Date:</b> February 2020					
<b>Appropriation/Budget Activity</b> 1319 / 6		<b>R-1 Program Element (Number/Name)</b> PE 0604256N / Threat Simulator Development		<b>Project (Number/Name)</b> 0672 / Effect Nav E/W (ENEWS)				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>								
			<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	
to meet DT/ OT testing requirements, development of detailed test resource requirements and provides an interface between OPNAV N2/N6, Office of Naval Research, and ENEWS oversight activities.								
<b>FY 2020 Plans:</b> - Continue to develop reports that compare the parametric data of the Anti-Ship Capable Missile (ASCM) threat simulators to the parametric data of the actual threat and provide technical management functions in support of the Effectiveness of Naval Electronic Warfare Systems (ENEWS) project. - Initiate and complete the FY 2020 ENEWS Program Management Plan. - Coordinate and conduct FY 2020 status reviews. - Draft and submit monthly reports, performance based management and analysis, financial execution reports and assessments. - Initiate characterization and hardware simulator documentation report for an RF simulator.								
<b>FY 2021 Base Plans:</b> - Continue all efforts of FY 2020 less those noted as completed above. - Continue to develop reports that compare parametric data of ASCM threat simulators to the parametric data of the actual threat for two RF simulators. - Provide technical and management support to the ENEWS project. - Initiate and complete the FY 2021 ENEWS Program Management Plan. - Draft and submit monthly reports, performance based management and analysis assessments and financial execution reports. - Conduct characterization testing of two RF simulators and initiate development of verification reports that compares parametric data of the ASCM threat simulators to the parametric data of the actual threat.								
<b>FY 2021 OCO Plans:</b> N/A								
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> The funding increase from FY 2020 to FY 2021 reflects the initiation of two simulator verification and validation reports that compare simulator parametric data with threat parametric data. The process also includes verification and characterization of the simulators. One report was deferred from FY20 due to a funding reduction.								
<b>Title:</b> Support and Computers Simulation Systems			<b>Articles:</b>	2.331	1.437	2.750	0.000	2.750
				-	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)		
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>				
		FY 2019	FY 2020	FY 2021 Base
				FY 2021 OCO
				FY 2021 Total
<b>Description:</b> Perform maintenance and intelligence upgrades to Electro-Optic/Infrared (EO/IR), Digital, and Radio Frequency (RF) Laboratory Simulation Testing facilities and flight support equipment based on existing and emerging complex threat systems. Development of Test & Evaluation scenarios and environmental modeling to support Electronic Support (ES) and Electronic Attack (EA) testing; modify Anti-Ship Cruise Missile (ASCM) threat simulators based on the latest intelligence data obtained from threat databases.				
<b>FY 2020 Plans:</b> <ul style="list-style-type: none"><li>- Continue to perform maintenance and intelligence upgrades to Electro-Optic/Infrared, Digital, and Radio Frequency Laboratory Simulation testing facilities and flight support equipment and provide ES and EA test support.</li><li>- Continue target models to support Surface Electronic Warfare Improvement Program Block 3 and Advanced Offboard Electronic Warfare (AOEW) effectiveness assessments.</li><li>- Continue update to the Scenario and Environmental Model used to support open and closed loop simulations.</li><li>- Continue maintenance and upgrades to shore-based test facilities and mobile test vans as required to conduct testing in support of Surface Electronic Warfare Improvement Program, Nulka and multi-function Electronic Warfare programs.</li><li>- Continue to transition environmental, threat and platform simulations from Subversion to Mercurial Distributed Version Control System.</li><li>- Continue upgrades to configuration control software library as new releases became available.</li><li>- Continue to develop new digital models of Anti-Ship Cruise Missile (ASCM) threats as they became available.</li><li>- Continue upgrades and maintenance of flight support systems as necessary to support the infrared / radio frequency Effectiveness of Naval Electronic Warfare Systems (ENEWS) simulators.</li><li>- Continue upgrades and user friendly enhancements to the Simulation Display (SIMDIS) toolset.</li><li>- Continue development of LIMA III and LIMA IV digital models.</li><li>- Continue digital model upgrades to support Surface Electronic Warfare Improvement Program (SEWIP) Block 3 test and evaluation.</li><li>- Continue simulator upgrades to support SEWIP Block 3 test and evaluation.</li><li>- Continue to perform maintenance and intelligence upgrades to Electro-Optic/Infrared, Digital, and Radio Frequency Laboratory Simulation testing facilities and flight support equipment and provide Electronic Support (ES) and Electronic Attack (EA) test support.</li><li>- Update and install new ship models into database to support Navy studies, Development Test (DT)/Operational Test (OT) events; ENEWS digital models will be updated to allow modeling and simulation (M&amp;S) based EW</li></ul>				

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy			<b>Date:</b> February 2020			
<b>Appropriation/Budget Activity</b> 1319 / 6		<b>R-1 Program Element (Number/Name)</b> PE 0604256N / Threat Simulator Development		<b>Project (Number/Name)</b> 0672 / Effect Nav E/W (ENEWS)		
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>						
FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total		
testing for SEWIP Block 3, Advanced Offboard Electronic Warfare (AOEW) and Navy Enterprise Testbed programs. - Complete HWIL millimeter wave capability update.						
<b>FY 2021 Base Plans:</b> - Continue maintenance and upgrades to EO/IR, digital, and RF laboratory simulation test and evaluation facilities and flight support equipment to provide ES and EA test support to SEWIP Block 3 and AOEW programs. - Continue to maintain and update the ENEWS CRUISE_Missiles ASCM models in support of M&S based EW testing for SEWIP Block 3, AOEW, and Navy Enterprise Testbed programs. - Continue updates to the Scenario and Environmental Model used to support open and closed loop simulations. - Continue upgrades to configuration control software library as new releases became available. - Continue to update and install new ship models into database and evaluate performance. - Initiate upgrades and user friendly enhancements to the Simulation Display (SIMDIS) toolset. - Evaluate various ship, Nulka, chaff and distraction chaff models for issues, test and repair any anomalies discovered. - Compare and verify the migration of existing missile simulations to the new real-time computer in CTS. At the end of FY 2021 five RF closed-loop missile simulations and two open-loop captive carry simulations will be migrated and verified in support of SEWIP Block 3 test requirements.						
<b>FY 2021 OCO Plans:</b> N/A						
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> The funding increase from FY 2020 to FY 2021 reflects initiation of the deferred updates to the Simulation Display (SIMDIS) visualization and display tool and completion of migration and verification of five missile simulations to the real-time computer in the Central Target Simulator (CTS).						
<b>Accomplishments/Planned Programs Subtotals</b>						
13.562      8.437      7.345      0.000      7.345						
<b>C. Other Program Funding Summary (\$ in Millions)</b>						
N/A						
<b>Remarks</b>						

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy	<b>Date:</b> February 2020	
<b>Appropriation/Budget Activity</b> 1319 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0604256N / <i>Threat Simulator Development</i>	<b>Project (Number/Name)</b> 0672 / <i>Effect Nav E/W (ENEWS)</i>
<b>D. Acquisition Strategy</b> Not applicable.		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy											Date: February 2020			
Appropriation/Budget Activity					R-1 Program Element (Number/Name)									
1319: Research, Development, Test & Evaluation, Navy / BA 6: RDT&E Management Support					PE 0604258N / Target Systems Development									
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	10.686	12.027	10.224	-	10.224	15.198	13.931	11.173	12.356	Continuing	Continuing		
0609: Aerial Target System Dev	0.000	9.415	7.874	8.839	-	8.839	13.784	12.489	9.702	10.856	Continuing	Continuing		
0612: Surface Targets Development	0.000	1.271	1.353	1.385	-	1.385	1.414	1.442	1.471	1.500	Continuing	Continuing		
2159: ASW TARGET	0.000	0.000	2.800	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	2.800		
<b>A. Mission Description and Budget Item Justification</b>														
This program element funds the development of Aerial Target Systems, Unmanned Aerial Vehicle targets, Sea Surface Target Systems, Target Control systems, and associated Target Mission Support Systems, Target Threat Simulation Program and Target Augmentation and Auxiliary Systems required to simulate real world threats. These capabilities are required to execute developmental/operational test and evaluation of naval combat weapon systems and to satisfy advanced fleet training requirements while ensuring the Navy continues to develop threat simulations of emerging threat requirements.														
JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under RESEARCH, DEVELOPMENT, TEST AND EVALUATION MANAGEMENT SUPPORT because it supports efforts directed toward sustaining or modernizing installations or operations required for general research, development, test and evaluation.														
<b>B. Program Change Summary (\$ in Millions)</b>				FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total						
Previous President's Budget				10.981	12.027	8.569	-	-				8.569		
Current President's Budget				10.686	12.027	10.224	-	-				10.224		
Total Adjustments				-0.295	0.000	1.655	-	-				1.655		
<ul style="list-style-type: none"> <li>• Congressional General Reductions</li> <li>• Congressional Directed Reductions</li> <li>• Congressional Rescissions</li> <li>• Congressional Adds</li> <li>• Congressional Directed Transfers</li> <li>• Reprogrammings</li> <li>• SBIR/STTR Transfer</li> <li>• Program Adjustments</li> <li>• Rate/Misc Adjustments</li> </ul>				-	-	-	-	-						
				-0.295	0.000	-	-	-						
				0.000	0.000	1.655	-	-				1.655		
				0.000	0.000	0.000	-	-				0.000		
<b>Change Summary Explanation</b>														
Project 0609 Aerial Targets Systems Development FY2021 funding request had a slight net increase with a \$4.000M increase to support Target Capability Enhancement focus and then a reduction of \$2.345M to account for the availability of prior year execution balances. Total overall adjustment of \$1.655M.														

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<b>Exhibit R-2, RDT&amp;E Budget Item Justification:</b> PB 2021 Navy	<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy / BA 6: RDT&amp;E Management Support</i>	<b>R-1 Program Element (Number/Name)</b> PE 0604258N / <i>Target Systems Development</i>
Project 0612 Surface Targets Development FY2021 funding request increased slightly above inflation due to increased weapon system Test and Evaluation and Fleet training requirements.	

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020	
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)			
1319 / 6					PE 0604258N / Target Systems Development				0609 / Aerial Target System Dev			
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
0609: Aerial Target System Dev	0.000	9.415	7.874	8.839	-	8.839	13.784	12.489	9.702	10.856	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

The mission of the Aerial Target Systems Development program is the design and development of threat representative subsonic and supersonic aerial targets that simulate threat weapon systems, threat aircraft or threat Unmanned Aerial Vehicles. In addition to representative air vehicles, this includes development of Target Control (TC) systems, and associated Target Augmentation and Auxiliary Systems (TA/AS) which are used to replicate specific threats. Targets and auxiliary payloads are developed to support test and evaluation of combat systems required to defend fleet surface and air units in a hostile environment. As to specific hardware development, this project includes:

- Supersonic Targets: Portfolio includes GQM-163A Supersonic Sea-Skimming Target (SSST), GQM-173A Multi-Stage Supersonic Target (MSST), and AQM-37 programs. Supersonic targets represent supersonic anti-ship cruise missile threats. The design and development of GQM-163A capabilities provide threat representative targets that are used in direct support of Developmental Test and Evaluation, Operational Test and Evaluation, and Live Fire Test and Evaluation of major combat weapons programs and to a lesser degree, support fleet training. Critical live-fire Test and Evaluation events are supported for AEGIS, DDG-1000, LHA-6, CVN-78, LCS, and LSD-41/49 (SM-6, SM-2, RAM, SSDS, and ESSM). The GQM-163A is a non-recoverable supersonic sea skimming aerial target, capable of speeds in excess of Mach 2.5 and cruise altitudes from 13.0 to 66 ft. The GQM-163A has also demonstrated higher altitude diving threat profiles. MSST was a supersonic development effort that was terminated on September 25, 2015. Once the contract termination costs have been determined by DCMA, funds may be required to cover settlement costs. However, the requirement still exists to provide a multi-stage vehicle presentation. New supersonic target development efforts include a replacement target for AQM-37.
- Subsonic Targets: Portfolio includes BQM-177A, and BQM-34 & BQM-74 subsonic target programs. The BQM-177A SSAT development primarily represents subsonic anti-ship cruise missile threats, replacing legacy BQM-74E targets with a modernized subsonic target with increased capabilities. The BQM-177A SSAT provides threat representation for developmental and operational test & evaluation events of major combat weapons systems programs and in support of fleet training events. Specifically, the BQM-177A SSAT provides critical live-fire test and evaluation events for AEGIS, SM-6, SM-2, RAM, and ESSM. BQM-34s are undergoing product improvement program efforts to increase their current performance envelope to meet evolving Fleet training requirements and weapon system test events.
- Target Threat Simulation Program (TTSP), Target Mission Support Systems (TMSS), and Target Control and Target Augmentation and Auxiliary Systems (TC/TA/AS) development: the TTSP portfolio provides the payload equipment required to electronically enhance aerial targets to provide threat representative radio frequency signatures, specifically the electronic attack and threat radar emissions (active emitters). Development of threat representative simulation components is on-going and required to keep pace with evolving threats and ensure that the Navy's threat simulation capabilities maintain warfighter readiness in the current environment. TC provides command and control of targets to enable the execution of threat-representative mission profiles. The mission also includes the design, development and qualification of various TMSS projects including but not limited to: Target RF datalink hardware, ground control hardware and software, scorer transponders, scoring ground stations, telemetry antennas, radar and locator beacons, identification, friend or foe transponders, and associated test sets. TA/AS enables each target to be

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020			
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)					
1319 / 6	PE 0604258N / Target Systems Development	0609 / Aerial Target System Dev					
uniquely configured for specific mission profiles and provide for high fidelity simulation of foreign threats. TA/AS-configured targets are used for radar acquisition test, electronic countermeasures (jamming) evaluation, infrared measurement and testing, radar cross section evaluation, decoy-effectiveness testing, maneuver analysis, electronic warfare evaluation, warhead-effectiveness testing and evaluation of fleet tactics. TA/AS scoring capabilities include both surface and airborne scalar scoring systems.							
In addition to the design and development of target hardware and software, funding supports studies performed by a University Affiliated Research Center (UARC) to specify and verify needed target performance for future target development. For the design and validation of targets under development, the UARC will provide engineering studies in areas such as structures, controls, guidance, and propulsion. For those hardware and software items presently under development by commercial vendors, the UARC will provide oversight and validation of vendor design and development approach.							
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	
<b>Title:</b> Supersonic Targets - Development & Upgrades of Supersonic targets		0.600	0.237	0.242	0.000	0.242	
<b>Articles:</b>		-	-	-	-	-	
<b>Description:</b> Provides funding for the development of GQM-163A upgrades/evolutionary development to keep pace with evolving threat characteristics. Efforts include continued development of performance envelope characteristics to include flight termination performance, enhanced speed and distance capabilities, and multiple target launch capability. Funding will also support the development of other unique supersonic targets as required, and the close out of the GQM-173 development effort.							
<b>FY 2020 Plans:</b> Complete the Orbital Front End System Space Allocation study. Continue the development of GQM-163A Supersonic Sea Skimming Targets (SSST) improvements and increased capability efforts including deployable chaff, Electronic Warfare (EW) payloads, and enhanced flight performance. Continue SSST redesign and development efforts as required for improvements and infrastructure upgrades to include those required to accommodate increased simultaneous launches. Continue to support the development and test of other unique supersonic targets as required.							
<b>FY 2021 Base Plans:</b> Continue the Orbital Front End System Space Allocation study. Continue the development of GQM-163A Supersonic Sea Skimming Targets (SSST) improvements and increased capability efforts including deployable chaff, Electronic Warfare (EW) payloads, and enhanced flight performance. Continue SSST redesign and development efforts as required for improvements and infrastructure upgrades to include those required to							

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<b>Exhibit R-2A, RDT&amp;E Project Justification: PB 2021 Navy</b>					<b>Date:</b> February 2020	
<b>Appropriation/Budget Activity</b> 1319 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0604258N / Target Systems Development	<b>Project (Number/Name)</b> 0609 / Aerial Target System Dev				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
accommodate increased simultaneous launches. Continue to support the development and test of other unique supersonic targets as required.						
<b>FY 2021 OCO Plans:</b> N/A						
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Increase of \$0.005 million from FY2020 to FY2021 to account for potential future Supersonic developments and inflation.						
<b>Title:</b> Subsonic Targets - Development & Upgrades of subsonic aerial targets with increased capabilities <b>Articles:</b> <p><b>Description:</b> A Subsonic Aerial Target (SSAT) replacement air vehicle, for the currently fielded BQM-74E target no longer in production, is required. The BQM-177A is a modernized subsonic target with increased capabilities providing realistic threat representation in support of critical live-fire Test and Evaluation events for major weapons systems and Fleet combat training. The target features increased capabilities to include higher speed, longer range, lower cruise altitudes and greater maneuverability. Other subsonic target alternatives are being explored, including the BQM-74G.</p> <p><b>FY 2020 Plans:</b>            Complete WSESRA approval of shipboard operations. Complete required shipboard suitability testing in preparation of FOC. Continue engineering, manufacturing, training, logistics and test efforts of the BQM-177A SSAT towards FOC including site activation, shipboard qualification and operations. Incorporate Engineering Change Proposals and modernizations in the baseline design configuration as mission and threats evolve. Continue studies &amp; development efforts on other subsonic target alternatives, including the BQM-74G.</p> <p><b>FY 2021 Base Plans:</b>            Complete site activations and required shipboard suitability testing in preparation of FOC. Continue engineering, manufacturing, training, logistics and test efforts of the BQM-177A SSAT. Incorporate Engineering Change Proposals and modernizations in the baseline design configuration as mission and threats evolve. Continue studies &amp; development efforts on other subsonic target alternatives.</p> <p><b>FY 2021 OCO Plans:</b>            N/A</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b></p>		1.357	1.020	1.040	0.000	1.040

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020		
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 0604258N / Target Systems Development	Project (Number/Name) 0609 / Aerial Target System Dev				
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Increase of \$0.020 million from FY2020 to FY2021 to account for potential future Subsonic developments and inflation.						
<b>Title:</b> Target Threat Simulation Program (TTSP), Target Mission Support Systems (TMSS), Target Control (TC) and Target Augmentation and Auxiliary Systems (TA/AS)	<b>Articles:</b>	7.458	6.617	7.557	0.000	7.557
<b>Description:</b> The Target Threat Simulation Program (TTSP) provides the payload equipment required to electronically enhance aerial/surface targets to provide threat representative Radio Frequency signatures, specifically the Electronic Attack and Threat Radar Emissions (Active Emitters). The TTSP accomplishes this by providing a collection of modules which are integrated into individual targets in various configurations to provide the ability to simulate the RF environment. TTSP equipment in various configurations is certified for carriage in aerial/surface targets. Funding supports the continued development of the TTSP portfolio so that the Navy can keep pace with emerging enemy threats. Funding is provided for the development of Target Control (TC) systems and Target Augmentation and Auxiliary Systems (TA/AS) capable of supporting Test and Evaluation (T&E) and fleet training activities to ensure emerging threat simulation requirements are met. Target Control Systems (TCS) involve the improved command and control systems capable of controlling multiple targets simultaneously while delivering adequate fidelity of T&E telemetry data. The TMSS program portfolio provides target control, scoring, location, and navigation of air, land and seaborne targets for fleet training and weapons systems test and evaluation. Funding also supports the design, development and qualification of TMSS including but not limited to the current and next generation TC systems, scalar scorers, scoring ground station, telemetry antennas, radar and locator beacons, identification friend or foe and associated test sets. Augmentation and auxiliary systems must be capable of augmenting targets in support of radar acquisition test, electronic countermeasures (jamming) evaluation, infrared measurement/test, radar cross section evaluation, decoy effectiveness, maneuver analysis, electronic warfare, warhead effectiveness and evaluation of fleet tactics, readiness, and training.						
<b>FY 2020 Plans:</b> Continue development, prototyping and integration of threat electronic attack & active emitter simulators to ensure the Fleet meets emerging threat requirements. Gather and exploit threat intelligence. Continue development and qualification of the SNTC BLK 4 Ground Control Station with associated hardware and software upgrades. Commence development of the DSQ-50B Vector Scorer. Begin fielding the replacement AN/DPN-90 Radar Beacon and the AN/DPN-88 IFF replacement. Continue fielding the DSQ-50A Scalar Scorer						

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy							<b>Date:</b> February 2020								
<b>Appropriation/Budget Activity</b> 1319 / 6			<b>R-1 Program Element (Number/Name)</b> PE 0604258N / Target Systems Development				<b>Project (Number/Name)</b> 0609 / Aerial Target System Dev								
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>							<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>				
and its associated Ground Telemetry Station and the TCS Radio Frequency Subsystem (SNTC BLK 3) upgrade hardware, both two to three year processes.															
<p><b>FY 2021 Base Plans:</b>          Continue development, prototyping and integration of threat electronic attack &amp; active emitter simulators to ensure the Fleet meets emerging threat requirements. Begin development of miniaturized electronic payloads. Continue development and qualification of the SNTC BLK 4 Ground Control Station with associated hardware and software upgrades. Continue development of the DSQ-50B Vector Scorer. Continue fielding the replacement AN/DPN-90 Radar Beacon. Continue fielding the DSQ-50A Scalar Scorer and its associated Ground Telemetry Station and continue fielding the TCS Radio Frequency Subsystem (SNTC BLK 3) upgrade hardware, both two to three year processes.</p> <p><b>FY 2021 OCO Plans:</b>          N/A</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b>          Increase of \$0.94 million from FY2020 to FY2021 for TTSP Target Capability Enhancement focus, which is the development of miniaturized TTSP payloads currently used on the BQM-34S subsonic target, for incorporation into the BQM-177A and to develop and miniaturize additional payloads for the GQM-163A supersonic target. The funding covers both development of the new payloads and prototypes.</p>															
<b>Accomplishments/Planned Programs Subtotals</b>							9.415	7.874	8.839	0.000	8.839				
<b>C. Other Program Funding Summary (\$ in Millions)</b>															
<b>Line Item</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>				
• WPN 2280: Aerial Targets	133.937	150.561	174.336	-	174.336	170.948	177.239	178.608	180.466	Continuing	Continuing				
<b>Remarks</b>															
<b>D. Acquisition Strategy</b>															
Supersonics: The GQM-163A Supersonic Sea-Skimming Target (SSST) is an Acquisition Category II program. The acquisition strategy includes the continued development of Quad Launch, design efforts for integration of new Radome and Radar Altimeter, Electronic Warfare (EW) systems and other Engineering Change Proposals as required to emulate emerging threat systems. These development efforts will continue to be rolled into the production baseline. Production efforts are expected to continue at higher quantities in order to meet projected MDAP T&E requirements. Additionally, development of alternative supersonic targets is being explored.															

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0604258N / <i>Target Systems Development</i>	<b>Project (Number/Name)</b> 0609 / <i>Aerial Target System Dev</i>
<p>Congress was notified on September 25, 2015 that the Department of the Navy made the decision to terminate the Multi-Stage Supersonic Target (MSST) development program. Termination settlement efforts are ongoing with DCMA.</p> <p>Subsonics: The Subsonic Aerial Target (SSAT) program is an ACAT-IV program. The Low Rate Initial Production (LRIP) 3 contract was awarded in 3rd Quarter of FY19 with Full Rate Production (FRP) Contracts to follow. Engineering Change Proposals will be contracted as required via IDIQ contract vehicles to keep pace with emerging threat systems and changes rolled into the production baseline. Development efforts for other subsonic targets will be resourced via other contracting efforts as required.</p> <p>Target Threat Simulation Program (TTSP), Target Mission Support Systems (TMSS), Target Control, and Target Augmentation and Auxiliary Systems: The acquisition strategy for these components vary, depending on industry responses to government issued Requests for Information, but most are acquired via Firm Fixed Price IDIQ contracts.</p>		

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020				
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)						
1319 / 6					PE 0604258N / Target Systems Development				0612 / Surface Targets Development						
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			
0612: Surface Targets Development	0.000	1.271	1.353	1.385	-	1.385	1.414	1.442	1.471	1.500	Continuing	Continuing			
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-					
<b>A. Mission Description and Budget Item Justification</b>															
This project develops seaborne targets and their related target augmentation systems in support of air-to-surface and surface-to-surface weapons test and evaluation and fleet training.															
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>											FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<b>Title:</b> Surface Targets Development  <b>Articles:</b>											1.271	1.353	1.385	0.000	1.385
<b>FY 2020 Plans:</b> Develop new hardware for Portable Command and Control Unit (PCCU) with reduced footprint to enhance portability. Develop post-exercise analysis system for target swarm exercises. Develop chaff countermeasure launch controller for seaborne targets. Research large-scale electronic scoring systems for application to seaborne target exercises. Develop improvements to SeaCAN data bus and signal processing. Develop encryption method for SeaCAN data. Develop improvements to SeaCAN system to reduce potential for Electro-Magnetic Interference (EMI) and perform testing on new system components. Research and develop station-keeping capability for towed target platforms.											-	-	-	-	-
<b>FY 2021 Base Plans:</b> Research extension and integration of swarm remote control capabilities to other powered seaborne targets including Fast Attack Craft Target (FACT) and QST-35. Develop refinements to swarm remote control system based upon feedback from Fleet end users and target operators. Research potential manufacturing of seaborne targets from materials with lower environmental impact. Integrate marine traffic awareness/Automatic Identification System (AIS) capability into Portable Command and Control Unit (PCCU). Develop improved cyber security on seaborne target command and control systems. Research replacement low-cost stationary floating target for crew-served weapons training. Research improved system for over-the-horizon command and control for Seaborne Targets. Develop and test replacement human-representative training target for use on seaborne targets.															
<b>FY 2021 OCO Plans:</b>															

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy								<b>Date:</b> February 2020						
<b>Appropriation/Budget Activity</b> 1319 / 6			<b>R-1 Program Element (Number/Name)</b> PE 0604258N / Target Systems Development				<b>Project (Number/Name)</b> 0612 / Surface Targets Development							
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>									<b>FY 2019</b>	<b>FY 2020</b>				
N/A									<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>				
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minimal increase in funding from FY 2020 to FY 2021.									<b>FY 2021 Total</b>					
<b>Accomplishments/Planned Programs Subtotals</b>									1.271	1.353				
									1.385	0.000				
<b>C. Other Program Funding Summary (\$ in Millions)</b>														
<b>Line Item</b>		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2021</b>	<b>FY 2021</b>								
• OPN/5429: ASW SE		21.309	18.181	26.584	Base	OCO	Total	FY 2022	FY 2023	FY 2024	Cost To Complete			
					-		26.584	24.888	27.180	28.333	25.556 Continuing			
<b>Remarks</b>														
<b>D. Acquisition Strategy</b>														
Not applicable.														

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020		
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0604258N / Target Systems Development				Project (Number/Name) 2159 / ASW TARGET				
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	
2159: ASW TARGET		0.000	0.000	2.800	0.000	-	0.000	0.000	0.000	0.000	0.000	2.800	
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-	-		

**Note**

This project is a new start in FY2020.

**A. Mission Description and Budget Item Justification**

RDT&E,N Budget provides funding for Small Business Innovation Research (SBIR) Phase 2.5 for sprint speed and frequency expansion to improve performance capability for the Mk39 Mod 3 Expendable Mobile ASW Training Target (EMATT). This effort supports the transition of the Sprint Speed and Low Frequency Improvement Phase 2.5 efforts into MK 39 Mod 3 EMATT production and starts to investigate Continuous Active Sonar (CAS) capability to provide better detection performance and provide operators with a continuous track. Sprint Speed and Frequency Expansion upgrade allows EMATT to more closely represent submarine tactics for evasion and will make it compatible with new ASW sensors like the LCS ASW mission package.

<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>					<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
<b>Title:</b> New Accomplishment/Planned Program Entry					0.000	2.800	0.000	0.000	0.000
					<b>Articles:</b>	-	-	-	-
<b>FY 2020 Plans:</b>									
RDT&E,N funding in FY20 will be used to continue to address performance shortfalls in the current fleet of MK39 Mod 3 EMATTs to add Sprint Speed and Frequency Expansion upgrades to be more compatible with New ASW Sensors.									
<b>FY 2021 Base Plans:</b>									
N/A									
<b>FY 2021 OCO Plans:</b>									
N/A									
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b>									
No additional development funding provided FY21+.									
<b>Accomplishments/Planned Programs Subtotals</b>					0.000	2.800	0.000	0.000	0.000

<b>C. Other Program Funding Summary (\$ in Millions)</b>									
N/A									

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy	<b>Date:</b> February 2020	
<b>Appropriation/Budget Activity</b> 1319 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0604258N / <i>Target Systems Development</i>	<b>Project (Number/Name)</b> 2159 / ASW TARGET
<b>C. Other Program Funding Summary (\$ in Millions)</b>		
<b>Remarks</b>		
<b>D. Acquisition Strategy</b> N/A		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy											Date: February 2020		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)								
1319: Research, Development, Test & Evaluation, Navy / BA 6: RDT&E Management Support					PE 0604759N / Major T&E Investment								
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	86.967	107.348	85.195	-	85.195	73.510	63.901	66.900	68.182	Continuing	Continuing	
2195: T & E Investment	0.000	73.935	85.348	85.195	-	85.195	73.510	63.901	66.900	68.182	Continuing	Continuing	
9999: Congressional Adds	0.000	13.032	22.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	35.032	

**A. Mission Description and Budget Item Justification**

This project corrects major deficiencies, improves Test & Evaluation (T&E) capabilities, and increases T&E support effectiveness at Navy Major Range and Test Facility Base ranges and facilities. The T&E Investment project improves, modernizes and adds new test capabilities at the following test facilities: the Naval Undersea Warfare Center Division Newport Atlantic Undersea Test and Evaluation Center, Andros Island, Bahamas; the Nanoose and Dabob ranges of the Naval Undersea Warfare Center Division Keyport, Keyport, WA; the Sea Range, Land Ranges, Target Operations, Ordnance T&E Facility, Test Wing Pacific located at the Naval Air Warfare Center Weapons Division, Point Mugu, CA and China Lake, CA; and the Atlantic Test Range, Air Combat Environment T&E Facility, Electromagnetic Environmental Effects, Air Vehicle Modification and Instrumentation facility, Test Wing Atlantic, Target Operations, and the Propulsion Systems Evaluation Facility located at the Naval Air Warfare Center Aircraft Division, Patuxent River, MD and the test and evaluation capabilities located at the Pacific Missile Range Facility, Kauai, HI.

**JUSTIFICATION FOR BUDGET ACTIVITY:** This program is funded under RESEARCH, DEVELOPMENT, TEST and EVALUATION MANAGEMENT SUPPORT because it supports efforts directed toward sustaining or modernizing installations or operations required for general research, development, test and evaluation.

B. Program Change Summary (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	90.514	85.348	83.560	-	83.560
Current President's Budget	86.967	107.348	85.195	-	85.195
Total Adjustments	-3.547	22.000	1.635	-	1.635
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	22.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-2.434	0.000			
• SBIR/STTR Transfer	-1.113	0.000			
• Program Adjustments	0.000	0.000	1.635	-	1.635
• Rate/Misc Adjustments	0.000	0.000	0.000	-	0.000

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

Project: 9999: Congressional Adds

FY 2019	FY 2020

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<b>Exhibit R-2, RDT&amp;E Budget Item Justification: PB 2021 Navy</b>		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy / BA 6: RDT&amp;E Management Support</i>	<b>R-1 Program Element (Number/Name)</b> PE 0604759N / <i>Major T&amp;E Investment</i>	
<b>Congressional Add Details (\$ in Millions, and Includes General Reductions)</b>		<b>FY 2019</b>
Congressional Add: <i>Fifth Generation Radar Ground Test Upgrades</i>		3.861
Congressional Add: <i>Complex Electronic Warfare Test Equipment</i>		3.379
Congressional Add: <i>Ground Based Sense-and-Avoid</i>		5.792
Congressional Add: <i>Undersea range modernization</i>		0.000
Congressional Add: <i>Naval research laboratory facilities</i>		0.000
		Congressional Add Subtotals for Project: 9999
		Congressional Add Totals for all Projects
		13.032
		22.000
		13.032
		22.000

**Change Summary Explanation**

The FY 2021 funding request increased by \$2.3M in support of Joint Electronic Warfare Threats (JETS).

FY 2021 funding request was reduced by \$0.665 million to account for the availability of prior year execution balances.

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020		
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0604759N / Major T&E Investment				Project (Number/Name) 2195 / T & E Investment				
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	
2195: T & E Investment	0.000	73.935	85.348	85.195	-	85.195	73.510	63.901	66.900	68.182	Continuing	Continuing	
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-			

**A. Mission Description and Budget Item Justification**

This project corrects major deficiencies, improves Test & Evaluation (T&E) capabilities, and increases T&E support effectiveness at Navy Major Range and Test Facility Base ranges and facilities. The T&E Investment project improves, modernizes and adds new test capabilities at the following test facilities: the Naval Undersea Warfare Center Division Newport Atlantic Undersea Test and Evaluation Center (AUTEC), Andros Island, Bahamas; the Nanoose and Dabob ranges of the Naval Undersea Warfare Center Division Keyport, Keyport, WA; the Sea Range, Land Ranges, Target Operations, Ordnance T&E Facility, Test Wing Pacific located at the Naval Air Warfare Center Weapons Division, Point Mugu, CA and China Lake, CA; and the Atlantic Test Range, Air Combat Environment T&E Facility, Electromagnetic Environmental Effects, Air Vehicle Modification and Instrumentation facility, Test Wing Atlantic, Target Operations, and the Propulsion Systems Evaluation Facility located at the Naval Air Warfare Center Aircraft Division, Patuxent River, MD and the test and evaluation capabilities located at the Pacific Missile Range Facility, Kauai, HI.

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

FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
6.611	6.281	11.736	0.000	11.736

**Title:** UNDERSEA RANGE INVESTMENTS

**Articles:**

**Description:** This effort funds the modernization, upgrades, and new test and evaluation capabilities required at the Navy's Major Range Test Facility Base undersea ranges, to include AUTEC, Andros Island, Bahamas and the Nanoose and Dabob ranges of the Naval Undersea Warfare Center Division Keyport, Keyport, WA.

**FY 2020 Plans:**

- Continue the minor upgrade and modernization of test capabilities at AUTEC, Nanoose and Dabob.
- Continue tracking system modernization at Nanoose and Dabob.
- Continue torpedo control panel modernization at Nanoose and Dabob.
- Complete recovery system improvement at Nanoose and Dabob.
- Initiate range telemetry and communications upgrade at Nanoose and Dabob.
- Initiate procurement of small range craft for unmanned underwater vehicle (UUV) work at Nanoose and Dabob.
- Initiate modernization of range data management system at Nanoose and Dabob.
- Initiate cyber security upgrades at Nanoose and Dabob.

**FY 2021 Base Plans:**

- Continue the minor upgrade and modernization of test capabilities at AUTEC, Nanoose and Dabob.
- Continue modernization of range data management system at Nanoose and Dabob.

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy				<b>Date:</b> February 2020			
<b>Appropriation/Budget Activity</b> 1319 / 6		<b>R-1 Program Element (Number/Name)</b> PE 0604759N / Major T&E Investment	<b>Project (Number/Name)</b> 2195 / T & E Investment				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>							
FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total			
<ul style="list-style-type: none"> <li>- Complete tracking system modernization at Nanoose and Dabob.</li> <li>- Complete torpedo control panel modernization at Nanoose and Dabob.</li> <li>- Complete range telemetry and communications upgrade at Nanoose and Dabob.</li> <li>- Complete procurement of small range craft for unmanned underwater vehicle (UUV) work at Nanoose and Dabob.</li> <li>- Complete cyber security upgrades to critical range instrumentation and networks at Nanoose and Dabob.</li> <li>- Initiate replacement of underwater cables to hydrophone arrays at Nanoose and Dabob.</li> <li>- Initiate upgrade to acoustic acquisition systems and replace the acoustic signal processing systems at Nanoose and Dabob.</li> <li>- Initiate replacement of the acoustic signal processing system at AUTEC.</li> <li>- Initiate replacement of the shore electronics interface to the hydrophone system at AUTEC.</li> <li>- Initiate replacement of the array structures at Nanoose and Dabob.</li> </ul>							
<b>FY 2021 OCO Plans:</b> N/A							
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> The funding increase from FY 2020 to FY 2021 is due to the initiation of multiple projects including the underwater cable replacement, shore electronics replacement and multiple acoustic signal processor efforts.							
<b>Title:</b> OPEN AIR RANGE INVESTMENTS		<b>Articles:</b>	40.168	34.901	37.695	0.000	37.695
<p><b>Description:</b> This effort funds the modernization and upgrades of existing capabilities and the development of new T&amp;E capabilities required at the Navy's Major Range Test Facility Base open air ranges at the Naval Air Warfare Center Aircraft Division (NAWCAD), Patuxent River, MD, Naval Air Warfare Center Weapons Division (NAWCWD), Point Mugu, CA and China Lake, CA and Pacific Missile Range Facility (PMRF), Kauai, HI.</p>							
<b>FY 2020 Plans:</b>							
<ul style="list-style-type: none"> <li>- Continue the minor upgrade and modernization of test capabilities at NAWCAD, NAWCWD and PMRF.</li> <li>- Continue procurement of Range Support Aircraft.</li> <li>- Continue the development of Environmental Impact Statements at NAWCAD and NAWCWD.</li> <li>- Continue the development and integration of Telemetry and optics equipment on the Range Support Aircraft.</li> <li>- Complete the modernization of the telemetry antenna controllers and data processors at PMRF.</li> <li>- Complete the modernization of the imaging radar at PMRF.</li> <li>- Complete the upgrade of the avionic data processing and display system at NAWCAD.</li> </ul>							

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy					Date: February 2020	
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 0604759N / Major T&E Investment	Project (Number/Name) 2195 / T & E Investment				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
- Complete modernization of the imaging radar mechanical assemblies at PMRF. - Complete the replacement of the FOCUS cable at NAWCWD. - Complete the upgrade for ground based testing against a 5th generation aerial threat. This effort will upgrade an existing track test facility at NAWCWD with the ability to suspend a 5th generation aircraft for use in testing sensors. - Initiate the imaging radar transmitter modernization at PMRF. - Initiate cyber security upgrades at NAWCWD. - Initiate and complete the modernization of the down range network at NAWCAD. - Initiate and complete the modernization of the surface surveillance radars at NAWCAD. - Initiate and complete the modernization of the HD video distribution capability at NAWCWD. - Initiate and complete the modernization of the command and control transmitter at NAWCWD. -Initiate and complete the laser designator modernization at NAWCWD.						
<b>FY 2021 Base Plans:</b> - Continue the minor upgrade and modernization of test capabilities at NAWCAD, NAWCWD and PMRF. - Continue procurement of Range Support Aircraft. - Continue the development of Environmental Impact Statements at NAWCAD. - Continue the development and integration of Telemetry and optics equipment on the Range Support Aircraft. - Continue the imaging radar transmitter modernization at PMRF. - Continue cyber security upgrades to critical range instrumentation and networks at NAWCWD. - Complete the development of Environmental Impact Statements at NAWCWD. - Initiate remotely operated tracking radar modernization at NAWCWD. - Initiate telemetry recorder replacement at PMRF. - Initiate telemetry processor modernization at NAWCAD. - Initiate optical tracking mount replacement at PMRF. - Initiate optical sensor modernization at PMRF. - Initiate tracking pedestal modernization at NAWCAD. - Initiate mobile radio replacement at NAWCWD. - Initiate imaging radar modernization at NAWCAD. - Initiate software modifications to increase Joint Electronic Warfare Threats (JETS) air warfare battleshaping capabilities at NAWC WD.						
<b>FY 2021 OCO Plans:</b>						

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy					Date: February 2020	
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 0604759N / Major T&E Investment	Project (Number/Name) 2195 / T & E Investment				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
N/A						
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> The funding increase from FY 2020 to FY 2021 is due to the initiation of multiple projects including increasing the Joint Electronic Warfare Threats (JETS) air warfare battleshaping capabilities, the modernization of the remotely operated radar, the telemetry processor, optical sensors, tracking pedestal, and the imaging radar as well as the purchase of mobile radios and the optical tracking mount.						
<b>Title:</b> TEST FACILITIES INVESTMENTS  <b>Articles:</b>	27.156	44.166	35.764	0.000	35.764	
<b>Description:</b> This effort funds the modernization and upgrades of existing capabilities and the development of new Test & Evaluation capabilities required at the Navy's Major Range Test Facility Base ground test facilities at NAWCAD, Patuxent River, MD, and NAWCWD, Point Mugu, CA and China Lake, CA.	-	-	-	-	-	-
<b>FY 2020 Plans:</b> <ul style="list-style-type: none"> <li>- Continue the minor upgrade and modernization of test capabilities at NAWCAD and NAWCWD and the upgrade to general instrumentation and equipment.</li> <li>- Continue the test cell performance improvement at NAWCAD. This effort will upgrade Propulsion Systems Evaluation Facility turbine engine test cell to provide uniform temperature and pressure intake airflow and improve dynamometer performance. FY 2020 work includes completing the design work, ordering materials and beginning the assembly of the equipment.</li> <li>- Continue the modernization of the insensitive munitions test arena at NAWCWD. Tasks include developing requirements for modernizing the control room, test pads and cable paths to the test arena and developing a contract package to implement the modernization of the Ordnance test facility.</li> <li>- Complete the upgrade for model and simulation testing against a 5th generation aerial threat. This effort will develop the capability to synchronize radio frequency output of different electronic warfare environment generators for a coherent presentation.</li> <li>- Complete the modernization of the data acquisition and processing system at NAWCAD. This effort will modernize the Electro Magnetic Pulse (EMP) instrumentation by replacing analog fiber links and obsolete oscilloscopes and control triggers with modern supportable equipment. In FY 2019, the prototype instrumentation package will be developed.</li> <li>- Complete the procurement of the direct drive electromagnetic test system at NAWCAD. This effort will evaluate potential amplifier solutions to replace amplifiers at the Electromagnetic/Environmental/Effects (E3) facility that are no longer supported by the manufacturer. The replacement amplifiers will provide less distortion/better representation responses and be maintainable.</li> </ul>						

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<b>Exhibit R-2A, RDT&amp;E Project Justification: PB 2021 Navy</b>					<b>Date:</b> February 2020	
<b>Appropriation/Budget Activity</b> 1319 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0604759N / Major T&E Investment	<b>Project (Number/Name)</b> 2195 / T & E Investment				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
- Initiate the purchase of materials that will enable the establishment of free standing chamber walls at NAWCAD. This will allow an increased through put of testing by allowing limited anechoic testing in spaces that were not designed to be anechoic.						
- Initiate and complete the purchase of a global positioning simulator at NAWCAD.						
- Initiate and complete the purchase of x-ray equipment designed to examine munitions and ordnance at NAWCWD.						
Modeling and Simulation:						
- Continue multi-site and multi-domain modeling and simulation test bed design. Develop virtualized representations of high-priority Navy systems to integrate into complex digital battle space and into National Cyber Range. Innovate and standardize virtualization and integration process for use in DON Modeling & Simulation/Live Virtual Constructive (LVC) Environment. Evaluate architecture of major modeling and simulation environments and integrate major multi-domain test beds using best practices, open interfaces and ensure standing persistent connectability. Task will promulgate Enterprise models across Air, Surface, Subsurface and Cyber domains. Collaborate on improvements required for multi-Domain modeling and complex security environments to facilitate "Capability" Analysis/RDT&E/Training and fund enabling technologies. FY 2020 work includes decomposing major modeling architecture frameworks and designing a common compatible framework and developing a configuration methodology for promulgating enterprise models across multiple domains.						
- Continue common modeling and simulation tool design effort. Enhance Model Based Systems Engineering tools and integrate tools with T&E capabilities, allowing improved planning for agile software testing and cyber evaluations. Develop state-of-the-art data analysis and mining tools to integrate and present cohesive results in complex LVC environments. Develop architecture to integrate emerging Threat Intelligence products for both classified software, virtual and low cost hardware representations. Improve and integrate Integrated Threat Analysis Simulation Environment to meet Navy requirements. Update immersive visualization model suite to add complex Electronic Warfare (EW) effects and improve ability to evaluate and understand complex interactions tied to warfighting outcomes. Continue to integrate and transition best-of-breed innovations coming from research centers, DIUX and the gaming industry into use at RDT&E facilities for program and prototyping support. Incorporate improved EW effects/interactions into constructive modeling and integrate with virtual/hardware in the loop labs/ranges to create a coherent LVC EW/Electromagnetic Spectrum Maneuver Warfare evaluation environment. Analyze future state and develop plan to assess new capabilities for fusion and predictive systems. Integrate ONR modeling tools into test beds to allow assessment of human performance when assisted by improved machine-learning technologies. Focus on integration with Next Generation Threat System as core enterprise simulation and allow assessment in both test/training environments. Design, develop and integrate reference Interoperability emulators, low fidelity capability assessment tools and battlespace						

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy					Date: February 2020	
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 0604759N / Major T&E Investment	Project (Number/Name) 2195 / T & E Investment				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
suite design to allow platforms to assess performance early in system development. FY 2020 work includes adding EW effects to immersive visualization model suites and adding EW effects into constructive models and integrating them with virtual and hardware in the loop labs and ranges.	- Initiate advanced immersive visualization of battlespace and red/blue interactions. Task will update immersive visualization model suite to add complex EW effects and improve ability to evaluate and understand complex interactions tied to warfighting outcomes. - Initiate update of Naval model and simulation environment to implement improved electronic warfare modeling effect and interactions. Task will incorporate improved Electronic Warfare (EW) effects and interactions into constructive modeling and integrate with virtual and hardware-in-the-loop labs and ranges to create a coherent Live Virtual Constructive (LVC) EW evaluation environment. - Initiate update to Family Of Simulation models to account for offensive and defensive cyber effects in the battlespace. Task will update constructive models used for analysis and RDT&E to incorporate modeling of red/blue cyber effects - Improvement to support assessment of machine-assisted learning and automated intelligence (AI). Integrate AI tools with Next Generation Threat System as core enterprise simulation and allow assessment in both test/training environments.					
<b>FY 2021 Base Plans:</b> - Continue the minor upgrade and modernization of test capabilities at NAWCAD and NAWCWD and the upgrade to general instrumentation and equipment. - Complete the test cell performance improvement at NAWCAD. This effort will upgrade Propulsion Systems Evaluation Facility turbine engine test cell to provide uniform temperature and pressure intake airflow and improve dynamometer performance. - Complete the modernization of the insensitive munitions test arena at NAWCWD. Tasks include renovating and modernizing the control room, refurbishing the test pads and cable paths to the test arena and replacing associated cabling between the test pad and control room at the Ordnance test facility. - Complete the implementation of a free standing chamber NAWCAD. This will allow an increased through put of testing by allowing limited anechoic testing in spaces that were not designed to be anechoic. - Initiate ordnance test arena at NAWC WD by replacing conduits, cabling, firing control system and data collection system. - Initiate helicopter drive system upgrade by aligning test stand and replacing loading and instrumentation at NAWCAD.  Modeling and Simulation:						

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy				<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 6		<b>R-1 Program Element (Number/Name)</b> PE 0604759N / Major T&E Investment	<b>Project (Number/Name)</b> 2195 / T & E Investment	
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>				
FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<p>- Continue multi-site and multi-domain modeling and simulation test bed design. Integrate virtualized representations of high-priority Navy systems including Littoral Combat Ship, P-8A and MQ-4C Triton into complex digital battle space and National Cyber Range. Implement virtualization and integration methodology for use in DON Modeling &amp; Simulation/Live Virtual Constructive (LVC) Environment. Implement enterprise toolbox to integrate diverse models into prototype laboratory environment.</p> <p>- Continue common modeling and simulation tool design effort. Implement and test architecture interface to integrate emerging Threat Intelligence products with hardware representations. Threat Intelligence models will include the Integrated Threat Analysis Simulation Environment.</p> <p>- Continue advanced immersive visualization of battlespace and red/blue interactions. Demonstrate immersive visualization model suite, which added complex Electronic Warfare (EW) effects, to evaluate the level of improvement over the traditional tools. Analyze visualization areas still requiring refinement and develop implementation plan.</p> <p>- Continue update of Naval model and simulation environment to implement improved electronic warfare modeling effect and interactions. Test and analyze the fidelity and accuracy of the Electronic Warfare (EW) interactions that are available because of the improvements to the modeling environment. Testing will include virtual and hardware-in-the-loop labs and ranges to create a coherent Live Virtual Constructive (LVC) EW evaluation environment.</p> <p>- Continue update to Family Of Simulation models to account for offensive and defensive cyber effects in the battlespace. Integrate Automated Intelligence and Machine Learning models with the Next Generation Threat System environment then assess the improvements available to both test and training.</p>				
<b>FY 2021 OCO Plans:</b> N/A				
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Funding decrease from FY 2020 to FY 2021 is due to the completion of the test cell performance improvement project, the modernization of the insensitive munitions test arena and the purchase of the freestanding chamber.				
<b>Accomplishments/Planned Programs Subtotals</b>		73.935	85.348	85.195
		0.000		85.195
<b>C. Other Program Funding Summary (\$ in Millions)</b>				
N/A				
<b>Remarks</b>				

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy	<b>Date:</b> February 2020	
<b>Appropriation/Budget Activity</b> 1319 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0604759N / Major T&E Investment	<b>Project (Number/Name)</b> 2195 / T & E Investment
<b>D. Acquisition Strategy</b> Not Applicable.		

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020		
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0604759N / Major T&E Investment				Project (Number/Name) 9999 / Congressional Adds				
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	
9999: Congressional Adds	0.000	13.032	22.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	35.032	
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-	-		
<b>A. Mission Description and Budget Item Justification</b>													
Congressional Add													
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>													
<b>Congressional Add:</b> Fifth Generation Radar Ground Test Upgrades										3.861	8.000		
<b>FY 2019 Accomplishments:</b> Initiate the development of advanced radar target generators for modern radar test support at NAWCAD.													
<b>FY 2020 Plans:</b> Continue and complete the development of advanced radar target generators for modern radar test support at NAWCAD.													
<b>Congressional Add:</b> Complex Electronic Warfare Test Equipment										3.379	5.000		
<b>FY 2019 Accomplishments:</b> Initiate upgrades to Air Combat Environment Test & Evaluation Facility (ACETEF) EW stimulation capability in support Mission testing at NAWCAD.													
<b>FY 2020 Plans:</b> Continue and complete upgrades to Air Combat Environment Test & Evaluation Facility (ACETEF) EW stimulation capability in support Mission testing at NAWCAD.													
<b>Congressional Add:</b> Ground Based Sense-and-Avoid										5.792	0.000		
<b>FY 2019 Accomplishments:</b> To initiate and complete the enhancement of Atlantic Test Range (ATR) air and ground surveillance capability in support of Unmanned Aircraft Systems (UAS) operations at Naval Air Warfare Center Aircraft Division (NAWCAD).													
<b>FY 2020 Plans:</b> N/A													
<b>Congressional Add:</b> Undersea range modernization										0.000	4.000		
<b>FY 2019 Accomplishments:</b> N/A													
<b>FY 2020 Plans:</b> Initiate and complete modernization to the undersea tracking and communication infrastructure at NUWC Keyport.													
<b>Congressional Add:</b> Naval research laboratory facilities										0.000	5.000		

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy			<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0604759N / Major T&E Investment	<b>Project (Number/Name)</b> 9999 / Congressional Adds	
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>			
<b>FY 2019 Accomplishments:</b> N/A		<b>FY 2019</b>	<b>FY 2020</b>
<b>FY 2020 Plans:</b> Initiate and complete modernization to laboratories and equipment at NAWC AD and NAWC WD.			
	<b>Congressional Adds Subtotals</b>	13.032	22.000
<b>C. Other Program Funding Summary (\$ in Millions)</b>			
N/A			
<b>Remarks</b>			
<b>D. Acquisition Strategy</b>			
Not required for Congressional Adds			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy											Date: February 2020						
Appropriation/Budget Activity					R-1 Program Element (Number/Name)												
1319: Research, Development, Test & Evaluation, Navy / BA 6: RDT&E Management Support					PE 0605126N I (U)Joint Theater Air and Missile Defense Org												
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	0.046	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.046					
3307: Maritime Integrated Air and Missile Defense (IAMD) Processing Sys (MIPS)	0.000	0.046	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.046					
<b>A. Mission Description and Budget Item Justification</b>																	
Maritime Integrated Air and Missile Defense (IAMD) Planning System (MIPS) is an automated air and missile defense planning tool that supports the Joint Force Maritime Component Commander at the Operational Level of War (OLW) by automatically and optimally allocating and stationing ships in support of Ballistic Missile Defense (BMD) and Anti-Air Warfare (AAW). MIPS contains United States Army Patriot and Terminal High Altitude Air Defense (THAAD) models to ensure synergistic allocation and positioning of maritime units in relation to other joint units, providing optimized mutual defense for selected defended assets against selected BMD and AAW threats. MIPS completed developing significantly improved inorganic Ballistic Missile Defense planning capabilities through the incorporation of Long Range Surveillance and Training, Cued Engagement, and Launch on Tactical Digital Information Links (TADIL) planning functionality. In FY2015, MIPS began development to deliver an automated planning capability for Naval Integrated Fire Control-Counter Air (NIFC-CA) operations, incorporating the Naval Positioning Assessment Tool (NPAT) to assist in aviation asset placement, bottom contours will be added to refine the areas of ship positioning during the planning process, and adding the Cooperative Engagement Capability (CEC) stationing planning capability.																	
<b>B. Program Change Summary (\$ in Millions)</b>					FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total								
Previous President's Budget					0.048	0.000	0.000	-	0.000								
Current President's Budget					0.046	0.000	0.000	-	0.000								
Total Adjustments					-0.002	0.000	0.000	-	0.000								
<ul style="list-style-type: none"> <li>• Congressional General Reductions</li> <li>• Congressional Directed Reductions</li> <li>• Congressional Rescissions</li> <li>• Congressional Adds</li> <li>• Congressional Directed Transfers</li> <li>• Reprogrammings</li> <li>• SBIR/STTR Transfer</li> <li>• Rate/Misc Adjustments</li> </ul>					-	-	-	-	-								
					-0.002	0.000	0.000	-	0.000								
					0.000	0.000	0.000	-	0.000								
<b>Change Summary Explanation</b>																	
FY19 reflects -\$0.002M due to SBIR transfer.																	

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020							
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)									
1319 / 6					PE 0605126N I (U)Joint Theater Air and Missile Defense Org				3307 I Maritime Integrated Air and Missile Defense (IAMD) Processing Sys (MIPS)									
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						
3307: Maritime Integrated Air and Missile Defense (IAMD) Processing Sys (MIPS)	0.000	0.046	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.046						
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-								
<b>A. Mission Description and Budget Item Justification</b>																		
Maritime Integrated Air and Missile Defense (IAMD) Planning System (MIPS) is an automated air and missile defense planning tool that supports the Joint Force Maritime Component Commander at the Operational Level of War (OLW) by automatically and optimally allocating and stationing ships in support of Ballistic Missile Defense (BMD) and Anti-Air Warfare (AAW). MIPS contains United States Army Patriot and Terminal High Altitude Air Defense (THAAD) models to ensure synergistic allocation and positioning of maritime units in relation to other joint units, providing optimized mutual defense for selected defended assets against selected BMD and AAW threats. MIPS completed developing significantly improved inorganic Ballistic Missile Defense planning capabilities through the incorporation of Long Range Surveillance and Training, Cued Engagement, and Launch on Tactical Digital Information Links (TADIL) planning functionality. In FY2015, MIPS began development to deliver an automated planning capability for Naval Integrated Fire Control-Counter Air (NIFC-CA) operations, incorporating the Naval Positioning Assessment Tool (NPAT) to assist in aviation asset placement, bottom contours will be added to refine the areas of ship positioning during the planning process, and adding the Cooperative Engagement Capability (CEC) stationing planning capability.																		
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>											FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total			
<b>Title:</b> Systems Engineering											<b>Articles:</b>			0.046	0.000	0.000	0.000	0.000
<b>FY 2020 Plans:</b> N/A														-	-	-	-	
<b>FY 2021 Base Plans:</b> N/A																		
<b>FY 2021 OCO Plans:</b> N/A																		
<b>Accomplishments/Planned Programs Subtotals</b>											0.046	0.000	0.000	0.000	0.000	0.000		
<b>C. Other Program Funding Summary (\$ in Millions)</b>																		
N/A																		

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0605126N I (U)Joint Theater Air and Missile Defense Org	<b>Project (Number/Name)</b> 3307 I Maritime Integrated Air and Missile Defense (IAMD) Processing Sys (MIPS)
<b>C. Other Program Funding Summary (\$ in Millions)</b>		
<b>Remarks</b>		
<b>D. Acquisition Strategy</b> ACAT III designation granted February 2011. The MIPS Capabilities Development Document (CDD) signed and approved 4QTRFY2016.		
Contracts: MIPS RDT&E FY15-FY17		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy											Date: February 2020						
Appropriation/Budget Activity					R-1 Program Element (Number/Name)												
1319: Research, Development, Test & Evaluation, Navy / BA 6: RDT&E Management Support					PE 0605152N / Studies & Analysis Supt - Navy												
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	3.870	3.908	3.089	-	3.089	3.158	3.381	3.342	3.409	Continuing	Continuing					
2092: Naval Warfare Studies	0.000	0.766	0.785	0.025	-	0.025	0.000	0.000	0.000	0.000	0.000	1.576					
2097: Manpower Personnel & Training	0.000	0.528	0.531	0.501	-	0.501	0.512	0.522	0.533	0.544	Continuing	Continuing					
3310: Naval Aviation Developmental Planning	0.000	2.576	2.592	2.563	-	2.563	2.646	2.859	2.809	2.865	Continuing	Continuing					
<b>A. Mission Description and Budget Item Justification</b>																	
This program provides analytical support to the Secretary of the Navy and the Chief of Naval Operations as a basis for major policy, planning and acquisition program execution decisions. It supports research and development strategy development and planning. It supports studies in the areas of manpower, personnel, training, and aviation. It also develops analytical tools for evaluating effectiveness of U.S. weapons against potential foreign threat ships and submarines.																	
<b>JUSTIFICATION FOR BUDGET ACTIVITY:</b> This program is funded under RESEARCH, DEVELOPMENT, TEST and EVALUATION MANAGEMENT SUPPORT because it supports efforts directed toward sustaining or modernizing installations or operations required for general research, development, test and evaluation.																	
<b>B. Program Change Summary (\$ in Millions)</b>			FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total										
Previous President's Budget			3.942	3.908	3.922	-	-										
Current President's Budget			3.870	3.908	3.089	-	-										
Total Adjustments			-0.072	0.000	-0.833	-	-										
• Congressional General Reductions			-	-	-												
• Congressional Directed Reductions			-	-	-												
• Congressional Rescissions			-	-	-												
• Congressional Adds			-	-	-												
• Congressional Directed Transfers			-	-	-												
• Reprogrammings			-	-	-												
• SBIR/STTR Transfer			-0.072	0.000	-												
• Program Adjustments			0.000	0.000	-0.844	-	-										
• Rate/Misc Adjustments			0.000	0.000	0.011	-	-										
<b>Change Summary Explanation</b>																	
Technical: Not applicable.																	
Schedule: Not applicable.																	

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<b>Exhibit R-2, RDT&amp;E Budget Item Justification:</b> PB 2021 Navy	<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy</i> / BA 6: <i>RDT&amp;E Management Support</i>	<b>R-1 Program Element (Number/Name)</b> PE 0605152N / <i>Studies &amp; Analysis Supt - Navy</i>
Funding: FY2020 to FY2021 funding reduction to Project 2092 was due to reduction of RAM user efforts.	

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020		
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0605152N / Studies & Analysis Supt - Navy				Project (Number/Name) 2092 / Naval Warfare Studies				
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	
2092: Naval Warfare Studies	0.000	0.766	0.785	0.025	-	0.025	0.000	0.000	0.000	0.000	0.000	1.576	
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

This project supports detailed mission, capability, and technical analysis of future naval warfighting requirements. This work provides the analytical basis for integration and prioritization of overall military capability requirements and acquisition programs in support of executing the Naval Capability Development Process and development/delivery of Mission Capability Packages, Naval Capability Packages, and Integrated Strategic Capability Plans for Chief of Naval Operations. The Resource Allocation Model (RAM) is an analytic decision support tool to aid Navy leadership with both investment and divestment programming decisions. This methodology provides an assessment process that fosters informed, understandable, repeatable investment decisions with consistent, pedigreed, and retrievable information. The focus of this work adds fidelity to the system through the inclusion of Mission Technical Baselines and Integrated Capabilities Technical Baselines data to identify program of record integration and interoperability dependencies to inform investment/divestment decisions. It provides leadership and resource sponsors with a starting point for their offset decision process as well as an issue ranking capability. RAM will include linkage of programs to strategic imperatives, programs mapped to warfare areas, program interdependencies annotated, and balance factors that can be adjusted to reflect Navy Leadership Priorities. This effort captures and maps issues/funding adjustments, and providing a system capable of identifying fiscal interdependencies and consideration to risk in order to increase accuracy in calculating programmatic risk.

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

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<b>Title:</b> Resource Allocation Model (RAM)	0.766	0.785	0.025	0.000	0.025
<b>Articles:</b>	-	-	-	-	-

**FY 2020 Plans:**  
 Continue establishing the Resource Allocation Model to provide an analytic portfolio management methodology to aid Navy leadership with investment decision support. Provide an assessment process that fosters informed, understandable, repeatable investment decisions with consistent, pedigreed, and retrievable information.  
 Assess programs of record and their proposed modifications on their capability to contribute to future warfighting requirements.

**FY 2021 Base Plans:**  
 Continue updating the Resource Allocation Model to provide an analytic portfolio management methodology to aid Navy leadership with investment decision support. Provide an assessment process that fosters informed, understandable, repeatable investment decisions with consistent, pedigreed, and retrievable information.

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020
<b>Appropriation/Budget Activity</b> 1319 / 6		<b>R-1 Program Element (Number/Name)</b> PE 0605152N / Studies & Analysis Supt - Navy	<b>Project (Number/Name)</b> 2092 / Naval Warfare Studies	
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>				
FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Assess programs of record and their proposed modifications on their capability to contribute to future warfighting requirements.				
<b>FY 2021 OCO Plans:</b> N/A				
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Reduction of -0.785 from FY 2020 to FY 2021 is due to reduction of RAM user efforts.				
<b>Accomplishments/Planned Programs Subtotals</b>		0.766	0.785	0.025
<b>C. Other Program Funding Summary (\$ in Millions)</b>		0.000	0.025	
N/A				
<b>Remarks</b>				
<b>D. Acquisition Strategy</b> Not applicable.				

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020				
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0605152N / Studies & Analysis Supt - Navy				Project (Number/Name) 2097 / Manpower Personnel & Training						
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		
2097: Manpower Personnel & Training		0.000	0.528	0.531	0.501	-	0.501	0.512	0.522	0.533	0.544	Continuing	Continuing		
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-	-				
<b>A. Mission Description and Budget Item Justification</b>															
The Chief of Naval Personnel has a continuing need for studies and analysis of Manpower and Personnel (M&P) policies and programs and critical M&P issues that have Navy-wide implications. This project provides an essential management tool to: (a) assess the effectiveness of existing M&P policies and programs; (b) identify needs for new policies and programs; (c) determine the required manpower and training mix relative to changing demographic, societal and legislative/regulatory actions, and to evolving strategic and geopolitical factors; (d) study the impact of M&P programs on Navy accession, attrition, retention, and performance; and, (e) to develop, validate and/or refine a broad range of M&P forecasting models. The program permits Navy to more effectively utilize Research and Development expertise to respond to emergent M&P issues on a continuing basis. This program is funded under RDT&E operational systems development because it encompasses engineering and development of new end-items prior to production approval decision.															
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>											FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<b>Title:</b> Manpower Personnel & Training  <b>Articles:</b>											0.528 4	0.531 5	0.501 5	0.000 -	0.501 5
<b>Description:</b> The Chief of Naval Personnel has a continuing need for studies and analysis of Manpower and Personnel (M&P) policies and programs and critical M&P issues that have Navy-wide implications. This project provides an essential management tool to: (a) assess the effectiveness of existing M&P policies and programs; (b) identify needs for new policies and programs; (c) determine the required manpower and training mix relative to changing demographic, societal and legislative/regulatory actions, and to evolving strategic and geopolitical factors; (d) study the impact of M&P programs on Navy accession, attrition, retention, and performance; and, (e) to develop, validate and/or refine a broad range of M&P forecasting models. The program permits Navy to more effectively utilize Research and Development expertise to respond to emergent M&P issues on a continuing basis. This program is funded under RDT&E operational systems development because it encompasses engineering and development of new end-items prior to production approval decision. Analytical support to the Secretary of the Navy and the Chief of Naval Personnel as a basis for major policy, planning, and acquisition program execution decisions. It supports the maturation and implementation of strategy and planning via studies in the areas of manpower, personnel, training, and education.															
<b>FY 2020 Plans:</b>															

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy			<b>Date:</b> February 2020			
<b>Appropriation/Budget Activity</b> 1319 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0605152N / Studies & Analysis Supt - Navy		<b>Project (Number/Name)</b> 2097 / Manpower Personnel & Training			
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>						
		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<ul style="list-style-type: none"> <li>- Continue assessing Special and Incentive Pay policies.</li> <li>- Continue assessing Econometric Modeling System and updating elasticity</li> <li>- Continue assessing and evaluating retention, accession and training trade-offs.</li> <li>- Continue assessing economic factors and relationships to MPTE business lines ISO forecasting and responses.</li> <li>- Continue assessing factors, thresholds and mitigation strategies in support of emerging business metrics (Primary)</li> </ul> <p><b>FY 2021 Base Plans:</b>            Continue assessing Special and Incentive Pay policies.  <ul style="list-style-type: none"> <li>- Continue assessing Econometric Modeling System and updating elasticity</li> <li>- Continue assessing and evaluating retention, accession and training trade-offs.</li> <li>- Continue assessing economic factors and relationships to MPTE business lines ISO forecasting and responses.</li> <li>- Continue assessing factors, thresholds and mitigation strategies in support of emerging business metrics (Primary)</li> </ul> <p><b>FY 2021 OCO Plans:</b>            N/A</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b>            Program decrease due to Process Improvement to Increase Efficiency in Military Spending and Economic Assumptions such as Purchase Inflation Rate Changes.</p> </p>						
<b>Accomplishments/Planned Programs Subtotals</b>		0.528	0.531	0.501	0.000	0.501
<b>C. Other Program Funding Summary (\$ in Millions)</b>						
N/A						
<b>Remarks</b>						
<b>D. Acquisition Strategy</b>						
N/A						

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)				
1319 / 6					PE 0605152N / Studies & Analysis Supt - Navy				3310 / Naval Aviation Developmental Planning				
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	
3310: Naval Aviation Developmental Planning	0.000	2.576	2.592	2.563	-	2.563	2.646	2.859	2.809	2.865	Continuing	Continuing	
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-			

  

<b>A. Mission Description and Budget Item Justification</b>				
Funding supports Naval aviation pre-Milestone B developmental activities to include the conduct and integration of systems engineering activities. This project unit provides information, automated tools, and decision aids necessary to perform acquisition planning in support of warfighter capability requirements. This project unit also supports research, development, and analysis efforts to include various studies, joint requirements analysis, and cost analysis in support of systems engineering activities, analyses of alternatives, and development of Capability Evolution Plan. Due to high turnover and end of service life of several Naval aircraft set against increasing threat capabilities, DOD 5000 series mandates documentation of capability requirements and mechanisms to obtain these capabilities. This project unit allows Naval aviation the means to properly identify capability gaps and potential solutions required to maintain maximum warfighting capability realizing (or achieving) reductions to technical risks and overall program costs.				

  

<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>					<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
<b>Title:</b> Naval Aviation Developmental Planning					2.576	2.592	2.563	0.000	2.563
<b>Articles:</b> <i>FY 2020 Plans:</i> Continue various studies for training aircraft, FA-18E/F/G, P-8A, MH-60R, MH-60S, and Joint Strike Fighter with integrated engineering, logistics, and manpower requirements. Meet emergent engineering requirements documentation within the air warfare portfolio. Update decision support toolset to facilitate internal air warfare and program office total life-cycle trades, and reduce long-term costs of data repositories, manpower, and computer programs. Fund total life-cycle analysis modeling environment required for multiple anticipated analyses of alternatives on fighter, adversary, and rotary-wing aircraft to reduce total cost of studies. Analyses are required to meet pre-Milestone B, DOD 5000 series mandated activities, as well as timelines mandated by the Congressional requirements for an Aviation Investment Plan.									
<b>FY 2021 Base Plans:</b> Continue studies for various aircraft with integrated engineering, logistics, and manpower requirements. Meet emergent engineering requirements documentation within the air warfare portfolio. Update decision support toolset to facilitate internal air warfare and program office total life-cycle trades, and reduce long-term costs of data repositories, manpower, and computer programs. Fund total life-cycle analysis modeling environment required for multiple anticipated analyses of alternatives on fighter, adversary, and rotary-wing aircraft to reduce									

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020
<b>Appropriation/Budget Activity</b> 1319 / 6		<b>R-1 Program Element (Number/Name)</b> PE 0605152N / Studies & Analysis Supt - Navy	<b>Project (Number/Name)</b> 3310 / Naval Aviation Developmental Planning	
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>				
FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
total cost of studies. Analyses are required to meet pre-Milestone B, DOD 5000 series mandated activities, as well as timelines mandated by the Congressional requirements for an Aviation Investment Plan.				
<b>FY 2021 OCO Plans:</b> N/A				
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> There is no significant change from FY 2020 and FY 2021.				
<b>Accomplishments/Planned Programs Subtotals</b>				2.576    2.592    2.563    0.000    2.563
<b>C. Other Program Funding Summary (\$ in Millions)</b>				
N/A				
<b>Remarks</b>				
<b>D. Acquisition Strategy</b>				
N/A				

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy											Date: February 2020	
Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
1319: Research, Development, Test & Evaluation, Navy / BA 6: RDT&E Management Support					PE 0605154N / Center For Naval Analyses							
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	42.361	47.669	43.517	-	43.517	46.289	47.811	48.827	49.806	Continuing	Continuing
0031: MCOAG	0.000	5.628	6.421	5.438	-	5.438	6.214	6.835	6.973	7.113	Continuing	Continuing
0148: Center For Naval Analyses (CNA)	0.000	36.733	41.248	38.079	-	38.079	40.075	40.976	41.854	42.693	Continuing	Continuing

**A. Mission Description and Budget Item Justification**

The Department of the Navy's (DON) Studies and Analysis Federally Funded Research and Development Center (DON S&A FFRDC - hereinafter referred to as the FFRDC) provides independent, objective, and expert analyses based on its unique access to sensitive data and hands-on exposure to fleet operations gained through a world-wide field program. The FFRDC's research program is centrally funded by this program element and is primarily concentrated along one Marine Corps category and thirteen Navy categories of study called product areas. These product areas are structured to enhance the FFRDC's focus of research and analysis upon the major present and future needs and issues of the Navy and the Marine Corps. Because of rapid advances in technology, changes in the fleet, the increasing complexity of weapon systems, and reductions in manpower, force structure, budgets, the current security environment, and Department of Defense (DOD) transformation, the Navy and Marine Corps have a greater need for analyses that are sophisticated, relevant, and timely. The FFRDC conducts research and analysis at all security classification levels, to include Sensitive Compartmented Information (SCI) and Special Access Programs (SAP).

Due to the number of efforts in this PE, the programs described herein are representative of the work included in this PE.

B. Program Change Summary (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	42.693	47.669	47.372	-	47.372
Current President's Budget	42.361	47.669	43.517	-	43.517
Total Adjustments	-0.332	0.000	-3.855	-	-3.855
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	1.312	0.000			
• SBIR/STTR Transfer	-1.644	0.000			
• Program Adjustments	0.000	0.000	-3.817	-	-3.817
• Rate/Misc Adjustments	0.000	0.000	-0.038	-	-0.038

**Change Summary Explanation**

Funding: FY 2021 decrease of \$2.694M associated with programmatic reductions and \$1.123M reduction for USMC Operations and analytical support.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy	Date: February 2020
<b>Appropriation/Budget Activity</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy / BA 6: RDT&amp;E Management Support</i>	<b>R-1 Program Element (Number/Name)</b> PE 0605154N / <i>Center For Naval Analyses</i>
Technical: N/A	
Schedule: N/A	

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020		
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0605154N / Center For Naval Analyses				Project (Number/Name) 0031 / MCOAG				
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	
0031: MCOAG	0.000	5.628	6.421	5.438	-	5.438	6.214	6.835	6.973	7.113	Continuing	Continuing	
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-			

**A. Mission Description and Budget Item Justification**

This project supports the Marine Corps portion of the Department of the Navy's (DoN) Studies and Analysis Federally Funded Research and Development Center (DoN S&A FFRDC - hereinafter referred to as the FFRDC) Research Program, and is managed as an element of the Marine Corps Studies System. This program provides the Marine Corps with independent and objective research and analysis of specific issues/topics appropriately performed by a FFRDC. Marine Corps Division analysts work at the FFRDC's headquarters and, through the FFRDC's Field representative Program serve at commands worldwide, including: Marine Forces Command, Marine Forces Pacific, Marine Special Operations Command, the three Marine Expeditionary Forces, and Marine Aviation Weapons and Tactics Squadron One (MAWTS-1). The FFRDC also assigns analysts to support the Deputy Commandants and their staffs as well as other Marine Corps organizations such as the Marine Corps Warfighting Lab, Marine Corps Systems Command, and the Commander, Marine Forces Reserve.

The program areas are linked to the Marine Corps Advocacy (prepotency), which are: (1) Logistics and Infrastructure; (2) Manpower and Training; (3) Research, Development and Acquisition; (4) Operations and Plans; (5) Programs and Resources; (6) Aviation; (7) Combat Development and Integration; and (8) Intelligence, Surveillance and Reconnaissance. FFRDC Scientific Analyst support provides six scientific analysts for the following six focus areas: Deputy Commandant (DC), Plans, Policies and Operations; DC Aviation; DC Installation and Logistics; DC Programs and Resources; DC Manpower Reserve Affairs; and Director, Manpower Plans (MP) - Manpower and Reserve Affairs (M&RA). The program continues analytical support for field exercises; Ad Hoc and Quick Response study requirements.

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

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<b>Title:</b> Marine Corps Operations and Analysis Group	5.628	6.421	5.438	0.000	5.438
<b>Articles:</b>	-	-	-	-	-
<b>FY 2020 Plans:</b> Completed: Studies in support of the FY 2020 Marine Corps Studies System Master Plan (MCSSMP) including the following priority areas: applying USMC capabilities today, balancing current demands against future readiness, innovating to enhance Marine Corps warfighting advantages, ways and means for USMC strategy and policy, and operating the Marine Corps more effectively and efficiently. Continue the FY 2019 analytic focus in support of CMC priorities. Enhanced support and increased capacity to address CMC priorities.					
<b>FY 2021 Base Plans:</b> In FY21 the FFRDC will provide study and analytical support to critical Combat Development and Integration (CD&I) and HQMC priorities in accordance with the FY 2021 Marine Corps Studies System Master Plan (MCSSMP) and the Marine Corps Vision and Strategy 2025. Priority areas: applying USMC capabilities today, balancing current demands against future sustainable expeditionary readiness, innovating to enhance Marine					

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy				<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 6		<b>R-1 Program Element (Number/Name)</b> PE 0605154N / Center For Naval Analyses	<b>Project (Number/Name)</b> 0031 / MCOAG	
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>				
FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<p>Corps warfighting advantages, ways and means for USMC strategy and policy, logistical and equipment support evaluation to operate the Marine Corps more effectively and efficiently, and taking care of our Marines and their families. Continue the FY 2020 analytic focus in support of Commandant Marine Corps (CMC) priorities. Enhanced support and increased capacity to address CMC priorities such as:</p> <ul style="list-style-type: none"> <li>- The relative threats posed by our major adversaries (e.g., Russian resurgence, N. African instability and PRC capabilities and activities)</li> <li>- Prosecuting global campaigns</li> <li>- Enabling and supporting distributed operations</li> <li>- Integrating information operations into the MAGTF construct both organizationally and to maximize effects on the battlefield</li> <li>- Leveraging autonomy and artificial intelligence to establish and maintain dominance over existing and emerging threats</li> <li>- Using big data/data science/predictive analysis to gain comparative advantage</li> <li>- Improving the use of gaming in Navy learning and research</li> <li>- Leveraging our analytic efforts for the Navy to support USMC priorities</li> </ul> <p><b>FY 2021 OCO Plans:</b> N/A</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> The decrease of \$0.983M from FY20 to FY21 is due to reduced investments in analytic efforts in support of USMC priorities.</p>				
<b>Accomplishments/Planned Programs Subtotals</b>				5.628    6.421    5.438    0.000    5.438
<b>C. Other Program Funding Summary (\$ in Millions)</b>				
N/A				
<b>Remarks</b>				
<b>D. Acquisition Strategy</b>				
N/A				

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020		
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0605154N / Center For Naval Analyses				Project (Number/Name) 0148 / Center For Naval Analyses (CNA)				
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	
0148: Center For Naval Analyses (CNA)	0.000	36.733	41.248	38.079	-	38.079	40.075	40.976	41.854	42.693	Continuing	Continuing	
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-			

**A. Mission Description and Budget Item Justification**

This program supports the Navy's portion of the Department of the Navy's (DON) Studies and Analysis Federally Funded Research and Development Center (DON S&A FFRDC - hereinafter referred to as the FFRDC)Research Program, which is primarily concentrated along thirteen Navy categories of study called product areas. These product areas include the following: (1) Manpower/Personnel, Medical and Training; (2) Intelligence, Information and Networks; (3) Plans, Policy, and Operations; (4) Infrastructure and Readiness; (5) Resources, Programs, and Assessments; (6) Capability Integration; (7) Research, Development and Acquisition; (8) Navy Field Program; (9) Navy Field Exercise Program; (10) Scientific Analyst Program; (11) Navy Quick Response Projects; (12) Navy General Concept Development and (13) Naval Analyses Initiated Projects. This program provides the Navy with independent and objective research and analysis of specific issues/topics in support of key operational problems; efforts include field support to fleet commanders, scientific analyst support to Deputy Chiefs of Naval Operations (DCNOs) and their staffs, exercise support, and studies and analysis across the full spectrum of Naval Operations. Support has resulted in substantial improvements in force structure, fleet effectiveness, and significant cost avoidance.

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

Title: CENTER FOR NAVAL ANALYSES, NAVY	Articles:	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Description: Funding in this project supports integrated research for the Department of Navy (DON) and other DOD components across a broad range of issues including the development and evaluation of tactics, operations testing of new systems, assessment of current capabilities, logistics and readiness, work-force management, space and space-related activities, cyber operations, cost and operational program analysis, assessment of advanced technology, force planning, and strategies implications of political-military developments.		36.733	41.248	38.079	0.000	38.079
<b>FY 2020 Plans:</b> Naval Analyses conducts individual analytic efforts for a wide range of DON and DOD sponsors including: OPNAV and HQMC, the Navy Secretariat, Type Commanders, the numbered Fleets and Navy/Marine Corps component commanders, Combatant Commands, operational test and evaluation (OT&E) activities including OPTEVFOR and DOT&E, SYSCOMs, Office of the Secretary of Defense, Defense agencies and the Defense Intelligence Community.		-	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020		
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 0605154N / Center For Naval Analyses	Project (Number/Name) 0148 / Center For Naval Analyses (CNA)				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
In FY 2020, studies and analysis support will be provided on critical Navy priorities tied to the National Defense Strategy (NDS). This analysis will review strategic efforts, including engagement with peer competitors and disruptive actions globally. The studies and analysis will informs operational requirements and will be integrated in the development of future initiatives.						
<b>FY 2021 Base Plans:</b> Perform studies and analysis on critical Navy priorities tied to the NDS.						
<b>FY 2021 OCO Plans:</b> N/A						
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> The reduction between FY20 to FY21 is due to reduced investments in studies and analysis efforts in support of US Navy priorities.						
<b>Accomplishments/Planned Programs Subtotals</b>		36.733	41.248	38.079	0.000	38.079
<b>C. Other Program Funding Summary (\$ in Millions)</b>						
N/A						
<b>Remarks</b>						
<b>D. Acquisition Strategy</b>						
N/A						

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy											Date: February 2020	
Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
1319: Research, Development, Test & Evaluation, Navy / BA 6: RDT&E Management Support					PE 0605285N / Next Generation Fighter							
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	4.981	7.100	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	12.081
2937: Next Generation Fighter	0.000	4.981	7.100	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	12.081
<b>A. Mission Description and Budget Item Justification</b>												
The details of program element are classified and are submitted to Congress in the classified budget justification books.												
<b>B. Program Change Summary (\$ in Millions)</b>				FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total				
Previous President's Budget				5.000	20.698	55.051	-	55.051				
Current President's Budget				4.981	7.100	0.000	-	0.000				
Total Adjustments				-0.019	-13.598	-55.051	-	-55.051				
• Congressional General Reductions				-	-							
• Congressional Directed Reductions				-	-13.598							
• Congressional Rescissions				-	-							
• Congressional Adds				-	-							
• Congressional Directed Transfers				-	-							
• Reprogrammings				-	-							
• SBIR/STTR Transfer				-0.019	0.000							
• Program Adjustments				0.000	0.000	-54.828	-	-54.828				
• Rate/Misc Adjustments				0.000	0.000	-0.223	-	-0.223				

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020			
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0605285N / Next Generation Fighter				Project (Number/Name) 2937 / Next Generation Fighter					
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		
2937: Next Generation Fighter	0.000	4.981	7.100	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	12.081		
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-	-			
<b>A. Mission Description and Budget Item Justification</b>														
The details of program element are classified and are submitted to Congress in the classified budget justification books.														
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>														
										FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<b>Title:</b> Next Generation Air Dominance Analysis										<b>Articles:</b>  4.981	<b>Articles:</b>  - 5.082	<b>Articles:</b>  0.000	<b>Articles:</b>  0.000	<b>Articles:</b>  0.000
<b>Description:</b> The details of program element are classified and are submitted to Congress in the classified budget justification books.														
<b>FY 2020 Plans:</b> N/A														
<b>FY 2021 Base Plans:</b> N/A														
<b>FY 2021 OCO Plans:</b> N/A														
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> The details of program element are classified and are submitted to Congress in the classified budget justification books.														
<b>Title:</b> NG Advanced Engines										<b>Articles:</b>  0.000	<b>Articles:</b>  - 2.018	<b>Articles:</b>  0.000	<b>Articles:</b>  0.000	<b>Articles:</b>  0.000
<b>Description:</b> The details of program element are classified and are submitted to Congress in the classified budget justification books.														
<b>FY 2020 Plans:</b> N/A														
<b>FY 2021 Base Plans:</b>														

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020		
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 0605285N / Next Generation Fighter	Project (Number/Name) 2937 / Next Generation Fighter				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
N/A						
<b>FY 2021 OCO Plans:</b> N/A						
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> The details of program element are classified and are submitted to Congress in the classified budget justification books.						
<b>Accomplishments/Planned Programs Subtotals</b>		4.981	7.100	0.000	0.000	0.000
<b>C. Other Program Funding Summary (\$ in Millions)</b>						
N/A						
<b>Remarks</b>						
<b>D. Acquisition Strategy</b>						
N/A						

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy											Date: February 2020	
Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
1319: Research, Development, Test & Evaluation, Navy / BA 6: RDT&E Management Support					PE 0605502N / Small Business Innovative Research							
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	433.656	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	433.656
1812: NAVAIR SBIR Program	0.000	127.434	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	127.434
1813: SPAWAR SBIR Program	0.000	12.185	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	12.185
1814: NAVSEA SBIR Program	0.000	98.982	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	98.982
1824: USMC SBIR Program	0.000	11.391	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	11.391
1862: SSPO SBIR Program	0.000	5.133	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.133
1863: NAVSUP SBIR Program	0.000	2.200	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	2.200
1864: ONR SBIR Program	0.000	87.806	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	87.806
1865: SBIR ADMIN - ONR	0.000	6.735	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	6.735
2204: Small Business Tech Transfer Program	0.000	30.853	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	30.853
2240: SBIR ADMIN - USMC	0.000	0.689	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.689
2241: SBIR ADMIN - SPAWAR	0.000	0.752	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.752
2242: SBIR ADMIN - NAVSEA	0.000	8.133	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	8.133
2243: SBIR ADMIN - NAVAIR	0.000	7.776	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	7.776
2244: SBIR ADMIN - NAVFAC	0.000	0.139	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.139
2248: SBIR ADMIN - SSPO	0.000	0.138	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.138
3201: SBIR CRP - NAVAIR	0.000	1.312	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1.312
3202: SBIR CRP - SPAWAR	0.000	0.127	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.127
3203: SBIR CRP - NAVSEA	0.000	0.987	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.987
3204: SBIR CRP - USMC	0.000	0.116	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.116
3205: SBIR CRP - ONR	0.000	1.046	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1.046
3213: NAVAIR STTR Program	0.000	18.447	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	18.447
3233: SPAWAR STTR Program	0.000	0.750	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.750
3235: Marine Corps STTR Program	0.000	0.415	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.415

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<b>Exhibit R-2, RDT&amp;E Budget Item Justification: PB 2021 Navy</b>											<b>Date:</b> February 2020			
<b>Appropriation/Budget Activity</b>				<b>R-1 Program Element (Number/Name)</b> PE 0605502N / Small Business Innovative Research										
1319: <i>Research, Development, Test &amp; Evaluation, Navy / BA 6: RDT&amp;E Management Support</i>														
3344: <i>SBIR Trial Admin Program</i>	0.000	10.110	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	10.110			
<b>A. Mission Description and Budget Item Justification</b>														
The Small Business Innovation Research (SBIR) program requires each Federal agency that has an extramural budget for Research and Development (R&D) in excess of \$100,000,000 to set aside 3.2% for SBIR. This funds R&D at small businesses. The program goals are to stimulate technological innovation; increase small business participation in federally funded R&D; foster participation by minority and disadvantaged firms in technological innovation; and increase private sector commercialization of federal R&D.														
<b>B. Program Change Summary (\$ in Millions)</b>				<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>						
Previous President's Budget				0.000	0.000	0.000	-	0.000						
Current President's Budget				433.656	0.000	0.000	-	0.000						
Total Adjustments				433.656	0.000	0.000	-	0.000						
• Congressional General Reductions				-	-									
• Congressional Directed Reductions				-	-									
• Congressional Rescissions				-	-									
• Congressional Adds				-	-									
• Congressional Directed Transfers				-	-									
• Reprogrammings				-0.029	0.000									
• SBIR/STTR Transfer				433.688	0.000									
• Rate/Misc Adjustments				-0.003	0.000	0.000	-	0.000						
<b>Change Summary Explanation</b>														
Technical: Not applicable.														
Schedule: Not applicable.														

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020	
<b>Appropriation/Budget Activity</b> 1319 / 6				<b>R-1 Program Element (Number/Name)</b> PE 0605502N / Small Business Innovative Research				<b>Project (Number/Name)</b> 1812 / NAVAIR SBIR Program				
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
1812: NAVAIR SBIR Program	0.000	127.434	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	127.434
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
<b>A. Mission Description and Budget Item Justification</b>												
The Small Business Innovation Research (SBIR) program requires each Federal agency that has an extramural budget for Research and Development (R&D) in excess of \$100,000,000 to set aside 3.2% for SBIR in FY 2019. This funds R&D at small businesses. The program goals are to stimulate technological innovation; increase small business participation in federally funded R&D; foster participation by minority and disadvantaged firms in technological innovation; and increase private sector commercialization of federal R&D.												
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>												
<b>Title:</b> NAVAIR SBIR Program <b>Articles:</b> <b>FY 2020 Plans:</b> N/A <b>FY 2021 Base Plans:</b> N/A <b>FY 2021 OCO Plans:</b> N/A												
<b>Accomplishments/Planned Programs Subtotals</b> 127.434    0.000    0.000    0.000    0.000												
<b>C. Other Program Funding Summary (\$ in Millions)</b>												
N/A												
<b>Remarks</b>												
<b>D. Acquisition Strategy</b>												
N/A												

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020															
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0605502N / Small Business Innovative Research				Project (Number/Name) 1813 / SPAWAR SBIR Program																	
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														
1813: SPAWAR SBIR Program	0.000	12.185	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	12.185														
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-																
<b>A. Mission Description and Budget Item Justification</b>																										
The Small Business Innovation Research (SBIR) program requires each Federal agency that has an extramural budget for Research and Development (R&D) in excess of \$100,000,000 to set aside 3.2% for SBIR. This funds R&D at small businesses. The program goals are to stimulate technological innovation; increase small business participation in federally funded R&D; foster participation by minority and disadvantaged firms in technological innovation; and increase private sector commercialization of federal R&D.																										
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>																										
<b>Title:</b> SPAWAR SBIR Program <b>FY 2020 Plans:</b> N/A <b>FY 2021 Base Plans:</b> N/A <b>FY 2021 OCO Plans:</b> N/A																										
<b>Articles:</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>FY 2019</th> <th>FY 2020</th> <th>FY 2021 Base</th> <th>FY 2021 OCO</th> <th>FY 2021 Total</th> </tr> </thead> <tbody> <tr> <td>12.185</td> <td>0.000</td> <td>0.000</td> <td>0.000</td> <td>0.000</td> </tr> <tr> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> </tbody> </table>												FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	12.185	0.000	0.000	0.000	0.000	-	-	-	-	-
FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total																						
12.185	0.000	0.000	0.000	0.000																						
-	-	-	-	-																						
<b>Accomplishments/Planned Programs Subtotals</b>																										
12.185      0.000      0.000      0.000      0.000																										
<b>C. Other Program Funding Summary (\$ in Millions)</b>																										
N/A																										
<b>Remarks</b>																										
<b>D. Acquisition Strategy</b>																										
N/A																										

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020				
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0605502N / Small Business Innovative Research				Project (Number/Name) 1814 / NAVSEA SBIR Program						
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			
1814: NAVSEA SBIR Program	0.000	98.982	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	98.982			
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-	-				
<b>A. Mission Description and Budget Item Justification</b>															
The Small Business Innovation Research (SBIR) program requires each Federal agency that has an extramural budget for Research and Development (R&D) in excess of \$100,000,000 to set aside 3.2% for SBIR in FY 2019. This funds R&D at small businesses. The program goals are to stimulate technological innovation; increase small business participation in federally funded R&D; foster participation by minority and disadvantaged firms in technological innovation; and increase private sector commercialization of federal R&D.															
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>															
<i>Title:</i> NAVSEA SBIR Program															
<i>Articles:</i>															
<i>FY 2020 Plans:</i> N/A															
<i>FY 2021 Base Plans:</i> N/A															
<i>FY 2021 OCO Plans:</i> N/A															
<b>Accomplishments/Planned Programs Subtotals</b>											98.982	0.000	0.000	0.000	0.000
<b>C. Other Program Funding Summary (\$ in Millions)</b>															
N/A															
<b>Remarks</b>															
<b>D. Acquisition Strategy</b>															
N/A															

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020															
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0605502N / Small Business Innovative Research				Project (Number/Name) 1824 / USMC SBIR Program																	
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														
1824: USMC SBIR Program	0.000	11.391	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	11.391														
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-																
<b>A. Mission Description and Budget Item Justification</b>																										
The Small Business Innovation Research (SBIR) program requires each Federal agency that has an extramural budget for Research and Development (R&D) in excess of \$100,000,000 to set aside 3.2% for SBIR. This funds R&D at small businesses. The program goals are to stimulate technological innovation; increase small business participation in federally funded R&D; foster participation by minority and disadvantaged firms in technological innovation; and increase private sector commercialization of federal R&D.																										
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>																										
<b>Title:</b> USMC SBIR Program <b>FY 2020 Plans:</b> N/A <b>FY 2021 Base Plans:</b> N/A <b>FY 2021 OCO Plans:</b> N/A																										
<b>Articles:</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>FY 2019</th> <th>FY 2020</th> <th>FY 2021 Base</th> <th>FY 2021 OCO</th> <th>FY 2021 Total</th> </tr> </thead> <tbody> <tr> <td>11.391</td> <td>0.000</td> <td>0.000</td> <td>0.000</td> <td>0.000</td> </tr> <tr> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> </tbody> </table>												FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	11.391	0.000	0.000	0.000	0.000	-	-	-	-	-
FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total																						
11.391	0.000	0.000	0.000	0.000																						
-	-	-	-	-																						
<b>Accomplishments/Planned Programs Subtotals</b>																										
11.391      0.000      0.000      0.000      0.000																										
<b>C. Other Program Funding Summary (\$ in Millions)</b>																										
N/A																										
<b>Remarks</b>																										
<b>D. Acquisition Strategy</b>																										
N/A																										

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020															
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0605502N / Small Business Innovative Research				Project (Number/Name) 1862 / SSPO SBIR Program																	
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														
1862: SSPO SBIR Program	0.000	5.133	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.133														
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-																
<b>A. Mission Description and Budget Item Justification</b>																										
The Small Business Innovation Research (SBIR) program requires each Federal agency that has an extramural budget for Research and Development (R&D) in excess of \$100,000,000 to set aside 3.2% for SBIR. This funds R&D at small businesses. The program goals are to stimulate technological innovation; increase small business participation in federally funded R&D; foster participation by minority and disadvantaged firms in technological innovation; and increase private sector commercialization of federal R&D.																										
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>																										
<b>Title:</b> SSPO SBIR Program <b>FY 2020 Plans:</b> N/A <b>FY 2021 Base Plans:</b> N/A <b>FY 2021 OCO Plans:</b> N/A																										
<b>Articles:</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>FY 2019</th> <th>FY 2020</th> <th>FY 2021 Base</th> <th>FY 2021 OCO</th> <th>FY 2021 Total</th> </tr> </thead> <tbody> <tr> <td>5.133</td> <td>0.000</td> <td>0.000</td> <td>0.000</td> <td>0.000</td> </tr> <tr> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> </tbody> </table>												FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	5.133	0.000	0.000	0.000	0.000	-	-	-	-	-
FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total																						
5.133	0.000	0.000	0.000	0.000																						
-	-	-	-	-																						
<b>Accomplishments/Planned Programs Subtotals</b>																										
5.133      0.000      0.000      0.000      0.000																										
<b>C. Other Program Funding Summary (\$ in Millions)</b>																										
N/A																										
<b>Remarks</b>																										
<b>D. Acquisition Strategy</b>																										
N/A																										

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020															
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0605502N / Small Business Innovative Research				Project (Number/Name) 1863 / NAVSUP SBIR Program																	
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														
1863: NAVSUP SBIR Program	0.000	2.200	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	2.200														
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-																
<b>A. Mission Description and Budget Item Justification</b>																										
The Small Business Innovation Research (SBIR) program requires each Federal agency that has an extramural budget for Research and Development (R&D) in excess of \$100,000,000 to set aside 3.2% for SBIR. This funds R&D at small businesses. The program goals are to stimulate technological innovation; increase small business participation in federally funded R&D; foster participation by minority and disadvantaged firms in technological innovation; and increase private sector commercialization of federal R&D.																										
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>																										
<b>Title:</b> NAVSUP SBIR Program <b>FY 2020 Plans:</b> N/A <b>FY 2021 Base Plans:</b> N/A <b>FY 2021 OCO Plans:</b> N/A																										
<b>Articles:</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>FY 2019</th> <th>FY 2020</th> <th>FY 2021 Base</th> <th>FY 2021 OCO</th> <th>FY 2021 Total</th> </tr> </thead> <tbody> <tr> <td>2.200</td> <td>0.000</td> <td>0.000</td> <td>0.000</td> <td>0.000</td> </tr> <tr> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> </tbody> </table>												FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	2.200	0.000	0.000	0.000	0.000	-	-	-	-	-
FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total																						
2.200	0.000	0.000	0.000	0.000																						
-	-	-	-	-																						
<b>Accomplishments/Planned Programs Subtotals</b>																										
2.200      0.000      0.000      0.000      0.000																										
<b>C. Other Program Funding Summary (\$ in Millions)</b>																										
N/A																										
<b>Remarks</b>																										
<b>D. Acquisition Strategy</b>																										
N/A																										

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020															
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0605502N / Small Business Innovative Research				Project (Number/Name) 1864 / ONR SBIR Program																	
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														
1864: ONR SBIR Program	0.000	87.806	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	87.806														
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-																
<b>A. Mission Description and Budget Item Justification</b>																										
The Small Business Innovation Research (SBIR) program requires each Federal agency that has an extramural budget for Research and Development (R&D) in excess of \$100,000,000 to set aside 3.2% for SBIR. This funds R&D at small businesses. The program goals are to stimulate technological innovation; increase small business participation in federally funded R&D; foster participation by minority and disadvantaged firms in technological innovation; and increase private sector commercialization of federal R&D.																										
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>																										
<b>Title:</b> ONR SBIR Program <b>FY 2020 Plans:</b> N/A <b>FY 2021 Base Plans:</b> N/A <b>FY 2021 OCO Plans:</b> N/A																										
<b>Articles:</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>FY 2019</th> <th>FY 2020</th> <th>FY 2021 Base</th> <th>FY 2021 OCO</th> <th>FY 2021 Total</th> </tr> </thead> <tbody> <tr> <td>87.806</td> <td>0.000</td> <td>0.000</td> <td>0.000</td> <td>0.000</td> </tr> <tr> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> </tbody> </table>												FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	87.806	0.000	0.000	0.000	0.000	-	-	-	-	-
FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total																						
87.806	0.000	0.000	0.000	0.000																						
-	-	-	-	-																						
<b>Accomplishments/Planned Programs Subtotals</b>																										
87.806																										
<b>C. Other Program Funding Summary (\$ in Millions)</b>																										
N/A																										
<b>Remarks</b>																										
<b>D. Acquisition Strategy</b>																										
N/A																										

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020	
<b>Appropriation/Budget Activity</b> 1319 / 6					<b>R-1 Program Element (Number/Name)</b> PE 0605502N / Small Business Innovative Research				<b>Project (Number/Name)</b> 1865 / SBIR ADMIN - ONR			
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
1865: SBIR ADMIN - ONR	0.000	6.735	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	6.735
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
<b>A. Mission Description and Budget Item Justification</b> Small Business Innovation Research (SBIR) Administration. Manage the program, technical efforts and award contracts related to SBIR.												
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>												
<i>Title:</i> SBIR Administration  <i>FY 2020 Plans:</i> N/A  <i>FY 2021 Base Plans:</i> N/A  <i>FY 2021 OCO Plans:</i> N/A						<i>Articles:</i>	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	
							6.735	0.000	0.000	0.000	0.000	
							-	-	-	-	-	
<b>Accomplishments/Planned Programs Subtotals</b>												
6.735      0.000      0.000      0.000      0.000												
<b>C. Other Program Funding Summary (\$ in Millions)</b>												
N/A												
<b>Remarks</b>												
<b>D. Acquisition Strategy</b>												
N/A												

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020		
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0605502N / Small Business Innovative Research				Project (Number/Name) 2204 / Small Business Tech Transfer Program				
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	
2204: Small Business Tech Transfer Program	0.000	30.853	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	30.853	
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-	-		
<b>A. Mission Description and Budget Item Justification</b>													
The Small Business Technology Transfer (STTR) program requires Federal agency that has an extramural budget for Research and Development (R&D) in excess of \$100,000,000 to set aside 0.45% for STTR. This funds cooperative R&D between small businesses and research institutions. The program goals are to create vehicles from moving ideas from research institutions to market; enable researchers to pursue commercial application of technologies; and bridge funding gap between basic research and commercial product.													
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>													
<i>Title:</i> Small Business Tech Transfer										<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>
<i>Articles:</i>										30.853	0.000	0.000	0.000
<i>FY 2020 Plans:</i> N/A										-	-	-	-
<i>FY 2021 Base Plans:</i> N/A													
<i>FY 2021 OCO Plans:</i> N/A													
<b>Accomplishments/Planned Programs Subtotals</b>										30.853	0.000	0.000	0.000
<b>C. Other Program Funding Summary (\$ in Millions)</b>													
N/A													
<b>Remarks</b>													
<b>D. Acquisition Strategy</b>													
N/A													

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020	
<b>Appropriation/Budget Activity</b> 1319 / 6					<b>R-1 Program Element (Number/Name)</b> PE 0605502N / Small Business Innovative Research				<b>Project (Number/Name)</b> 2240 / SBIR ADMIN - USMC			
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
2240: SBIR ADMIN - USMC	0.000	0.689	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.689
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
<b>A. Mission Description and Budget Item Justification</b> Small Business Innovative Research (SBIR) Administration. Manage the program, technical efforts and award contracts related to SBIR.												
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>												
<i>Title:</i> USMC SBIR Administration  <i>FY 2020 Plans:</i> N/A  <i>FY 2021 Base Plans:</i> N/A  <i>FY 2021 OCO Plans:</i> N/A						<i>Articles:</i>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	
							0.689	0.000	0.000	0.000	0.000	
							-	-	-	-	-	
<b>Accomplishments/Planned Programs Subtotals</b>												
0.689      0.000      0.000      0.000      0.000      0.000												
<b>C. Other Program Funding Summary (\$ in Millions)</b>												
N/A												
<b>Remarks</b>												
<b>D. Acquisition Strategy</b>												
N/A												

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020	
<b>Appropriation/Budget Activity</b> 1319 / 6					<b>R-1 Program Element (Number/Name)</b> PE 0605502N / Small Business Innovative Research				<b>Project (Number/Name)</b> 2241 / SBIR ADMIN - SPAWAR			
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
2241: SBIR ADMIN - SPAWAR	0.000	0.752	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.752
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
<b>A. Mission Description and Budget Item Justification</b> Small Business Innovative Research (SBIR) Administration. Manage the program, technical efforts and award contracts related to SBIR.												
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>												
<i>Title:</i> SPAWAR SBIR ADMIN  <i>FY 2020 Plans:</i> N/A  <i>FY 2021 Base Plans:</i> N/A  <i>FY 2021 OCO Plans:</i> N/A						<i>Articles:</i>	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	
							0.752	0.000	0.000	0.000	0.000	
							-	-	-	-	-	
<b>Accomplishments/Planned Programs Subtotals</b>												
0.752      0.000      0.000      0.000      0.000      0.000												
<b>C. Other Program Funding Summary (\$ in Millions)</b>												
N/A												
<b>Remarks</b>												
<b>D. Acquisition Strategy</b>												
N/A												

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020	
<b>Appropriation/Budget Activity</b> 1319 / 6					<b>R-1 Program Element (Number/Name)</b> PE 0605502N / Small Business Innovative Research				<b>Project (Number/Name)</b> 2242 / SBIR ADMIN - NAVSEA			
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
2242: SBIR ADMIN - NAVSEA	0.000	8.133	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	8.133
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
<b>A. Mission Description and Budget Item Justification</b> Small Business Innovative Research (SBIR) Administration. Manage the program, technical efforts and award contracts related to SBIR.												
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>												
<i>Title:</i> NAVSEA SBIR Administration  <i>FY 2020 Plans:</i> N/A  <i>FY 2021 Base Plans:</i> N/A  <i>FY 2021 OCO Plans:</i> N/A						<i>Articles:</i>	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	
							8.133	0.000	0.000	0.000	0.000	
							-	-	-	-	-	
<b>Accomplishments/Planned Programs Subtotals</b>												
8.133      0.000      0.000      0.000      0.000      0.000												
<b>C. Other Program Funding Summary (\$ in Millions)</b>												
N/A												
<b>Remarks</b>												
<b>D. Acquisition Strategy</b>												
N/A												

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020	
<b>Appropriation/Budget Activity</b> 1319 / 6					<b>R-1 Program Element (Number/Name)</b> PE 0605502N / Small Business Innovative Research				<b>Project (Number/Name)</b> 2243 / SBIR ADMIN - NAVAIR			
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
2243: SBIR ADMIN - NAVAIR	0.000	7.776	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	7.776
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
<b>A. Mission Description and Budget Item Justification</b> Small Business Innovative Research (SBIR) Administration. Manage the program, technical efforts and award contracts related to SBIR.												
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>												
<i>Title:</i> SBIR ADMIN PROGRAM  <i>FY 2020 Plans:</i> N/A  <i>FY 2021 Base Plans:</i> N/A  <i>FY 2021 OCO Plans:</i> N/A						<i>Articles:</i>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	
							7.776	0.000	0.000	0.000	0.000	
							-	-	-	-	-	
<b>Accomplishments/Planned Programs Subtotals</b>												
7.776      0.000      0.000      0.000      0.000      0.000												
<b>C. Other Program Funding Summary (\$ in Millions)</b>												
N/A												
<b>Remarks</b>												
<b>D. Acquisition Strategy</b>												
N/A												

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020	
<b>Appropriation/Budget Activity</b> 1319 / 6					<b>R-1 Program Element (Number/Name)</b> PE 0605502N / Small Business Innovative Research				<b>Project (Number/Name)</b> 2244 / SBIR ADMIN - NAVFAC			
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
2244: SBIR ADMIN - NAVFAC	0.000	0.139	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.139
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
<b>A. Mission Description and Budget Item Justification</b> Small Business Innovative Research (SBIR) Administration. Manage the program, technical efforts and award contracts related to SBIR.												
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>												
<i>Title:</i> SBIR ADMIN NAVFAC  <i>FY 2020 Plans:</i> N/A  <i>FY 2021 Base Plans:</i> N/A  <i>FY 2021 OCO Plans:</i> N/A						<i>Articles:</i>	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	
							0.139	0.000	0.000	0.000	0.000	
							-	-	-	-	-	
<b>Accomplishments/Planned Programs Subtotals</b>												
0.139      0.000      0.000      0.000      0.000      0.000												
<b>C. Other Program Funding Summary (\$ in Millions)</b>												
N/A												
<b>Remarks</b>												
<b>D. Acquisition Strategy</b>												
N/A												

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020	
<b>Appropriation/Budget Activity</b> 1319 / 6					<b>R-1 Program Element (Number/Name)</b> PE 0605502N / Small Business Innovative Research				<b>Project (Number/Name)</b> 2248 / SBIR ADMIN - SSPO			
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
2248: SBIR ADMIN - SSPO	0.000	0.138	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.138
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
<b>A. Mission Description and Budget Item Justification</b> Small Business Innovative Research (SBIR) Administration. Manage the program, technical efforts and award contracts related to SBIR.												
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>												
<i>Title:</i> SBIR ADMIN SSPO  <i>FY 2020 Plans:</i> N/A  <i>FY 2021 Base Plans:</i> N/A  <i>FY 2021 OCO Plans:</i> N/A						<i>Articles:</i>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	
							0.138	0.000	0.000	0.000	0.000	
							-	-	-	-	-	
<b>Accomplishments/Planned Programs Subtotals</b>												
0.138      0.000      0.000      0.000      0.000												
<b>C. Other Program Funding Summary (\$ in Millions)</b>												
N/A												
<b>Remarks</b>												
<b>D. Acquisition Strategy</b>												
N/A												

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020					
<b>Appropriation/Budget Activity</b> 1319 / 6					<b>R-1 Program Element (Number/Name)</b> PE 0605502N / Small Business Innovative Research				<b>Project (Number/Name)</b> 3201 / SBIR CRP - NAVAIR							
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				
3201: SBIR CRP - NAVAIR		0.000	1.312	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	1.312				
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-	-					
<b>A. Mission Description and Budget Item Justification</b>																
Section 252 of the 2006 NDAA Public law No. 109-163 allowed up to 1% of the SBIR to be used to fund the administrative costs of the Commercialization Pilot Program (CPP). The pilot program transitioned to the Commercialization Readiness Program (CRP). CRP is part of the SBIR and STTR Reauthorization Act of 2012 (P. L. 112-81, Section 5001).																
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>																
									FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total			
<i>Title:</i> Commercialization Readiness Program  <i>FY 2020 Plans:</i> N/A  <i>FY 2021 Base Plans:</i> N/A  <i>FY 2021 OCO Plans:</i> N/A								<i>Articles:</i>	1.312	0.000	0.000	0.000	0.000			
									-	-	-	-	-			
<b>Accomplishments/Planned Programs Subtotals</b>												1.312	0.000	0.000	0.000	0.000
<b>C. Other Program Funding Summary (\$ in Millions)</b>																
N/A																
<b>Remarks</b>																
<b>D. Acquisition Strategy</b>																
Not Applicable																

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020		
<b>Appropriation/Budget Activity</b> 1319 / 6					<b>R-1 Program Element (Number/Name)</b> PE 0605502N / Small Business Innovative Research				<b>Project (Number/Name)</b> 3202 / SBIR CRP - SPAWAR				
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	
3202: SBIR CRP - SPAWAR	0.000	0.127	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.127	
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-			
<b>A. Mission Description and Budget Item Justification</b>													
Section 252 of the 2006 NDAA Public law No. 109-163 allowed up to 1% of the SBIR to be used to fund the administrative costs of the Commercialization Pilot Program (CPP). The pilot program transitioned to the Commercialization Readiness Program (CRP). CRP is part of the SBIR and STTR Reauthorization Act of 2012 (P. L. 112-81, Section 5001).													
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>													
									FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<i>Title:</i> Commercialization Readiness Program  <i>FY 2020 Plans:</i> N/A								<i>Articles:</i>	0.127	0.000	0.000	0.000	0.000
<i>FY 2021 Base Plans:</i> N/A									-	-	-	-	-
<i>FY 2021 OCO Plans:</i> N/A													
<b>Accomplishments/Planned Programs Subtotals</b>									0.127	0.000	0.000	0.000	0.000
<b>C. Other Program Funding Summary (\$ in Millions)</b>													
N/A													
<b>Remarks</b>													
<b>D. Acquisition Strategy</b>													
N/A													

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020	
<b>Appropriation/Budget Activity</b> 1319 / 6					<b>R-1 Program Element (Number/Name)</b> PE 0605502N / Small Business Innovative Research				<b>Project (Number/Name)</b> 3203 / SBIR CRP - NAVSEA			
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
3203: SBIR CRP - NAVSEA	0.000	0.987	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.987
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
<b>A. Mission Description and Budget Item Justification</b>												
Section 252 of the 2006 NDAA Public law No. 109-163 allowed up to 1% of the SBIR to be used to fund the administrative costs of the Commercialization Pilot Program (CPP). The pilot program transitioned to the Commercialization Readiness Program (CRP). CRP is part of the SBIR and STTR Reauthorization Act of 2012 (P. L. 112-81, Section 5001).												
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>												
<i>Title:</i> NAVSEA SBIR CRP  <i>FY 2020 Plans:</i> N/A  <i>FY 2021 Base Plans:</i> N/A  <i>FY 2021 OCO Plans:</i> N/A												
<i>Articles:</i>												
FY 2019      FY 2020      FY 2021 Base      FY 2021 OCO      FY 2021 Total												
0.987      0.000      0.000      0.000      0.000												
<b>Accomplishments/Planned Programs Subtotals</b>												
0.987      0.000      0.000      0.000      0.000												
<b>C. Other Program Funding Summary (\$ in Millions)</b>												
N/A												
<b>Remarks</b>												
<b>D. Acquisition Strategy</b>												
N/A												

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020	
<b>Appropriation/Budget Activity</b> 1319 / 6					<b>R-1 Program Element (Number/Name)</b> PE 0605502N / Small Business Innovative Research				<b>Project (Number/Name)</b> 3204 / SBIR CRP - USMC			
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
3204: SBIR CRP - USMC	0.000	0.116	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.116
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
<b>A. Mission Description and Budget Item Justification</b>												
Section 252 of the 2006 NDAA Public law No. 109-163 allowed up to 1% of the SBIR to be used to fund the administrative costs of the Commercialization Pilot Program (CPP). The pilot program transitioned to the Commercialization Readiness Program (CRP). CRP is part of the SBIR and STTR Reauthorization Act of 2012 (P. L. 112-81, Section 5001).												
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>												
<i>Title:</i> SBIR Commercialization Readiness Program USMC <i>Articles:</i>												
<i>FY 2020 Plans:</i> N/A												
<i>FY 2021 Base Plans:</i> N/A												
<i>FY 2021 OCO Plans:</i> N/A												
<b>Accomplishments/Planned Programs Subtotals</b>												
0.116      0.000      0.000      0.000      0.000												
<b>C. Other Program Funding Summary (\$ in Millions)</b>												
N/A												
<b>Remarks</b>												
<b>D. Acquisition Strategy</b>												
N/A												

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020				
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0605502N / Small Business Innovative Research				Project (Number/Name) 3205 / SBIR CRP - ONR						
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			
3205: SBIR CRP - ONR		0.000	1.046	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	1.046			
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-	-				
<b>A. Mission Description and Budget Item Justification</b>															
Section 252 of the 2006 NDAA Public law No. 109-163 allowed up to 1% of the SBIR to be used to fund the administrative costs of the Commercialization Pilot Program (CPP). The pilot program transitioned to the Commercialization Readiness Program (CRP). CRP is part of the SBIR and STTR Reauthorization Act of 2012 (P. L. 112-81, Section 5001).															
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>															
<i>Title:</i> SBIR Commercialization Readiness Program ONR										<i>Articles:</i>	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<i>FY 2020 Plans:</i> N/A											1.046	0.000	0.000	0.000	0.000
<i>FY 2021 Base Plans:</i> N/A											-	-	-	-	-
<i>FY 2021 OCO Plans:</i> N/A															
<b>Accomplishments/Planned Programs Subtotals</b>											1.046	0.000	0.000	0.000	0.000
<b>C. Other Program Funding Summary (\$ in Millions)</b>															
N/A															
<b>Remarks</b>															
<b>D. Acquisition Strategy</b>															
N/A															

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020		
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0605502N / Small Business Innovative Research				Project (Number/Name) 3213 / NAVAIR STTR Program				
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	
3213: NAVAIR STTR Program		0.000	18.447	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	18.447	
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-	-		
<b>A. Mission Description and Budget Item Justification</b>													
The Small Business Technology Transfer (STTR) program requires each Federal agency that has an extramural budget for Research and Development (R&D) in excess of \$1,000,000,000 to set aside 0.45% for STTR in FY 2019. This funds cooperative R&D between small businesses and research institutions. The program goals are to create vehicles from moving ideas from research institutions to market; enable researchers to pursue commercial application of technologies; and bridge funding gap between basic research and commercial product.													
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>													
<i>Title:</i> NAVAIR STTR Program										<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>
<i>Articles:</i>										18.447	0.000	0.000	0.000
<i>FY 2020 Plans:</i> N/A										-	-	-	-
<i>FY 2021 Base Plans:</i> N/A													
<i>FY 2021 OCO Plans:</i> N/A													
<b>Accomplishments/Planned Programs Subtotals</b>										18.447	0.000	0.000	0.000
<b>C. Other Program Funding Summary (\$ in Millions)</b>													
N/A													
<b>Remarks</b>													
<b>D. Acquisition Strategy</b>													
N/A													

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020		
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0605502N / Small Business Innovative Research				Project (Number/Name) 3233 / SPAWAR STTR Program				
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	
3233: SPAWAR STTR Program		0.000	0.750	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.750	
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-	-		
<b>A. Mission Description and Budget Item Justification</b>													
The Small Business Technology Transfer (STTR) program requires each Federal agency that has an extramural budget for Research and Development (R&D) in excess of \$1,000,000,000 to set aside 0.45% for STTR in FY 2019. This funds cooperative R&D between small businesses and research institutions. The program goals are to create vehicles from moving ideas from research institutions to market; enable researchers to pursue commercial application of technologies; and bridge funding gap between basic research and commercial product.													
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>													
<i>Title:</i> SPAWAR STTR Program										<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>
<i>Articles:</i>										0.750	0.000	0.000	0.000
<i>FY 2020 Plans:</i> N/A										-	-	-	-
<i>FY 2021 Base Plans:</i> N/A													
<i>FY 2021 OCO Plans:</i> N/A													
<b>Accomplishments/Planned Programs Subtotals</b>										0.750	0.000	0.000	0.000
<b>C. Other Program Funding Summary (\$ in Millions)</b>													
N/A													
<b>Remarks</b>													
<b>D. Acquisition Strategy</b>													
N/A													

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020				
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0605502N / Small Business Innovative Research				Project (Number/Name) 3235 / Marine Corps STTR Program						
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			
3235: Marine Corps STTR Program	0.000	0.415	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.415			
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-	-				
<b>A. Mission Description and Budget Item Justification</b>															
The Small Business Technology Transfer (STTR) program requires each Federal agency that has an extramural budget for Research and Development (R&D) in excess of \$1,000,000,000 to set aside 0.45% for STTR in FY 2019. This funds cooperative R&D between small businesses and research institutions. The program goals are to create vehicles from moving ideas from research institutions to market; enable researchers to pursue commercial application of technologies; and bridge funding gap between basic research and commercial product.															
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>															
<i>Title:</i> USMC SBIR STTR										<i>Articles:</i>	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<i>FY 2020 Plans:</i> N/A											0.415	0.000	0.000	0.000	0.000
<i>FY 2021 Base Plans:</i> N/A											-	-	-	-	-
<i>FY 2021 OCO Plans:</i> N/A															
<b>Accomplishments/Planned Programs Subtotals</b>											0.415	0.000	0.000	0.000	0.000
<b>C. Other Program Funding Summary (\$ in Millions)</b>															
N/A															
<b>Remarks</b>															
<b>D. Acquisition Strategy</b>															
N/A															

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020	
<b>Appropriation/Budget Activity</b> 1319 / 6					<b>R-1 Program Element (Number/Name)</b> PE 0605502N / Small Business Innovative Research				<b>Project (Number/Name)</b> 3344 / SBIR Trial Admin Program			
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
3344: SBIR Trial Admin Program	0.000	10.110	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	10.110
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
<b>A. Mission Description and Budget Item Justification</b>												
The Small Business Innovation Research (SBIR) program requires each Federal agency that has an extramural budget for Research and Development (R&D) in excess of \$100,000,000 to set aside 3.2% for SBIR in FY 2019. This funds R&D at small businesses. The program goals are to stimulate technological innovation; increase small business participation in federally funded R&D; foster participation by minority and disadvantaged firms in technological innovation; and increase private sector commercialization of federal R&D.												
This project provides funding for the pilot administrative program authorized by the FY2012 National Defense Authorization Act (SEC. 5141. PILOT TO ALLOW FUNDING FOR ADMINISTRATIVE, OVERSIGHT, and CONTRACT PROCESSING COSTS).												
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>												
						FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total		
<i>Title:</i> SBIR Trial Admin						<i>Articles:</i>	10.110	0.000	0.000	0.000	0.000	
<i>FY 2020 Plans:</i> N/A							-	-	-	-	-	
<i>FY 2021 Base Plans:</i> N/A												
<i>FY 2021 OCO Plans:</i> N/A												
<b>Accomplishments/Planned Programs Subtotals</b>						10.110	0.000	0.000	0.000	0.000	0.000	
<b>C. Other Program Funding Summary (\$ in Millions)</b>												
N/A												
<b>Remarks</b>												
<b>D. Acquisition Strategy</b>												
N/A												

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy											Date: February 2020							
Appropriation/Budget Activity					R-1 Program Element (Number/Name)													
1319: Research, Development, Test & Evaluation, Navy / BA 6: RDT&E Management Support					PE 0605804N / Technical Information Services													
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	1.465	0.988	0.932	-	0.932	0.945	0.965	0.985	1.004	Continuing	Continuing						
0835: Tech Info System	0.000	1.001	0.988	0.932	-	0.932	0.945	0.965	0.985	1.004	Continuing	Continuing						
2296: Federal Lab Consortium	0.000	0.464	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.464						
<b>A. Mission Description and Budget Item Justification</b>																		
The Department of the Navy (DON) often funds research and new technologies that have commercial application and payoff. To facilitate the "tactical to practical" transition, the DON Technology Transfer (T2) Program Office produces policy and guidance, products and services to help make Navy-developed technologies available for public use, as appropriate. There are a number of ways in which the actual transfer may take place., Technology Transfer Offices to enhance U.S. naval forces effectiveness by strategically leveraging industrial and academic research and development partnerships for modernization. These partnerships transition private sector technology into the NRE, and transfer appropriate Navy-developed innovative concepts, inventions, facilities and materiel to the private sector for the purposes of dual-use commercialization, to benefit DoD, the public economy, and academia. (Public Law 96-480, Federal Technology Transfer Act of 1986.) This program also provides the Department of the Navy interface to the Office of the Assistant Secretary of Defense for Research and Engineering, and to the Assistant Secretary of Commerce for Technology Policy for matters relating to policy and reporting requirements for technology transfer.																		
Due to the number of efforts in this PE, the programs described herein are representative of the work included in this PE.																		
<b>B. Program Change Summary (\$ in Millions)</b>				FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total										
Previous President's Budget				1.029	0.988	0.930	-	-										
Current President's Budget				1.465	0.988	0.932	-	-										
Total Adjustments				0.436	0.000	0.002	-	-										
• Congressional General Reductions				-	-	-	-	-										
• Congressional Directed Reductions				-	-	-	-	-										
• Congressional Rescissions				-	-	-	-	-										
• Congressional Adds				-	-	-	-	-										
• Congressional Directed Transfers				-	-	-	-	-										
• Reprogrammings				-	-	-	-	-										
• SBIR/STTR Transfer				0.436	0.000	-	-	-										
• Rate/Misc Adjustments				0.000	0.000	0.002	-	-										
<b>Change Summary Explanation</b>																		
Funding: No significant change																		
Technical: Not applicable.																		

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<b>Exhibit R-2, RDT&amp;E Budget Item Justification:</b> PB 2021 Navy	<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy / BA 6: RDT&amp;E Management Support</i>	<b>R-1 Program Element (Number/Name)</b> PE 0605804N / <i>Technical Information Services</i>
Schedule: Not applicable.	

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020				
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0605804N / Technical Information Services				Project (Number/Name) 0835 / Tech Info System						
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			
0835: Tech Info System	0.000	1.001	0.988	0.932	-	0.932	0.945	0.965	0.985	1.004	Continuing	Continuing			
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-					
<b>A. Mission Description and Budget Item Justification</b>															
The Department of Navy Technology Transfer (T2) Program Office produces policy and guidance, products and services to the Naval Research Enterprise's (NRE) 42 Technology Transfer Offices to enhance warfighter effectiveness and modernize maintenance and sustainment by strategically leveraging industrial and academic research and development partnerships. These partnerships transition private sector technology into the NRE, and transfer appropriate Navy-developed innovative concepts, inventions, facilities and materiel to the private sector for the purposes of dual-use commercialization, to benefit DoD, the public economy, and academia (Public Law 96-480, Federal Technology Transfer Act of 1986). This program also provides the Department of the Navy interface to the Office of the Assistant Secretary of Defense for Research and Engineering, and to the Assistant Secretary of Commerce for Technology Policy for matters relating to policy and reporting requirements for technology transfer.															
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>															
<i>Title:</i> DON Technology Transfer										<i>Articles:</i>	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<i>Description:</i> DOD Technology Transfer (T2) Program Office is responsible for Technology Transfer policy updates, administration, and oversight as delegated by the Secretary of the Navy (SECNAV). The T2 Program Office is also responsible for programmatic and financial management, setting requirements for and administering professional training, opportunity marketing, setting T2 laboratory designation authority, pilot program administration T2 records management, review, reporting, and storage. This program also provides the Department of the Navy interface to the Office of the Assistant Secretary of Defense for Research and Engineering, and to the Assistant Secretary of Commerce for Technology Policy for matters relating to policy and reporting requirements for technology transfer.											1.001	0.988	0.932	0.000	0.932
<i>FY 2020 Plans:</i>											-	-	-	-	-
To enhance transactional efficiency between the Navy laboratories and industry and academic collaborators, the Navy Technology Transfer (T2) Office will revise and update Technology Transfer mechanisms (e.g., Cooperative Research and Development Agreements (CRADAs), PIAs templates, Navy Defense Technology Transfer Information System (NDTTIS) database, online training), Technology Transfer Handbook, Licensing Handbook and Policy Guidance. It will also execute at least two new pilot programs to embolden innovative T2 efforts at Navy Office of Research and Technology Application (ORTA) activities across laboratories and															

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020		
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 0605804N / Technical Information Services	Project (Number/Name) 0835 / Tech Info System				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
	commercialize Navy laboratory-developed technologies. Additionally, the T2 Program Office will raise the visibility of Navy technologies through publications, videos, website/social media, marketing and outreach to capitalize on the Navy laboratory developed innovations and systematically drive economic growth in the industrial base, create new services and products and amplify an inclusive technology based economic development.					
	In order to deliver solutions and capabilities to the acquisition workforce in support of the warfighter, the Navy T2 Program Office will enhance the NDTTIS database to leverage the value/impact of CRADAs. The Navy-wide T2 Innovation Discovery/Intellectual Property Mining Program will be expanded to identify, license and transition more patentable inventions that provide solutions to acquisition and commercial industry technological challenges that can benefit the warfighter and society. The Program Office will also lead and participate in national and regional technology transfer industry and academia engagement events to optimize the marketing and outreach of Navy developed inventions and expand on collaboration opportunities with industry and engage with underserved communities and non-traditional partners to advance commercialization.					
	The Navy T2 Program Office will institute a customer relationship and transaction management system that harmonizes and streamlines the T2 mechanism collaboration process, consolidates the Navy's intellect capital into a single structure through a centrally managed portfolio that will include a marketing analysis component, provide for external and internal stakeholder engagement, licensing and ecosystem landscape analysis to discover and forge opportunities for mutually beneficial T2 commercialization collaborations with academia, economic development agencies and start-up businesses.					
<b>FY 2021 Base Plans:</b>	To enhance transactional efficiency between the Navy laboratories and industry and academic collaborators, the Navy Technology Transfer (T2) Program Office will continue to revise and update Technology Transfer mechanisms Development Agreements (CRADAs), Partnership Intermediary Agreement (PIA) templates, the Navy Defense Technology Transfer Information System (NDTTIS) database, online training, Technology Transfer Handbook, Licensing Handbook, and Policy Guidance. It will also continue to execute at least two new pilot programs to embolden innovative T2 efforts Navy Office of Research and Technology Application (ORTA) activities across laboratories and commercialize Navy laboratory-developed technologies. Additionally the T2 Program Office will continue to raise the visibility of Navy technologies through enhancing and updating publications, videos, website/social media, marketing and outreach to capitalize on the Navy laboratory-					

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020		
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 0605804N / Technical Information Services	Project (Number/Name) 0835 / Tech Info System				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
developed innovations and systematically drive economic growth in the industrial base, create new services and products and amplify an inclusive technology based economic development.						
In order to deliver solutions and capabilities to the acquisition workforce in support of the warfighter, the Navy T2 Program Office will continue to enhance and maintain the NDTTIS database to leverage the value/impact of CRADAs. The Navy-wide T2 Innovation Discovery/Intellectual Property Mining Program will continue to be expanded and enhanced to identify, license and transition more patentable inventions that provide solutions to acquisition and commercial industry technological challenges that can benefit the warfighter and society. The Program Office will continue to lead and participate in national and regional technology transfer, SBIR/STTR, industrial, and academic engagement events to optimize the marketing and outreach of Navy-developed inventions and expand on collaboration opportunities with industry and engage with underserved communities and non-traditional partners to advance commercialization.						
The Navy T2 Program Office will continue to institute customer relationship and transaction management system that harmonizes and streamlines the T2 mechanism collaboration process, consolidates the Navy's intellecton capital into a single structure through a centrally managed portfolio that will include a marketing analysis component, provide for external and internal stakeholder engagement, licensing and ecosystem landscape analysis to discover and forge opportunities for mutually beneficial T2 commercialization collaborations with academia, economic development agencies and start-up businesses.						
<b>FY 2021 OCO Plans:</b> N/A						
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> No significant changes from FY 2020 to FY 2021; no programmatic impact.						
<b>Accomplishments/Planned Programs Subtotals</b>		1.001	0.988	0.932	0.000	0.932
<b>C. Other Program Funding Summary (\$ in Millions)</b>						
N/A						
<b>Remarks</b>						
<b>D. Acquisition Strategy</b>						
N/A						

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0605804N / <i>Technical Information Services</i>	<b>Project (Number/Name)</b> 2296 / <i>Federal Lab Consortium</i>
<b>C. Other Program Funding Summary (\$ in Millions)</b>		
<b>Remarks</b>		
<b>D. Acquisition Strategy</b> N/A		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy											Date: February 2020					
Appropriation/Budget Activity					R-1 Program Element (Number/Name)											
1319: Research, Development, Test & Evaluation, Navy / BA 6: RDT&E Management Support					PE 0605853N / Management, Technical & Intl Supt											
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	84.378	113.844	94.297	-	94.297	104.904	103.791	103.094	105.151	Continuing	Continuing				
0149: International Coop RDT&E	0.000	3.199	3.658	3.511	-	3.511	3.547	3.621	3.694	3.769	Continuing	Continuing				
1767: Naval War Col Strategic Studies Supt	0.000	5.060	5.658	5.765	-	5.765	5.875	5.987	6.108	6.230	Continuing	Continuing				
2098: Navy Postgraduate School (NPS) Studies Support	0.000	11.142	10.840	11.467	-	11.467	11.544	11.720	11.944	12.175	Continuing	Continuing				
2221: JT Mission Assessment Studies	0.000	24.457	25.799	22.423	-	22.423	27.867	27.743	27.085	27.627	Continuing	Continuing				
3017: Enterprise Information Systems	0.000	0.000	0.932	0.954	-	0.954	0.972	0.993	1.013	1.033	Continuing	Continuing				
3027: Defense Critical Infrastructure Program	0.000	5.632	7.743	5.772	-	5.772	7.767	7.658	7.330	7.477	Continuing	Continuing				
3312: MTMD-Maritime Theater Missile Defense Forum	0.000	6.983	10.601	16.251	-	16.251	15.028	14.308	14.486	14.776	Continuing	Continuing				
3330: Naval Research Laboratory (NRL) Facilities Modernization	0.000	15.379	19.026	16.441	-	16.441	16.837	16.460	16.788	17.124	Continuing	Continuing				
3363: PACOM Initiative	0.000	12.526	14.587	11.713	-	11.713	15.467	15.301	14.646	14.940	Continuing	Continuing				
9999: Congressional Adds	0.000	0.000	15.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	15.000				

**A. Mission Description and Budget Item Justification**

International Cooperative RDT&E: provide program management, execution, and support to implement a broad range of cooperative Naval Research and Development, Test and Evaluation initiatives to improve coalition interoperability, harmonize US Navy requirements with allied and friendly nations, and identify cooperative international opportunities, and improve coalition interoperability. In addition, it develops coherent approaches, coordinating with partner nations, to sea-based missile defense, command, control, communications, computers and intelligence (C4I), and cooperative acquisition programs while also identifying technology to support the Global Maritime Partnership initiative.

Naval War College Strategic Studies Support:

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<b>Exhibit R-2, RDT&amp;E Budget Item Justification: PB 2021 Navy</b>		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy / BA 6: RDT&amp;E Management Support</i>	<b>R-1 Program Element (Number/Name)</b> PE 0605853N / <i>Management, Technical &amp; Intl Supt</i>	
Provides research, analysis and gaming activities which serve as a focal point, stimulus, and major source of strategic and operational thought within the Navy, joint and interagency communities. These efforts generate strategic and operational alternatives, quantitative analysis, war gaming and political military assessments, and provide recommendations regarding the formulation and execution of maritime options . The War Gaming Department plans, designs, executes, analyzes and reports on the Navy's Title 10 war games. These war games provide analytical input to the Navy's Strategic Plan, assessments of future concepts, and recommendations to the Navy's Quadrennial Defense Review, force design, and strategy process. The War Gaming Department also designs, executes and analyzes war games for theater security cooperation plans and operational war fighting issues.		
<b>Assessment Program:</b>  The Navy Assessment Program provides capability-based planning assessment for Joint Capabilities Integration and Development System (JCIDS), conducts analysis to affect war fighting capability trades and enterprise resources, identifies needs, gaps, and overlaps, and assesses alternative solutions to Joint needs. The program supports both the development and use of modeling, simulation and analytically-based warfare and provides business analyses and analytic tools that provide the basis for decision making with respect to concepts of operations (CONOPS), Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) Systems (Information Dominance); warfare systems (Sea Strike, Sea Shield, and Sea Basing) and analytical underpinnings/basis for programmatic decisions of the Navy's top leadership regarding their architectures, force structure, and the Navy's core "organize, train, and equip mission" (the warfare and provider Enterprises). The program provides overarching Planning, Programming, Budgeting and Execution System (PPBES) analyses and guidance for PPBES which provides gap analysis and investment strategy and total obligation authority allocation. It provides independent capability analysis and assists in structuring follow-on Navy analyses. The program coordinates Navy's position for the enhanced planning process and conducts net assessments. It serves as the lead campaign analysis to approve Navy warfare and support requirements. The program supports "A Cooperative Strategy for 21st Century Seapower 21" as modified by the Maritime Strategy which charts a course for the Navy, Coast Guard and Marine Corps to work collectively with each other and international partners to prevent crises from occurring or reacting quickly should one occur to avoid negative impact to the United States. It serves as an independent assessor providing a broad-view perspective across the Navy staff apart from resource sponsors, with an integrated look at both war fighting and war fighting support programs. The program supports the world class modeling efforts to attain a level of Modeling and Simulation (M&S) capability that is world class and establishes the Navy as a leader in the Department of Defense (DoD) M&S community. It provides Navy alternatives in assessing the implications embedded within resource decisions in a quantified context of costs versus capability versus risk. The program provides independent analytic support to Navy leadership in conjunction with various executive level decision forums. It develops tools and analytical methodologies that assist in evaluating Navy programs and provides technical leadership for the analysis functional area of Naval Modeling and Simulation.		
<b>Operations Integration Group:</b> Classified  Naval Research Laboratory (NRL)Facilities Modernization: This program has been established to provide a systematic and planned approach to improve vital in-house science and technology (S&T) laboratory facilities which are reaching or have reached critical stages of deterioration. The program includes restoration and modernization (R&M) initiatives for about 350,000 net square feet, where the average age of the buildings is 67 years old.		

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<b>Exhibit R-2, RDT&amp;E Budget Item Justification:</b> PB 2021 Navy		<b>Date:</b> February 2020		
<b>Appropriation/Budget Activity</b>	<b>R-1 Program Element (Number/Name)</b>			
1319: <i>Research, Development, Test &amp; Evaluation, Navy / BA 6: RDT&amp;E Management Support</i>	PE 0605853N / <i>Management, Technical &amp; Intl Supt</i>			
<p>The Joint Information Environment (JIE) initiative provides the supporting IT capability framework comprised of shared information technology infrastructure, enterprise services, interoperability with coalition partners and a single security architecture that enables mission commanders to execute mission partnered operations. JIE provides the U.S. configuration controls necessary for enterprise capabilities. By utilizing a U.S enterprise-wide secure Identity and Access Management system, JIE ensures that authorized users at the right classification level gain access to only the data and services they are entitled. The continued development and refinement of a Joint Information Environment will provide for a significant improvement in data sharing within, and between, coalition maritime elements.</p>				
<p><b>MTMD - Maritime Theater Missile Defense Forum:</b></p> <p>This project funds participation in Maritime Integrated Air and Missile Defense projects with other nations through the Maritime Missile Defense Projects Framework Memorandum of Understanding of 2004 (as amended 2009, 2015, and 2016). Known as the Maritime Theater Missile Defense (MTMD) Forum, it promotes interoperability with the Navies of eleven participating nations (Australia, Canada, Denmark, France, Germany, Italy, Netherlands, Norway, Spain, United Kingdom and the United States). This project funds participation in multiple Projects and includes a maritime contribution to the NATO Active Layered Theater Ballistic Missile Defense (ALTBMD) project, now known as NATO Ballistic Missile Defense (BMD). Engineering analysis and recommendations from MTMD activities are provided to European, Pacific and Central Combatant Commands to influence present day operations. Specifically, the MTMD Forum is addressing challenges with "Maritime Allied Air Defense in Support of Ballistic Missile Defense Operations" that face the Combatant Commanders during present day operations. The MTMD Forum is leveraging At-Sea Demonstration (ASD) test events and operational Fleet Exercises to integrate technology with concepts of operations developed within MTMD Forum working groups.</p> <p>The MTMD Forum develops systems and techniques that enhance protection and defense against the proliferation of short, medium and long-range Ballistic Missile (BM) and Advanced Anti-Ship Cruise Missile (ASCM) threats through the development of interoperable sea-based Integrated Air and Missile Defense (IAMD) capability among coalition nations. This includes protection across the full spectrum of these threats through the enhanced utilization of existing sea-based systems to protect against current threats while progressively improving and developing systems and system-of- systems to effectively counter evolving threats.</p> <p>This project supports USN participation in several Maritime IAMD related Project Arrangements and Working Groups including:</p> <p>(1) Battle Management Command, Control, Communications, Computers, and Intelligence (BMC4I) to define and develop architectures as well as to perform engineering to address coalition capability gaps.</p> <p>(2) Modeling &amp; Simulation (M&amp;S) to establish and maintain a maritime coalition M&amp;S testbed and to perform legacy and future systems simulation testing.</p> <p>(3) Coalition Distributed Engineering Plant (CDEP) to establish and maintain a maritime coalition Hardware-in-the-Loop Testbed and to conduct CDEP testing.</p> <p>(4) Open Architecture (OA) to develop Interface Standards and Data Models.</p> <p>(5) Test Planning and Execution (TPEX) to develop Test Plans, oversee exercise participation and conduct post event data analysis and reporting.</p> <p>(6) Operational Requirements (OR) to develop a Coalition Maritime Missile Defense Operational Concept Document and to identify operational constraints and tactical constructs surrounding coalition maritime missile defense activities.</p> <p>(7) Reciprocal Use of Test Facilities agreements with other nations to support Maritime IAMD and MTMD related demonstrations.</p>				

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<b>Exhibit R-2, RDT&amp;E Budget Item Justification:</b> PB 2021 Navy		<b>Date:</b> February 2020			
<b>Appropriation/Budget Activity</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy / BA 6: RDT&amp;E Management Support</i>	<b>R-1 Program Element (Number/Name)</b> PE 0605853N / <i>Management, Technical &amp; Intl Supt</i>				
(8) Tactical Advancement for Next Generation (TANG) to work with our Allies and International Partners using human-centered design methodologies to identify solutions to technology and sailor performance issues that have been cited during previously conducted experiments, exercises, and demonstrations. This process will seek to leverage R&D investments and risk reduction research commercial companies are making today that can provide potential "dual use" technology and process solutions to complex problems.					
Anti-Tamper (AT): The AT program performs as the Navy Technical Process Owner for the Anti-Tamper systems engineering activity that is intended to prevent and/or delay the exploitation of critical technologies in U.S. systems; manages the research, design, development, implementation, and testing of AT measures and coordinates with Department of Defense AT Executive Agent. Starting in FY19, funding for AT is realigned to PE 0605024N Anti-Tamper Technology Support.					
JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under RESEARCH, DEVELOPMENT, TEST and EVALUATION MANAGEMENT SUPPORT because it supports efforts directed toward sustaining or modernizing installations or operations required for general research, development, test and evaluation.					
<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
Previous President's Budget	86.932	102.401	100.981	-	100.981
Current President's Budget	84.378	113.844	94.297	-	94.297
Total Adjustments	-2.554	11.443	-6.684	-	-6.684
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-3.557			
• Congressional Rescissions	-	-			
• Congressional Adds	-	15.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.243	0.000			
• SBIR/STTR Transfer	-2.311	0.000			
• Program Adjustments	0.000	0.000	-6.109	-	-6.109
• Rate/Misc Adjustments	0.000	0.000	-0.575	-	-0.575
<b>Congressional Add Details (\$ in Millions, and Includes General Reductions)</b>					
<b>Project: 9999: Congressional Adds</b>					
Congressional Add: <i>Printed Circuit Board Executive Agent</i>			Congressional Add Subtotals for Project: 9999		
			Congressional Add Totals for all Projects		
			<b>FY 2019</b>	<b>FY 2020</b>	
			0.000	15.000	
			0.000	15.000	
			0.000	15.000	

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<b>Exhibit R-2, RDT&amp;E Budget Item Justification:</b> PB 2021 Navy	<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy / BA 6: RDT&amp;E Management Support</i>	<b>R-1 Program Element (Number/Name)</b> PE 0605853N / <i>Management, Technical &amp; Intl Supt</i>
<p><b><u>Change Summary Explanation</u></b></p> <p>PRJ 2221 JT Mission Assessment Studies: The FY2021 funding request was reduced by \$3.079 million to account for the availability of prior year execution balances.</p> <p>PRJ 3027 Defense Critical Infrastructure Program: The FY2021 funding request was reduced by \$1.165 million to account for the availability of prior year execution balances.</p> <p>PRJ 3363 - PACOM Initiative: The FY2021 funding request was reduced by \$2.410 million to account for the availability of prior year execution balances.</p>	

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020	
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)			
1319 / 6					PE 0605853N / Management, Technical & Intl Supt				0149 / International Coop RDT&E			
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
0149: International Coop RDT&E	0.000	3.199	3.658	3.511	-	3.511	3.547	3.621	3.694	3.769	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
<b>A. Mission Description and Budget Item Justification</b>												
Provides funding for program management, execution, and support activities to implement a broad range of cooperative naval Research and Development, Test and Evaluation (RDT&E) initiatives to improve coalition interoperability, harmonize US Navy requirements with allied and friendly nations, and identify cooperative international opportunities. The funding is used to develop approaches to international cooperation consistent with combatant commanders (COCOMs), Chief of Naval Operations (CNO), and Secretary of the Navy (SECNAV) priorities in the maritime domain.												
Various cooperative RDT&E programs, projects and exchanges are pursued to identify cooperative acquisition programs, enhance Overseas Contingency Operations (OCO) efforts, fill capability gaps, improve US/coalition interoperability, and standardize defense capabilities with international partners. Such efforts have resulted in:												
1. Negotiating and developing approximately 57 international RDT&E Agreements annually with allied and friendly nations;												
2. Executing Information Exchange Annexes (IEAs) with foreign partners;												
3. Improving IEA information dissemination with allied and friendly countries and within Department of the Navy (DON);												
4. Coordinating Navy inputs to the Office of the Under Secretary of Defense (OUSD) Acquisition, Technology, and Logistics (AT&L) Foreign Comparative Test (FCT) Program, and Coalition Warfare Program (CWP) as well as the DON Technology Transfer Security Assistance Review Boards (TTSARB).												
5. Represent the US Navy in Office of the Secretary of Defense (OSD) directed Armaments Cooperation Forums, including the Conference of NATO Armaments Directors' groups {NATO Naval Armaments Group (NNAG)}, and Senior National Representative (SNR);												
6. Funding of various international RDT&E support databases including Technical Project Officer (TPO), International Agreement Generators, Information/Data Exchange Agreements, and Project Agreements/Memorandums of Understanding;												
7. Funding for Engineering and Scientist Exchange Program (ESEP).												
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>												
Title: International Coop RDT&E						Articles:						

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020				
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 0605853N / Management, Technical & Intl Supt	Project (Number/Name) 0149 / International Coop RDT&E				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Engineer and Scientist Exchange Program (ESEP), with a focused increase (~4-5 additional/year) on ESEP placements in Five Eye's nations, such as Australia and the United Kingdom.						
<ul style="list-style-type: none"> <li>-Continue execution of approximately 150 Information Exchange Agreements/Data Exchange Agreements (IEA/DEA) with more than 30 countries.</li> <li>-Continue to coordinate U.S. Navy participation in OUSD (AT&amp;L) Coalition Warfare Program (CWP) selection processes to meet emerging military capability requirements.</li> <li>-Support U.S.-India Defense Technology and Trade Initiative Working Groups, including the Joint Working Group on Aircraft Carrier Technology Cooperation (JWGACTC), the Jet Engine Technology Joint Working Group (JETJWG), and the Joint Working Group on Naval Systems (JWGNS).</li> <li>-Support U.S.-India Defense Technology and Trade Initiative Information Exchange and Terms of Reference (TOR) exchanges to promote cooperative opportunity development.</li> <li>-Continue to execute Above Water Working Group (AWWG)activities.</li> <li>-Continue to support NATO Naval Armaments Group (NNAG) and Five Power Groups on cooperative programs.</li> <li>-Provide contract support for Senior National Representative (SNR) and Navy International Programs Office for international outreach, development, and administrative activities</li> <li>-Provide travel support for SNR participation in Senior Naval National Representative (SNNR) meetings with key foreign partners, and for select NATO meetings in support of CNO priorities</li> </ul>						
<b>FY 2021 Base Plans:</b>						
<ul style="list-style-type: none"> <li>-Continue all efforts from prior FYs.</li> <li>-Continue and increase support for an international Theater ASW Forum with foreign partners, including expansion of international participation in technical discussions.</li> <li>-Continue execution and support in placement of U.S. Navy and partner nation engineers and scientists under OSD's Engineer and Scientist Exchange Program (ESEP), with a focused increase (~4-5 additional/year) on ESEP placements.</li> <li>-Continue execution of approximately 150 Information Exchange Agreements/Data Exchange Agreements (IEA/DEA) with more than 30 countries.</li> <li>-Continue to coordinate U.S. Navy participation in OUSD (AT&amp;L) Coalition Warfare Program (CWP) selection processes to meet emerging military capability requirements.</li> <li>-Support U.S.-India Defense Technology and Trade Initiative Working Groups, including the Joint Working Group on Aircraft Carrier Technology Cooperation (JWGACTC), the Jet Engine Technology Joint Working Group (JETJWG), and the Joint Working Group on Naval Systems (JWGNS).</li> </ul>						

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020		
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 0605853N / Management, Technical & Intl Supt	Project (Number/Name) 0149 / International Coop RDT&E				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
-Support U.S.-India Defense Technology and Trade Initiative Information Exchange and Terms of Reference (TOR) exchanges to promote cooperative opportunity development.						
-Continue to execute Above Water Working Group (AWWG) activities.						
-Continue to support NATO Naval Armaments Group (NNAG) and Five Power Groups on cooperative programs.						
-Provide contract support for Senior National Representative (SNR) and Navy International Programs Office for international outreach, development, and administrative activities.						
-Provide travel support for SNR participation in Senior Naval National Representative (SNNR) meetings with key foreign partners, and for select NATO meetings in support of CNO priorities.						
<b>FY 2021 OCO Plans:</b> N/A						
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor decrease from FY2020 to FY2021 reflects a reduction to travel support funding.						
<b>Accomplishments/Planned Programs Subtotals</b>		3.199	3.658	3.511	0.000	3.511
<b>C. Other Program Funding Summary (\$ in Millions)</b>						
N/A						
<b>Remarks</b>						
<b>D. Acquisition Strategy</b>						
N/A						

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											<b>Date:</b> February 2020		
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0605853N / Management, Technical & Intl Supt				Project (Number/Name) 1767 / Naval War Col Strategic Studies Supt				
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	
1767: Naval War Col Strategic Studies Supt	0.000	5.060	5.658	5.765	-	5.765	5.875	5.987	6.108	6.230	Continuing	Continuing	
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-			
<b>A. Mission Description and Budget Item Justification</b>													
Naval War College (NWC) research, analysis and gaming activities serve as a focal point, stimulus, and major source of strategic and operational thought within the Navy, Joint and Interagency communities. These efforts generate strategic and operational alternatives, tactical imperatives, quantitative analysis, war gaming, political-military assessments, and provide recommendations to the Chief of Naval Operations (CNO), Fleet Commanders and numbered Fleet Commanders regarding the formulation and execution of maritime options for the President of the United States.													
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>													
<b>Title:</b> Strategic Studies <b>Articles:</b> <b>Description:</b> Naval War College (NWC) conducts research in strategic studies in response to tasking from the Secretary of the Navy (SECNAV), Chief of Naval Operation (CNO), Fleet Commanders, numbered Fleet Commanders, and Combatant Commanders. NWC research includes strategic documents produced by its Chinese Maritime Studies Institute (CMSI), Russia Maritime Studies Institute (RMSI), Center for Cyber Conflict Studies (C3S), and Institute for Future Warfare Studies (IFWS). <b>FY 2020 Plans:</b> - Conduct research and analysis projects and provide supporting events for OPNAV, the numbered Fleets, Navy Component Commanders, and Combatant Commanders. - Continue to support OPNAV Staff on tasked research projects. - Conduct research into Chinese, Russian, and Future maritime capabilities and affairs in order to enhance understanding of global developments and provide studies and advice for CNO and Fleet. - Continue research on cyber capabilities, focusing on deterrence. - Continue Mahan Program research on deterrence capabilities with increased focus on Navy contribution to national nuclear deterrence missions and future Navy capabilities. <b>FY 2021 Base Plans:</b> - Conduct research and analysis projects and provide supporting events for OPNAV, the numbered Fleets, Navy Component Commanders, and Combatant Commanders.													
FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total									
0.700	0.714	0.728	0.000	0.728									
-	-	-	-	-									

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy					<b>Date:</b> February 2020	
<b>Appropriation/Budget Activity</b> 1319 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0605853N / Management, Technical & Intl Supt	<b>Project (Number/Name)</b> 1767 / Naval War Col Strategic Studies Supt				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
<ul style="list-style-type: none"> <li>- Continue to support OPNAV Staff on tasked research projects.</li> <li>- Conduct research into Cyber, Chinese, Russian, and Future maritime capabilities and affairs to enhance understanding of global developments and provide studies and advice for CNO and Fleet.</li> <li>- Continue research on cyber capabilities, focusing on deterrence.</li> <li>- Continue Mahan Program research on deterrence capabilities with increased focus on Navy contribution to national nuclear deterrence missions and future Navy capabilities.</li> </ul>						
<b>FY 2021 OCO Plans:</b> N/A						
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> There is no significant change from FY2020 to FY2021.						
<b>Title:</b> Naval War Gaming Support  <b>Description:</b> Naval War College (NWC) conducts strategic and operational war gaming and research for Office of the Chief of Naval Operations (OPNAV), the numbered Fleets, Fleet Commanders, and the Combatant Commanders. Each year, 45-60 major war games and associated events provide support to efforts that explore and analyze military, political, informational and economic aspects of differing strategic and operational scenarios and tactical imperatives. NWC continues to expand its capability and capacity to execute war games of increased scope, magnitude and complexity.		<b>Articles:</b> - - - - -	3.733 - - - -	4.304 - - - -	4.385 - - - -	0.000 - - - -
<b>FY 2020 Plans:</b> <ul style="list-style-type: none"> <li>- Conduct 55-60 major war games and related events in support of OPNAV, the numbered Fleets, and the Combatant Commands.</li> <li>- Conduct 8 Executive Committee submitted and CNO approved war games and Navy Title X war games, directed research, and analysis.</li> <li>- Continue to foster cooperative relationships with international partners through use of war gaming, research, analysis and education.</li> <li>- Refine capstone war gaming exercises that support the International Maritime Staff Operators Course.</li> <li>- Execute Fleet Synchronization Conferences.</li> </ul>						

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy				<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 6		<b>R-1 Program Element (Number/Name)</b> PE 0605853N / Management, Technical & Intl Supt	<b>Project (Number/Name)</b> 1767 / Naval War Col Strategic Studies Supt	
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>				
FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
- Execute capstone war game exercise for the Joint Force Maritime Component Commander (JFMCC) Course. - Resource and provision life cycle maintenance requirements for networks, communications, and modeling and simulation capacity. - Resource and provision required manpower and equipment for the High Security Research and Wargaming Facility.				
<b>FY 2021 Base Plans:</b> - Conduct 55-60 major war games and related events in support of OPNAV, the numbered Fleets, and the Combatant Commands. - Conduct 35 events supporting 8 Executive Committee and CNO approved war games and Navy Title X war games, directed research, and analysis. - Continue to foster cooperative relationships with international partners through use of war gaming, research, analysis and education. - Refine capstone war gaming exercises that support the International Maritime Staff Operators Course. - Execute Fleet Synchronization Conferences. - Execute capstone war game exercise for the Joint Force Maritime Component Commander (JFMCC) Course. Fleet Synchronization Conferences. - Resource and provision life cycle maintenance requirements for networks, communications, and modeling and simulation capacity. - Resource and provision required manpower and equipment for the High Security Research and Wargaming Facility.				
<b>FY 2021 OCO Plans:</b> N/A				
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Increased funding from FY20 to FY21 continues to resource the Naval War College expansion to execute high security war gaming and research.				
<b>Title:</b> Warfare Analysis and Research	<b>Articles:</b>	0.544	0.555	0.566
<b>Description:</b> Naval War College (NWC) supports senior decision-makers from the Department of Defense, Department of the Navy, the numbered Fleets, Fleet Commanders and Combatant Commanders in reaching		0.000	0.566	-

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy				<b>Date:</b> February 2020			
<b>Appropriation/Budget Activity</b> 1319 / 6		<b>R-1 Program Element (Number/Name)</b> PE 0605853N / Management, Technical & Intl Supt	<b>Project (Number/Name)</b> 1767 / Naval War Col Strategic Studies Supt				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>							
FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total			
well-informed, objective decisions on strategic, operational and programmatic issues through collaborative research which integrates traditional research and analysis with advanced decision support tools.							
<b>FY 2020 Plans:</b> <ul style="list-style-type: none"> <li>- Continue conducting major decision events in support of OPNAV, the numbered Fleets, Fleet Commanders, and the Combatant Commanders.</li> <li>- Continue warfighting analysis requirements for numbered Fleet commanders.</li> <li>- Continue analytical research on key strategic and operational challenges such as maritime ballistic missile defense, proliferation security initiative, global maritime security, maritime situational awareness, maritime operations headquarters, interconnectivity, and multi-service force deployment.</li> <li>- Continue evaluation of concepts and decision events in conjunction with war gaming center.</li> <li>- Continue research targeted at the strategic and policy level decision making within China and Russia.</li> <li>- Continue providing direct support to NWC student research groups and war gaming.</li> <li>- Execute approximately 20 major decision events in support of these efforts.</li> </ul>							
<b>FY 2021 Base Plans:</b> <ul style="list-style-type: none"> <li>- Continue conducting major decision events in support of OPNAV, the numbered Fleets, Fleet Commanders, and the Combatant Commanders.</li> <li>- Continue warfighting analysis requirements for numbered Fleet commanders.</li> <li>- Continue analytical research on key strategic and operational challenges such as maritime ballistic missile defense, proliferation security initiative, global maritime security, maritime situational awareness, maritime operations headquarters, interconnectivity, and multi-service force deployment.</li> <li>- Continue evaluation of concepts and decision events in conjunction with war gaming center.</li> <li>- Continue research targeted at the strategic and policy level decision making within China and Russia.</li> <li>- Continue providing direct support to NWC student research groups and war gaming.</li> <li>- Execute approximately 20 major decision events in support of these efforts.</li> </ul>							
<b>FY 2021 OCO Plans:</b> N/A							
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> There is no significant change from FY2020 to FY2021.							
<b>Title:</b> NWC Student Research Projects		<b>Articles:</b>	0.083	0.085	0.086	0.000	0.086
			-	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020		
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 0605853N / Management, Technical & Intl Supt	Project (Number/Name) 1767 / Naval War Col Strategic Studies Supt				
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<b>Description:</b> Selected top performing Naval War College (NWC) students to conduct focused research and analysis of current and future strategic and operational challenges and tactical imperatives. These students are organized under the supervision of the Mahan Scholars Program and the Halsey Group Program.						
<b>FY 2020 Plans:</b> - Conduct focused research, analysis and war gaming of current and future strategic/operational challenges and tactical imperatives by the Halsey Groups and Mahan Scholars programs. - Research groups continue to conduct focused research, analysis and free-play war gaming of current and future operational challenges and tactical imperatives arising from regional threats, homeland defense and access denial efforts at the high end of the conflict spectrum in the Pacific, European Command (EUCOM), Central Command (CENTCOM) and Northern Command (NORTHCOM) area of responsibility (AOR). Research and analysis efforts continue in those areas above, and will be expanded to include a detailed focus on counter-targeting, operational deception, and countering information denial and missile defense at the theater joint operational level.						
<b>FY 2021 Base Plans:</b> - Conduct focused research, analysis and war gaming of current and future strategic/operational challenges and tactical imperatives by the Halsey, Gravely and Holloway Group Programs and Mahan Scholars. - Research groups continue to conduct focused research, analysis and free-play war gaming of current and future operational challenges and tactical imperatives arising from regional threats, homeland defense and access denial efforts at the high end of the conflict spectrum in the Pacific, European Command (EUCOM), Central Command (CENTCOM) and Northern Command (NORTHCOM) area of responsibility (AOR). Research and analysis efforts continue in those areas above, and will be expanded to include a detailed focus on counter-targeting, operational deception, and countering information denial and missile defense at the theater joint operational level.						
<b>FY 2021 OCO Plans:</b> N/A						
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> There is no significant increase from FY2020 to FY2021.						
<b>Accomplishments/Planned Programs Subtotals</b>		5.060	5.658	5.765	0.000	5.765

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0605853N / <i>Management, Technical &amp; Intl Supt</i>	<b>Project (Number/Name)</b> 1767 / <i>Naval War Col Strategic Studies Supt</i>
<b>C. Other Program Funding Summary (\$ in Millions)</b>		
N/A		
<b>Remarks</b>		
<b>D. Acquisition Strategy</b>		
N/A		

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020				
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)						
1319 / 6					PE 0605853N / Management, Technical & Intl Supt				2098 / Navy Postgraduate School (NPS) Studies Support						
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			
2098: Navy Postgraduate School (NPS) Studies Support	0.000	11.142	10.840	11.467	-	11.467	11.544	11.720	11.944	12.175	Continuing	Continuing			
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-					
<b>A. Mission Description and Budget Item Justification</b>															
Navy Postgraduate School (NPS) research and analysis activities serve as a focal point, stimulus, and major source of strategic, tactical and operational thought within the Navy communities. These efforts generate strategic and operational alternatives, tactical imperatives, quantitative analyses, technical developments and assessments, and political-military assessments. Also, provide recommendations to the Chief of Naval Operations (CNO), Fleet Commanders and numbered Fleet Commanders regarding the formulation and execution of maritime options for the President of the United States. Research will be conducted that will enhance graduate education for Naval Officers and potentially provide students with areas of studies for theses and faculty projects. These research activities also serve as a means for OPNAV Resource Sponsors and Major Commands to have analysis and decision support research conducted in the uses of the applied, soft, and hard sciences in solving diverse and complex resource allocation and strategic issues facing the Navy today and envisioned in the future.															
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>											FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<b>Title:</b> Faculty and Student Studies, Analysis and Research  <b>Articles:</b>											11.142 76	10.840 74	11.467 77	0.000 -	11.467 77
<b>Description:</b> Navy Postgraduate School (NPS) research and analysis activities serve as a focal point, stimulus, and major source of strategic, tactical and operational alternatives, tactical imperatives, quantitative analyses, technical developments and assessments, and political-military assessments. Also, provide recommendations to the Chief of Naval Operations (CNO), Fleet Commanders and numbered Fleet Commanders regarding the formulation and execution of maritime options for the President of the United States. Research will be conducted to support graduate students theses determination and completion as part of Faculty projects. These research activities also serve as a means for OPNAV Resource Sponsors and Major Commands to have analysis and decision support research conducted in the uses of the applied, soft, and hard sciences in solving diverse and complex resource allocation and strategic issues facing the Navy today and envisioned in the future.															
<b>FY 2020 Plans:</b> Continue Studies planned in the following areas:  - 1 in the area of Applied Mathematics - 15 in the area of Executive Education															

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020		
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 0605853N / Management, Technical & Intl Supt	Project (Number/Name) 2098 / Navy Postgraduate School (NPS) Studies Support				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
- 24 in the area of Computer Science - 97 in the area of Defense Analysis - 7 in the area of Electrical and Computer Engineering - 14 in the area of Energy Academic Group - 76 in the area of Business & Public Policy - 112 in the area of Information Sciences - 31 in the area of Information Sciences and Modeling, Virtual Environments and Simulation (MOVES) - 25 in the area of Mechanical and Aerospace Engineering - 10 in the area of Meteorology - 20 in the area of National Security Affairs - 12 in the area of Oceanography - 275 in the area of Operations Research - 32 in the area of Physics - 3 in the area of Space Systems - 135 in the area of Systems Engineering						
<b>FY 2021 Base Plans:</b> Continue Studies planned in the following areas:						
- 1 in the area of Applied Mathematics - 15 in the area of Executive Education - 24 in the area of Computer Science - 97 in the area of Defense Analysis - 7 in the area of Electrical and Computer Engineering - 14 in the area of Energy Academic Group - 76 in the area of Business & Public Policy - 112 in the area of Information Sciences - 31 in the area of Information Sciences and Modeling, Virtual Environments and Simulation (MOVES) - 25 in the area of Mechanical and Aerospace Engineering - 10 in the area of Meteorology - 20 in the area of National Security Affairs - 12 in the area of Oceanography - 276 in the area of Operations Research						

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020
<b>Appropriation/Budget Activity</b> 1319 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0605853N / Management, Technical & Intl Supt	<b>Project (Number/Name)</b> 2098 / Navy Postgraduate School (NPS) Studies Support		
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>
- 32 in the area of Physics - 3 in the area of Space Systems - 138 in the area of Systems Engineering				
<b>FY 2021 OCO Plans:</b> N/A				
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Funding has increased from FY2020 to FY2021 due to approximately 5 more research projects being executed. Average NRP research project size is approximately \$130K.				
<b>Accomplishments/Planned Programs Subtotals</b>				11.142    10.840    11.467    0.000    11.467
<b>C. Other Program Funding Summary (\$ in Millions)</b>				
N/A				
<b>Remarks</b>				
<b>D. Acquisition Strategy</b>				
N/A				

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020	
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)			
1319 / 6					PE 0605853N / Management, Technical & Intl Supt				2221 / JT Mission Assessment Studies			
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
2221: JT Mission Assessment Studies	0.000	24.457	25.799	22.423	-	22.423	27.867	27.743	27.085	27.627	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

This exhibit has been updated to reflect the establishment of the Navy Analytic Office (NAO), which is responsible for the executive oversight of Navy studies and analysis. The NAO was stood up to better align the annual Analytic Agenda to CNO's strategic priorities while also providing for study of the more tactical requirements of the Fleet and Navy writ large. The outcome will be synchronized modeling, simulation, assessments, wargames, experiments and exercises providing rich, shared data to support and refine warfighting concepts and to inform budget decisions.

The Navy Annual Studies Program supports the Analytic Agenda by providing both the development and use of modeling, simulation and analytically-based warfare, business analyses and analytic tools that provide the basis for decision making with respect to concepts of operations (CONOPS), Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) Systems; warfare systems, and analytical underpinnings/basis for programmatic decisions of the Navy's top leadership regarding their architectures, force structure, and the Navy's core "organize, train, and equip mission" (the warfare and provider Enterprises). The program provides capability-based planning assessment for Joint Capabilities Integration and Development System (JCIDS), conducts analysis to affect warfighting capability trades and enterprise resources, identifies needs, gaps and overlaps, and assesses alternative solutions to Joint needs. The program provides overarching Planning, Programming, Budgeting and Execution System (PPBES) analyses and guidance for PPBES which provides gap analysis and investment strategy and total obligation authority allocation. It provides independent capability analysis and assists in structuring follow-on Navy analyses. The program coordinates Navy's position for the enhanced planning process and conducts net assessments. It serves as the lead campaign analysis to approve Navy warfare and support requirements. The program supports the Maritime Strategy which charts a course for the Navy, Coast Guard and Marine Corps to work collectively with each other and international partners to prevent crises from occurring, or reacting quickly should one occur to avoid negative impact to the United States. The Studies Program provides a broad-view perspective across the Fleet and Navy staff, with an integrated look at both warfighting and warfighting-support programs. It provides Navy alternatives in assessing the implications embedded within resource decisions in a quantified context of costs versus capability versus risk. The program provides independent analytic support to Navy leadership in conjunction with various executive level decision forums.

This project funds concept development engineering, mission effectiveness analysis, and other analyses for formulation of future surface ship and associated platform force structure along with development of the tools to accomplish these efforts. Advanced platform concept studies and systems technology assessments will be conducted as will the development and upgrade of concept design and engineering tools, methods, and criteria. Concept Formulation (CONFORM)/Concept Development and Experimentation (CDE) for ships, boats and unmanned maritime vehicles must be continuously exercised to remain viable. It takes years to train competent practitioners, and knowledge currency is quickly lost without practice. Evolving threats and technologies drive concepts (and the tools, processes, and skills needed to produce them) towards obsolescence without constant attention. Capability Based Assessments and Analysis of Alternatives (AoA) timelines are insufficient for establishing potential material solution cost versus capability relationships without significant concept formulation work beforehand. Active collaboration between the Office of the Chief of Naval Operations requirement sponsors, Program Offices, and the various System Commands (Naval Sea Systems Command, Naval Air

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy					Date: February 2020				
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 0605853N / Management, Technical & Intl Supt	Project (Number/Name) 2221 / JT Mission Assessment Studies							
Systems Command and Space and Naval Warfare Systems Command) engineers is critical for fully exploring the trade space by conducting analysis for affordability, effectiveness and risk. The majority of Total Ownership Cost (TOC) is locked into a design before it is even a program. In the later stages of a program it becomes much more costly to make changes that will significantly impact TOC. Investment up front in concept design can have a high payoff in TOC reduction over the life of a platform class. Outputs include concept costing and performance parameterization for comparative assessment against capability objectives and synthesis to quantify overall (Fleet) capabilities. These products (expressions of cost vs. capability) will serve as the basis of requirements and Joint Capabilities Integration and Development System analysis, define the trade space for AoA efforts, and underpin discussion of force architecture/structure during Quadrennial Defense Review, Long Range Shipbuilding Strategy builds, and Joint Requirements Oversight Council reviews.									
Capabilities-Based Assessment (CBA) is the Joint Capabilities Integration and Development System (JCIDS) analysis process that includes three phases: Functional Area Analysis (FAA), Functional Needs Analysis (FNA), and Functional Solution Analysis (FSA). The results of the CBA are used to develop a joint capabilities document (based on the FAA and FNA) or initial capabilities document (based on the full analysis). CBA funding provides the resource sponsors the means to develop the analytic underpinning required by Chairman of the Joint Chiefs of Staff Instruction 3170.01G to support the determination of Naval warfighting capabilities and force structure needed to support the Joint Requirements Oversight Council (JROC)/JCIDS requirements validation process and to inform Program Objective Memorandum programming decisions. This analysis includes evaluation of integration and interoperability gaps of both current and future Navy platforms and systems capabilities.									
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)									
Title: Navy Studies & Analysis	Articles:								
<b>FY 2020 Plans:</b> -Continue to develop, update and maintain detailed level Navy Standard scenarios based on DPG. -Continue to develop alternative scenarios in support of Defense Review guidance, Joint studies, and Navy resource analyses. -Continue to develop, update and maintain analytic baselines for the MCO based on DPG. -Continue to develop details required to execute analysis of designated Defense Planning Scenarios and their respective Multi-Service Force Deployment Plans. -Continue to develop and maintain a framework and common set of processes to ensure that essential elements of warfare analyses, including scenarios, operational concepts, tactics, capabilities of platforms and systems (for Navy, Joint, coalition and threat forces), key assumptions and input data are defined and traceable to government approved/provided source material. -Continue to develop scenarios and operational concepts based on government inputs that are sufficiently detailed for use in naval and joint campaign analyses.  -At the mission level, continue to script Operational Situations (OPSITS) or Tactical Situations (TACSITS) for use in effectiveness analyses in specific warfare mission areas.									
		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total			
		19.965	21.404	18.637	0.000	18.637			
		-	-	-	-	-			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020		
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 0605853N / Management, Technical & Intl Supt	Project (Number/Name) 2221 / JT Mission Assessment Studies				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
-Continue to provide analytically-based decision recommendations to CNO for both warfighting and support areas. -Continue to develop CNO investment strategy recommendations and assessments for Program Review and Program Objective Memorandum. -Continue to perform rigorous, time critical naval and joint campaign and mission-level analyses, usually based on modeling and simulation that illuminated complex warfare issues which support decision-making in the PPBE process.  -Continue to conduct ISR and METOC assessments to determine the optimal mix of Naval ISR and METOC sensors, platforms, and processing, analysis and fusion disposition to support MCOs, the OCO, and intelligence preparation of the environment for both MCOs and OCO. -Continue to develop and maintain common baselines from which campaign excursions and mission-level analyses are executed. -Continue to identify, develop and improve data and modeling, and broker agreements upon assumptions, CONOPS, scenarios, and data. -Continue to lead campaign analysis for OPNAV and lead Navy's participation in OSD/Joint Staff analytic agenda, baseline development, and collection of data. -Continue to conduct modeling and simulation support for ongoing OPNAV missile defense analysis requirements. -Continue to provide analytically-based decision recommendations to OPNAV for joint warfighting and support areas. -Continue to develop new analytic models and techniques for informing resource allocation decisions; conduct all campaign and warfare mission-level analyses and develop investment strategies. -Continue to develop and improve the Navy's analysis capabilities which support Joint and Navy analytic agendas and resource-allocation decision making by refining the linkages between cost and performance in performance-modeled programs in support of Navy analysis and assessment. Areas of tool development and improvement included mission and campaign-level warfighting models, active and reserve manpower, afloat and ashore readiness, and medical capabilities. -Continue to focus on integrated analysis capabilities that cut across business and program accounts. Specific efforts address cyber warfare and security, optimizing the training pipeline, integrating ship maintenance and operations price performance models, and improving mission- and campaign-level C5ISR models and representations.						

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020		
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 0605853N / Management, Technical & Intl Supt	Project (Number/Name) 2221 / JT Mission Assessment Studies				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
-Continue to develop medical analysis that links to campaign analysis including movement of injured between care facilities, life-saving treatment of injured and recuperation support of injured to support Navy Medical Program decisions. -Continue to update the high-level readiness model that fully integrates all aspects of warfighting support (operational utilization, training cycles, training centers, depots, etc.) and personnel (recruitment, training, development, deployment, retention, etc.) across the Navy's warfighting platforms (aircraft, ships, submarines, etc.), facilities and personnel development centers. -Continue to conduct ship, boat, and unmanned marine vehicle concept studies in preparation for Capabilities Based Assessments (CBAs) and Analysis of Alternatives (AoAs). Studies will be performed in a continuous manner to support future recapitalization of Surface Combatants, Amphibious Ships, Carriers, Auxiliary Ships and other emerging program requirements. -Continue to collaborate with Warfare Systems design experts to perform continuous Warfare Systems analysis at the ship and fleet level. Warfare Systems effectiveness assessment tools are being continually developed and enhanced as required to address future concepts and to incorporate improvements in information technology systems. Additionally, collaborate with aircraft, C4ISR, and networks by continuing dialog and collaboration between NAVSEA, NAVAIR, and SPAWAR systems commands which refines fleet level requirements. -Continue to conduct future force structure concept formulation. Fleet synthesis and analysis will be conducted, which includes capabilities requirements, platform design and cost and quantitative tracking of the long-term evolution of the fleet as new platforms are introduced and old ones are retired. Areas to be examined include interoperability concepts, force architecture impact studies, and operational employment concept studies.						
<b>FY 2021 Base Plans:</b> Continue to develop, update and maintain detailed level Navy Standard scenarios based on DPG. -Continue to develop alternative scenarios in support of Defense Review guidance, Joint studies, and Navy resource analyses. -Continue to develop, update and maintain analytic baselines for the MCO based on DPG. -Continue to develop details required to execute analysis of designated Defense Planning Scenarios and their respective Multi-Service Force Deployment Plans. -Continue to develop and maintain a framework and common set of processes to ensure that essential elements of warfare analyses, including scenarios, operational concepts, tactics, capabilities of platforms and systems (for Navy, Joint, coalition and threat forces), key assumptions and input data are defined and traceable to government approved/provided source material.						

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020		
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 0605853N / Management, Technical & Intl Supt	Project (Number/Name) 2221 / JT Mission Assessment Studies				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
-Continue to develop scenarios and operational concepts based on government inputs that are sufficiently detailed for use in naval and joint campaign analyses. -At the mission level, continue to script Operational Situations (OPSITS) or Tactical Situations (TACSITS) for use in effectiveness analyses in specific warfare mission areas. -Continue to provide analytically-based decision recommendations to CNO for both warfighting and support areas. -Continue to develop CNO investment strategy recommendations and assessments for Program Review and Program Objective Memorandum. -Continue to perform rigorous, time critical naval and joint campaign and mission-level analyses, usually based on modeling and simulation that illuminated complex warfare issues which support decision-making in the PPBE process. -Continue to conduct ISR and METOC assessments to determine the optimal mix of Naval ISR and METOC sensors, platforms, and processing, analysis and fusion disposition to support MCOs, the OCO, and intelligence preparation of the environment for both MCOs and OCO. -Continue to develop and maintain common baselines from which campaign excursions and mission-level analyses are executed. -Continue to identify, develop and improve data and modeling, and broker agreements upon assumptions, CONOPS, scenarios, and data. -Continue to lead campaign analysis for OPNAV and lead Navy's participation in OSD/Joint Staff analytic agenda, baseline development, and collection of data. -Continue to conduct modeling and simulation support for ongoing OPNAV missile defense analysis requirements. -Continue to provide analytically-based decision recommendations to OPNAV for joint warfighting and support areas. -Continue to develop new analytic models and techniques for informing resource allocation decisions; conduct all campaign and warfare mission-level analyses and develop investment strategies. -Continue to develop and improve the Navy's analysis capabilities which support Joint and Navy analytic agendas and resource-allocation decision making by refining the linkages between cost and performance in performance-modeled programs in support of Navy analysis and assessment. Areas of tool development and improvement included mission and campaign-level warfighting models, active and reserve manpower, afloat and ashore readiness, and medical capabilities. -Continue to focus on integrated analysis capabilities that cut across business and program accounts. Specific efforts address cyber warfare and security, optimizing the training pipeline, integrating ship maintenance						

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020		
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 0605853N / Management, Technical & Intl Supt	Project (Number/Name) 2221 / JT Mission Assessment Studies				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
and operations price performance models, and improving mission- and campaign-level C5ISR models and representations. -Continue to develop medical analysis that links to campaign analysis including movement of injured between care facilities, life-saving treatment of injured and recuperation support of injured to support Navy Medical Program decisions. -Continue to update the high-level readiness model that fully integrates all aspects of warfighting support (operational utilization, training cycles, training centers, depots, etc.) and personnel (recruitment, training, development, deployment, retention, etc.) across the Navy's warfighting platforms (aircraft, ships, submarines, etc.), facilities and personnel development centers. -Continue to conduct ship, boat, and unmanned marine vehicle concept studies in preparation for Capabilities Based Assessments (CBAs) and Analysis of Alternatives (AoAs). Studies will be performed in a continuous manner to support future recapitalization of Surface Combatants, Amphibious Ships, Carriers, Auxiliary Ships and other emerging program requirements. -Continue to collaborate with Warfare Systems design experts to perform continuous Warfare Systems analysis at the ship and fleet level. Warfare Systems effectiveness assessment tools are being continually developed and enhanced as required to address future concepts and to incorporate improvements in information technology systems. Additionally, collaborate with aircraft, C4ISR, and networks by continuing dialog and collaboration between NAVSEA, NAVAIR, and SPAWAR systems commands which refines fleet level requirements. -Continue to conduct future force structure concept formulation. Fleet synthesis and analysis will be conducted, which includes capabilities requirements, platform design and cost and quantitative tracking of the long-term evolution of the fleet as new platforms are introduced and old ones are retired. Areas to be examined include interoperability concepts, force architecture impact studies, and operational employment concept studies.						
<b>FY 2021 OCO Plans:</b> N/A						
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> The FY 2021 funding request was reduced by \$2.324 million to account for the availability of prior year execution balances in addition to a reduction of \$443K for rate adjustments.						
<b>Title:</b> Joint Mission Assessment Studies	<b>Articles:</b>	4.492	4.395	3.786	0.000	3.786

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020		
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 0605853N / Management, Technical & Intl Supt	Project (Number/Name) 2221 / JT Mission Assessment Studies				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<b>Description:</b> Capabilities-Based Assessment (CBA) is the JCIDS analysis process that includes three phases: the Functional Area Analysis (FAA), the Functional Needs Analysis (FNA), and the Functional Solution Analysis (FSA). The results of the CBA are used to develop a joint capabilities document (based on the FAA and FNA) or initial capabilities document (based on the full analysis). CBA funding provides the resource sponsors the means to develop the analytic underpinning required by Chairman of the Joint Chiefs of Staff Instruction 3170.01G to support the determination of Naval war fighting capabilities and force structure needed to support the JROC/JCIDS requirements validation process and to inform Program Objective Memorandum programming decisions.						
<b>FY 2020 Plans:</b> CBA such as advanced Naval surface fires and Naval aviation training to identify future capability requirements. Develop metrics to describe the effectiveness of solutions, and evaluate current and programmed systems ability to meet capability requirements to determine capability gaps. Expand warfighting gap assessments addressing interaction of mission area kill chain platforms, sensors, and weapons in a system-of-system construct.						
<b>FY 2021 Base Plans:</b> CBA such as advanced Naval Warfare fires and Naval aviation integrated analysis to identify future capability requirements. Develop metrics to describe the effectiveness of solutions, and evaluate current and programmed systems ability to meet capability requirements to determine capability gaps. Expand warfighting gap assessments addressing interaction of mission area kill chain platforms, sensors, and weapons in a system-of-system construct.						
<b>FY 2021 OCO Plans:</b> N/A						
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> The FY 2021 funding request was reduced by \$0.609 to account for the availability of prior year execution balances.						
<b>Accomplishments/Planned Programs Subtotals</b>		24.457	25.799	22.423	0.000	22.423
<b>C. Other Program Funding Summary (\$ in Millions)</b>						
N/A						
<b>Remarks</b>						

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy	<b>Date:</b> February 2020	
<b>Appropriation/Budget Activity</b> 1319 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0605853N / <i>Management, Technical &amp; Intl Supt</i>	<b>Project (Number/Name)</b> 2221 / <i>JT Mission Assessment Studies</i>
<b>D. Acquisition Strategy</b> N/A.		

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020				
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0605853N / Management, Technical & Intl Supt				Project (Number/Name) 3017 / Enterprise Information Systems						
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			
3017: Enterprise Information Systems	0.000	0.000	0.932	0.954	-	0.954	0.972	0.993	1.013	1.033	Continuing	Continuing			
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-					
<b>A. Mission Description and Budget Item Justification</b>															
This project funds the Office of Naval Research (ONR) Next Generation Enterprise Network (NGEN) Information Technology corporate costs.															
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>											FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<i>Title:</i> Next Generation Enterprise Network (NGEN)											0.000	0.932	0.954	0.000	0.954
<i>Articles:</i>											-	-	-	-	
<i>Description:</i> This project funds the Office of Naval Research (ONR) Next Generation Enterprise Network (NGEN) Information Technology corporate costs.															
<i>FY 2020 Plans:</i> This project funds Next Generation Enterprise Network (NGEN) Corporate information technology requirements.															
<i>FY 2021 Base Plans:</i> This project funds Next Generation Enterprise Network (NGEN) Corporate information technology requirements.															
<i>FY 2021 OCO Plans:</i> N/A															
<i>FY 2020 to FY 2021 Increase/Decrease Statement:</i> There is no significant change from FY 2020 to FY 2021															
<b>Accomplishments/Planned Programs Subtotals</b>											0.000	0.932	0.954	0.000	0.954
<b>C. Other Program Funding Summary (\$ in Millions)</b>															
N/A															
<b>Remarks</b>															
<b>D. Acquisition Strategy</b>															
N/A															

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020		
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0605853N / Management, Technical & Intl Supt				Project (Number/Name) 3027 / Defense Critical Infrastructure Program				
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	
3027: Defense Critical Infrastructure Program	0.000	5.632	7.743	5.772	-	5.772	7.767	7.658	7.330	7.477	Continuing	Continuing	
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-			

**A. Mission Description and Budget Item Justification**

Funds received pursuant to the transfer of budget authority from OUSD Policy (OUSD (P)) Homeland Defense Mission Assurance Directorate will be used for infrastructure analysis, assessment, and research required to support execution of the Defense Critical Infrastructure and Mission Assurance Program (DCIP / MA). Additionally, the transferred budget authority will be used to provide in-depth/cross-cutting analysis to the Mission Assurance (MA)/DCIP programs at the Office of the Secretary of Defense (OSD), Joint Staff, Military Departments/Services, Defense Agencies, and Combatant Commands. NSWCDD-A40 will also perform cyber mission assurance research and provide expertise in infrastructure mitigation techniques and solutions.

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

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<b>Title:</b> Mission Assurance Risk Management System (MARMS) Technical Support  <b>Articles:</b>  <b>Description:</b> Provide capabilities to meet the technical requirements in support of the developmental efforts for the current and future common operating picture for Mission Assurance supporting Joint Staff MARMS development team, program office and A40 mission assurance database organization.  The OSD (P) Mission Assurance Directorate and the Joint Staff provide oversight for funding that will be used for infrastructure analysis, assessment, and research required in support of Mission Assurance and Defense Critical Infrastructure (DCI) programs at the Joint Staff and OSD (P).	0.371	0.530	0.530	0.000	0.530
<b>FY 2020 Plans:</b> 1 MARMS TWG guidance & requirements traceability tracking and enforcement upon anticipated FY 2019 contract award 2 MARMS programmatic acquisition support to Joint Staff and DTRA Program Office based on milestone decision authority phase entry and anticipated system engineering support 3 MARMS Architecture (DoDAF) tracking and incorporating data registry scheme between existing Joint Staff portals and MARMS developed user interface (EPRM)	-	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy			Date: February 2020		
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)			
1319 / 6	PE 0605853N / Management, Technical & Intl Supt	3027 / Defense Critical Infrastructure Program			
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>					
4 Database mapping and analysis for MARMS and update of data from emerging analysis and assessment data for initial operational capability for MARMS use and implementation  <b>FY 2021 Base Plans:</b> 1 MARMS TWG guidance & requirements traceability tracking and enforcement upon anticipated FY 2020 contract award 2 MARMS programmatic acquisition support to Joint Staff and DTRA Program Office based on milestone decision authority phase entry and anticipated system engineering support 3 MARMS Architecture (DoDAF) tracking and incorporating data registry scheme between existing Joint Staff portals and MARMS developed user interface (EPRM) 4 Database mapping and analysis for MARMS and update of data from emerging analysis and assessment data for initial operational capability for MARMS use and implementation - Data Librarian & Mission Mapping task  <b>FY 2021 OCO Plans:</b> N/A  <b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> There is no change from FY2020 to FY2021	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<b>Title:</b> Mission Assurance Assessments (MAA) Support  <b>Articles:</b>  <b>Description:</b> Provide analysis and characterization of Defense Critical Infrastructure through research and study of existing assessment data and incoming assessment data to analyze trends, provide feedback, and significant impacts to defense missions and assets during events, exercises, and planning efforts.  The OSD (P) Mission Assurance Directorate and the Joint Staff will provide oversight to A40 for funding that will be used for infrastructure analysis, assessment, and research required in support of Mission Assurance and Defense Critical Infrastructure (DCI) programs at the Joint Staff and OSD (P).  <b>FY 2020 Plans:</b> 1 Mission Assurance Trends Analysis Methodology continue refinement of data inputs from latest assessment results 2 Annual trends analysis on MAA reports conducted to ensure common vulnerabilities are identified, tracked, and enterprise solutions offered to enhance efficient use of limited budgets and funding for risk mitigations	0.884	1.365	0.697	0.000	0.697

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy					<b>Date:</b> February 2020	
<b>Appropriation/Budget Activity</b> 1319 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0605853N / Management, Technical & Intl Supt	<b>Project (Number/Name)</b> 3027 / Defense Critical Infrastructure Program				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
3 Review of Joint Staff quantitative processes in Mission Assurance Assessments to ensure viable and verified risk estimates are defendable within the budget process and gain attention for immediate resolution from cyber and physical threats						
4 Incorporate NAVSEA 001 assessment needs into existing Mission Assurance methods and execute two Mission Assurance / Cyber Network Assurance combined assessments at NAVSEA laboratory as pilot and shipyard as initial rollout.						
<b>FY 2021 Base Plans:</b> 1 Mission Assurance Trends Analysis Methodology continue refinement of data inputs from latest assessment results 2 Annual trends analysis on MAA reports conducted to ensure common vulnerabilities are identified, tracked, and enterprise solutions offered to enhance efficient use of limited budgets and funding for risk mitigations 3 Review of Joint Staff quantitative processes in Mission Assurance Assessments to ensure viable and verified risk estimates are defendable within the budget process and gain attention for immediate resolution from cyber and physical threats 4 Incorporate NAVSEA 001 assessment needs into existing Mission Assurance methods and execute two Mission Assurance / Cyber Network Assurance combined assessments at NAVSEA laboratory as pilot and shipyard as initial rollout.						
<b>FY 2021 OCO Plans:</b> N/A						
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> The funding decrease from FY2020 to FY2021 reflects the incorporation of lessons learned from previous year tasking developing methodologies of pilot assessments and realizing efficiencies among assessment team planning and hiring						
<b>Title:</b> Cyber Mission Assurance  <b>Description:</b> Analysts will investigate cyber impacts to missions and infrastructure associated with DoD assets. This information will be conveyed in assessments, memorandums, and white papers to inform senior leaders and teams about the significance of cyber infrastructure and the interdependencies with physical infrastructure.	<b>Articles:</b> -  <b>Articles:</b> -  <b>Articles:</b> -	0.624	1.498	0.849	0.000	0.849

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)		
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>				
		FY 2019	FY 2020	FY 2021 Base
				FY 2021 OCO
				FY 2021 Total
The OSD (P) Mission Assurance Directorate and the Joint Staff will provide oversight to A40 for funding that will be used for infrastructure analysis, assessment, and research required in support of Mission Assurance and Defense Critical Infrastructure (DCI) programs at the Joint Staff and OSD (P).				
<b>FY 2020 Plans:</b>				
1 Best Practices report for risk reduction to Platform Information Technology - Control Systems (PIT-CS) will be edited to encompass weapons platform IT constructs and other critical infrastructure platforms on which DoD has dependencies				
2 Annual ICS update to Best Practices Report will be conducted to identify enhanced methods and metrics to monitor progress and accomplishment towards categorizing entire inventory of critical DoD control systems and their known vulnerabilities				
3 Research and develop cyber-specific infrastructure assessment methods to complement assessment teams and data incoming from ongoing assessments across DoD and Services, with particular focus on NAVSEA Red Team enhancement				
4 Technical Liaison Support to Cyber MA Enterprise will continue to identify paths for engaging MA partners on a collaborative tool that identifies cyber mission risks from assets identified as part of ongoing assessment efforts across multiple missions and cyber domains				
<b>FY 2021 Base Plans:</b>				
1 Best Practices report for risk reduction to Platform Information Technology - Control Systems (PIT-CS) will be edited to encompass weapons platform IT constructs and other critical infrastructure platforms on which DoD has dependencies				
2 Annual ICS update to Best Practices Report will be conducted to identify enhanced methods and metrics to monitor progress and accomplishment towards categorizing entire inventory of critical DoD control systems and their known vulnerabilities				
3 Research and develop cyber-specific infrastructure assessment methods to complement assessment teams and data incoming from ongoing assessments across DoD and Services, with particular focus on NAVSEA Red Team enhancement				
4 Technical Liaison Support to Cyber MA Enterprise will continue to identify paths for engaging MA partners on a collaborative tool that identifies cyber mission risks from assets identified as part of ongoing assessment efforts across multiple missions and cyber domains				
<b>FY 2021 OCO Plans:</b>				

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020		
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 0605853N / Management, Technical & Intl Supt	Project (Number/Name) 3027 / Defense Critical Infrastructure Program				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
N/A						
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> The funding decrease from FY020 to FY2021 is based on the plan to incorporate funding for NAVSEA Red Team support into separate funding line for assessment team sustainment planning. Task 4						
<b>Title:</b> Defense Critical Electric Infrastructure (DCEI)  <b>Description:</b> Provide electric power analysis and characterization of defense installations at the request of senior leaders engaged with energy security and resilience efforts for national security with interagency representatives from industry utilities, DHS, and DoE.  The OSD (P) Mission Assurance Directorate and the Joint Staff will provide oversight to A40 for funding that will be used for infrastructure analysis, assessment, and research required in support of Mission Assurance and Defense Critical Infrastructure (DCI) programs at the Joint Staff and OSD (P).	<b>Articles:</b>  -	0.494	0.494	0.494	0.000	0.494
<b>FY 2020 Plans:</b> 1 Update installation peak power methodology and primary EP infrastructure pathways in support of interagency FAST act collaboration 2 Update DCEI analysis as requested per ongoing interagency collaborations in DoD cluster areas 3 Analyzing post table top exercise feedback (Constrained Eagle) to enhance leadership understanding of commercial electric power grid dependencies for DoD Missions 4 Provide recommendations on what DoD processes may be appropriate to use to engage with utilities to discuss analysis findings 5 Engage with other federal and private industry agencies to deepen understanding of utility operations and grid operations (FERC, NERC, NRECA, etc.)						
<b>FY 2021 Base Plans:</b> 1 Update installation peak power methodology and primary EP infrastructure pathways in support of interagency FAST act collaboration 2 Update DCEI analysis as requested per ongoing interagency collaborations in DoD cluster areas 3 Analyzing post table top exercise feedback (Constrained Eagle) to enhance leadership understanding of commercial electric power grid dependencies for DoD Missions						

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020		
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 0605853N / Management, Technical & Intl Supt	Project (Number/Name) 3027 / Defense Critical Infrastructure Program				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
4 Provide recommendations on what DoD processes may be appropriate to use to engage with utilities to discuss analysis findings						
5 Engage with other federal and private industry agencies to deepen understanding of utility operations and grid operations (FERC, NERC, NRECA, etc.)						
<b>FY 2021 OCO Plans:</b> N/A						
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> There is no change from FY2020 to FY2021						
<b>Title:</b> Mission Assurance Program Management  <b>Description:</b> Monitor, track and report on all budget related inquiries and task planning and execution for the Mission Assurance / DCIP programs including data calls, weekly budget reports, and deliverables.  The OSD (P) Mission Assurance Directorate and the Joint Staff will provide oversight to A40 for funding that will be used for infrastructure analysis, assessment, and research required in support of Mission Assurance and Defense Critical Infrastructure (DCI) programs at the Joint Staff and OSD (P).	<b>Articles:</b> -  -  -	0.839	0.900	0.770	0.000	0.770
<b>FY 2020 Plans:</b> 1 Enhance program management support to OSD and NAVSEA to include financial tracking and updates to support reclama notices or budget execution data calls 2 Offer options for enhanced information sharing to MA community and related entities, potentially in support of Combatant Command (CCMD) exercises or real world events that showcases A40 expertise 3 Continue to discover ways to save funding via IT footprint consolidation and efficient use of network resources and database files						
<b>FY 2021 Base Plans:</b> 1 Enhance program management support to OSD and NAVSEA to include financial tracking and updates to support reclama notices or budget execution data calls 2 Offer options for enhanced information sharing to MA community and related entities, potentially in support of Combatant Command (CCMD) exercises or real world events that showcases A40 expertise						

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy					<b>Date:</b> February 2020	
<b>Appropriation/Budget Activity</b> 1319 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0605853N / Management, Technical & Intl Supt	<b>Project (Number/Name)</b> 3027 / Defense Critical Infrastructure Program				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
3 Continue to discover ways to save funding via IT footprint consolidation and efficient use of network resources and database files						
<b>FY 2021 OCO Plans:</b> N/A						
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> The funding decrease from FY2020 to FY2021 reflects anticipated savings from licensing of virtual tools and network resource management / consolidation of hardware footprint currently being planned						
<b>Title:</b> Defense Critical Infrastructure <b>Articles:</b> <b>Description:</b> Provide mission assurance assessment and support for characterization of defense critical infrastructure and supporting links to commercial industry and equipment. Analysis and research will provide details on critical links to defense missions and assets and support risk management decision planning for installations, services, and COCOMS.  The OSD (P) Mission Assurance Directorate and the Joint Staff will provide oversight to A40 for funding that will be used for infrastructure analysis, assessment, and research required in support of Mission Assurance and Defense Critical Infrastructure (DCI) programs at the Joint Staff and OSD (P).		0.527	0.600	0.396	0.000	0.396
<b>FY 2020 Plans:</b> 1 Maintain Global Mission Assurance Portal (GMAP) portal documentation requirements and continue development of database solution and provide best practices / option in support and coordination with MARMS effort 2 DCI criticality assessments and nominations will continue to flow in and be reviewed / analyzed for completeness and prioritized for review 3 Mission Mitigation and Risk Reduction Plan coordination and review of new or existing nominated assets and need for budget prioritization of vulnerability solutions 4 Risk Management Plan draft summaries will be coordinated, edited, and reviewed for correctness, completeness and identified appropriate vulnerabilities and threats to justify risk management plan efforts cover the issues 5 Continue nomination package preparation for biannual update and finalization of critical defense assets and infrastructure		-	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020		
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 0605853N / Management, Technical & Intl Supt	Project (Number/Name) 3027 / Defense Critical Infrastructure Program				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
6 Revalidation packages for Defense Critical Assets (DCAs) will be reviewed and nominated based on previous mission plan inputs and current Joint Staff and OSD defense planning guidance updates						
7 Development and support of Defense Industrial Base pilot assessment "Supporting Eagle" will be executed and feedback gained from exercise execution to implement in future policy documents						
<b>FY 2021 Base Plans:</b>						
1 Maintain Global Mission Assurance Portal (GMAP) portal documentation requirements and continue development of database solution and provide best practices / option in support and coordination with MARMS effort						
2 DCI criticality assessments and nominations will continue to flow in and be reviewed / analyzed for completeness and prioritized for review						
3 Mission Mitigation and Risk Reduction Plan coordination and review of new or existing nominated assets and need for budget prioritization of vulnerability solutions						
4 Risk Management Plan draft summaries will be coordinated, edited, and reviewed for correctness, completeness and identified appropriate vulnerabilities and threats to justify risk management plan efforts cover the issues						
5 Continue nomination package preparation for biannual update and finalization of critical defense assets and infrastructure						
6 Revalidation packages for Defense Critical Assets (DCAs) will be reviewed and nominated based on previous mission plan inputs and current Joint Staff and OSD defense planning guidance updates						
7 Development and support of Defense Industrial Base pilot assessment "Supporting Eagle" will be executed and feedback gained from exercise execution to implement in future policy documents						
<b>FY 2021 OCO Plans:</b>						
N/A						
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b>						
Decrease from FY20 to FY21 due to availability of prior year execution balances.						
<b>Title:</b> Defense Critical Mission (DCM)	<b>Articles:</b>	0.526	0.526	0.326	0.000	0.326
<b>Description:</b> Conduct research and provide expertise on the defense critical missions nominated by the Joint Staff and Mission Assurance community for development of mitigations and solutions to vulnerabilities discovered as part of mission assurance assessment processes. Analysts will provide expertise and knowledge	-	-	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020		
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 0605853N / Management, Technical & Intl Supt	Project (Number/Name) 3027 / Defense Critical Infrastructure Program				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
in multiple areas of engineering and infrastructure to provide robust and resilient plans and projects to enhance installation infrastructure and planning to increase successful support of critical missions.						
The OSD (P) Mission Assurance Directorate and the Joint Staff will provide oversight to A40 for funding that will be used for infrastructure analysis, assessment, and research required in support of Mission Assurance and Defense Critical Infrastructure (DCI) programs at the Joint Staff and OSD (P).						
<b>FY 2020 Plans:</b> 1 Continue update of Mission Maps to maintain awareness of existing and new DCMs and the assets supporting multiple AORs and across mission owners (and de-conflict) 2 Provide DCM process briefings to MA community to enhance awareness of critical mission assets and their common vulnerabilities within domains and across operational areas to enhance enterprise solutions and identify funding dollars to fix vulnerabilities 3 Support Mission Assurance Senior Steering and Executive Steering Group briefings and papers to Joint Staff led initiatives incorporating the DCM concept into doctrine or best practices 4 Continued update of Defense Critical Mission Methodology Brief to include Plan of Action and Milestones and execute tasks to provide a more holistic concept of mission assurance and protection of assets in support of multiple missions						
<b>FY 2021 Base Plans:</b> 1 Continue update of Mission Maps to maintain awareness of existing and new DCMs and the assets supporting multiple AORs and across mission owners (and de-conflict) 2 Provide DCM process briefings to MA community to enhance awareness of critical mission assets and their common vulnerabilities within domains and across operational areas to enhance enterprise solutions and identify funding dollars to fix vulnerabilities 3 Support Mission Assurance Senior Steering and Executive Steering Group briefings and papers to Joint Staff led initiatives incorporating the DCM concept into doctrine or best practices 4 Continued update of Defense Critical Mission Methodology Brief to include Plan of Action and Milestones and execute tasks to provide a more holistic concept of mission assurance and protection of assets in support of multiple missions						
<b>FY 2021 OCO Plans:</b>						

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy					<b>Date:</b> February 2020	
<b>Appropriation/Budget Activity</b>	<b>R-1 Program Element (Number/Name)</b>	<b>Project (Number/Name)</b>				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
N/A						
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Decrease from FY20 to FY21 due to availability of prior year execution balances.						
<b>Title:</b> Outside the Wire (OTW) Infrastructure Reports	<b>Articles:</b>	0.614	0.620	0.500	0.000	0.500
<b>Description:</b> Provide infrastructure characterization reports on non-DoD owned supporting infrastructure at DoD installations on the same schedule as the Defense Threat Reduction Agency (DTRA) mission assurance assessments						
<b>FY 2020 Plans:</b> Up to 16 OTW reports anticipated to be provided by A40 Dahlgren to DTRA teams ahead of pre-site scheduled visit						
<b>FY 2021 Base Plans:</b> Up to 16 OTW reports anticipated to be provided by A40 Dahlgren to DTRA teams ahead of pre-site scheduled visit						
<b>FY 2021 OCO Plans:</b> N/A						
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Funding decrease reflects the transition of this tasking from a mostly government civilian supported effort to a contracted team with government oversight and editing / management / distribution team overseeing the work.						
<b>Title:</b> NAVSEA Mission Assurance Cyber Assessments (MACA) Pilot	<b>Articles:</b>	0.753	1.210	1.210	0.000	1.210
<b>Description:</b> NAVSEA MACA Pilot is a combination mission decomposition of programs and assets combined with NAVSEA Red Team cyber assurance techniques on associated navy, program, and asset networks.						
<b>FY 2020 Plans:</b> Conduct 2-3 assessments and NAVSEA designated priority sites in combination with Red Team and Mission Assurance experts						
<b>FY 2021 Base Plans:</b>						

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020
<b>Appropriation/Budget Activity</b> 1319 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0605853N / Management, Technical & Intl Supt	<b>Project (Number/Name)</b> 3027 / Defense Critical Infrastructure Program		
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>
Grow team from FY2020 to 3-4 assessments per year on a steady periodic basis through FY2021. Provide cyber and mission assurance analysis and expertise to assets, infrastructure, and networks and provide reporting to senior leadership to mitigate found vulnerabilities; grow local expertise and persistent cyber awareness based on initial assessment team survey				
<b>FY 2021 OCO Plans:</b> N/A				
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> There is no change from FY2020 to FY2021				
<b>Accomplishments/Planned Programs Subtotals</b>		5.632	7.743	5.772
		0.000	5.772	
<b>C. Other Program Funding Summary (\$ in Millions)</b>				
N/A				
<b>Remarks</b>				
<b>D. Acquisition Strategy</b>				
N/A				

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											<b>Date:</b> February 2020		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)				
1319 / 6					PE 0605853N / Management, Technical & Intl Supt				3312 / MTMD-Maritime Theater Missile Defense Forum				
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	
3312: MTMD-Maritime Theater Missile Defense Forum	0.000	6.983	10.601	16.251	-	16.251	15.028	14.308	14.486	14.776	Continuing	Continuing	
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-			

**A. Mission Description and Budget Item Justification**

This project funds participation in Maritime Integrated Air and Missile Defense projects with other nations through the Maritime Missile Defense Projects Framework Memorandum of Understanding of 2004 (as amended 2009, 2015, and 2016). Known as the Maritime Theater Missile Defense (MTMD) Forum, it promotes interoperability with the Navies of eleven participating nations (Australia, Canada, Denmark, France, Germany, Italy, Netherlands, Norway, Spain, United Kingdom and the United States). This project funds participation in multiple Projects and includes a maritime contribution to the NATO Active Layered Theater Ballistic Missile Defense (ALTBMD) project, now known as NATO Ballistic Missile Defense (BMD). Engineering analysis and recommendations from MTMD activities are provided to European, Pacific and Central Combatant Commands to influence present day operations. Specifically, the MTMD Forum is addressing challenges with "Maritime Allied Air Defense in Support of Ballistic Missile Defense Operations" that face the Combatant Commanders during present day operations. The MTMD Forum is leveraging At-Sea Demonstration (ASD) test events and operational Fleet Exercises to integrate technology with concepts of operations developed within MTMD Forum working groups.

The MTMD Forum develops systems and techniques that enhance protection and defense against the proliferation of short, medium and long-range Ballistic Missile (BM) and Advanced Anti-Ship Cruise Missile (ASCM) threats through the development of interoperable sea-based Integrated Air and Missile Defense (IAMD) capability among coalition nations. This includes protection across the full spectrum of these threats through the enhanced utilization of existing sea-based systems to protect against current threats while progressively improving and developing systems and system-of- systems to effectively counter evolving threats.

This project supports USN participation in several Maritime IAMD related Project Arrangements and Working Groups including:

- (1) Battle Management Command, Control, Communications, Computers, and Intelligence (BMC4I) to define and develop architectures as well as to perform engineering to address coalition capability gaps.
- (2) Modeling & Simulation (M&S) to establish and maintain a maritime coalition M&S testbed and to perform legacy and future systems simulation testing.
- (3) Coalition Distributed Engineering Plant (CDEP) to establish and maintain a maritime coalition Hardware-in-the-Loop Testbed and to conduct CDEP testing.
- (4) Open Architecture (OA) to develop Interface Standards and Data Models.
- (5) Test Planning and Execution (TPEX) to develop Test Plans, oversee exercise participation and conduct post event data analysis and reporting.
- (6) Operational Requirements (OR) to develop a Coalition Maritime Missile Defense Operational Concept Document and to identify operational constraints and tactical constructs surrounding coalition maritime missile defense activities.
- (7) Reciprocal Use of Test Facilities agreements with other nations to support Maritime IAMD and MTMD related demonstrations.
- (8) Tactical Advancement for Next Generation (TANG) to work with our Allies and International Partners using human-centered design methodologies to identify solutions to technology and sailor performance issues that have been cited during previously conducted experiments, exercises, and demonstrations. This process will

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Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)			
1319 / 6	PE 0605853N / Management, Technical & Intl Supt	3312 / MTMD-Maritime Theater Missile Defense Forum			
seek to leverage R&D investments and risk reduction research commercial companies are making today that can provide potential "dual use" technology and process solutions to complex problems.					
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<b>Title:</b> MTMD-Martime Theater Missile Defense Forum  <b>Articles:</b>	6.983	10.601	16.251	0.000	16.251
<b>FY 2020 Plans:</b> (1) BMC4I will continue engineering analysis and multi-national interoperability gap assessment for the Target Architecture utilizing test results from project events and complete development of the Target Architecture based on additional request for information inputs from member nations. BMC4I will evaluate emergent Possible Point Solutions and provide recommendations for implementation in correcting coalition interoperability gaps. BMC4I will update information exchange requirements in preparation for at-sea demonstrations. BMC4I will develop updates to MTMD Coalition Capabilities and Interoperability (CCI) publications as appropriate.  (2) M&S will continue analysis of Target Architectures and conduct further assessments in support of providing recommendations to improve information exchange requirements identified by BMC4I and the SET. M&S will model future Target Architectures and provide analysis in support of future at-sea demonstrations. The M&S team will continue development of the test bed and add additional computing power to the test environment to provide faster and more powerful analytical capability to the Forum System Engineering Team. The M&S Working Group will continue development of Mission Models in support of capability development to illustrate operational impact of proposed solutions to complex Integrated Air and Missile Defense (IAMD) problems.  (3) CDEP will continue to assess interoperability of joint air and land assets in Annual Test Event (ATE) 2020. CDEP will also characterize risks of future at-sea events such as at-sea demo (ASD) 2020 and ASD 2021. CDEP will work with BMC4I and OR working groups to update the Coalition Capabilities and Interoperability (CCI) gaps document and develop test plans to assess capabilities suitable for land-based testing. CDEP will prepare for and conduct hardware-in-the-loop tests with allied partners, and will provide assessments and recommendations to improve information exchanges required to conduct at-sea demos or to evaluate performance as an effective and efficient alternative to at-sea events. CDEP will undertake early-look testing of Identification Friend or Foe Mode 5 and Mode S systems between U.S. and Coalition partners and the impacts to interoperability. CDEP will continue to align with the stated objectives in the MTMD Forum Capability Roadmap. CDEP will continue to improve a hardware-in-the-loop (HWIL) suite that can supplement live testing and facilitate a robust engineering evaluation of integrated air and missile defense performance for coalition interoperability.	-	-	-	-	-

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Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)		
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>				
		FY 2019	FY 2020	FY 2021 Base
				FY 2021 OCO
				FY 2021 Total
(4) Open Architecture will model and extend the component interfaces for additional Force Level Functions (FLFs), such as Engageability Assessment and Effector Management. The Force Data Model will be updated to support the information exchange of additional FLFs. A Force Threat Evaluation and Weapons Assignment (FTEWA) prototype will be identified and work will begin implementing a Force Level Open Architecture Technical Standard (FLOATS) in order to test and debug the standard, and exercise the interfaces within an M&S and CDEP environment. These exercises will demonstrate various operational methodologies for distributing data within the Force and identify performance parameters for the FLOATS standard. The OAWG will continue to collaborate with BMC4I, OR, CDEP and the System Experts Meeting (SEM) to ensure these interfaces align with the Target and Reference Architectures as well as selected Possible Point Solutions (PPSs). The OAWG will collaborate with the FTEWA Workshops and Subject Matter Experts (SMEs) to ensure the FLF component interfaces align with FTEWA and operational requirements. The OAWG will monitor the OARIS Industry Group as required.				
(5) TPEX will continue preparations for MTMD participation in its ongoing at-sea test event series. ASD 2020 will execute in Q4 of FY20. Three live-fire Integrated Air and Missile Defense (IAMD) events are planned to be conducted. These at-sea demonstrations will include live tracking events and a combination of live and simulated engagements within a fleet exercise, focused on interoperability assessment. Planning for At-Sea Demonstrations and follow-on at-sea testing will continue into future years and include ballistic target procurement. Future planning activity in FY20 will include ASD 21/FS-21 (Exercise Formidable Shield 21), Pacific Dragon 22, and FS-23, which will serve as risk reduction for future ASD events and provide data that enables interoperability assessments.				
(6) Operational Requirements group will continue to provide operator's perspective and recommendations to the engineering and test activity conducted in the other working groups.				
(7) TANG will lead projects that solve mission focused, human-centered challenges using innovation and systems engineering methods for the Navy and USMC. For each project, TANG will tailor the research and solution generation methods to the respective topic and scope. Methods may include ethnographic research, synthesis of findings into opportunities, leading, facilitation and conduct of workshops, development of strategy				

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020		
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 0605853N / Management, Technical & Intl Supt	Project (Number/Name) 3312 / MTMD-Maritime Theater Missile Defense Forum				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
	and solution roadmaps, and support of prototyping and experimentation. TANG will continue to investigate trends, share lessons learned, and grow the TANG capability.					
	<p><b>FY 2021 Base Plans:</b></p> <p>(1) BMC4I will continue engineering analysis of multi-national interoperability gap assessment for the Target Architecture utilizing test results from project events and complete development of the Target Architecture based on additional request for information inputs from member nations. BMC4I will evaluate emergent Possible Point Solutions and provide recommendations for implementation in correcting coalition interoperability gaps. BMC4I examination of allied capabilities and limitations, and follow-on production of a capabilities / limitations database, is critical to the success of At-Sea Demonstration / Formidable Shield 2021 (ASD/FS21). BMC4I will develop updates to MTMD Coalition Capabilities and Interoperability (CCI) publications that contribute to alignment of requirements among the participating nations of the MTMD-F.</p> <p>(2) M&amp;S will continue analysis of Target Architectures and conduct further assessments in support of providing recommendations to improve information exchange requirements identified by BMC4I and the System Engineering Team (SET). M&amp;S will refresh equipment and software that was procured in the 2013 timeframe and ensure all associated authorities to operate are in place for continued coalition modeling and simulation. The technical refresh is required in order to maintain compatibility with allied M&amp;S systems. M&amp;S will model future Target Architectures and provide analysis in support of future at-sea demonstrations. The M&amp;S team will continue development of the test bed and add additional computing power to the test environment to provide faster and more powerful analytical capability to the Forum System Engineering Team. The M&amp;S Working Group will continue development of Mission Models in support of capability development to illustrate operational impact of proposed solutions to complex Integrated Air and Missile Defense (IAMD) problems.</p> <p>(3) CDEP will continue to assess interoperability of joint air and land assets in Annual Test Event (ATE) 2021. The controlled test environment offers greater repeatability than the at-sea events. Three additional nations have fielded their national Hardware in the Loop (HWIL) capabilities in the last two years, requiring more frequent connection testing by the U.S. CDEP Team. CDEP will also characterize risks of future at-sea events such as at-sea demo (ASD) 2021 and ASD 2022. CDEP will work with BMC4I and OR working groups to update the Coalition Capabilities and Interoperability (CCI) gaps document and develop test plans to assess capabilities suitable for synthetic-based testing. CDEP will prepare for and conduct hardware-in-the-loop tests with allied partners, and will provide assessments and recommendations to improve information exchanges required to conduct at-sea demos or to evaluate performance as an effective and efficient alternative to at-sea events.</p>					

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)		
1319 / 6	PE 0605853N / Management, Technical & Intl Supt	3312 / MTMD-Maritime Theater Missile Defense Forum		
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>				
CDEP will allow for early-look testing that assesses Identification Friend or Foe (IFF) Mode S interoperability between the US and Coalition partners and the impacts to interoperability. CDEP is planned to test integrated Link 22 between the US and its Coalition partners to characterize possible interoperability impacts during future ASD events. CDEP will continue to align with the stated objectives within the MTMD Forum Capability Roadmap. CDEP will continue to improve a hardware-in-the-loop (HWIL) suite that can supplement live testing and facilitate a robust engineering evaluation of integrated air and missile defense performance for coalition interoperability.		FY 2019	FY 2020	FY 2021 Base
(4) Open Architecture will model and extend the component interfaces for additional Force Level Functions (FLFs), such as Network and Track Management. The Force Data Model will be extended to support the information exchange of additional FLFs. The Force Threat Evaluation and Weapons Assignment (FTEWA) prototype with a FLOATS implementation will be finalized and exercised via scenarios within an M&S and CDEP environment. In addition to identifying errors and deficiencies in the standard, these exercises will demonstrate various operational methodologies for distributing data within the Force as well as identifying performance parameters for updating FLOATS. The OAWG will continue to collaborate with BMC4I, OR, CDEP and the System Experts Meeting (SEM) to ensure these interfaces align with the Target and Reference Architectures as well as selected Possible Point Solutions (PPSs). The OAWG will collaborate with the FTEWA Workshops and Subject Matter Experts (SMEs) to ensure the FLF component interfaces align with FTEWA and operational requirements. The OAWG will monitor the OARIS Industry Group as required.				FY 2021 OCO
(5) TPEX will continue preparations for MTMD participation and support for ongoing at-sea test event series. t-Sea Demonstration 21 / Exercise Formidable Shield 2021 (ASD/FS21) will execute in Q3 of FY21. The exercise is specified and endorsed by the Joint Chiefs of Staff Joint Exercise Program, and incorporated into U.S. European Command schedule for FY 21 activity. Further, the event is specified and scheduled in NATO's Master Training Exercise Program for FY 21 conduct. Live-fire Integrated Air and Missile Defense (IAMD) events are planned to be conducted with MTMD Forum nations bringing ships, aircraft, and ground based sensors. These at-sea demonstrations will include live tracking events and a combination of live and simulated engagements within a fleet exercise, focused on interoperability assessment. The MTMD Forum Project is the sponsor for the supersonic target associated activity and responsible for the integration efforts of ground-launched supersonic targets at the Ministry of Defence Hebrides Range. Planning for At-Sea Demonstrations and follow-on at-sea testing will continue into future years and include ballistic target procurement. The data analysis effort contained within the TPEX line of effort provides the linkage and measures of success between the various MTMD-F supported at sea demonstrations that enabled key policy makers and leaders to understand capability gaps /				FY 2021 Total

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)		
1319 / 6	PE 0605853N / Management, Technical & Intl Supt	3312 / MTMD-Maritime Theater Missile Defense Forum		
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		FY 2019	FY 2020	FY 2021 Base
possible solutions with quantified metrics. Future planning in FY21 will include Pacific Dragon 22, and FS-23 which will be risk reduction for future ASD events.				
(6) Operational Requirements group will continue to provide operator's perspective and recommendations to the engineering and test activity conducted in the other working groups. This critical cooperation with Surface Mine Warfare Development Command (SMWDC) enables the allied linkage into the established relationship between SMWDC and NAVSEA.				
(7) TANG will lead projects that solve mission focused, human-centered challenges using innovation and systems engineering methods for the Navy and USMC. Planned projects in FY21 include Surface Bridge Redesign partly in response to the collisions in the 7th Fleet; improved approach to the PEO COLUMBIA commitments process; Submarine Advanced Development process strategy; NAVSEA Digital Engineering effort; development of USMC Future Vertical Lift design requirements; exploration of Surface Training and Readiness concepts to assess tactical proficiency on surface ships; and other potential projects for the Department of the Navy.				
<b>FY 2021 OCO Plans:</b>				
N/A				
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b>				
The FY 21 increase will fund the required levels of effort needed to support and conduct the dual-purpose At-Sea Demonstration 21 / Exercise Formidable Shield 2021 (ASD/FS21) event planned for Q3 of FY 21. The increase in funding is required to support both the exercise and a perpetual supersonic testing capability in the UK for deployed US forces to use. Major elements of the increased effort include: ballistic and supersonic target shipping and buildup; test planning and Aegis weapons system analysis; and combat system integration testing within the Tactical Data Link architecture that supports and enables the exercises. The exercise will involve the first use of the GQM-163A Supersonic Sea Skimming Target at the Hebrides Range and there are significant demands that attach to the use of this high-end target safely and successfully, including range safety engineering to ensure safe and successful integration of the target into existing range systems and procedures.				
TANG increase from FY 2020 to FY 2021 supports additional projects to include Surface Bridge Redesign partly in response to the collisions in the 7th Fleet; improved approach to the PEO COLUMBIA commitments process; Submarine Advanced Development process strategy; NAVSEA Digital Engineering effort; development of USMC				

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy			<b>Date:</b> February 2020		
<b>Appropriation/Budget Activity</b> 1319 / 6		<b>R-1 Program Element (Number/Name)</b> PE 0605853N / Management, Technical & Intl Supt	<b>Project (Number/Name)</b> 3312 / MTMD-Maritime Theater Missile Defense Forum		
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>
Future Vertical Lift design requirements; and exploration of Surface Training and Readiness concepts to assess tactical proficiency on surface ship.					
<b>Accomplishments/Planned Programs Subtotals</b>		6.983	10.601	16.251	0.000
<b>C. Other Program Funding Summary (\$ in Millions)</b>					
N/A					
<b>Remarks</b>					
<b>D. Acquisition Strategy</b>					
N/A					

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)				
1319 / 6					PE 0605853N / Management, Technical & Intl Supt				3330 / Naval Research Laboratory (NRL) Facilities Modernization				
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	
3330: Naval Research Laboratory (NRL) Facilities Modernization	0.000	15.379	19.026	16.441	-	16.441	16.837	16.460	16.788	17.124	Continuing	Continuing	
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-			

**A. Mission Description and Budget Item Justification**

This program has been established to provide a systematic and planned approach to improve vital in-house science and technology (S&T) laboratory facilities at the Naval Research Laboratory (NRL) which are reaching or have reached critical stages of deterioration. The program includes restoration and modernization (R&M) initiatives for about 350,000 net square feet, where the average age of the buildings is 67 years old.

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

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<b>Title:</b> NRL Facilities Modernization  <b>Articles:</b>  <b>Description:</b> Critical Science and Technology research cannot be sustained or succeed in deteriorated facilities. World class research can only be accomplished in facilities that are at a minimum "adequate", but preferably "state-of-the-art." Due to their advanced age and deterioration, funds are planned to restore/modernize various laboratory facilities at the Naval Research Laboratory.  <b>FY 2020 Plans:</b> Continue to address planned and emergent studies, evaluations, and modernization projects of laboratory facilities and infrastructure modernization of laboratories to meet future technological threats. Execute planned Corporate Facility Investment Plan (CFIP) actions which include continuing laboratory consolidation efforts and relocation of highly sensitive, highly specialized equipment into refurbished buildings. Projects planned for FY 2020 include but are not limited to the replacement of existing duct work and control systems for multiple air handlers that support materials science research into the synthesis, processing, characterization, and implementation of advanced materials; the renovation of additional laboratory space to support research of electronic materials including semiconductors, heterostructures, and superconductors as well as materials characterization and properties; and the replacement of 50 year old chilled water lines that service multiple facilities, laboratories, and critical equipment located within these laboratories.  <b>FY 2021 Base Plans:</b>	15.379	19.026	16.441	0.000	16.441

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy			<b>Date:</b> February 2020		
<b>Appropriation/Budget Activity</b> 1319 / 6		<b>R-1 Program Element (Number/Name)</b> PE 0605853N / Management, Technical & Intl Supt		<b>Project (Number/Name)</b> 3330 / Naval Research Laboratory (NRL) Facilities Modernization	
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>					
FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	
<p>The Naval Research Laboratory plan to undertake numerous planned and emergent studies, evaluations, and modernization projects of laboratory facilities and infrastructure modernization of laboratories to meet future technological threats. Plans in FY 2021 include providing upgrades to current facilities to increase effectiveness as well as critical facilities and equipment repairs.</p> <p>Upgrades to facilities planned for in FY 2021 include:</p> <ul style="list-style-type: none"> <li>- Fire suppression system in laboratory space utilized by the Naval Center for Space Technology. This project is planned to be funded fully in FY 2021.</li> </ul> <p>Facility repair projects planned for in FY 2021 include:</p> <ul style="list-style-type: none"> <li>- Replacement of numerous transformers and switchgears to ensure NRL main-site is able to meet the electrical power needs to conduct S&amp;T work. This project is planned to be funded fully in FY 2021.</li> <li>- Replacement and repair of numerous air handling units to ensure that proper regulation and circulation of air in the heating, ventilating, and air-conditioning (HVAC). This project is planned to be funded fully in FY 2021.</li> <li>- Repair of numerous roofs to ensure laboratory space is not impacted by weather. This project is planned to be funded fully in FY 2021.</li> </ul> <p><b>FY 2021 OCO Plans:</b> N/A</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> The decrease in FY 2021 is due to the re-phasing of projects from FY 2019 to FY 2020. Projects such as the replacement of multiple transformers, switchgears, and electric feeders at numerous facilities, such as the Beam Physics Center for Computational Science, were delayed due to accommodate further planning of the replacement these critical improvements. The re-phasing of FY 2019 to FY 2020 will put NRL back on their planned schedule for facility improvements and thus planned execution will commence in FY 21.</p>					
<b>Accomplishments/Planned Programs Subtotals</b>					15.379    19.026    16.441    0.000    16.441
<b>C. Other Program Funding Summary (\$ in Millions)</b>					
N/A					
<b>Remarks</b>					

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy	<b>Date:</b> February 2020	
<b>Appropriation/Budget Activity</b> 1319 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0605853N / <i>Management, Technical &amp; Intl Supt</i>	<b>Project (Number/Name)</b> 3330 / <i>Naval Research Laboratory (NRL) Facilities Modernization</i>
<b>D. Acquisition Strategy</b> None		

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											<b>Date:</b> February 2020		
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0605853N / Management, Technical & Intl Supt				Project (Number/Name) 3363 / PACOM Initiative				
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	
3363: PACOM Initiative	0.000	12.526	14.587	11.713	-	11.713	15.467	15.301	14.646	14.940	Continuing	Continuing	
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-			

**A. Mission Description and Budget Item Justification**

China Strategic Initiative (CSI) (LI 0605853N). The CSI became a DoD RDTE program in FY 2014. The CSI program is INDOPACOM's first Asia Rebalance initiative and provides critical support to planning efforts across the Command addressing Secretary of Defense's # 1 priority. CSI is a command-directed program that provides the Commander, INDOPACOM, and his staff vital support at all levels of planning and decision-making within the INDOPACOM Area Of Responsibility. The CSI program provides: cutting-edge research on adversary approaches to warfare, monitoring and analysis of adversary social media and censorship, unique understanding of effects of U.S. actions at the strategic and operational levels, sponsorship of Track 1.5/2 Strategic Nuclear Dialogue with China, etc. This funding is for a classified effort and details can be provided at a higher classification level.

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

Title: INDOPACOM Initiative	Articles:	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Description: China Strategic Initiative (CSI) (LI 0605853N). The CSI became a DoD RDTE program in FY 2014. The CSI program is INDOPACOM's first Asia Rebalance initiative and provides critical support to planning efforts across the Command addressing Secretary of Defense's # 1 priority. CSI is a command-directed program that provides the Commander, INDOPACOM, and his staff vital support at all levels of planning and decision-making within the INDOPACOM Area Of Responsibility. The CSI program provides: cutting-edge research on adversary approaches to warfare, monitoring and analysis of adversary social media and censorship, unique understanding of effects of US actions at the strategic and operational levels, sponsorship of Track 1.5/2 Strategic Nuclear Dialogue with China, etc. This funding is for a classified effort and details can be provided at a higher classification level.		12.526	14.587	11.713	0.000	11.713
<b>FY 2020 Plans:</b>		-	-	-	-	-
Continue development and refinement of: deeper analysis of Chinese war theory and planning, increase in the overall number of critical vulnerabilities assessments and methodology, increase in the number of effects testing events, and continued expansion of China media analysis to all Combatant Commands. Integration with routine policy and planning processes will mature, alongside efforts to consolidate knowledge management of high-output data yields that generate unique insights into adversary intentions and methodologies in warfare approaches; research/analysis on China's economy (aerospace and medicine, other areas requiring high levels						

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020
<b>Appropriation/Budget Activity</b> 1319 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0605853N / Management, Technical & Intl Supt	<b>Project (Number/Name)</b> 3363 / PACOM Initiative		
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>
of R&D and human capital) and assess their Made in China 2025 plan and potential key policy implications for US and INDOPACOM allies and partners.				
<b>FY 2021 Base Plans:</b> Continue development and refinement of: deeper analysis of Chinese war theory and strategic planning; increase in the overall number of critical vulnerabilities assessments and methodology, increase in the number of effects testing events at both strategic and operational levels; expansion and sustainment of China media analysis to all Combatant Commands; research/analysis on China's economy and short/long-term effects of U.S. Integration with routine policy and planning processes will mature, alongside efforts to consolidate knowledge management of high-output data yields that generate unique insights into adversary intentions and methodologies in warfare approaches; continue to monitor/analyze Chinese economy and Made in China 2025 plan.				
<b>FY 2021 OCO Plans:</b> N/A				
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Decrease from FY20 to FY21 due to availability of prior year execution balances.				
<b>Accomplishments/Planned Programs Subtotals</b>		12.526	14.587	11.713
<b>C. Other Program Funding Summary (\$ in Millions)</b>		0.000	11.713	
N/A				
<b>Remarks</b>				
<b>D. Acquisition Strategy</b>				
N/A				

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020		
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0605853N / Management, Technical & Intl Supt				Project (Number/Name) 9999 / Congressional Adds				
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	
9999: Congressional Adds	0.000	0.000	15.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	15.000	
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-	-		
<b>A. Mission Description and Budget Item Justification</b>													
Funds execution of DoD's Executive Agent (EA) for Printed Circuit Board (PrCB) Technologies as established by the 2009 National Defense Authorization Act (Section 256, PL 110-417). The primary deliverable from this effort will be a PrCB and Interconnect Technology Roadmap, or strategic plan, identifying domestic technology gaps, future research and development needs, and any policy changes required to ensure that the DoD has access to PrCB manufacturing capabilities and technical expertise necessary to meet future military requirements. As mandated, the EA will also address DoD PrCB supply chain issues, including diversity and vulnerabilities, and develop trustworthiness requirements for PrCBs used in defense systems.													
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>													
<b>Congressional Add:</b> Printed Circuit Board Executive Agent											FY 2019	FY 2020	
<b>FY 2019 Accomplishments:</b> N/A											0.000	15.000	
<b>FY 2020 Plans:</b> - Coordinate executive agent activities, receive and assess Service Component PCB R&D activities, and establish DoD Cross-Service Advisory Panel - Conduct Organic Substrate Risk & Gap Analysis - Implement and maintain PCB Trust Specification (IPC-1791) - Monitor/Assess/Evaluate Technology Development Issues & Topics - Conduct DoD PCB manufacturing capability projects - Develop processes for Embedded Devices, Additive Manufacturing, and Printed Electronics - Coordinate with Department of Commerce and Industry Organizations to resolve Industrial Base Supply Chain Issues - Develop & Implement SCRM Solutions & Tools - Conduct Research, Development, and Assessment in support of PCB Roadmap creation - Coordinate Knowledge and Capability efforts across DoD to avoid duplication and ensure appropriate technology focus - Develop PCB-related Training Modules													
<b>Congressional Adds Subtotals</b>											0.000	15.000	

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy	<b>Date:</b> February 2020	
<b>Appropriation/Budget Activity</b> 1319 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0605853N / <i>Management, Technical &amp; Intl Supt</i>	<b>Project (Number/Name)</b> 9999 / <i>Congressional Adds</i>
<b>C. Other Program Funding Summary (\$ in Millions)</b>		
N/A		
<b>Remarks</b>		
<b>D. Acquisition Strategy</b>		
N/A		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy											Date: February 2020	
Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
1319: Research, Development, Test & Evaluation, Navy / BA 6: RDT&E Management Support					PE 0605856N / Strategic Technical Support							
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	4.068	3.742	3.813	-	3.813	3.904	3.995	4.086	4.168	Continuing	Continuing
0128: Mgmt/Tech Supt Strategic	0.000	1.163	1.226	1.501	-	1.501	1.532	1.564	1.596	1.629	Continuing	Continuing
1038: Acoustic & Non-Acoustic Analysis Supt	0.000	2.905	2.516	2.312	-	2.312	2.372	2.431	2.490	2.539	Continuing	Continuing
<b>A. Mission Description and Budget Item Justification</b>												
This program element supports technical studies and analyses as directed by the Director for Submarine Warfare to support major policy and procurement decisions. This program is divided into two elements to support decision making in the areas of submarine and antisubmarine warfare and undersea surveillance.												
<b>B. Program Change Summary (\$ in Millions)</b>			<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>					
Previous President's Budget			4.231	3.742	3.815	-	-				3.815	
Current President's Budget			4.068	3.742	3.813	-	-				3.813	
Total Adjustments			-0.163	0.000	-0.002	-	-				-0.002	
• Congressional General Reductions			-	-								
• Congressional Directed Reductions			-	-								
• Congressional Rescissions			-	-								
• Congressional Adds			-	-								
• Congressional Directed Transfers			-	-								
• Reprogrammings			-	-								
• SBIR/STTR Transfer			-0.163	0.000								
• Rate/Misc Adjustments			0.000	0.000	-0.002	-	-				-0.002	
<b>Change Summary Explanation</b>												
Internal realignment between PU 0128 and PU 1038 in FY21-FY25 that supports additional effort directed towards Tactical Submarine Evolution Plan (TSEP) requirements development for VIRGINIA Class Block VI/VII and follow-on attack submarines (SSNs), TSEP Analysis of Alternatives and Subsea and Seabed Warfare and Undersea Constellation plan development and supporting studies.												
FY21 increase in PU 0128 supports Unmanned Undersea Vehicle (UUV) inventory and capabilities modeling, and Subsea and Seabed Warfare requirements.												

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<b>Exhibit R-2, RDT&amp;E Budget Item Justification:</b> PB 2021 Navy	<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy / BA 6: RDT&amp;E Management Support</i>	<b>R-1 Program Element (Number/Name)</b> PE 0605856N / <i>Strategic Technical Support</i>
Technical: N/A	
Schedule: N/A	

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020		
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0605856N / Strategic Technical Support				Project (Number/Name) 0128 / Mgmt/Tech Supt Strategic				
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	
0128: Mgmt/Tech Supt Strategic	0.000	1.163	1.226	1.501	-	1.501	1.532	1.564	1.596	1.629	Continuing	Continuing	
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-			

**A. Mission Description and Budget Item Justification**

The project provides analytical support to the Director, Undersea Warfare Division as a basis for major policy, planning, and acquisition program decisions. It supports the development of the Submarine Force strategic vision to guide research and development investment strategy and future planning. Additionally, this line supports studies in the area of submarine and undersea surveillance missions, force structure, payloads and sensors, and force employment.

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

FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
1.163	1.226	1.501	0.000	1.501
-	-	-	-	-

**Title:** MANAGEMENT AND TECHNICAL SUPPORT, STRATEGIC

**Articles:**

**FY 2020 Plans:**

- Conduct analysis to identify and weigh options for addressing problems/challenges and assessing the impact across the strategic and conventional military spectrum.
- Develop supporting strategic guidance in the undersea domain with regard to force structure, capabilities, and budgetary decisions with analysis. Anticipate emerging and future USW challenges, and lead effective assessment efforts to proactively address those challenges.
- Provide analysis and support for development and implementation of the Undersea Constellation warfare area strategy.

**FY 2021 Base Plans:**

- Conduct analysis to identify and weigh options for addressing problems/challenges and assessing the impact across the strategic and conventional military spectrum with use of modeling and simulation, including projects such as Tactical Submarine Evolution Plan, Unmanned Undersea Vehicle (UUV) inventory and capabilities modeling, and Subsea and Seabed Warfare.
- Anticipate emerging and future USW challenges, and lead effective assessment efforts to proactively address those challenges.
- Provide analysis and support for development and implementation of the Undersea Constellation warfare area strategy.

**FY 2021 OCO Plans:**

N/A

**FY 2020 to FY 2021 Increase/Decrease Statement:**

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy				<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 6		<b>R-1 Program Element (Number/Name)</b> PE 0605856N / Strategic Technical Support	<b>Project (Number/Name)</b> 0128 / Mgmt/Tech Supt Strategic	
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>				
FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
FY20 to FY21 increase due to internal realignment in the PE that supports additional effort directed towards Tactical Submarine Evolution Plan (TSEP) requirements development for VIRGINIA Class Block VI/VII and follow-on SSNs, TSEP Analysis of Alternatives and Subsea and Seabed Warfare and Undersea Constellation plan development and supporting studies. Funding increase also supports Unmanned Undersea Vehicle (UUV) inventory and capabilities modeling, and Subsea and Seabed Warfare requirements.				
<b>Accomplishments/Planned Programs Subtotals</b>		1.163	1.226	1.501
<b>C. Other Program Funding Summary (\$ in Millions)</b>		0.000	1.501	
N/A				
<b>Remarks</b>				
<b>D. Acquisition Strategy</b>				
N/A				

**UNCLASSIFIED**

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020				
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)						
1319 / 6					PE 0605856N / Strategic Technical Support				1038 / Acoustic & Non-Acoustic Analysis Supt						
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			
1038: Acoustic & Non-Acoustic Analysis Supt	0.000	2.905	2.516	2.312	-	2.312	2.372	2.431	2.490	2.539	Continuing	Continuing			
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-					
<b>A. Mission Description and Budget Item Justification</b>															
This project provides analytical support to the Director, Undersea Warfare as a basis for major policy, planning, and acquisition program decisions. It supports studies in the area of undersea surveillance missions, sensor system communications, and acoustic performance prediction systems, environmental and medical effects of acoustic systems, operational security, and future threat analysis. Supports synthetic mission lay down simulations for Integrated Undersea Surveillance System (IUSS) strategic planning and resource allocation. Supports continued development and documentation of architecture for future undersea surveillance capabilities and systems. Supports studies to determine long-term impact of IUSS active sensors on marine animals and development of Surveillance Towed Array Sensor System (SURTASS) Low Frequency Active (LFA), and Compact LFA (CLFA).															
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>											FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<b>Title:</b> ACOUSTIC AND NON-ACOUSTIC ANALYSIS SUPPORT  <b>Articles:</b>											2.905	2.516	2.312	0.000	2.312
<b>FY 2020 Plans:</b> - Transfer execution of the Surveillance Engineering Measurements Program (SEMP) to the Maritime Surveillance Systems Program Office (PMS 485). Continue to provide critical analytic insight into engineering and operational performance components of the IUSS shore based, fixed, and mobile systems as directed and resourced by PMS 485. - Continue comprehensive case analyses to establish a basis for understanding what impact, both positive and negative, our legacy tactical sonar systems and new ASB capability deliveries have on fleet operations. Continue to contribute to OWR. - Continue data set identification and production as the sole source for real-world data to enable advanced development initiatives which span Defense Advanced Research Projects Agency (DARPA), Office of Naval Research (ONR), Integrated Warfare Systems (IWS), Space & Naval Warfare Systems Command (SPAWAR), Naval Research Laboratory (NRL), and others to bring critically needed new capabilities and capability improvements to the IUSS community. - Provide support for requirements development for the Integrated Undersea Surveillance Systems family of systems provided by fixed, mobile, deployable sensors, integrated common processor, and the advanced surveillance builds.											-	-	-	-	-

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy			<b>Date:</b> February 2020								
<b>Appropriation/Budget Activity</b> 1319 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0605856N / Strategic Technical Support		<b>Project (Number/Name)</b> 1038 / Acoustic & Non-Acoustic Analysis Supt								
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>											
		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>					
<ul style="list-style-type: none"> <li>- Provide support on IUSS systems in the gate and JCIDS process, including IUSS Deployable family of systems.</li> <li>- Provide analyses in support of IUSS Future Plan and Maritime Surveillance Evolution Plan.</li> <li>- Provide analysis and support for development and implementation of the Undersea Constellation warfare area strategy.</li> </ul>											
<p><b>FY 2021 Base Plans:</b></p> <ul style="list-style-type: none"> <li>- Continue comprehensive case analyses to establish a basis for understanding what impact, both positive and negative, our legacy tactical sonar systems and new ASB capability deliveries have on fleet operations. Continue to contribute to OWR.</li> <li>- Continue data set identification and production as the sole source for real-world data to enable advanced development initiatives which span Defense Advanced Research Projects Agency (DARPA), Office of Naval Research (ONR), Integrated Warfare Systems (IWS), Space &amp; Naval Warfare Systems Command (SPAWAR), Naval Research Laboratory (NRL), and others to bring critically needed new capabilities and capability improvements to the IUSS community.</li> <li>- Provide support for requirements development for the Integrated Undersea Surveillance Systems family of systems provided by fixed, mobile, deployable sensors, integrated common processor, and the advanced surveillance builds.</li> <li>- Provide support on IUSS systems in the gate and JCIDS process, including IUSS Deployable family of systems.</li> <li>- Provide analyses in support of IUSS Future Plan and Maritime Surveillance Evolution Plan.</li> <li>- Provide analysis and support for development and implementation of the Undersea Constellation warfare area strategy.</li> </ul>											
<p><b>FY 2021 OCO Plans:</b></p> <p>N/A</p>											
<p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b></p> <p>FY20 to FY21 decrease is due to internal realignment within the PE that supports additional effort directed towards Tactical Submarine Evolution Plan (TSEP) requirements development for VIRGINIA Class Block VI/VII and follow-on SSNs, TSEP Analysis of Alternatives.</p>											
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%; text-align: center;"><b>Accomplishments/Planned Programs Subtotals</b></td> <td style="width: 15%; text-align: center;">2.905</td> <td style="width: 15%; text-align: center;">2.516</td> <td style="width: 15%; text-align: center;">2.312</td> <td style="width: 15%; text-align: center;">0.000</td> <td style="width: 15%; text-align: center;">2.312</td> </tr> </table>						<b>Accomplishments/Planned Programs Subtotals</b>	2.905	2.516	2.312	0.000	2.312
<b>Accomplishments/Planned Programs Subtotals</b>	2.905	2.516	2.312	0.000	2.312						

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0605856N / <i>Strategic Technical Support</i>	<b>Project (Number/Name)</b> 1038 / <i>Acoustic &amp; Non-Acoustic Analysis Supt</i>
<b>C. Other Program Funding Summary (\$ in Millions)</b>		
N/A		
<b>Remarks</b>		
<b>D. Acquisition Strategy</b>		
N/A		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy											Date: February 2020			
Appropriation/Budget Activity					R-1 Program Element (Number/Name)									
1319: Research, Development, Test & Evaluation, Navy / BA 6: RDT&E Management Support					PE 0605861N / RDT&E Science & Tech Mgmt									
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	1.041	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1.041		
0135: ONR Science & Technology Mgmt	0.000	1.041	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1.041		
<b>A. Mission Description and Budget Item Justification</b>														
This program element (PE) covers Office of Naval Research (ONR) corporate expenses including salaries, Information Technology (IT), Financial Improvement Plan (FIP) efforts and some of the day-to-day logistical costs. The vast majority of these items represent fixed costs associated with Scientists and Engineers supporting the Navy's Science and Technology (S&T) Programs.														
<b>B. Program Change Summary (\$ in Millions)</b>				FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total						
Previous President's Budget				1.072	0.000	0.000	-	-						
Current President's Budget				1.041	0.000	0.000	-	-						
Total Adjustments				-0.031	0.000	0.000	-	-						
• Congressional General Reductions				-	-	-	-	-						
• Congressional Directed Reductions				-	-	-	-	-						
• Congressional Rescissions				-	-	-	-	-						
• Congressional Adds				-	-	-	-	-						
• Congressional Directed Transfers				-	-	-	-	-						
• Reprogrammings				-	-	-	-	-						
• SBIR/STTR Transfer				-0.031	0.000	-	-	-						
• Rate/Misc Adjustments				0.000	0.000	0.000	-	-						
<b>Change Summary Explanation</b>														
The funding decrease from FY 2019 to FY 2020 reflects the transfer of Financial Improvement and Audit Readiness (FIAR) Civilian Salary (1 Full Time Equivalent (FTE)) to Program Element (PE) 0605898N Management of Headquarters Activity to better align with other existing Civilian Salary FIAR positions. Next Generation Enterprise Networks (NGEN) corporate requirements were also transferred to PE 0605853N Management, Technical and International Support, Project 3017 Enterprise Information Systems.														
Technical: Not applicable.														
Schedule: Not applicable.														

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020	
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)			
1319 / 6					PE 0605861N / RDT&E Science & Tech Mgmt				0135 / ONR Science & Technology Mgmt			
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
0135: ONR Science & Technology Mgmt	0.000	1.041	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1.041
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

This project supports ONR leadership, management and direction for the Naval S&T program. This project funds ONR HQ Non-Management Headquarters Activities (Non-MHA) salaries, communications, and other fixed costs. In FY16 and out, the Mid-Range Financial Improvement Plan effort will be transferred into this project from PE 0605853N Project 3025 to support ONR's goal of attaining a clean and auditable financial statement. ONR sponsors scientific advances, which lead to Future Naval Capabilities (FNCs), supporting the Fleet's ability to operate from a position of technological superiority. Functions performed include (1) scientific and technical direction of the nationwide 6.1 basic research program with colleges, universities, non-profit organizations and Naval Laboratories and Warfare Centers; (2) scientific and technical direction of the 6.2 applied research program through the Naval R&D laboratories and Warfare Centers and industry; (3) scientific and technical direction of the Naval 6.3 advanced technology development program through the Navy's R&D laboratories, Warfare Centers and industry; (4) management, resource formulation, program assessment, and contract negotiation/administration of the Navy basic research, applied research and advanced technology development program; and (5) coordination of the Navy's Technology Base program within the context of total DoD/Government (e.g., National Science Foundation, National Academy of Sciences) R&D initiatives in order to maximize scientific advances. This project also supports ONR Non-MHA management and direction for the following Navy-wide programs: Small Business Innovation Research, Naval Research Advisory Committee, Navy Patent Program, Historically Black Colleges and Universities/Minority Institutions Program, Navy Manufacturing Technology Program and the Ballistic Missile Submarine Nuclear (SSBN) Security Technology Program.

Additionally, this project funds ONR field salaries, communications, and other fixed costs. Functions performed support ONR's Navy-wide responsibilities in the negotiation and establishment of indirect cost rates for DoD-assigned universities and performance of contract administration for all DoD contracts/grants at all colleges and universities.

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

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<b>Title:</b> S&T Management Support  <b>Articles:</b>	1.041	0.000	0.000	0.000	0.000

**Description:** Provides for the salary associated with 1 Financial Improvement and Audit Readiness (FIAR) Full Time Equivalent (FTE) assigned to ONR Headquarters to support Financial Improvement Plan (FIP) efforts. Funding also supports information technology costs associated with the operations of the Next Generation Enterprise Networks (NGEN) efforts.

**FY 2020 Plans:**

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020		
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 0605861N / RDT&E Science & Tech Mgmt	Project (Number/Name) 0135 / ONR Science & Technology Mgmt				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
N/A						
<b>FY 2021 Base Plans:</b> N/A						
<b>FY 2021 OCO Plans:</b> N/A						
<b>Accomplishments/Planned Programs Subtotals</b>		1.041	0.000	0.000	0.000	0.000
<b>C. Other Program Funding Summary (\$ in Millions)</b>						
N/A						
<b>Remarks</b>						
<b>D. Acquisition Strategy</b>						
N/A						

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy											Date: February 2020				
Appropriation/Budget Activity					R-1 Program Element (Number/Name)										
1319: Research, Development, Test & Evaluation, Navy / BA 6: RDT&E Management Support					PE 0605863N / RDT&E Ship & Aircraft Support										
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	100.950	93.872	104.822	-	104.822	105.814	106.825	107.347	109.494	Continuing	Continuing			
0568: RDT&E Acft Flt Hours	0.000	33.895	33.543	37.700	-	37.700	38.582	39.012	38.178	38.941	Continuing	Continuing			
0569: RDT&E Acft Supt	0.000	39.991	33.232	39.142	-	39.142	39.722	40.308	41.114	41.937	Continuing	Continuing			
2924: SDTS	0.000	14.563	13.386	12.607	-	12.607	12.400	12.409	12.657	12.910	Continuing	Continuing			
3206: T&E Enterprise	0.000	12.501	13.511	15.173	-	15.173	14.910	14.896	15.198	15.502	Continuing	Continuing			
3238: Threat Engineering	0.000	0.000	0.200	0.200	-	0.200	0.200	0.200	0.200	0.204	Continuing	Continuing			
<b>A. Mission Description and Budget Item Justification</b>															
This continuing program provides support for the ships, Self Defense Test Ship and aircraft required to accommodate Research, Development, Test and Evaluation (RDT&E) of new systems. The RDT&E ship and aircraft inventory is required to adequately test modifications and improvements to fielded weapon systems and sensors and new weapon systems and sensors and evaluate modifications to address new threat capabilities to increase the warfighting capability of the fleet. The program provides integrated logistics support for aircraft at selected field activities, provides depot-level maintenance of aircraft, engines and components for the Navy's inventory of RDT&E aircraft; and provides support for DON ships and aircraft in the custody of contractors in support of RDT&E. Cost covered under this element include test execution for the Air Warfare Ship Self-Defense Enterprise, aircrew training and proficiency, fuel, supplies, equipment, repair and Aviation Depot Level Repairables, as well as organizational, intermediate and depot maintenance of aircraft in the Navy RDTE inventory and the Self Defense Test Ship.															
JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under RESEARCH, DEVELOPMENT, TEST and EVALUATION MANAGEMENT SUPPORT because it supports efforts directed toward sustaining or modernizing installations or operations required for general research, development, test and evaluation.															
B. Program Change Summary (\$ in Millions)		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total									
Previous President's Budget		97.471	93.872	104.982	-	104.982									
Current President's Budget		100.950	93.872	104.822	-	104.822									
Total Adjustments		3.479	0.000	-0.160	-	-0.160									
• Congressional General Reductions		-	-												
• Congressional Directed Reductions		-	-												
• Congressional Rescissions		-	-												
• Congressional Adds		-	-												
• Congressional Directed Transfers		-	-												
• Reprogrammings		4.058	0.000												
• SBIR/STTR Transfer		-0.580	0.000												
• Program Adjustments		0.000	0.000	-0.150	-	-0.150									
• Rate/Misc Adjustments		0.001	0.000	-0.010	-	-0.010									

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<b>Exhibit R-2, RDT&amp;E Budget Item Justification:</b> PB 2021 Navy	<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy / BA 6: RDT&amp;E Management Support</i>	<b>R-1 Program Element (Number/Name)</b> PE 0605863N / <i>RDT&amp;E Ship &amp; Aircraft Support</i>
<b>Change Summary Explanation</b>	
Project 0568: Budget increase of \$4.157M from FY20 to FY21 reflects increased costs associated with Fuel, Consumable Parts and organizational maintenance in support of monthly readiness flight hour requirements for NAVAIR test pilots supporting RDT&E of Navy aviation programs. Increase is based on assessment of FY21 program workload to ensure assigned test pilots accrue a minimum of 11 hours per month between program funded test flights and the 0568 project unit, in order to meet Fleet directed minimum flight hour requirements to ensure safety, reduce the risk of aviation mishaps and ensure proficient test pilots are available to support test and evaluation of aviation acquisition programs.	
Project 0569: Budget increase of \$5.915M from FY20 to FY21 reflects increased costs associated with depot maintenance of NAVAIR RDT&E Aircraft. Specifically accounts for increase in costs associated with Planned Depot Maintenance of two KC-130T aircraft and the cost associated with the Planned Depot Maintenance for two E-2D aircraft which were extended in the RDT&E aircraft inventory to support developmental test of planned E-2D upgrades and associated cost increases in Aviation Depot Level Repairable (AVDLR) items which are found deficient during test pilot proficiency/readiness flights on associated type / model / series aircraft in the RDT&E aircraft inventory.	
Project 2924: The 2017 Board of Inspection and Survey (INSURV) report identified numerous material issues that has resulted in an increase in the required labor and consumable parts to accomplish routine preventive maintenance to prevent recurrence of identified deficiencies and material degradation of Self Defense Test Ship Hull, Mechanical and Electrical (HM&E) systems. FY2019 funding increase of \$4.100M was to accomplish emergent repairs to the Port and Starboard Shaft Bearings. Without the increase in funding, the Self Defense Test Ship would be unable to get underway for at sea operations to support CVN 78 and DDG 1000 ship self-defense testing.	
Project 3206 FY21 decrease of \$0.150M is due to funding reduction rephased into FY22.	
Project 3238: Project was established to support the Acquisition Threat Evaluation Projects (ATEP). Funding was realigned within the PE from project 3206 T&E Enterprise.	
Schedule: Not applicable.	

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											<b>Date:</b> February 2020	
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0605863N / <i>RDT&amp;E Ship &amp; Aircraft Support</i>				Project (Number/Name) 0568 / <i>RDT&amp;E Acft Flt Hours</i>			
<b>COST (\$ in Millions)</b>	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
0568: <i>RDT&amp;E Acft Flt Hours</i>	0.000	33.895	33.543	37.700	-	37.700	38.582	39.012	38.178	38.941	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

Research, Development, Test and Evaluation (RDT&E) Aircraft Flight Hours. This non-acquisition project supports direct flight hour costs associated with NAVAIR test pilot proficiency flights, including organizational and intermediate maintenance, associated consumables, including petroleum, oil and lubricants. Annual test pilot flight hours, as delineated in OPNAVINST 3710.7 are satisfied through a combination of program funded test flights, which vary year to year based on program schedules; and flights funded through this project unit to ensure a baseline level of pilot readiness. These flight hours ensure test pilots remain proficient in assigned type / model / series aircraft in which they are qualified (approximately 3 hours per month) during lulls in program test schedules to ensure proficient test pilots are available to safely support aviation program testing. Readiness hours are designed to provide aircrew with a minimum of 11 flight hours per month, for a total of 133 hours annually. Flight hours support post maintenance acceptance test flights, aircrew training and test pilot proficiency when test program demand is low, in direct support of Research and Development Programs at Naval Air Systems Command, and Office of Naval Research flight activities.

**JUSTIFICATION FOR BUDGET ACTIVITY:** This program is funded under RESEARCH, DEVELOPMENT, TEST and EVALUATION MANAGEMENT SUPPORT because it supports efforts directed toward sustaining or modernizing installations or operations required for general research, development, test and evaluation.

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

	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
<b>Title:</b> RDT&E Acft Flt Hours	33.895	33.543	37.700	0.000	37.700
<b>Articles:</b>	-	-	-	-	-
<b>FY 2020 Plans:</b> Continue to provide planned organizational and intermediate-level maintenance, supply and petroleum, oil and lubricants in support of RDT&E aircraft operations.					
<b>FY 2021 Base Plans:</b> Continue to provide organizational and intermediate-level maintenance, supply and petroleum, oil and lubricants in support of test pilot proficiency flights. Increase in funding, funds readiness to 60% of the requirement. Increase is based on assessment of FY21 program workload to ensure test pilots remain sufficiently proficient in order to meet OPNAVINST 3710.7 requirements to ensure flight safety and to reduce the risk of aviation mishaps.					
<b>FY 2021 OCO Plans:</b>					

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020		
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 0605863N / <i>RDT&amp;E Ship &amp; Aircraft Support</i>	Project (Number/Name) 0568 / <i>RDT&amp;E Acft Flt Hours</i>				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
N/A						
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Budget increase of \$4.157M from FY20 to FY21 reflects increased costs associated with Fuel and Consumable Parts in support of monthly readiness flight hour requirements for NAVAIR test pilots supporting RDT&E of Navy aviation programs. Increase is based on assessment of FY21 program workload to ensure test pilots accrue a minimum of 11 hours per month between program funded test flights and the 0568 project unit in accordance with Fleet minimum flight hour requirements to ensure safety, reduce the risk of aviation mishaps and ensure proficient test pilots are available to support test and evaluation of aviation acquisition programs.						
<b>Accomplishments/Planned Programs Subtotals</b>		33.895	33.543	37.700	0.000	37.700
<b>C. Other Program Funding Summary (\$ in Millions)</b>						
N/A						
<b>Remarks</b>						
<b>D. Acquisition Strategy</b>						
Not Applicable						

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020		
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0605863N / RDT&E Ship & Aircraft Support					Project (Number/Name) 0569 / RDT&E Acft Supt			
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	
0569: RDT&E Acft Supt	0.000	39.991	33.232	39.142	-	39.142	39.722	40.308	41.114	41.937	Continuing	Continuing	
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-			

**A. Mission Description and Budget Item Justification**

Research, Development, Test and Evaluation (RDT&E) Aircraft Support. This continuing project funds costs associated with RDT&E of fixed and rotary wing aircraft which accommodate test and evaluation of aircraft and associated weapon systems and sensors. Testing aboard dedicated RDT&E aircraft reduces the number of fleet units required to support test and evaluation of aviation programs. This project unit funds airframe Standard Depot Level Maintenance (SDLM), the Integrated Maintenance Concept and Planned Depot Maintenance, major in-service repairs, emergent repairs and aircraft engine periodic maintenance and overhauls and aircraft material condition and field inspections. Also included in this project unit, are the costs of Aviation Depot Level Repairables (AVDLR), which are spare and replacement parts for components that fail during the conduct of readiness flight operations, aircrew training and proficiency flight hours, and must be replaced to support follow-on flight operations. This project unit also funds Aircraft Structure Periodic Assessments (ASPA), Individual Material Readiness List (IMRL) tools and support equipment, Aviation Climate Assessment Survey System (ACASS) and other projects and peripheral equipment associated with the maintenance of flight readiness for RDT&E aircraft.

**JUSTIFICATION FOR BUDGET ACTIVITY:** This program is funded under RESEARCH, DEVELOPMENT, TEST and EVALUATION MANAGEMENT SUPPORT because it supports efforts directed toward sustaining or modernizing installations or operations required for general research, development, test and evaluation.

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

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<b>Title:</b> Aircraft/Engine Maintenance and AVDLR/IMRL Support  <b>Articles:</b>	39.391	32.632	38.542	0.000	38.542
<b>FY 2020 Plans:</b> Continue to support RDT&E aircraft maintenance requirements, while funding the following sustainment costs: AVDLR/IMRL in support of Pilot Readiness, engine repairs, support of aircraft in the RDT&E inventory. Continue operation and implementation of maintenance and material management programs at Naval Air Warfare Center activities.	-	-	-	-	-
<b>FY 2021 Base Plans:</b> Provide support of RDT&E Aircraft planned depot maintenance availabilities while funding annual operating and sustainment costs associated with Aviation Depot Level Repairables (AVDLR) and Individual Material Readiness List (IMRL) items associated with test pilot proficiency flights, engine repairs and overhauls, and emergent repairs to RDT&E aircraft. Execute Depot Availabilities for two KC-130Ts, newly established Planned Depot Maintenance activity for two E-2D aircraft, Engine Overhauls for the C-20G and Depot availabilities for eight F-18					

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020
<b>Appropriation/Budget Activity</b> 1319 / 6		<b>R-1 Program Element (Number/Name)</b> PE 0605863N / <i>RDT&amp;E Ship &amp; Aircraft Support</i>	<b>Project (Number/Name)</b> 0569 / <i>RDT&amp;E Acft Supt</i>	
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>				
FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
variant aircraft and three MH-60S helicopters. Continue operations and implementation of Naval Air Enterprise Naval Sustainment Systems in support of fleet aircraft readiness efforts.				
<b>FY 2021 OCO Plans:</b> N/A				
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Budget Increase of \$5.910M from FY20 to FY21 reflects extensions in Fixed Induction Dates as a direct result of engineering evaluations, which resulted in the planned shift of depot events from FY20 to FY21 to support acquisition program flight test objectives. The budget increase also addresses cost increases in depot maintenance events for two KC-130T's and accounts for a program of record increase in the RDT&E E-2D inventory from two aircraft to five aircraft, resulting in a Depot Maintenance cost increase in FY21. Additional funding was added to address cost increases associated with Aviation Depot Level Repairables (AVDLR) which directly supports the monthly readiness flight hour requirements for NAVAIR test pilots on all type / model / series (T/M/S) aircraft in the RDTE aircraft inventory. Cost increases in AVDLR components are a direct result of an increased failure rate and higher cost of parts due to aging airframes and the lack of sufficient T/M/S in the RDT&E inventory to support testing if parts are not replaced. Funding also addresses "as found" conditions when the RDT&E aircraft are opened up for inspection and maintenance.				
<b>Title:</b> In-Service Repairs  <b>FY 2020 Plans:</b> Continue to provide planned In-Service Repair funds for emergent repair requirements to aircraft performing mission critical test and evaluation projects.  <b>FY 2021 Base Plans:</b> Continue to provide planned In-Service Repair funds for emergent repair requirements to aircraft performing mission critical test and evaluation projects.  <b>FY 2021 OCO Plans:</b> N/A				<b>Articles:</b> 0.600      -      0.600      -      0.000      0.600
<b>Accomplishments/Planned Programs Subtotals</b>				39.991      33.232      39.142      0.000      39.142
<b>C. Other Program Funding Summary (\$ in Millions)</b> N/A				

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0605863N / <i>RDT&amp;E Ship &amp; Aircraft Support</i>	<b>Project (Number/Name)</b> 0569 / <i>RDT&amp;E Acft Supt</i>
<b>C. Other Program Funding Summary (\$ in Millions)</b>		
<b>Remarks</b>		
<b>D. Acquisition Strategy</b> N/A		

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020				
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0605863N / RDT&E Ship & Aircraft Support					Project (Number/Name) 2924 / SDTS					
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			
2924: SDTS	0.000	14.563	13.386	12.607	-	12.607	12.400	12.409	12.657	12.910	Continuing	Continuing			
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-					
<b>A. Mission Description and Budget Item Justification</b>															
This project provides for the Hull Mechanical and Electrical (HM&E) and remote control system maintenance aboard the Self-Defense Test Ship (SDTS) in support of the Navy RDT&E of ship self-defense systems. Testing aboard this ship provides the capability to safely test self-defense weapon systems within their minimum range and reduces the number of fleet units required to support RDT&E efforts.															
Funds are used to purchase expendable supplies, routine equipment maintenance, and repairs and supporting services.															
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>											FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<i>Title:</i> SDTS  <i>Articles:</i>											14.563	13.386	12.607	0.000	12.607
<i>FY 2020 Plans:</i> NSWC PHD continues to conduct management, operation, maintenance and repair/upgrade of ship HM&E critical items to ensure ongoing safe operation, and performance of the SDTS. Maintain, operate, configure and upgrade the TSRCS and associated infrastructure in support of T&E requirements onboard SDTS to support the AW SSD Enterprise test requirements as well as surface ship combat system developmental test programs. Continue efforts to address issues identified by the INSURV report. Continue to improve the routine maintenance and repair efforts onboard SDTS.											-	-	-	-	
<i>FY 2021 Base Plans:</i> NSWC PHD continues to conduct management, operation, maintenance and repair/upgrade of critical ship HM&E systems to ensure safe operation of the Self Defense Test Ship (SDTS). Maintain, operate, configure and upgrade the Test Ship Remote Control System (TSCRS) and associated infrastructure in support of T&E requirements onboard the SDTS to support the Air Warfare Ship Self Defense Enterprise test requirements as well as surface ship combat system developmental test programs. Continue to work outstanding maintenance and repair efforts and complete necessary repairs to clear any outstanding Departures from Specification (DFS).															
<i>FY 2021 OCO Plans:</i>															

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020		
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 0605863N / <i>RDT&amp;E Ship &amp; Aircraft Support</i>	Project (Number/Name) 2924 / <i>SDTS</i>				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
N/A						
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> \$0.779M decrease in FY21 was due to a funding adjustment to account for maintenance that was accelerated into FY20. FY21 effort will cover management, operation and routine and corrective maintenance necessary to keep the Self Defense Test Ship ready for at sea operations.						
<b>Accomplishments/Planned Programs Subtotals</b>		14.563	13.386	12.607	0.000	12.607
<b>C. Other Program Funding Summary (\$ in Millions)</b>						
N/A						
<b>Remarks</b>						
<b>D. Acquisition Strategy</b> This line of accounting is for recurring HM&E and ship maintenance.						

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020		
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0605863N / RDT&E Ship & Aircraft Support					Project (Number/Name) 3206 / T&E Enterprise			
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	
3206: <i>T&amp;E Enterprise</i>	0.000	12.501	13.511	15.173	-	15.173	14.910	14.896	15.198	15.502	Continuing	Continuing	
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-			

**A. Mission Description and Budget Item Justification**

The intent of the T&E Enterprise is to consolidate all Air Warfare (AW) Ship Self Defense (SSD) at-sea testing across multiple class ships, beginning with LHD 8, LSD 52, LHA 6, DDG 1000, CVN 78, and Littoral Combat Ship (LCS). This consolidated AW SSD test and evaluation approach meets the Probability of Raid Annihilation (PRA) (PRA is defined as a required surface ship defense against Anti-Ship Cruise Missiles), Self Defense Test Ship (SDTS) testing requirements as outlined in Air Warfare Ship Self Defense Enterprise TEMP 1714, and lead/operational ship testing requirements for Evolved Sea Sparrow Missile (ESSM) TEMP 1471, Rolling Airframe Missile (RAM) Blk 2 TEMP 286-2, DDG 1000 TEMP 1560, CVN 78 TEMP 1610, Cooperative Engagement Capability (CEC) TEMP 1415, SSDS TEMP 1400, LHA 6 TEMP 1697, AN/SPQ-9B TEMP 1463, Surface Electronic Warfare Improvement Program (SEWIP) TEMP 1658 (Block 1A), and LCS TEMP 1695.

Enterprise Cost elements:

- a) SDTS Summary includes installation, check-out and stage testing of the major combat systems elements on the SDTS.
- b) SDTS Test includes tracking and firing exercises versus single and dual, subsonic and supersonic Anti-Ship Cruise Missile (ASCM) threat surrogates for ship classes in the Enterprise TEMP from the SDTS including: LSD 52, DDG 1000, LCS and CVN 78.
- c) Lead Ship Test includes tracking and firing exercises versus single and dual, subsonic and supersonic ASCM threat surrogates for ship classes in the Enterprise TEMP from the Lead Ship including: LSD 50, LCS and CVN 78.
- d) Testbed includes all modeling and simulation (M&S) costs required to create OT-quality digital representations of shipboard combat system performance including infrastructure, distributed secure network, common environmental services for Developmental Test (DT) and Operational Test (OT).
- e) Enterprise Testing and Planning includes the contractor and government costs to administer the Enterprise, collect and distribute data from live events, maintain Cybersecurity certifications, and financial management.
- f) Maintenance of Combat System (CS) includes the costs for the routine preventive maintenance and repairs of the Combat Systems elements on the SDTS.

The T&E Enterprise merges common ship, element, and system requirements into the least number of test events while leveraging planned Combat System Ship Qualification Trials (CSSQTs) to accomplish Developmental Testing (DT) and Operational Testing (OT) requirements. All tests on the SDTS require the sharing of infrastructure, missile range allocations, execution time and underway time to eliminate duplicative testing. T&E Enterprise provides end-to-end mission Operational Testing in a realistic operational environment, capitalizing on Probability of Raid Annihilation Modeling and Simulation (M&S) data validated with results of that

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<b>Exhibit R-2A, RDT&amp;E Project Justification: PB 2021 Navy</b>					<b>Date:</b> February 2020				
<b>Appropriation/Budget Activity</b> 1319 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0605863N / <i>RDT&amp;E Ship &amp; Aircraft Support</i>	<b>Project (Number/Name)</b> 3206 / <i>T&amp;E Enterprise</i>							
Operational and Live Fire Testing, and ensuring a consistent approach across ship classes. Applicability of all test events is beneficial across multiple ship classes with the same variation under test.									
Current funding levels do not provide funding for SDTS installation and check-out, SDTS Test, Lead Ship Test, or Testbed modeling and simulation (M&S) costs. Current funding levels covers core support requirements only which covers combat system maintenance, cybersecurity of installed combat systems, test ship remote control system maintenance (shared with K2924), hardware and infrastructure to support co-located and geographically distributed Testbed baselines. Testbed virtual range development, and documentation of the Testbed. Verification, Validation & Accreditation (VV&A) Master Plan development.									
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>									
<i>Title:</i> T&E Enterprise		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>				
<b>Articles:</b> <i>FY 2020 Plans:</i> Continue to conduct test planning which includes: conducting white cell planning meetings, TEMP working group meetings, and other working meetings that support at sea and Testbed tests for CVN 78, LSD 52, and LCS. In order to be postured to execute CVN 78, LSD 52, and LCS events if funding is made available to support it and for future years. Continue test planning efforts for the next generation of Ship classes to be tested utilizing the SDTS (e.g. CVN 79, LHA 8) and assist the pertinent stakeholders in developing test planning documentation and resourcing requirements. The Enterprise will continue routine maintenance, IA/Cybersecurity Certification and Accreditation on combat systems elements and the remote control system on the SDTS. Continue to facilitate the integration of systems into the PEO IWS M&S framework.  Funding levels funds T&E Enterprise core activities only.		12.501	13.511	15.173	0.000				
<i>FY 2021 Base Plans:</i> Continue to conduct test planning which includes: conducting white cell planning meetings, TEMP working group meetings, and other working meetings that support at sea and Testbed tests for CVN 78, LSD 52, and LCS. In order to be postured to execute CVN 78, LSD 52, and LCS events if funding is made available to support it and for future years. Continue test planning efforts for the next generation of Ship classes to be tested utilizing the SDTS (e.g. CVN 79, LHA 8) and assist the pertinent stakeholders in developing test planning documentation and resourcing requirements. The Enterprise will continue routine maintenance, IA/Cybersecurity Certification and Accreditation on combat systems elements and the remote control system on the SDTS. Continue to facilitate the integration of systems into the PEO IWS M&S framework.		-	-	-	-				

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020		
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 0605863N / <i>RDT&amp;E Ship &amp; Aircraft Support</i>	Project (Number/Name) 3206 / <i>T&amp;E Enterprise</i>				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Funding levels funds T&E Enterprise core activities only.						
<b>FY 2021 OCO Plans:</b> N/A						
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> \$1.662 million increase from FY20 to FY21 represents a return to the minimum amount of \$15M required to maintain operational readiness; combat system maintenance and Information Assurance (IA) of the Self Defense Test Ship (SDTS), and T&E Enterprise operating functions.						
	<b>Accomplishments/Planned Programs Subtotals</b>	12.501	13.511	15.173	0.000	15.173
<b>C. Other Program Funding Summary (\$ in Millions)</b>						
N/A						
<b>Remarks</b>						
<b>D. Acquisition Strategy</b>						
N/A						

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020		
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0605863N / RDT&E Ship & Aircraft Support					Project (Number/Name) 3238 / Threat Engineering			
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	
3238: Threat Engineering	0.000	0.000	0.200	0.200	-	0.200	0.200	0.200	0.200	0.204	Continuing	Continuing	
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-			

**A. Mission Description and Budget Item Justification**

Threat Engineering produces Acquisition Threat Evaluation Products (ATEPs) that are inputs to System of System requirements across Program Executive Office (PEO) Integrated Warfare Systems (IWS) platforms, elements, and DoD systems to deliver scalable fleet level performance capability. This program also produces critical, valid T&E assets that satisfy Commander Operational Test & Evaluation Force (COMOPTEVFOR) and Director of Operational Test and Evaluation (DOT&E) requirements as these same tools will be used to support and supplement test and evaluation and training against the assessed threats in both testbed and at-sea configurations, ensuring consistency between the development and T&E acquisition phases.

ATEP is the surface navy cost effective, affordable, single, common threat modeling architecture that supports its Major Defense Acquisition Program (MDAP), (and other subordinate programs) RDT&E activities throughout the acquisition life cycle and extending through operations and sustainment. ATEP satisfies Life Cycle Mission Planning (LCMP) requirements by providing the threat modeling architecture needs to support systems engineering trade-off analysis, T&E (DT and OT) and operations and sustainment (OA) through testbed evaluation activities. ATEP is a critical component in ensuring requirements are achievable, affordable and testable.

ATEP provides the required threat models to ensure fleet operational readiness against the threat. Specifically, ATEP Satisfies Operational Test (OT) and Operational Assessment (OA) requirements documented in COMOPTEVFOR Itr 3960 Ser 00/43 of 5 Jun 2018. This requirement specifies ATEP is necessary to provide the surface navy validated Anti-Ship Cruise Missile (ASCM) threat models for use in the M&S infrastructure supporting OT&E. Moreover, ATEP satisfies COMOPTEVFOR requirement that threat models must be at a fidelity commensurate with the blue-force system representations and contain intel-derived lethality/vulnerability data, physics-based six degrees-of-freedom models, reactive seekers and guidance, and other engineering data. ATEP is necessary to evaluate mandatory Key Performance Parameters including operational effectiveness, and suitability to include a systems lethality and survivability, and achieving its performance requirements within operation and sustainment costs.

ATEP provides the threat models necessary to ensure the surface navy 1.) Avoids Technological Surprise and 2.) Eliminates Point Solutions. ATEP satisfies necessary Threat model requirements to conduct warfare systems analysis of alternatives including gaps analysis, and threat systems mission and performance analysis and effectiveness studies supporting both material and non-material solutions while supporting the development of Intelligence Community Tasking Threat.

With Threat Engineering efforts and development of ATEPs the Navy and PEO IWS will produce substantiated risk and cost based Fleet Level Engineering decisions producing predictable and timely fleet capability against stressing threats. Scalable warfighting performance will be evaluated against the appropriate threat environment, using sufficient, verified and validated models applied to produce Fleet Level Engineering requirements and gaps analysis.

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020	
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)			
1319 / 6	PE 0605863N / RDT&E Ship & Aircraft Support	3238 / Threat Engineering			
Without Threat Engineering efforts and ATEPs the Navy and the PEO will incur unsubstantiated risk and cost in developing capability for the fleet. Scalable warfighting performance will not be evaluated against the threat environment, sufficient models will not be developed or applied to produce Fleet Level Engineering requirements and gaps analysis.					
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<b>Title:</b> Threat Engineering  <b>Articles:</b>  <b>FY 2020 Plans:</b> -Acquisition Threat Evaluation Projects (ATEP) Products Support and Sustainment, which includes support of the ATEP products, as well as tracking and troubleshooting issues. This could result in the production of an upgraded version and/or a development plan with an updated systems requirements document (dependent upon the magnitude of the changes). -Threat Requirements Development, which includes identifying additional requirements from the program offices and other users to determine what work needs to be accomplished to satisfy those requirements and to develop the appropriate planning to address the requirements based on prioritization from the PEO program offices that will result in the development plan and updated system requirements document.  <b>FY 2021 Base Plans:</b> -Acquisition Threat Evaluation Projects (ATEP) Products Support and Sustainment, which includes support of the ATEP products, as well as tracking and troubleshooting issues. This could result in the production of an upgraded version and/or a development plan with an updated systems requirements document (dependent upon the magnitude of the changes). -Threat Requirements Development, which includes identifying additional requirements from the program offices and other users to determine what work needs to be accomplished to satisfy those requirements and to develop the appropriate planning to address the requirements based on prioritization from the PEO program offices that will result in the development plan and updated system requirements document.  <b>FY 2021 OCO Plans:</b> N/A	0.000	0.200	0.200	0.000	0.200
<b>Accomplishments/Planned Programs Subtotals</b>	0.000	0.200	0.200	0.000	0.200
C. Other Program Funding Summary (\$ in Millions)					
N/A					
<b>Remarks</b>					

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy	<b>Date:</b> February 2020	
<b>Appropriation/Budget Activity</b> 1319 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0605863N / <i>RDT&amp;E Ship &amp; Aircraft Support</i>	<b>Project (Number/Name)</b> 3238 / <i>Threat Engineering</i>
<b>D. Acquisition Strategy</b> New start program required integration into an existing applicable PE to consolidate and bring to bear scalable fleet level warfighting capability to the fleet and is not accounted for within this exhibit.		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy											Date: February 2020					
Appropriation/Budget Activity					R-1 Program Element (Number/Name)											
1319: Research, Development, Test & Evaluation, Navy / BA 6: RDT&E Management Support					PE 0605864N / Test & Evaluation Support											
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	370.229	522.972	446.960	-	446.960	444.077	453.976	449.706	425.042	Continuing	Continuing				
0541: AUTEC	0.000	52.080	54.507	54.213	-	54.213	55.175	56.288	57.413	58.562	Continuing	Continuing				
0566: NAVAIR Environmental Compliance	0.000	4.402	4.572	4.158	-	4.158	5.059	5.053	4.948	5.047	Continuing	Continuing				
0653: NAWC Weapons Division	0.000	141.269	155.097	152.741	-	152.741	157.458	156.402	158.971	162.152	Continuing	Continuing				
0654: NAWC Acft Division	0.000	95.496	100.281	101.753	-	101.753	103.733	105.776	108.853	111.028	Continuing	Continuing				
2511: Natural Disaster Relief	0.000	0.000	130.444	54.136	-	54.136	39.655	47.000	33.000	0.000	0.000	304.235				
2921: Pacific Missile Range Facility	0.000	5.139	5.394	5.413	-	5.413	5.523	5.634	5.746	5.862	Continuing	Continuing				
2922: MRTFB Maint & Repair	0.000	44.685	41.382	37.246	-	37.246	47.743	47.506	49.695	50.690	Continuing	Continuing				
2958: Cyberspace Activities	0.000	0.000	0.433	0.445	-	0.445	0.445	0.445	0.454	0.463	Continuing	Continuing				
3154: Nanoose and Dabob Bay Ranges	0.000	11.833	12.714	12.899	-	12.899	12.741	12.996	13.412	13.680	Continuing	Continuing				
3386: MRTFB Marine Vessels	0.000	15.325	18.148	23.956	-	23.956	16.545	16.876	17.214	17.558	Continuing	Continuing				

**A. Mission Description and Budget Item Justification**

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under RESEARCH, DEVELOPMENT, TEST and EVALUATION MANAGEMENT SUPPORT because it supports efforts directed toward sustaining or modernizing installations or operations required for general research, development, test and evaluation.

This program provides institutional maintenance and operations support for: the Naval Undersea Warfare Center Detachment Atlantic Undersea Test and Evaluation Center, Andros Island, Bahamas; the Environmental Compliance Program; Naval Air Warfare Center Weapons Division, Point Mugu and China Lake, CA; Naval Air Warfare Center Aircraft Division, Patuxent River, MD; Test and Evaluation related capabilities at the Pacific Missile Range Facility, Barking Sands, HI; Maintenance and Repair at Naval Air Warfare Center Weapons Division, Naval Air Warfare Center Aircraft Division, and Naval Undersea Warfare Center Detachment Atlantic Undersea Test and Evaluation Center. The program also provides marine vessels overhauls and preventative maintenance in support of the 23 Major Range and Test Facility Base marine vessels located at Naval Air Warfare Center Weapons Division, Point Mugu, CA, Pacific Missile Range Facility, Honolulu, HI, Naval Undersea Warfare Center Keyport Nanoose and Dabob Bay Ranges, Keyport, WA, Naval Air Warfare Center Aircraft Division, Patuxent River, MD, and Naval Undersea Warfare Center Detachment Atlantic Undersea Test and Evaluation Center. The Test and Evaluation activities make up the Navy portion of the Department of Defense's Major Range and Test Facility Base. These activities are chartered to perform Test and Evaluation for the development and acquisition of technologically advanced weapons systems. Core Test and Evaluation capabilities and capacity are operated to obtain weapons system performance documentation for acquisition program milestone decisions to provide operational forces with effective weapons systems. This program provides Navy Acquisition Program Managers required test capabilities; lowers cost of Test

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<b>Exhibit R-2, RDT&amp;E Budget Item Justification: PB 2021 Navy</b>					<b>Date:</b> February 2020					
<b>Appropriation/Budget Activity</b>	<b>R-1 Program Element (Number/Name)</b>									
1319: <i>Research, Development, Test &amp; Evaluation, Navy / BA 6: RDT&amp;E Management Support</i>	PE 0605864N / <i>Test &amp; Evaluation Support</i>									
and Evaluation; removes cost and scheduling impact of developing and providing their own Test and Evaluation capabilities; and retains the physical airspace, land space and sea space needed to conduct testing.										
<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>					
Previous President's Budget	373.834	394.020	400.395	-	400.395					
Current President's Budget	370.229	522.972	446.960	-	446.960					
Total Adjustments	-3.605	128.952	46.565	-	46.565					
• Congressional General Reductions	-	-								
• Congressional Directed Reductions	-	-1.492								
• Congressional Rescissions	-	-								
• Congressional Adds	-	130.444								
• Congressional Directed Transfers	-	-								
• Reprogrammings	-1.687	0.000								
• SBIR/STTR Transfer	-1.919	0.000								
• Program Adjustments	0.000	0.000	46.603	-	46.603					
• Rate/Misc Adjustments	0.001	0.000	-0.038	-	-0.038					
<b>Change Summary Explanation</b>										
New Project 2511 was created in support of Natural Disaster Relief starting in FY 2020. \$54.136M was added in FY 2021 to project 2511 for damages caused by the Searles Valley Earthquake to MRTFB facilities, infrastructure and instrumentation at Naval Weapons Station China Lake.										
The FY 2021 funding request was reduced by \$6.544 million to account for the availability of prior year execution balances.										

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy										Date: February 2020			
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0605864N / Test & Evaluation Support				Project (Number/Name) 0541 / AUTEC				
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	
0541: AUTEC	0.000	52.080	54.507	54.213	-	54.213	55.175	56.288	57.413	58.562	Continuing	Continuing	
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-			

**A. Mission Description and Budget Item Justification**

As a detachment of Naval Undersea Warfare Center, Division Newport, the mission of the Atlantic Undersea Test and Evaluation Center is to provide the US Navy an underwater range facility for full-spectrum test and evaluation of Undersea Warfare systems and for Fleet training and readiness assessment. The Atlantic Undersea Test and Evaluation Center Program Office is headquartered at Newport, RI. Atlantic Undersea Test and Evaluation Center's administrative offices are located at West Palm Beach, Florida. Test facilities are located at Andros Island, Sites 1 through 4, and the Berry Islands in the Bahamas. Atlantic Undersea Test and Evaluation Center aircraft make scheduled daily flights between West Palm Beach and Andros Town Airport.

Atlantic Undersea Test and Evaluation Center manages and, under service contract, maintains and operates a 500 square nautical miles deep-water and a 100 square nautical miles shallow-water range; air-target tracking capabilities; sonobuoy simulation systems; electronic warfare threat simulation systems; rotary wing aircraft; aircraft ground support facilities; acoustic targets; torpedo retrieval and flushing capabilities; open-ocean range craft; marine support facilities; and data processing and analysis capabilities.

Major test facilities on Andros Island are located at Site 1. The Command Control Building houses the range tracking displays and replay centers, the computer center, operations support functions, communications center, and the central timing system. The Range Support Facility houses a torpedo post-run workshop, Mark 46 /Mark 50 and Mark 54 lightweight torpedo Intermediate Maintenance Activity, a Mark 30 undersea target Intermediate Maintenance Activity, a Mark 48 heavyweight torpedo Research and Development Turnaround facility and related technical facilities. The complex includes electrical and physical calibration labs, a complete electronics maintenance shop, a dive locker, a precision machine shop, and logistics support areas.

Atlantic Undersea Test and Evaluation Center has a 285-foot concrete pier with a controlling depth of 17 feet (5.2 meters) at mean low tide. An adjacent wharf is approximately 240 feet in length (72 meters) with a controlling depth of 15 feet at mean low tide. Power is available at both locations. Facilities at the pier/marine area include fully equipped machine/fabrication and marine overhaul shops. Also at Site 1, six Range User Buildings are maintained for assembling test equipment and equipment check-out during test mobilization or dockside periods. These staging areas are equipped with a variety of power sources, gantry cranes, compressed air and security features. A fully equipped range user hanger for ground maintenance and storage of helicopters is located at the Atlantic Undersea Test and Evaluation Center helicopter airstrip. Sites 2, 3, and 4 are small instrumented areas located south of Site 1 used to extend tracking of sonobuoys, communications, and air target track. This project funds costs that are not chargeable to customers.

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

Title: Atlantic Undersea Test and Eval Ctr Facility	Articles:	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
		40.324	42.751	42.457	0.000	42.457

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020		
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 0605864N / Test & Evaluation Support	Project (Number/Name) 0541 / AUTEC				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		FY 2019	FY 2020	FY 2021 Base		
<p><b>Description:</b> Atlantic Undersea Test and Evaluation Center is a Test and Evaluation facility for collecting selected underwater, surface and air tracking data on test participants. This project funds the overhead/institutional costs required to sustain the Major Range and Test Facility capabilities at Atlantic Undersea Test and Evaluation Center in accordance with Department of Defense Directive 3200.11.</p> <p><b>FY 2020 Plans:</b> Continue to maintain and operate mission essential/core test support resources, instrumentation systems and marine craft required to meet customer test workload. Fund civilian labor, travel, transportation, equipment, supplies, communication, equipment maintenance, purchased service contracts, annual utilities and any costs necessary to manage and sustain Major Range and Test Facility Base operations. Reimburse the Command for General and Administrative support services. Continue to support resolution of policy compliance issues resulting from a Naval Sea Systems Command Inspector General/Newport Office of Counsel and Contracting review.</p> <p><b>FY 2021 Base Plans:</b> Continue to maintain and operate mission essential/core test support resources, instrumentation systems and marine craft required to meet customer test workload. Fund civilian labor, travel, transportation, equipment, supplies, communication, equipment maintenance, purchased service contracts, annual utilities and any costs necessary to manage and sustain Major Range and Test Facility Base operations. Reimburse the Command for General and Administrative support services. Continue to support resolution of policy compliance issues resulting from a Naval Sea Systems Command Inspector General/Newport Office of Counsel and Contracting review.</p> <p><b>FY 2021 OCO Plans:</b> N/A</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> The funding decrease from FY 2020 to FY 2021 is due to realignment of funds for Cyber Pure Line project unit 2958.</p>		FY 2021 OCO	FY 2021 Total			
<p><b>Title:</b> Bahamian Lease</p> <p><b>Articles:</b></p> <p><b>Description:</b> Rental payments to the Bahamian government for use of land and ocean in the Bahamas.</p> <p><b>FY 2020 Plans:</b></p>		11.756	11.756	11.756	0.000	11.756

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020		
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 0605864N / Test & Evaluation Support	Project (Number/Name) 0541 / AUTEC				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Continue to provide rental payments to the Bahamian government for use of land and ocean in the Bahamas.						
<b>FY 2021 Base Plans:</b> Continue to provide rental payments to the Bahamian government for use of land and ocean in the Bahamas.						
<b>FY 2021 OCO Plans:</b> Not applicable						
<b>Accomplishments/Planned Programs Subtotals</b>		52.080	54.507	54.213	0.000	54.213
<b>C. Other Program Funding Summary (\$ in Millions)</b>						
N/A						
<b>Remarks</b>						
<b>D. Acquisition Strategy</b>						
Not applicable.						

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020				
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0605864N / Test & Evaluation Support				Project (Number/Name) 0566 / NAVAIR Environmental Compliance						
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			
0566: NAVAIR Environmental Compliance	0.000	4.402	4.572	4.158	-	4.158	5.059	5.053	4.948	5.047	Continuing	Continuing			
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-					
<b>A. Mission Description and Budget Item Justification</b>															
This continuing project supports environmental compliance, conservation and pollution prevention related efforts at the Navy Major Range and Test Facility Base located at Patuxent River, MD, China Lake, CA, Point Mugu, CA, and Atlantic Undersea Test and Evaluation Center, Bahamas. The Navy Major Range and Test Facility Base environmental projects include ongoing efforts to comply with Federal, State, and local environmental requirements.															
The Major Range and Test Facility Base are test and evaluation facilities that provide for Department of Defense test and evaluation support missions. These missions include: Weapons system testing, military operational squadron training on new weapon systems, and validation of performance or operational characteristics.															
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>											FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<b>Title:</b> Environmental Compliance <b>Articles:</b>											4.402	4.572	4.158	0.000	4.158
<b>Description:</b> Projects supporting level 1 compliance requirements at Naval Air Systems Command Ranges inclusive of hazardous waste disposal, Resource Conservation & Recovery Act, Subtitle C - 40 CFR 260 through 279, and Emergency Planning and Community Right-to-Know Act, Sections 311-312; solid waste disposal, Resource Conservation & Recovery Act, Subtitle D - 40 CFR Parts 239 through 259; natural & cultural resources programs, National Environmental Policy Act, Environmental Protection Act, Marine Mammal Protection Act, Endangered Species Act, Archeological and Historic Preservation Act, maintenance of environmental permits, Clean Air Act, Clean Water Act, and environmental monitoring. Resource Conservation & Recovery Act, 42 U.S.C. Section 6901 et sequens 1976; Emergency Planning and Community Right-to-Know Act, 42 U.S.C. Section 11001-11050 et sequens 1986; National Environmental Policy Act, 42 U.S.C. Section 4331 et sequens 1969; Marine Mammal Protection Act, 16 U.S.C. Section 1361 et sequens 1972; Clean Water Act, 33 U.S.C. Section 1251-1387 1972; ESA, 7 U.S.C. Section 136, 16 U.S.C. Section 1531 et sequens 1973; Archeological and Historic Preservation Act, 16 USC Section 469-469c-2 1960; and Clean Air Act, Title V, 33 U.S.C. Section 1251 et sequens 1972.											-	-	-	-	
<b>FY 2020 Plans:</b>															

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy					Date: February 2020	
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 0605864N / Test & Evaluation Support	Project (Number/Name) 0566 / NAVAIR Environmental Compliance				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Continue the identification and funding of level 1 requirements that support compliance projects at Naval Air Systems Command Ranges to ensure applicable laws and regulations are met and Range mission/operations proceed unencumbered. Global Information Systems Encroachment Data Supporting Testing & Training, 0.2 Cultural Surveys Supporting Testing & Training, 0.1						
<b>FY 2021 Base Plans:</b> Continue the identification and funding of level 1 requirements that support compliance projects at Naval Air Systems Command Ranges to ensure applicable laws and regulations are met and Range mission/operations proceed unencumbered. Support Testing for Global Information Systems Encroachment and Cultural Surveys.						
<b>FY 2021 OCO Plans:</b> N/A						
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> The FY 2021 funding request was reduced to account for the availability of prior year execution balances.						
<b>Accomplishments/Planned Programs Subtotals</b>		4.402	4.572	4.158	0.000	4.158
<b>C. Other Program Funding Summary (\$ in Millions)</b>						
N/A						
<b>Remarks</b>						
<b>D. Acquisition Strategy</b>						
Not applicable.						

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020		
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0605864N / Test & Evaluation Support				Project (Number/Name) 0653 / NAWC Weapons Division				
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	
0653: NAWC Weapons Division	0.000	141.269	155.097	152.741	-	152.741	157.458	156.402	158.971	162.152	Continuing	Continuing	
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-			

**A. Mission Description and Budget Item Justification**

Project provides continuing maintenance and operational support for the Naval Air Warfare Center Weapons Division Test and Evaluation capabilities. These capabilities include the Pacific Ranges and Facilities, consisting of China Lake Ranges and the Point Mugu Sea Range, aerial and surface target launch and recovery, target test instrumentation and Test and Evaluation aircraft. The Pacific Ranges use China Lake's 1.1 million acres of land and 17,000 square miles of military restricted (R-2508) airspace together with Point Mugu's 125,000 square miles of instrumented sea range and 36,000 square miles of controlled overlying airspace, and airfield and test instrumentation at San Nicolas Island to perform its Test and Evaluation mission. Included in the China Lake ranges is the Electronic Combat Range, which provides outdoor free space developmental and operational testing of airborne electronic warfare systems and tactics against shipboard and land based air defense systems. These ranges perform metric radar, multilateration and optical tracking of test objects; command, control, and destruct for range safety purposes; communications; frequency interference control and analysis; collection processing and display of telemetered data; real-time data processing and display; and the operation of a sub scale aerial target launch capability. Other test capabilities include sled tracks, measurement facilities; propulsion, warhead, environmental, rocket motor, and other missile component test facilities; and gun ranges. This project funds costs that are not chargeable to customers.

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

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<b>Title:</b> Pacific Ranges <b>Articles:</b> <b>Description:</b> In accordance with Department of Defense Directive 3200.11., this project funds the overhead/institutional costs required to sustain the Major Range and Test Facility Base capabilities at the Pacific Ranges and Facilities located at China Lake and Point Mugu, CA. These facilities provide safe, instrumented, controlled open air testing utilizing the Land Range, Sea Range, Electronic Combat Ranges, and San Nicholas Island. <b>FY 2020 Plans:</b> Continue to maintain and operate mission essential/core test support resources. These resources include test article instrumentation and/or modification for Flight Test Aircraft and Weapons Undersea Test as well as ground and flight test instrumentation systems, range instrumentation systems and data processing and communication systems required to meet customer test workload. Fund civilian labor, travel, transportation, equipment, supplies, communication, equipment maintenance, purchased service contracts, annual utilities and any costs necessary to manage and sustain the Major Range and Test Facility Base operations. Maintenance will begin on five	59.339	63.221	62.917	0.000	62.917

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy					<b>Date:</b> February 2020	
<b>Appropriation/Budget Activity</b> 1319 / 6		<b>R-1 Program Element (Number/Name)</b> PE 0605864N / Test & Evaluation Support		<b>Project (Number/Name)</b> 0653 / NAWC Weapons Division		
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>						
FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total		
<p>Radar Signal Emulators (RSEs) and a battlespace shaping capability that requires Special Access Program (SAP) facilities.</p> <p><b>FY 2021 Base Plans:</b> Continue to maintain and operate mission essential/core test support resources. These resources include test article instrumentation as well as ground and flight test instrumentation systems, range instrumentation systems and data processing and communication systems required to meet customer test workload. Fund civilian labor, travel, transportation, equipment, supplies, communication, equipment maintenance, purchased service contracts, annual utilities and any costs necessary to manage and sustain the Major Range and Test Facility Base operations. Sustain maintenance activities associated with five Radar Signal Emulators (RSEs) and a battlespace shaping capability that requires Special Access Program (SAP) facilities. Initiate maintenance activities to sustain warfare battle shaping capability.</p> <p><b>FY 2021 OCO Plans:</b> Not applicable</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> No significant changes from FY 2020 to FY 2021</p>						
<b>Title:</b> Navy Test Wing Pacific	<b>Articles:</b>	22.521	27.118	24.595	0.000	24.595
<p><b>Description:</b> This project funds the overhead/institutional costs required to sustain the Major Range and Test Facility Base capabilities of the Naval Test Wing Pacific located at China Lake and Point Mugu, CA. These facilities provide the Navy's principal Pacific test activity for Naval Aviation Systems Team aircraft, engaged in or supporting Test &amp; Evaluation of aircraft, weapons and weapons systems.</p> <p><b>FY 2020 Plans:</b> Continue to maintain and operate mission essential/core test support resources associated with airborne and seaborne targets required to meet customer test workload. Fund civilian labor, travel, transportation, equipment, supplies, communication, equipment maintenance, purchased service contracts, annual utilities and any costs necessary to manage and sustain the Major Range and Test Facility Base operations. Stand up maintenance activity for the new Gulf Stream C-20 aircraft.</p> <p><b>FY 2021 Base Plans:</b></p>						

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy					<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 6		<b>R-1 Program Element (Number/Name)</b> PE 0605864N / Test & Evaluation Support	<b>Project (Number/Name)</b> 0653 / NAWC Weapons Division		
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>					
FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	
Continue to maintain and operate mission essential/core test support aircraft associated with aviation platform and weapon system test and evaluation. Fund civilian labor, travel, transportation, equipment, supplies, communication, equipment maintenance, purchased service contracts, annual utilities and any costs necessary to manage and sustain Naval Test Wing Pacific operations.					
<b>FY 2021 OCO Plans:</b> Not applicable.					
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Funding decrease from FY 2020 to FY 2021 reflects the completion of stand up for the Gulf Stream Maintenance Operations Base support C-20 Aircraft.					
<b>Title:</b> Threat/Target Systems	<b>Articles:</b>	11.454	11.804	11.713	0.000
<b>Description:</b> This project funds the overhead/institutional costs required to sustain the Major Range and Test Facility Base capabilities of the Threat/Target Systems facilities. These facilities provide the airborne and seaborne target presentations for test and evaluation.		-	-	-	-
<b>FY 2020 Plans:</b> Continue to maintain and operate mission essential/core test support resources associated with airborne and seaborne targets required to meet customer test workload. Fund civilian labor, travel, transportation, equipment, supplies, communication, equipment maintenance, purchased service contracts, annual utilities and any costs necessary to manage and sustain the Major Range and Test Facility Base operations.					
<b>FY 2021 Base Plans:</b> Continue to maintain and operate mission essential/core test support resources associated with airborne and seaborne target operations required to meet customer test workload. Fund civilian labor, travel, transportation, equipment, supplies, communication, equipment maintenance, purchased service contracts, annual utilities and any costs necessary to manage and sustain the Major Range and Test Facility Base target operations.					
<b>FY 2021 OCO Plans:</b> Not applicable.					
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> There are no significant change from FY 2020 to FY 2021.					
<b>Title:</b> Test and Evaluation Ordnance	<b>Articles:</b>	3.540	3.500	3.590	0.000
		-	-	-	-

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy				<b>Date:</b> February 2020			
<b>Appropriation/Budget Activity</b> 1319 / 6		<b>R-1 Program Element (Number/Name)</b> PE 0605864N / Test & Evaluation Support	<b>Project (Number/Name)</b> 0653 / NAWC Weapons Division				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>							
FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total			
<b>Description:</b> This project funds the overhead/institutional costs required to sustain the Major Range and Test Facility Base capabilities of the Test and Evaluation Ordnance facilities. These facilities provide test and evaluation of All-Up live ordnance and components.							
<b>FY 2020 Plans:</b> Continue to maintain and operate mission essential/core test support resources associated propulsion, warhead, environmental, rocket motor, and other missile component test facilities required to meet customer test workload. Fund civilian labor, travel, transportation, equipment, supplies, communication, equipment maintenance, purchased service contracts, annual utilities and any costs necessary to manage and sustain Major Range and Test Facility Base operations.							
<b>FY 2021 Base Plans:</b> Continue to maintain and operate mission essential/core test support resources associated propulsion, warhead, environmental, rocket motor, and other missile component test facilities required to meet customer test workload. Fund civilian labor, travel, transportation, equipment, supplies, communication, equipment maintenance, purchased service contracts, annual utilities and any costs necessary to manage and sustain Major Range and Test Facility Base operations.							
<b>FY 2021 OCO Plans:</b> Not applicable.							
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> There are no significant changes from FY 2020 to FY 2021.							
<b>Title:</b> Naval Air Warfare Center Weapons Division Command		<b>Articles:</b>	44.415	49.454	49.926	0.000	49.926
<b>Description:</b> This project funds the overhead/institutional costs required to sustain the Naval Air Warfare Center Weapons Division Major Range and Test Facility Base Test and Evaluation capabilities.				-	-	-	-
<b>FY 2020 Plans:</b> Continue to reimburse the Command for General and Administration Support services. Continue to fund civilian labor, travel, transportation, equipment, supplies, communication, equipment maintenance, purchased service contracts, annual utilities, Navy Marine Corps Intranet, and any costs necessary to manage and sustain Major Range and Test Facility Base operations.							
<b>FY 2021 Base Plans:</b>							

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy				<b>Date:</b> February 2020		
<b>Appropriation/Budget Activity</b> 1319 / 6		<b>R-1 Program Element (Number/Name)</b> PE 0605864N / <i>Test &amp; Evaluation Support</i>	<b>Project (Number/Name)</b> 0653 / <i>NAWC Weapons Division</i>			
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>						
Continue to reimburse the Command for General and Administration Support services. Continue to fund civilian labor, travel, transportation, equipment, supplies, communication, equipment maintenance, purchased service contracts, annual utilities, Navy Marine Corps Intranet, and any costs necessary to manage and sustain Major Range and Test Facility Base operations.	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	
<b>FY 2021 OCO Plans:</b> Not applicable						
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Increase from FY 2020 to FY 2021 is due to FAA rate increase for Air Traffic Control Services in R2508.						
<b>Accomplishments/Planned Programs Subtotals</b>		141.269	155.097	152.741	0.000	152.741
<b>C. Other Program Funding Summary (\$ in Millions)</b>						
N/A						
<b>Remarks</b>						
<b>D. Acquisition Strategy</b> Not applicable.						

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy										Date: February 2020			
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0605864N / Test & Evaluation Support				Project (Number/Name) 0654 / NAWC Acft Division				
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	
0654: NAWC Acft Division	0.000	95.496	100.281	101.753	-	101.753	103.733	105.776	108.853	111.028	Continuing	Continuing	
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-			

**A. Mission Description and Budget Item Justification**

This project provides funds for the maintenance and operations of the Naval Air Warfare Center Aircraft Division's Major Range and Test Facility Base capabilities used to conduct test and evaluation for air platforms. Naval Air Warfare Center Aircraft Division has extensive airfield, flight test ranges, aircraft systems test facilities and simulation laboratories to support aircraft Research Development Test and Evaluation. This includes 50,000 square miles of airspace, 39,375 square miles of sea space, and 7,950 acres of land space. Product areas include aircraft systems flight test and evaluation, carrier suitability certification, test article preparation, installed system test and evaluation, and modeling and simulation support of the acquisition program test requirements. The Test and Evaluation Group, Patuxent River, performs development and operational test and evaluation of manned and unmanned air vehicle systems, including mission systems, equipment, subsystems, components, and support systems. This project also provides test and evaluation facilities for air-breathing propulsion systems and extensive facilities for conducting both installed and uninstalled aircraft engine development and test and evaluation. This project funds costs that are not chargeable to customers.

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

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<b>Title:</b> Atlantic Ranges  <b>Articles:</b>	23.349	24.871	25.257	0.000	25.257

**Description:** This project funds the overhead/institutional costs required to sustain the Major Range and Test Facility Base capabilities associated with the Atlantic Ranges and Facilities and Air Vehicle Modification and Instrumentation. These facilities provide safe, instrumented, controlled flight testing and training in air, sea, and land arenas.

**FY 2020 Plans:**

Continue to maintain and operate mission essential/core test support resources. These resources include test article instrumentation and/or modification for Flight Test Aircraft and Weapons Undersea Test as well as ground and flight test instrumentation systems, range instrumentation systems and data processing and communication systems required to meet customer test workload. Fund civilian labor, travel, transportation, equipment, supplies, communication, equipment maintenance, purchased service contracts, annual utilities and any costs necessary to manage and sustain the Major Range and Test Facility Base operations. Maintenance will begin for two new control rooms that operate at the Special Access Program (SAP) level, including the IT equipment required to perform test and evaluation operations from the control rooms.

**FY 2021 Base Plans:**

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy				<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 6		<b>R-1 Program Element (Number/Name)</b> PE 0605864N / Test & Evaluation Support	<b>Project (Number/Name)</b> 0654 / NAWC Acft Division	
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>				
FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Continue to maintain and operate mission essential/core test support resources. These resources include test article instrumentation and/or modification for Flight Test Aircraft and Weapons Undersea Test as well as ground and flight test instrumentation systems, range instrumentation systems and data processing and communication systems required to meet customer test workload. Fund civilian labor, travel, transportation, equipment, supplies, communication, equipment maintenance, purchased service contracts, annual utilities and any costs necessary to manage and sustain the Major Range and Test Facility Base operations. Continue maintenance for two new control rooms that operate at the Special Access Program (SAP) level, including the IT equipment required to perform test and evaluation operations from the control rooms.				
<b>FY 2021 OCO Plans:</b> Not applicable				
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> There is no significant change from FY 2020 to FY 2021.				
<b>Title:</b> Electromagnetic Environmental Effects and Air Combat Environment Test and Evaluation Facility <b>Articles:</b>				
<b>Description:</b> This project funds the overhead/institutional costs required to sustain the Major Range and Test Facility Base capabilities associated with Electromagnetic Environmental Effects and Air Combat Environment Test and Evaluation Facility. These facilities provide Test and Evaluation support with integrated, interactive, and repeatable synthetic environments and reduce the risk and cost for programs with the use of installed systems tests to include simulation and stimulation tools, techniques and technologies.				
<b>FY 2020 Plans:</b> Continue to maintain and operate mission essential/core test support resources required to meet customer test workload. Fund civilian labor, travel, transportation, equipment, supplies, communication, equipment maintenance, purchased service contracts, annual utilities and any costs necessary to manage and sustain the Major Range and Test Facility Base operations.				
<b>FY 2021 Base Plans:</b> Continue to maintain and operate mission essential/core test support resources required to meet customer test workload. Fund civilian labor, travel, transportation, equipment, supplies, communication, equipment maintenance, purchased service contracts, annual utilities and any costs necessary to manage and sustain the Electromagnetic Environmental Effects and Air Combat Environment Test and Evaluation Facility operations.				
<b>FY 2021 OCO Plans:</b>				

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy					Date: February 2020	
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 0605864N / Test & Evaluation Support	Project (Number/Name) 0654 / NAWC Acft Division				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Not applicable						
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Increase from FY 2020 to FY 2021 supports increase in maintenance requirements associated with Air Combat Environment Test and Evaluation Facility Electronic Warfare test capabilities.						
<b>Title:</b> Propulsion Systems Evaluation Facility	<b>Articles:</b>	4.498	4.587	4.646	0.000	4.646
<b>Description:</b> This project funds the overhead/institutional costs required to sustain the Major Range and Test Facility Base capabilities of the Propulsion Systems Evaluation Facility. These facilities perform Test and Evaluation of propulsion systems in the laboratories, engine test chambers and component test rigs of the Propulsion Systems Evaluation Facility and the Aircraft Test and Evaluation Facility. Propulsion Systems consists of engines, engine components and accessories.						
<b>FY 2020 Plans:</b> Continue to maintain and operate mission essential/core test support resources required to meet customer test requirements. Fund civilian labor, travel, transportation, equipment, supplies, communication, equipment maintenance, purchased service contracts, annual utilities and any costs necessary to manage and sustain the Major Range and Test Facility Base operations.						
<b>FY 2021 Base Plans:</b> Continue to maintain and operate mission essential/core test support resources required to meet customer test workload. Fund civilian labor, travel, transportation, equipment, supplies, communication, equipment maintenance, purchased service contracts, annual utilities and any costs necessary to manage and sustain the Propulsion System Evaluation Facility operations.						
<b>FY 2021 OCO Plans:</b> Not applicable.						
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> There is no significant change from FY 2020 to FY 2021.						
<b>Title:</b> Threat/Target Systems	<b>Articles:</b>	2.284	2.329	2.376	0.000	2.376

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy					Date: February 2020	
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 0605864N / Test & Evaluation Support	Project (Number/Name) 0654 / NAWC Acft Division				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<b>Description:</b> This project funds the overhead/institutional costs required to sustain the Major Range and Test Facility Base. Threat/Target Systems operations provide the airborne and seaborne target presentations for test and evaluation.						
<b>FY 2020 Plans:</b> Continue to maintain and operate mission essential/core test support resources associated with airborne and seaborne targets required to meet customer test workload. Fund civilian labor, travel, transportation, equipment, supplies, communication, equipment maintenance, purchased service contracts, annual utilities and any costs necessary to manage and sustain the Major Range and Test Facility Base operations.						
<b>FY 2021 Base Plans:</b> Continue to maintain and operate mission essential/core test support resources associated with airborne and seaborne target operations required to meet customer test workload. Fund civilian labor, travel, transportation, equipment, supplies, communication, equipment maintenance, purchased service contracts, annual utilities and any costs necessary to manage and sustain the Major Range and Test Facility Base target operations.						
<b>FY 2021 OCO Plans:</b> Not applicable.						
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> There is no significant change from FY 2020 to FY 2021.						
<b>Title:</b> Naval Test Wing Atlantic	<b>Articles:</b>	22.320	22.757	22.747	0.000	22.747
<b>Description:</b> This project funds the overhead/institutional costs required to sustain the Major Range and Test Facility Base capabilities of the Naval Test Wing Atlantic. These facilities provide support for Naval Aviation Systems Team aircraft, engaged in or supporting aircraft system test and evaluation.		-	-	-	-	-
<b>FY 2020 Plans:</b> Continue to maintain and operate mission essential/core test support resources associated with 11 aircraft and related systems and flight test safety required to meet customer test workload. Fund civilian labor, travel, transportation, equipment, supplies, communication, equipment maintenance, purchased service contracts, annual utilities and any costs necessary to manage and sustain the Major Range and Test Facility Base operations.						
<b>FY 2021 Base Plans:</b>						

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy				<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 6		<b>R-1 Program Element (Number/Name)</b> PE 0605864N / Test & Evaluation Support	<b>Project (Number/Name)</b> 0654 / NAWC Acft Division	
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>				
FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Continue to maintain and operate mission essential/core test support resources associated with 11 aircraft and related systems and flight test safety required to meet customer test operations. Fund civilian labor, travel, transportation, equipment, supplies, communication, equipment maintenance, purchased service contracts, annual utilities and any costs necessary to manage and sustain the Naval Test Wing Atlantic.				
<b>FY 2021 OCO Plans:</b> Not applicable.				
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> There is no significant change from FY 2020 to FY 2021.				
<b>Title:</b> Naval Air Warfare Center Aircraft Division Command		<b>Articles:</b>	22.857	24.653
<b>Description:</b> This project funds the overhead/institutional costs required to sustain the Naval Air Warfare Center Aircraft Division Major Range and Test Facility Base Test and Evaluation capabilities.			24.933	0.000
<b>FY 2020 Plans:</b> Continue to reimburse the Command for General and Administrative support services. Continue to fund civilian labor, travel, transportation, equipment, supplies, communication, equipment maintenance, purchased service contracts, annual utilities and any costs necessary to manage and sustain the Major Range and Test Facility Base operations.			-	-
<b>FY 2021 Base Plans:</b> Continue to reimburse the Command for General and Administrative support services. Continue to fund civilian labor, travel, transportation, equipment, supplies, communication, equipment maintenance, purchased service contracts, annual utilities and any costs necessary to manage and sustain the Naval Air Warfare Center Aircraft Division Range and Test Facility Base operations.				
<b>FY 2021 OCO Plans:</b> Not applicable				
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> No significant change from FY 2020 to FY 2021.				
<b>Accomplishments/Planned Programs Subtotals</b>				95.496
				100.281
				101.753
				0.000
				101.753
<b>C. Other Program Funding Summary (\$ in Millions)</b>				
N/A				

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy	<b>Date:</b> February 2020	
<b>Appropriation/Budget Activity</b> 1319 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0605864N / <i>Test &amp; Evaluation Support</i>	<b>Project (Number/Name)</b> 0654 / <i>NAWC Acft Division</i>
<b>C. Other Program Funding Summary (\$ in Millions)</b>		
<b>Remarks</b>		
<b>D. Acquisition Strategy</b> Not applicable.		

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020		
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0605864N / Test & Evaluation Support				Project (Number/Name) 2511 / Natural Disaster Relief				
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	
2511: <i>Natural Disaster Relief</i>	0.000	0.000	130.444	54.136	-	54.136	39.655	47.000	33.000	0.000	0.000	304.235	
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-	-		

**Note**

New Project 2511 created in support of Natural Disaster Relief.

**A. Mission Description and Budget Item Justification**

This project was created in response to the 2019 Searles Valley Earthquakes at Naval Weapons Station China Lake to support repairs at Navy MRTFB sites that have been damaged by natural disasters to include earthquakes, wildfires, hurricanes, tornadoes, landslides and floods.

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

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<b>Title:</b> Natural Disaster Relief	0.000	130.444	54.136	0.000	54.136
<b>Articles:</b>	-	-	-	-	-
<b>FY 2020 Plans:</b> Funds provided in support of repairing damage caused by the July 2019 Searles Valley Earthquake to the MRTFB facilities, infrastructure and instrumentation at Naval Weapons Station China Lake. FY20 plans include repair of Class-3 property; Propulsion Lab Repairs at Cal Tech Sites 1 and 4, the Environmental Test Area and Burro Canyon. Plans also include network fiber optic repairs to instrumentation on North and South Range complexes; Replacement and integration of Optical Systems; Replacement and integration of Communications Systems; and Repairs to Remotely Operated Tracking Radars Instrumentation; Energetic Material mixers; and Laser equipment.					
<b>FY 2021 Base Plans:</b> This is a continuation of repairing damage caused by natural disasters at Navy MRTFB sites. FY21 repairs will include: Class-3 property; Propulsion Lab Repairs at Cal Tech Sites 1 and 4, the Environmental Test Area and Burro Canyon. Plans also include network fiber optic repairs to instrumentation on North and South Range complexes; Replacement and integration of Optical Systems; Replacement and integration of Communications Systems; and Repairs to Remotely Operated Tracking Radars Instrumentation; Energetic Material mixers; and Laser equipment					
<b>FY 2021 OCO Plans:</b> N/A					
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b>					

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy				<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 6		<b>R-1 Program Element (Number/Name)</b> PE 0605864N / <i>Test &amp; Evaluation Support</i>	<b>Project (Number/Name)</b> 2511 / <i>Natural Disaster Relief</i>	
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>				
Decrease from FY20 to FY21 is due to a large number of priority repair projects having been addressed in FY20.		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>
<b>Accomplishments/Planned Programs Subtotals</b>				<b>FY 2021 OCO</b>
				<b>FY 2021 Total</b>
<b>C. Other Program Funding Summary (\$ in Millions)</b>				
N/A				
<b>Remarks</b>				
<b>D. Acquisition Strategy</b>				
N/A				

**UNCLASSIFIED**

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020		
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0605864N / Test & Evaluation Support				Project (Number/Name) 2921 / Pacific Missile Range Facility				
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	
2921: <i>Pacific Missile Range Facility</i>	0.000	5.139	5.394	5.413	-	5.413	5.523	5.634	5.746	5.862	Continuing	Continuing	
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-			
<b>A. Mission Description and Budget Item Justification</b>													
This program provides continuing maintenance and operations support for Test and Evaluation related capabilities at the Pacific Missile Range Facility located at Barking Sands on Kauai, HI. Pacific Missile Range Facility's Test and Evaluation capabilities include precision radar and telemetry assets, the Mobile Aerial Target Support System, and Stabilized High-accuracy Optical Tracking System. These assets support Navy, Department of Defense, and Missile Defense Agency Test and Evaluation. This project funds costs not chargeable to customers.													
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>													
<b>Title:</b> Pacific Missile Range Facility <b>Articles:</b> <i>This project funds the overhead/institutional costs required to sustain the recognized Major Range and Test Facility Base capabilities at Pacific Missile Range Facility in accordance with Department of Defense Directive 3200.11.</i> <b>FY 2020 Plans:</b> Continue to maintain and operate mission essential/core test support resources including three precision radars and eight telemetry antennas, the Mobile Aerial Target Support System barge, and the four Optical Systems required to meet customer test workload. Fund civilian labor, travel, transportation, equipment, supplies, communication, equipment maintenance, purchased service contracts, annual utilities and any costs necessary to manage and sustain the Major Range and Test Facility Base operations. Reimburse the Command for General and Administrative support services. <b>FY 2021 Base Plans:</b> Continue to maintain and operate mission essential/core test support resources including three precision radars and eight telemetry antennas, the Mobile Aerial Target Support System barge, and the four Optical Systems required to meet customer test requirements. Fund civilian labor, travel, transportation, equipment, supplies, communication, equipment maintenance, purchased service contracts, annual utilities and any costs necessary to manage and sustain the Major Range and Test Facility Base operations. Reimburse the Command for General and Administrative support services. <b>FY 2021 OCO Plans:</b>													
FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total									
5.139	5.394	5.413	0.000	5.413									
	-	-	-	-									

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy				<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 6		<b>R-1 Program Element (Number/Name)</b> PE 0605864N / <i>Test &amp; Evaluation Support</i>	<b>Project (Number/Name)</b> 2921 / <i>Pacific Missile Range Facility</i>	
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>				
Not applicable		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> There is no significant change from FY 2020 to FY 2021.				<b>FY 2021 OCO</b>
<b>Accomplishments/Planned Programs Subtotals</b>				<b>FY 2021 Total</b>
<b>C. Other Program Funding Summary (\$ in Millions)</b>				
N/A				
<b>Remarks</b>				
<b>D. Acquisition Strategy</b>				
Not applicable.				

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020		
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0605864N / Test & Evaluation Support				Project (Number/Name) 2922 / MRTFB Maint & Repair				
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	
2922: MRTFB Maint & Repair	0.000	44.685	41.382	37.246	-	37.246	47.743	47.506	49.695	50.690	Continuing	Continuing	
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-			

**A. Mission Description and Budget Item Justification**

This project provides funding for the maintenance and repair of the Major Range and Test Facility Base Real Property Maintenance Activities at the Naval Air Warfare Center Weapons Division, the Naval Air Warfare Center Aircraft Division, and the Atlantic Undersea Test and Evaluation Center. Funds mission critical emergency services, recurring maintenance and repair, and major repair projects. In addition it addresses priority items on the Backlog of Maintenance and Repair list.

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

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<b>Title:</b> Facility Maintenance and Repair  <b>Description:</b> Maintenance and repair of the Major Range and Test Facility Base Real Property Maintenance Activities at Naval Air Warfare Center Weapons Division, Naval Air Warfare Center Aircraft Division, and the Naval Undersea Warfare Center Detachment Atlantic Undersea Test and Evaluation Center.	44.685	41.382	37.246	0.000	37.246
<b>Articles:</b>  <b>FY 2020 Plans:</b> Continue to support mission critical emergency services, recurring maintenance and repair, and minor and major repair efforts at Naval Air Warfare Center Weapons Division, Naval Air Warfare Center Aircraft Division, and the Naval Undersea Warfare Center Detachment Atlantic Undersea Test and Evaluation Center. FY20 budget funds Major Range and Test Facility Base facility to 75% of Department of Defense Facility Sustainment Model v19.1 with \$9M to continue the Naval Air Systems Command Hangar recapitalization efforts and complete Atlantic Undersea Test and Evaluation Center Inspector General Compliance projects to improve security.	-	-	-	-	-
<b>FY 2021 Base Plans:</b> Continue to support mission critical emergency services, recurring maintenance and repair, and minor and major repair efforts at Naval Air Warfare Center Weapons Division, Naval Air Warfare Center Aircraft Division, and the Naval Undersea Warfare Center Detachment Atlantic Undersea Test and Evaluation Center. FY21 budget funds Major Range and Test Facility Base facility to 65% of Department of Defense Facility Sustainment Model v19.1 with \$11M to continue the Naval Air Systems Command Hangar recapitalization efforts and complete Atlantic Undersea Test and Evaluation Center Inspector General Compliance projects to improve perimeter security.					
<b>FY 2021 OCO Plans:</b>					

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy				<b>Date:</b> February 2020			
<b>Appropriation/Budget Activity</b> 1319 / 6		<b>R-1 Program Element (Number/Name)</b> PE 0605864N / <i>Test &amp; Evaluation Support</i>		<b>Project (Number/Name)</b> 2922 / <i>MRTFB Maint &amp; Repair</i>			
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>							
Not applicable.							
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> The FY 2021 funding request was reduced to account for the availability of prior year execution balances.							
<b>Accomplishments/Planned Programs Subtotals</b>					44.685    41.382    37.246    0.000    37.246		
<b>C. Other Program Funding Summary (\$ in Millions)</b>							
N/A							
<b>Remarks</b>							
<b>D. Acquisition Strategy</b>							
Not applicable.							

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020		
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0605864N / Test & Evaluation Support				Project (Number/Name) 2958 / Cyberspace Activities				
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	
2958: Cyberspace Activities	0.000	0.000	0.433	0.445	-	0.445	0.445	0.445	0.454	0.463	Continuing	Continuing	
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-			
<b>A. Mission Description and Budget Item Justification</b>													
This project provides funding for cyber requirements for the Major Range and Test Facility Base Real Property at the Atlantic Undersea Test and Evaluation Center. Funds critical cybersecurity upgrades to instrumentation and networks to ensure capabilities are secure and available to support customer test requirements.													
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>													
<i>Title: Cyberspace Activities</i>													
<i>Articles:</i>													
<i>Description:</i> This project funds network and instrumentation compliance with cybersecurity requirements at the Atlantic Undersea Test and Evaluation Center.													
<i>FY 2020 Plans:</i> Maintain critical cyber requirements and equipment at Atlantic Undersea Test and Evaluation Center as required to support test and evaluations operations at the Atlantic Undersea Test and Evaluation Center.													
<i>FY 2021 Base Plans:</i> Maintain compliance with cybersecurity requirements at Atlantic Undersea Test and Evaluation Center as required to support test and evaluations operations at the Atlantic Undersea Test and Evaluation Center.													
<i>FY 2021 OCO Plans:</i> Not applicable.													
<i>FY 2020 to FY 2021 Increase/Decrease Statement:</i> Increase is no significant change from FY 2020 to FY 2021.													
<b>Accomplishments/Planned Programs Subtotals</b>													
0.000      0.433      0.445      0.000      0.445													
<b>C. Other Program Funding Summary (\$ in Millions)</b>													
N/A													
<b>Remarks</b>													
<b>D. Acquisition Strategy</b>													
Not applicable.													

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020		
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0605864N / Test & Evaluation Support				Project (Number/Name) 3154 / Nanoose and Dabob Bay Ranges				
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	
3154: Nanoose and Dabob Bay Ranges	0.000	11.833	12.714	12.899	-	12.899	12.741	12.996	13.412	13.680	Continuing	Continuing	
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-			

**A. Mission Description and Budget Item Justification**

This project provides maintenance and operations support for the Nanoose and Dabob Bay Ranges along with associated support systems to provide Test and Evaluation and readiness assessment services for acquisition programs and the Fleet. Operates ocean-based environment, measurement and support systems. Maintains and repairs systems that measure warfare system performance. Oversees test, training, and measurement facilities, equipment, operations and maintenance processes. Satisfies customer exercise and measurement requirements through the operation of ocean based test and measurement systems. Assures the readiness of systems through the implementation of calibration, maintenance, repair and life cycle processes. Performs exercise planning, exercise interpretation and development of surrogate environments, for system performance measurement. Assists in the design, fabrication and testing of systems for Undersea Warfare applications. Oversees the manning and maintenance of Naval Undersea Warfare Center Division Keyport range craft and range craft systems. This project funds costs not chargeable to customers.

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

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<b>Title:</b> Undersea Ranges  <b>Articles:</b>	11.833	12.714	12.899	0.000	12.899
<b>Description:</b> This project funds the overhead/institutional costs required to sustain the Major Range and Test Facility Base capabilities at the Nanoose and Dabob Bay undersea tracking ranges.	-	-	-	-	-
<b>FY 2020 Plans:</b> Continue to maintain and operate mission essential/core test support resources associated with the unique test environments for Test and Evaluation of undersea weapons, sensors, submarines and other undersea systems required to meet customer test workload. Fund civilian labor, travel, transportation, equipment, supplies, communication, equipment maintenance, purchased service contracts, annual utilities and any costs necessary to manage and sustain the Major Range and Test Facility Base operations. Reimburse the Command for General and Administrative support services.					
<b>FY 2021 Base Plans:</b> Continue to maintain and operate mission essential/core test support resources associated with the unique test environments for Test and Evaluation of undersea weapons, sensors, submarines and other undersea systems required to meet customer test requirements. Fund civilian labor, travel, transportation, equipment, supplies, communication, equipment maintenance, purchased service contracts, annual utilities and any costs necessary					

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy				<b>Date:</b> February 2020		
<b>Appropriation/Budget Activity</b> 1319 / 6		<b>R-1 Program Element (Number/Name)</b> PE 0605864N / Test & Evaluation Support	<b>Project (Number/Name)</b> 3154 / Nanoose and Dabob Bay Ranges			
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>  to manage and sustain the Major Range and Test Facility Base operations. Reimburse the Command for General and Administrative support services.	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	
<b>FY 2021 OCO Plans:</b> Not applicable.						
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> There is no significant change from FY 2020 to FY 2021.						
<b>Accomplishments/Planned Programs Subtotals</b>		11.833	12.714	12.899	0.000	12.899
<b>C. Other Program Funding Summary (\$ in Millions)</b>						
N/A						
<b>Remarks</b>						
<b>D. Acquisition Strategy</b>						
Not applicable.						

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020		
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0605864N / Test & Evaluation Support				Project (Number/Name) 3386 / MRTFB Marine Vessels				
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	
3386: MRTFB Marine Vessels	0.000	15.325	18.148	23.956	-	23.956	16.545	16.876	17.214	17.558	Continuing	Continuing	
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-			

**A. Mission Description and Budget Item Justification**

This project funds the overhauls and preventative maintenance of the 23 Major Range and Test Facility Base marine vessels located at Naval Air Warfare Center Weapons Division, Point Mugu, CA, Pacific Missile Range Facility, Honolulu, HI, Naval Undersea Warfare Center Keyport, WA, Naval Air Warfare Center Aircraft Division, Patuxent River, MD, and Atlantic Undersea Test and Evaluation Center. These vessels are used to launch and recover torpedoes, acoustic systems, and other weapons, provide range surveillance and clearance, and can be configured for target services. Overhauls are required to operate ships over 300 tons overseas in compliance with American Bureau of Shipping "Load Line" certification requirements. Major preventative maintenance requiring shipyard support is also performed during these periods to mitigate risks of failures and sustain critical, Hull, Mechanical and Electrical systems to support operations at sea.

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

FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
15.325	18.148	23.956	0.000	23.956

**Title:** MRTFB Marine Vessels

**Articles:**

**Description:** This project funds the overhauls and preventative maintenance of the 23 Major Range and Test Facility Base marine vessels located at Naval Air Warfare Center Weapons Division, Point Mugu, CA, Pacific Missile Range Facility, Honolulu, HI, Naval Undersea Warfare Center Keyport Keyport Nanoose and Dabob Bay Ranges, Keyport, WA, Naval Air Warfare Aircraft Division, Patuxent River, MD, and Naval Undersea Warfare Center Detachment Atlantic Undersea Test and Evaluation Center.

**FY 2020 Plans:**

Perform overhauls of a Naval Undersea Warfare Center Keyport, Atlantic Undersea Test and Evaluation Center, Naval Air Warfare Center Aircraft Division, and Naval Air Warfare Center Weapons Division vessel. Continue purchase of the Naval Undersea Warfare Center Detachment Atlantic Undersea Test and Evaluation center Rover replacement vessel.

**FY 2021 Base Plans:**

Perform overhauls of a Naval Undersea Warfare Center Keyport, Atlantic Undersea Test and Evaluation Center, Naval Air Warfare Center Aircraft Division, and Naval Air Warfare Center Weapons Division vessel. Purchase replacement of Naval Air Warfare Center Weapons Division Mobile Ship Target.

**FY 2021 OCO Plans:**

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy				<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 6		<b>R-1 Program Element (Number/Name)</b> PE 0605864N / <i>Test &amp; Evaluation Support</i>	<b>Project (Number/Name)</b> 3386 / <i>MRTFB Marine Vessels</i>	
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>				
FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Not applicable.				
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Increase from FY 2020 to FY 2021 reflects replacement of the Mobile Ship Target at Naval Air Warfare Center Weapons Division.				
<b>Accomplishments/Planned Programs Subtotals</b>				15.325    18.148    23.956    0.000    23.956
<b>C. Other Program Funding Summary (\$ in Millions)</b>				
N/A				
<b>Remarks</b>				
<b>D. Acquisition Strategy</b>				
Not applicable.				

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy											Date: February 2020	
Appropriation/Budget Activity				R-1 Program Element (Number/Name)								
1319: Research, Development, Test & Evaluation, Navy / BA 6: RDT&E Management Support				PE 0605865N / Operational Test & Eval Capability								
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	21.218	25.145	27.241	-	27.241	25.492	25.914	26.053	26.594	Continuing	Continuing
0831: OPTEVFOR Support	0.000	21.218	25.145	25.207	-	25.207	23.419	23.800	23.899	24.399	Continuing	Continuing
2958: Cyberspace Activities	0.000	0.000	0.000	2.034	-	2.034	2.073	2.114	2.154	2.195	Continuing	Continuing

**A. Mission Description and Budget Item Justification**

Funding in this project funds the civilian salaries and operating costs for the Commander, Operational Test and Evaluation Force (COMOPTEVOR). In addition, it supports several senior management initiatives aimed at increasing efficiencies in Test and Evaluation (T&E). These initiatives include IT database and decision making technology

upgrades; implementation of Integrated Testing and Mission Based Test Design across all programs; and improved staffing and expertise in the areas of DON acquisition processes, Modeling and Simulation, Statistical Studies, Cybersecurity, and similar disciplines. All of these initiatives are aimed at improving the quality of testing and evaluation, thus ensuring delivery to fleet units of fully tested and capable combat systems.

B. Program Change Summary (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	21.554	25.145	25.774	-	25.774
Current President's Budget	21.218	25.145	27.241	-	27.241
Total Adjustments	-0.336	0.000	1.467	-	1.467
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.336	0.000			
• Program Adjustments	0.000	0.000	1.467	-	1.467
• Rate/Misc Adjustments	0.000	0.000	0.000	-	0.000

**Change Summary Explanation**

The FY 2021 funding increase supports additional Cyber Security manpower to meet the Program Cyber Security Operational Tests (OT) required by DoD. DoD mandated an increase in Cyber Security testing due to an increase in cyber intrusions from adversaries. Cyber intrusions continue to challenge our weapon systems' ability to detect threats, react to threats, and restore system functionality after a cyber-attack. Cyber intrusion prevention requires specialized training, tool sets, and increased proficiency in COMOPTEVFOR's cyber security test manpower.

The FY 2021 funding increase continues to support the Network Modernization effort. Part of this

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<b>Exhibit R-2, RDT&amp;E Budget Item Justification:</b> PB 2021 Navy	<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy / BA 6: RDT&amp;E Management Support</i>	<b>R-1 Program Element (Number/Name)</b> PE 0605865N / <i>Operational Test &amp; Eval Capability</i>
modernization will strengthen COMOPTEVFOR's presence on the Defense Research Engineering Network (DREN) and enhance collaboration, access and data flow to stakeholders operating on NMCI. COMOPTEVOR legacy unclassified and classified networks prevent collaboration, sharing, and access to operational test tools, test results, and data with Commands that work for COMOPTEVOR while executing operational testing (VX-1, VX-9, VMX-1, HMX-1), organizations that use operational test products (SYSCOMs, PEO/PMs, Fleet Shore Commands), and VCNO, OPNAV	
Technical: N/A	
Schedule: N/A	

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)				
1319 / 6					PE 0605865N / Operational Test & Eval Capability				0831 / OPTEVFOR Support				
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	
0831: OPTEVFOR Support	0.000	21.218	25.145	25.207	-	25.207	23.419	23.800	23.899	24.399	Continuing	Continuing	
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-			

  

<b>A. Mission Description and Budget Item Justification</b>										
This program element (PE) provides Commander, Operational Test and Evaluation Force (COMOPTEVFOR) general support funding for headquarters annual operating expenses and ensures COMOPTEVFOR compliance with Secretary of Defense (SECDEF) and Secretary of the Navy (SECNAV) directives during the conduct of independent operational testing and evaluation. This funding supports planning, testing, and reporting on the operational effectiveness, suitability, and cyber survivability of new and improved systems and recommending fleet usage to the Chief of Naval Operations (CNO). Funding also supports recently instituted initiatives (including the manpower to execute) that improve COMOPTEVFOR's ability to develop "minimum, adequate" test strategies maximizing efficiencies and minimizing assets required to conduct planned operational testing, thereby driving down overall test and evaluation costs for the Navy. The CNO, as well as acquisition executives and managers at all levels, have a continuing need for expeditious and efficient conduct of Operational Test and Evaluation (OT&E) by COMOPTEVFOR in support of training and equipping fleet forces. To this end, this funding supports COMOPTEVFOR's continued pursuit of a variety of senior management initiatives aimed at increasing efficiencies in T&E; these senior management initiatives include IT Network, database and decision making technology upgrades, implementation of Integrated Testing and Mission Based Test Design across all programs, and improved staffing and expertise in the areas of DON acquisition processes, Modeling and Simulation, Statistical Studies, Information Assurance, and similar disciplines. All of these initiatives are aimed at improving the quality of testing and evaluation, thus ensuring delivery to fleet units of fully tested and capable combat systems. OT&E issues have direct long term Navy-wide implications on the Fleet's readiness and warfighting capability. Rapid advances in technology, changes in fleet tactics, and increased complexity of weapons systems and platforms, combined with reductions in manpower, force structure, and budgets have created an increased need for technical and operational analyses that are sophisticated and timely in order to ensure an optimal return on investment of Navy resources.										

  

<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>											FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<b>Title:</b> OPTEVFOR SUPPORT											21.218	25.145	25.207	0.000	25.207
											-	-	-	-	-

  

<b>Description:</b> Funding in this project funds the civilian salaries and operating costs for the Commander, Operational Test and Evaluation Force (COMOPTEVOR). In addition, it supports several senior management initiatives aimed at increasing efficiencies in Test and Evaluation (T&E). These initiatives include IT Network, database and decision making technology upgrades; implementation of Integrated Testing and Mission Based Test Design across all programs; and improved staffing and expertise in the areas of DON acquisition processes, Modeling and Simulation, Statistical Studies, Information Assurance, and related disciplines. All of these initiatives are aimed at improving the quality of testing and evaluation, thus ensuring delivery to fleet units of fully tested and capable combat systems.											<b>Articles:</b>			
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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020		
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 0605865N / Operational Test & Eval Capability	Project (Number/Name) 0831 / OPTEVFOR Support				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<b>FY 2020 Plans:</b> <ul style="list-style-type: none"><li>- This project will fund civilian salaries and operating costs for COMOPTEVOR</li><li>- Agile IT: Agile IT is a Continuous Process Improvement (CPI) underway for IT Management. Expect to continue Agile IT OT&amp;E efforts; additional programs are under consideration for inclusion in this method.</li><li>- Test and Product Processes: as a learning organization, COMOPTEVOR will continue efforts to enhance and improve test processes and products in support of increasing the value of OT&amp;E.</li><li>- Continue to provide Warfare Capability Baseline (WCB) assessments and report on the Navy's capability across all platforms, networks, weapons, or sensors. The Warfare Capability Baseline assessment report distills the large volume of operational test data into clear, concise annotated charts that assist senior leaders in quickly identifying critical issues. The 11th increment of Warfare Capability Baseline (WCB) is expected to be completed.</li><li>- Continue electronic database efforts associated with Project for Holistic Evaluation for Navy Test Information Exchange (PHOENIX)</li><li>- The increased Non-IP Cybersecurity Workforce will continue to support the increased operational tempo in cyber security testing.</li><li>- The Total Force Management Council professional development criteria for Statistical Studies is on-going.</li></ul>						
<b>FY 2021 Base Plans:</b> <ul style="list-style-type: none"><li>- This project will fund civilian salaries and operating costs for COMOPTEVOR</li><li>- Agile IT: Agile IT is a Continuous Process Improvement (CPI) underway for IT Management. Expect to continue Agile IT OT&amp;E efforts; additional programs are under consideration for inclusion in this method.</li><li>- Test and Product Processes: as a learning organization, COMOPTEVOR will continue efforts to enhance and improve test processes and products in support of increasing the value of OT&amp;E.</li><li>- Continue to provide Warfare Capability Baseline (WCB) assessments and report on the Navy's capability across all platforms, networks, weapons, or sensors. The Warfare Capability Baseline assessment report distills the large volume of operational test data into clear, concise annotated charts that assist senior leaders in quickly identifying critical issues. The 12th increment of Warfare Capability Baseline (WCB) is expected to be completed.</li><li>- Continue electronic database efforts associated with Project for Holistic Evaluation for Navy Test Information Exchange (PHOENIX)</li><li>- The increased Non-IP Cybersecurity Workforce will continue to support the increased operational tempo in cyber security testing.</li></ul>						

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy			<b>Date:</b> February 2020			
<b>Appropriation/Budget Activity</b> 1319 / 6		<b>R-1 Program Element (Number/Name)</b> PE 0605865N / <i>Operational Test &amp; Eval Capability</i>		<b>Project (Number/Name)</b> 0831 / <i>OPTEVFOR Support</i>		
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>						
FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total		
<p>- The Total Force Management Council professional development criteria for Statistical Studies is on-going.</p> <p><b>FY 2021 OCO Plans:</b> N/A</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> The FY 2020 to FY 2021 funding increase supports additional Cyber Security manpower to meet the Program Cyber Security Operational Tests (OT) required by DoD. DoD mandated an increase in Cyber Security testing due to an increase in cyber intrusions from adversaries. Cyber intrusions continue to challenge our weapon systems' ability to detect threats, react to threats, and restore system functionality after a cyber-attack. Cyber intrusion prevention requires specialized training, tool sets, and increased proficiency in COMOPTEVFOR's cyber security test manpower.</p> <p>The FY 2020 to FY 2021 funding increase continues to support the Network Modernization effort. Part of this modernization will strengthen COMOPTEVFOR's presence on the Defense Research Engineering Network (DREN) and enhance collaboration, access and data flow to stakeholders operating on NMCI. COMOPTEVOR legacy unclassified and classified networks prevent collaboration, sharing, and access to operational test tools, test results, and data with Commands that work for COMOPTEVOR while executing operational testing (VX-1, VX-9, VMX-1, HMX-1), organizations that use operational test products (SYSCOMs, PEO/PMs, Fleet Shore Commands), and VCNO, OPNAV Resource Sponsors, and ASN/RDA.</p> <p>The recent decrease from FY20 to FY21 accomplished the movement of Cyberspace Activities from PRJ 0831 to cyber pure PRJ 2958.</p>						
<b>Accomplishments/Planned Programs Subtotals</b>		21.218	25.145	25.207	0.000	25.207
<b>C. Other Program Funding Summary (\$ in Millions)</b>						
N/A						
<b>Remarks</b>						

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0605865N / <i>Operational Test &amp; Eval Capability</i>	<b>Project (Number/Name)</b> 0831 / <i>OPTEVFOR Support</i>
<b>D. Acquisition Strategy</b> COMOPTEVFOR leverages a Firm Fixed Price, multi-award contract for services.		

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020		
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0605865N / Operational Test & Eval Capability				Project (Number/Name) 2958 / Cyberspace Activities				
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	
2958: Cyberspace Activities	0.000	0.000	0.000	2.034	-	2.034	2.073	2.114	2.154	2.195	Continuing	Continuing	
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-			

**Note**  
Funding was internally realigned from PRJ 0831 to cyber pure project 2958. This is not a new start.

**A. Mission Description and Budget Item Justification**  
Funding in this project funds the civilian salaries and hardware, software, and toolset costs for the Cybersecurity division of Commander, Operational Test and Evaluation Force (COMOPTEVOR). The FY 2021 funding supports Cyber Security manpower to meet the Program Cyber Security Operational Tests (OT) required by DoD. DoD mandated an increase in Cyber Security testing due to an increase in cyber intrusions from adversaries. Cyber intrusions continue to challenge our weapon systems' ability to detect threats, react to threats, and restore system functionality after a cyber-attack. Cyber intrusion prevention requires specialized training, tool sets, and increased proficiency in COMOPTEVFOR's cyber security test manpower.

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

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<b>Title:</b> Cyberspace Activities  <b>Articles:</b>  <b>Description:</b> Funding in this project funds the civilian salaries and hardware, software, and toolset costs for the Cybersecurity division of Commander, Operational Test and Evaluation Force (COMOPTEVOR). The FY 2021 funding supports Cyber Security manpower to meet the Program Cyber Security Operational Tests (OT) required by DoD. DoD mandated an increase in Cyber Security testing due to an increase in cyber intrusions from adversaries. Cyber intrusions continue to challenge our weapon systems' ability to detect threats, react to threats, and restore system functionality after a cyber-attack. Cyber intrusion prevention requires specialized training, tool sets, and increased proficiency in COMOPTEVFOR's cyber security test manpower.	0.000	0.000	2.034	0.000	2.034
<b>FY 2020 Plans:</b> N/A	-	-	-	-	-
<b>FY 2021 Base Plans:</b> - This project will fund the civilian salaries, hardware, software, and toolset costs for the Cybersecurity division of Commander, Operational Test and Evaluation Force (COMOPTEVOR). - Test and Product Processes: as a learning organization, COMOPTEVOR will continue efforts to enhance and improve test processes and products in support of increasing the value of OT&E.					

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020		
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 0605865N / Operational Test & Eval Capability	Project (Number/Name) 2958 / Cyberspace Activities				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
- The increased Non-IP Cybersecurity Workforce will continue to support the increased operational tempo in cyber security testing.						
Number of Tests Conducted - FY 2019 = 30; FY 2020 = 27; FY 2021 = 32						
<b>FY 2021 OCO Plans:</b> N/A						
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> The FY 2021 funding increase is due to the movement of Cyberspace Activities from PRJ 0831 to PRJ 2958. This funding was previously accounted for in the total controls for PE 0605865N, PRJ 0831.						
<b>Accomplishments/Planned Programs Subtotals</b>		0.000	0.000	2.034	0.000	2.034
<b>C. Other Program Funding Summary (\$ in Millions)</b>						
N/A						
<b>Remarks</b>						
<b>D. Acquisition Strategy</b>						
N/A						

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy											Date: February 2020				
Appropriation/Budget Activity					R-1 Program Element (Number/Name)										
1319: Research, Development, Test & Evaluation, Navy / BA 6: RDT&E Management Support					PE 0605866N / Navy Space & Electr Warfare Supt										
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	16.032	12.652	15.787	-	15.787	18.890	17.667	17.099	17.440	Continuing	Continuing			
0706: EMC & RF Mgmt	0.000	16.032	2.233	3.177	-	3.177	3.106	2.960	3.011	3.070	Continuing	Continuing			
3239: Real-Time Spectrum Operations (RTSO)	0.000	0.000	10.419	12.610	-	12.610	15.784	14.707	14.088	14.370	Continuing	Continuing			
<b>A. Mission Description and Budget Item Justification</b>															
Project 0706, Electromagnetic Compatibility (EMC) and Radio Frequency (RF) Management Program: Develops advanced technology to identify and eliminate Electromagnetic Interference (EMI) sources from Navy systems. Supports research and development technology efforts, develops top-level plans, and supports systems in the Space and Electronic Warfare (SEW) mission area.															
Project 3239, The Real-Time Spectrum Operations (RTSO) effort researches and develops software to automate analyses of the Electromagnetic (EM) Environmental Effects (E3) between shipboard transmitters and receivers on ships and the interactions of the EM systems within the other systems installed on units within a strike group. RTSO develops and updates numerical models, algorithms, data bases, and software which aids and supports warfighter spectrum planning, sensing and monitoring characterization and prediction, and managing and maneuvering within the EM spectrum.															
<b>B. Program Change Summary (\$ in Millions)</b>				FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total							
Previous President's Budget				16.227	15.773	17.632	-	17.632							
Current President's Budget				16.032	12.652	15.787	-	15.787							
Total Adjustments				-0.195	-3.121	-1.845	-	-1.845							
• Congressional General Reductions				-	-	-	-								
• Congressional Directed Reductions				-	-3.121	-	-								
• Congressional Rescissions				-	-	-	-								
• Congressional Adds				-	-	-	-								
• Congressional Directed Transfers				-	-	-	-								
• Reprogrammings				-	-	-	-								
• SBIR/STTR Transfer				-0.195	0.000	-	-								
• Program Adjustments				0.000	0.000	-1.868	-	-1.868							
• Rate/Misc Adjustments				0.000	0.000	0.023	-	0.023							
<b>Change Summary Explanation</b>															
Real-Time Spectrum Operations (RTSO) funding was realigned into PU 3239 from PU 0706 starting in FY20 to support transition to the designated lead capability integrator.															

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<b>Exhibit R-2, RDT&amp;E Budget Item Justification:</b> PB 2021 Navy	<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy / BA 6: RDT&amp;E Management Support</i>	<b>R-1 Program Element (Number/Name)</b> PE 0605866N / <i>Navy Space &amp; Electr Warfare Supt</i>
RTSO - FY21 \$2.191M increase is associated with the start of the design, development, and transition of the RTSO Own Force Monitoring (OFM) Deployable Mission Module (DMM) capability to meet critical Fleet requirements for Emissions Control (EMCON) Validation and Tactical Situation (TACSIM) management to all non-capable ships. The RTSO OFM DMM will be developed and fielded to meet validated OFM capability requirements outlined in U.S. Fleet Forces Command / Commander, U.S. Pacific Fleet RTSO Requirements Document Ltr dtd 4 Dec 2017.	

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020	
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0605866N / Navy Space & Electr Warfare Supt				Project (Number/Name) 0706 / EMC & RF Mgmt			
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
0706: EMC & RF Mgmt	0.000	16.032	2.233	3.177	-	3.177	3.106	2.960	3.011	3.070	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

Electromagnetic Compatibility (EMC) and Radio Frequency (RF) Management Program. This project develops tools, processes, and algorithms to identify and mitigate EMI sources for Navy systems and platforms.

- (a) It will support the Afloat Electromagnetic Spectrum Operations Program (AESOP), an automated spectrum Fleet operational capability. The application will be enhanced to comply with fleet operational requirements and streamline Strike Force frequency management processes. It will provide automated Spectrum Management (SM) tools for development of operational task communication and radar/weapon plans to support fleet deployments, exercises, and contingency operations. It will provide identification and mitigation of EMI in Navy, North Atlantic Treaty Organization (NATO), Allied, Ashore and Joint Combat Operations. It will provide analysis related to spectrum reallocation proposals to assess impacts on Navy operations and systems, as well as for the Spectrum Supportability Risk Assessments.
- (b) It will support the Shipboard Electromagnetic Compatibility Improvement Program (SEMCIP) to identify, engineer, and evaluate effectiveness of potential EMI corrections. The program also characterizes and quantifies the operational impact of EMI problems on system's mission performance.
- (c) It will support the Nuclear Electromagnetic Pulse (EMP) Survivability Program. The program assesses the EMP survivability of all mission critical systems and funds development of a hardness assurance and maintenance program. It will develop improved modeling capability to reduce hardness validation costs at delivery and over the lifetime of the system/platform. The program develops new and updated design criteria, test methodology, test limits, and survivability validation procedures for all Navy systems, ships, submarines and shore facilities.
- (d) It will support the Real-Time Spectrum Operations Program (RTSO). The program researches the Electromagnetic (EM) Environmental Effects (E3) between shipboard transmitters and receivers on ships and the interactions of the EM systems within the other systems installed on units within a strike group. The program will develop a capability to monitor the EM Spectrum Usage on a ship and be able to validate the spectrum plan to ensure Electromagnetic Capability (EMC) is achieved within the strike group. The program will develop a capability to display compliance with the spectrum plan in a Common Operational Picture (COP) display. These initial capabilities of Own Force Monitoring provide Battlespace Awareness and will be instrumental in enabling Electromagnetic Maneuver Warfare. These capabilities of self-awareness will further enhance the Navy's ability to perform Command and Control (C2) of the EM Spectrum warfighting domain.

At the direction of OPNAV, in the beginning of FY2018 the project changed the technical approach to mitigate cost, schedule, and performance risks associated with the original Hardware (H/W) solution that required extensive integration and networking of all spectrum dependent systems. The revised technical approach simplifies the original hardware plan required in favor of a centralized radio frequency monitoring capability with software applications that can still meet fleet requirements of own force monitoring. This has resulted in near term schedule delay that is recoverable in FY19.

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<b>Exhibit R-2A, RDT&amp;E Project Justification: PB 2021 Navy</b>					<b>Date:</b> February 2020	
<b>Appropriation/Budget Activity</b> 1319 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0605866N / Navy Space & Electr Warfare Supt	<b>Project (Number/Name)</b> 0706 / EMC & RF Mgmt				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
<b>Title:</b> Afloat Electromagnetic Spectrum Operations Program (AESOP)	<b>Articles:</b>	0.324	0.300	0.415	0.000	0.415
<p><b>FY 2020 Plans:</b></p> <ul style="list-style-type: none"> <li>- Develop updates for spectrum models, develop revised electromagnetic compatibility (EMC) criteria, spectrum coordination procedures, and update required databases.</li> <li>- Document EMC criteria in the NAVSEA Operational Publication S9407-AA-GYD-010/(S) OP-3840 "Electromagnetic Compatibility Criteria for Navy Systems (U)".</li> <li>- Research and update spectrum usage and revised coordination procedures based on updates to Numbered Fleet Standing Communications Plans.</li> <li>- Research and update spectrum usage and revised coordination procedures based on updates to international or national guidance to ensure compliance.</li> <li>- Develop spectrum compatibility and coordination procedures for Navy systems.</li> <li>- Develop tactically feasible interference mitigation strategies.</li> </ul> <p><b>FY 2021 Base Plans:</b></p> <ul style="list-style-type: none"> <li>- Provide engineering analyses and recommendations for updating Littoral Radiation Restrictions for numbered fleet areas of responsibility. Document the worldwide Littoral Radiation Restrictions and provide to the fleet and to RTSO.</li> <li>- Conduct engineering analyses and testing to determine electromagnetic compatibility (EMC) criteria for Navy assets.</li> <li>- Document EMC criteria in NAVSEA Operational Publication S9407-AA-GYD-010/(S) OP-3840 "Electromagnetic Compatibility Criteria for Navy Systems (U)".</li> <li>- Revise and update Standing Operational Tasking (OPTASK) Communications Plans to accommodate Navy equipment and host nation regulations.</li> <li>- Provide impact assessments and analysis for new spectrum-dependent equipment, spectrum policy updates, and changing geopolitical conditions.</li> <li>- Research interactions and leveraging opportunities between various data sources for spectrum data; provide the Navy layer input for joint restricted frequency lists, and equipment, platform, and other databases.</li> <li>- Serve as the Navy's subject matter experts for spectrum de-confliction, EMC, and tactical spectrum management within Navy, DoD, and external components.</li> </ul> <p><b>FY 2021 OCO Plans:</b></p>						

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020		
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 0605866N / Navy Space & Electr Warfare Supt	Project (Number/Name) 0706 / EMC & RF Mgmt				
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
N/A						
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Increase of 0.11 from FY 2020 to FY 2021 is for increased engineering analysis requirements to support Real-Time Spectrum Operations (RTSO) and provide compatibility criteria and spectrum assessments for Navy operations and systems.						
<b>Title:</b> Shipboard Electromagnetic Compatibility Improvement Program (SEMCIP) <b>Articles:</b> <ul style="list-style-type: none"> <li>-</li> </ul>		1.677	1.273	1.817	0.000	1.817
<b>FY 2020 Plans:</b> <ul style="list-style-type: none"> <li>- Characterize and quantify operational impact of Electromagnetic Interference (EMI) on approximately 60 specific EMI problems to identify level of problem severity and prioritize EMI mitigation efforts, with Fleet commanders, system and ship or submarine program managers.</li> <li>- Provide engineering, analytical, and technical support to achieve electromagnetic compatibility (EMC) among and between shipboard electronic/electric systems and/or equipment.</li> <li>- Develop and evaluate the effectiveness of proposed Electromagnetic Interference (EMI) solutions to mitigate interference among and between shipboard electronic/electric systems and/or equipment.</li> <li>- Coordinate the proposed solutions with the system and ship or submarine program managers for ensure proper integration, and long term logistic support.</li> <li>- Develop and field limited production fixes, and evaluate their effectiveness in mitigating shipboard Interference.</li> <li>- Investigate the operational impacts to deployed shipboard radars, based on the Radar Spectrum Engineering Criteria (RSEC) to ensure continued operational capability.</li> <li>- Develop innovative measurement capabilities, to reduce test time and to quantify electromagnetic environmental effects of Navy platforms, systems, subsystems, and equipment to and from their intended operational electromagnetic environment.</li> </ul>						
<b>FY 2021 Base Plans:</b> <ul style="list-style-type: none"> <li>- Characterize and quantify operational impact of new Electromagnetic Interference (EMI) problems reported and predicted from FY18 to present.</li> <li>- Analyze and evaluate effectiveness of radar signal processing algorithms for the mitigation of current and future electromagnetic environment waveforms.</li> <li>- Analyze and evaluate effectiveness of forward error correction algorithms for the mitigation of current and future electromagnetic environment waveforms.</li> </ul>						

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020				
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 0605866N / Navy Space & Electr Warfare Supt	Project (Number/Name) 0706 / EMC & RF Mgmt				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
- Continue to develop new EMI fixes and evaluate their effectiveness in mitigating shipboard EMI. - Continue evaluation of Unmanned Bit Error Rate Test (UBERT) capability and research applicability to Ship EMC Certification. - Develop autonomous EMI detection capabilities for radar and communication systems in order to reduce test time and quantify likelihood over extended periods, like ship underway periods or operational deployments. - Research historical context of high frequency (HF) intermodulation (IMI) test methods and standards, and develop alternate test methods applicable to digital HF receivers.						
<b>FY 2021 OCO Plans:</b> N/A						
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Increase of 0.524 from FY 2020 to FY2021 is due to the required technical support needed to perform Radar Spectrum Engineering Criteria analysis and direct fleet support.						
<b>Title:</b> Electromagnetic Pulse (EMP) Survivability	<b>Articles:</b>	0.811	0.660	0.945	0.000	0.945
<b>FY 2020 Plans:</b> - Complete Continue computational electromagnetic (CEM) modeling capability to assist in ship hardness design. - Develop new Hybrid-Based High Altitude Electrometric Pulse (HEMP) evaluation technique to evaluate HEMP hardness of navy ships via a low-cost, low potential for equipment damage and quicker method of analysis (decreasing costs in the performance of tests). - Investigate small, inexpensive measurement devices for incorporation into Hybrid-Based HEMP evaluation methodology. - Develop instrumentation and data acquisition capability in support of the HEMP Ashore Test Facility [i.e., Naval Ordnance Transient Electromagnetic Simulator]. - Develop and/or improve design criteria, test methodology, test limits, and survivability validation procedures for Navy systems, ships, submarines and shore facilities. - Perform research and development of integrated solutions that for EMP hardening. Investigate improvements to the cable shield ground adapters, terminal protection devices and cable maintenance procedures.		-	-	-	-	-
<b>FY 2021 Base Plans:</b> - Complete computational electromagnetic (CEM) modeling capability to assist in ship hardness design.						

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy			<b>Date:</b> February 2020							
<b>Appropriation/Budget Activity</b> 1319 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0605866N / Navy Space & Electr Warfare Supt	<b>Project (Number/Name)</b> 0706 / EMC & RF Mgmt								
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>				
<ul style="list-style-type: none"> <li>- Continue developing new Hybrid-Based High Altitude Electrometric Pulse (HEMP) evaluation technique to evaluate HEMP hardness of navy ships via a low-cost, low potential for equipment damage and quicker method of analysis (decreasing costs in the performance of tests).</li> <li>- Continue investigating small, inexpensive measurement devices for incorporation into Hybrid-Based HEMP evaluation methodology.</li> <li>- Finish developing instrumentation and data acquisition capability in support of the HEMP Ashore Test Facility [i.e., Naval Ordnance Transient Electromagnetic Simulator].</li> <li>- Refine design criteria, test methodology, test limits, and survivability validation procedures for Navy systems, ships, submarines and shore facilities.</li> <li>- Perform research and development of integrated solutions that for EMP hardening. Investigate improvements to the cable shield ground adapters, terminal protection devices and cable maintenance procedures.</li> </ul>										
<b>FY 2021 OCO Plans:</b> N/A										
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Increase of 0.285 from FY 2020 to FY 2021 is due to support development of new Hybrid-Based High Altitude Electromagnetic Pulse (HEMP) evaluation technique										
<b>Title:</b> Real-Time Spectrum Operations (RTSO)		<b>Articles:</b> - -		13.220	0.000	0.000	0.000	0.000		
<b>FY 2020 Plans:</b> N/A				-	-	-	-	-		
<b>FY 2021 Base Plans:</b> N/A				-	-	-	-	-		
<b>FY 2021 OCO Plans:</b> N/A				-	-	-	-	-		
<b>Accomplishments/Planned Programs Subtotals</b>				16.032	2.233	3.177	0.000	3.177		
<b>C. Other Program Funding Summary (\$ in Millions)</b>										
N/A										
<b>Remarks</b>										

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy	<b>Date:</b> February 2020	
<b>Appropriation/Budget Activity</b> 1319 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0605866N / <i>Navy Space &amp; Electr Warfare Supt</i>	<b>Project (Number/Name)</b> 0706 / <i>EMC &amp; RF Mgmt</i>
<b>D. Acquisition Strategy</b> An acquisition strategy is not required.		

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020	
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)			
1319 / 6					PE 0605866N / Navy Space & Electr Warfare Supt				3239 / Real-Time Spectrum Operations (RTSO)			
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
3239: <i>Real-Time Spectrum Operations (RTSO)</i>	0.000	0.000	10.419	12.610	-	12.610	15.784	14.707	14.088	14.370	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

**Note**

Real-Time Spectrum Operations (RTSO) funding was realigned into PU 3239 from PU 0706 starting in FY20 to support transition to the designated lead capability integrator.

**A. Mission Description and Budget Item Justification**

Real-Time Spectrum Operations (RTSO) develops tools, processes, and algorithms to conduct spectrum planning, sense and monitor, characterize and predict Electromagnetic Environmental Effects(E3), and manage and maneuver to avoid and mitigate Electromagnetic Interference (EMI) and Electromagnetic (EM) Vulnerability for Navy systems and platforms.

RTSO supports Navy and Marine Corps Electromagnetic Spectrum Operations for global spectrum usage and allocation planning. The effort researches the EM E3 between shipboard transmitters and receivers on ships and the interactions of the EM systems within the other systems installed on units within a strike group. RTSO will develop a capability to sense and monitor shipboard EM Spectrum Usage and validate the spectrum plan to achieve Emissions Control (EMCON) within the strike group. The effort will validate and display spectrum plan compliance with a spectrum common operational picture. This EM spectrum Management Aid with own force monitoring sensor input supports Battlespace Awareness and Information Operations. These self-awareness and validation capabilities will greatly enhance the Navy's ability to perform Command and Control of the EM Spectrum warfighting domain.

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

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<i>Title:</i> Real-Time Spectrum Operations (RTSO)	0.000	10.419	12.610	0.000	12.610
<i>Articles:</i>	-	-	-	-	-

**FY 2020 Plans:**

- Continue the development and fielding of a capability to perform Frequency Plan Compliance Verification monitoring ship's radiating spectrum dependent systems ensuring compliance to frequency plans.
- Continue the development of a new multi-mode radar coordination procedures and assignments to ensure new U.S. Navy radars are electromagnetically compatible within the strike group.
- Leverage FY2019 Plans to build an initial Spectrum Operational Planning Tool (SOPT) developing alternate operational and map views, utilizing a Naval Tactical Data System (NTDS) type displays.
- Continue the development of spectrum restrictions visualization map for shipboard personnel.

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)		
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>				
		FY 2019	FY 2020	FY 2021 Base
				FY 2021 OCO
				FY 2021 Total
- Continue the development of processes and methods to publish the emissions control (EMCON) bill for a given ship.				
- Continue the development of processes and software capability for numbered fleet commands, combatant commands, and Navy Marine Corps Spectrum Offices to develop and publish littoral radiation restriction regulations.				
- Continue to participate in the Consolidated Afloat Networks and Enterprise Services (CANES) Application Integration (AI) System Integration Test (SIT).				
- Continue to participate in exercises and experiments.				
- Continue updates to Real-Time Spectrum Operations (RTSO) software documents and artifacts to include, but not limited to, the Top Level Requirements (TLR), Requirements Traceability Matrix (RTM), Requirements Definition Package (RDP), functional Architecture, RMF cybersecurity accreditation documentation, test and fielding plans, training development and consolidated training strategy, and sustainment plans.				
<b>FY 2021 Base Plans:</b>				
- Continue to research, develop, enhance and refine Cloud architecture, Spectrum COP, Live data, Detect, counter-detect (1-to-1), Time slide, and Network nodes.				
- Continue research, development, testing, and evaluation for own-force spectrum monitoring capabilities, including commercial and military sensors, antenna, and network connections.				
- Continue research and development of proof-of-concept capabilities for spectrum mission planning decision aids and intelligent sectoring/cut-outs for radiating systems				
- Continue research and development efforts for models to estimate effective RF performance ranges of spectrum dependent systems in the complex electromagnetic environment (one-on-one and multi-on-one effects)				
- Continue to refine analysis with Ship Signal Exploitation Equipment (SSEE) Family of Systems (FoS) Programs of Records to identify long-term hardware solution set for deployment for SSEE enabled platforms as well as non-SSEE enables platforms.				
- Continue research on RTSO support on Tactical Airborne and Submarine platforms.				
- Continue Limited Objective Experiments (LOEs) to demonstrate incremental capability to Fleet users.				
- Continue development of an architecture that supports mission module delivery of RTSO capability on all platforms				
<b>FY 2021 OCO Plans:</b>				

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)		
1319 / 6	PE 0605866N / Navy Space & Electr Warfare Supt	3239 / Real-Time Spectrum Operations (RTSO)		
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		FY 2019	FY 2020	FY 2021 Base
N/A				
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b>				
RTSO - FY21 \$2.191M increase is associated with the start of the design, development, and transition of the RTSO Own Force Monitoring (OFM) Deployable Mission Module (DMM) capability to meet critical Fleet requirements for Emissions Control (EMCON) Validation and Tactical Situation (TACSIT) management to all non-capable ships. The RTSO OFM DMM will be developed and fielded to meet validated OFM capability requirements outlined in U.S. Fleet Forces Command / Commander, U.S. Pacific Fleet RTSO Requirements Document Ltr dtd 4 Dec 2017.				
<b>Accomplishments/Planned Programs Subtotals</b>		0.000	10.419	12.610
<b>C. Other Program Funding Summary (\$ in Millions)</b>		0.000	12.610	12.610
N/A				
<b>Remarks</b>				
<b>D. Acquisition Strategy</b>				
An Acquisition strategy is not required				

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy											Date: February 2020	
Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
1319: Research, Development, Test & Evaluation, Navy / BA 6: RDT&E Management Support					PE 0605867N / (U)SEW SURVEILLANCE/RECONNAISSANCE SUPPORT							
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	0.000	8.402	8.559	-	8.559	8.729	8.909	9.087	9.269	Continuing	Continuing
1034: TAC SAT Recon Office	0.000	0.000	8.402	8.559	-	8.559	8.729	8.909	9.087	9.269	Continuing	Continuing

**Note**

Efforts previously funded in FY19 under PE 1206867N, SEW Surveillance/Reconnaissance Support. Beginning in FY20 funding is under PE 0605867N Space & Elec War Surv/Recon.

**A. Mission Description and Budget Item Justification**

(U) Link Crimson (Navy Tactical Exploitation of National Capabilities (TENCAP)) is a congressionally directed program to rapidly develop (12-18 months) systems, processes, and training that leverages and exploits National Technical Means (NTM) and Intelligence Community (IC) resources to meet fleet tactical warfighting gaps. This is done through innovative research and development of capabilities aligned with Navy Programs of Record (PoR), while influencing national systems support and development. These efforts include advanced sensors, platform and ground processing, and integrated national-to-tactical information fusion capabilities. Link Crimson supports all Navy mission areas, including Anti-Submarine Warfare (ASW), Integrated Air and Missile Defense, Mine Warfare (MIW), Power projection/Precision Strike, Maritime Domain Awareness (MDA), and Intelligence, Surveillance, and Reconnaissance (ISR), in support of the Navy's Information Dominance pillars: Assured Command and Control (AC2), Battlespace Awareness (BA) and Integrated Fires (IF).

(U) This program is funded under Budget Activity 6 because it supports the operations and installations required for general research and development. Program baseline addresses research and development on specific capabilities to support these mission areas such as signals collection and exploitation, acoustic and electronic signal detection, countering Unmanned Air Systems, Processing, Exploitation, and Dissemination (PED) processes, Commercial Maritime Navigation Radar (CMNR) detection and exploitation, open-ocean surveillance, and hostile threat geo-location. Link Crimson fields both prototypes to demonstrate new capabilities in real world environments in coordination with operational users, and develops warfighting capabilities for insertion into Navy, joint, and national agency programs of record. Additional detailed information is available at higher levels of classification.

(U) Project 1034: Established to exploit all National and Service sensor systems to improve tactical support to Fleet operational commanders. Project also supports equipment upgrades, training and Fleet exercises which provide the venue for testing modifications to existing programs.

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<b>Exhibit R-2, RDT&amp;E Budget Item Justification: PB 2021 Navy</b>					<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319: Research, Development, Test & Evaluation, Navy / BA 6: RDT&E Management Support	<b>R-1 Program Element (Number/Name)</b> PE 0605867N / (U)SEW SURVEILLANCE/RECONNAISSANCE SUPPORT				
<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
Previous President's Budget	0.000	8.402	8.565	-	8.565
Current President's Budget	0.000	8.402	8.559	-	8.559
Total Adjustments	0.000	0.000	-0.006	-	-0.006
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Rate/Misc Adjustments	0.000	0.000	-0.006	-	-0.006

**Change Summary Explanation**

Technical: Not applicable.

Schedule: Not applicable.

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											<b>Date:</b> February 2020		
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0605867N I (U)SEW SURVEILLANCE/ RECONNAISSANCE SUPPORT				Project (Number/Name) 1034 I TAC SAT Recon Office				
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	
1034: TAC SAT Recon Office	0.000	0.000	8.402	8.559	-	8.559	8.729	8.909	9.087	9.269	Continuing	Continuing	
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-			

**A. Mission Description and Budget Item Justification**

(U) Link Crimson (Navy Tactical Exploitation of National Capabilities (TENCAP)) is a congressionally directed program to rapidly develop (12-18 months) systems, processes, and training that leverages and exploits National Technical Means (NTM) and Intelligence Community (IC) resources to meet fleet tactical warfighting gaps. This is done through innovative research and development of capabilities aligned with Navy Programs of Record (PoR), while influencing national systems support and development. These efforts include advanced sensors, platform and ground processing, and integrated national-to-tactical information fusion capabilities. Link Crimson supports all Navy mission areas, including Anti-Submarine Warfare (ASW), Integrated Air and Missile Defense, Mine Warfare (MIW), Power projection/Precision Strike, Maritime Domain Awareness (MDA), and Intelligence, Surveillance, and Reconnaissance (ISR), in support of the Navy's Information Dominance pillars: Assured Command and Control (AC2), Battlespace Awareness (BA) and Integrated Fires (IF).

(U) This program is funded under Budget Activity 6 because it supports the operations and installations required for general research and development. Program baseline addresses research and development on specific capabilities to support these mission areas such as signals collection and exploitation, acoustic and electronic signal detection, countering Unmanned Air Systems, Processing, Exploitation, and Dissemination (PED) processes, Commercial Maritime Navigation Radar (CMNR) detection and exploitation, open-ocean surveillance, and hostile threat geo-location. Link Crimson fields both prototypes to demonstrate new capabilities in real world environments in coordination with operational users, and develops warfighting capabilities for insertion into Navy, joint, and national agency programs of record. Additional detailed information is available at higher levels of classification.

(U) Project 1034: Established to exploit all National and Service sensor systems to improve tactical support to Fleet operational commanders. Project also supports equipment upgrades, training and Fleet exercises which provide the venue for testing modifications to existing programs.

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

	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
<b>Title:</b> Assured Command and Control  <b>Articles:</b>	0.000	0.627	0.621	0.000	0.621

**Description:** The Navy must assure its ability to command and control forces. This requires capabilities that enable commanders to rapidly and with certainty: 1) exchange orders and responses with subordinates; 2) understand the disposition of friendly and adversarial forces, as well as uninvolved/neutral elements in the area of operations; 3) have access to target quality intelligence at the right time to conduct strikes as part of the joint force; and 4) assess the result of those strikes. Sensing the environment, understanding our adversaries, and operating and defending our communications and networked systems are inextricably linked to the assurance of C2.

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy					<b>Date:</b> February 2020	
<b>Appropriation/Budget Activity</b> 1319 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0605867N I (U)SEW SURVEILLANCE/ RECONNAISSANCE SUPPORT	<b>Project (Number/Name)</b> 1034 I TAC SAT Recon Office				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
<b>FY 2020 Plans:</b> Additional details with respect to this line item are held at a higher classification.						
<b>FY 2021 Base Plans:</b> N/A						
<b>FY 2021 OCO Plans:</b> N/A						
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minimal decrease in funding from FY 2020 - FY2021.						
<b>Title:</b> Battlespace Awareness		<b>Articles:</b> 0.000	5.737	5.900	0.000	5.900
<b>Description:</b> This is the traditional mission of the Navy's Information Warfare and the constituent components of meteorology, oceanography, intelligence, cryptology, communications, networks, space, and electronic warfare (EW). It includes: 1) persistent surveillance of the maritime and information battlespace; 2) knowledge of how to employ existing and emerging collection capabilities to great effectiveness to gather critical intelligence; 3) penetrating knowledge of the capabilities and intent of our adversaries to hold our successful operations at risk; and 4) expertise within the electromagnetic spectrum. Automation in data extraction and alignment and machine learning algorithms can significantly enhance the human analyst's ability to achieve battlespace awareness in the face of vast data repositories and numerous collection platforms/opportunities.		-	-	-	-	-
<b>FY 2020 Plans:</b> Additional details with respect to this line item are held at a higher classification.						
<b>FY 2021 Base Plans:</b> N/A						
<b>FY 2021 OCO Plans:</b> N/A						
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> The increase of \$163K will allow Navy TENCAP the ability to expand our capabilities in the area of Battle Space Awareness and better influence NTM requirements.						
<b>Title:</b> Integrated Fires		0.000	2.038	2.038	0.000	2.038

PE 0605867N: (U)SEW SURVEILLANCE/RECONNAISSANCE  
SUPPO...  
Navy

UNCLASSIFIED

Page 4 of 5

R-1 Line #187

Volume 4 - 228

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy			<b>Date:</b> February 2020		
<b>Appropriation/Budget Activity</b> 1319 / 6		<b>R-1 Program Element (Number/Name)</b> PE 0605867N / (U)SEW SURVEILLANCE/ RECONNAISSANCE SUPPORT		<b>Project (Number/Name)</b> 1034 / TAC SAT Recon Office	
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>					
		<i>Articles:</i>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>
<b>Description:</b> Integration of the right combination of kinetic and/or non-kinetic fires to achieve the desired effect on the target and on the adversary's decision calculus requires: 1) in-depth understanding of the adversary's centers of gravity and vulnerabilities; 2) the right fidelity of the target's location, movement, and window of vulnerability; 3) commander's confidence that the weapon is postured to achieve the desired effect; and 4) the ability to provide this information to the weapon system(s) and weapon release authority(ies) before the target can employ effective defensive measures.			-	-	-
<b>FY 2020 Plans:</b> Additional details with respect to this line item are held at a higher classification.					
<b>FY 2021 Base Plans:</b> N/A					
<b>FY 2021 OCO Plans:</b> N/A					
<b>Accomplishments/Planned Programs Subtotals</b>			0.000	8.402	8.559
				0.000	8.559
<b>C. Other Program Funding Summary (\$ in Millions)</b>					
N/A					
<b>Remarks</b>					
<b>D. Acquisition Strategy</b>					
Not applicable					

PE 0605867N: (U)SEW SURVEILLANCE/RECONNAISSANCE  
SUPPO...  
Navy

**UNCLASSIFIED**

Page 5 of 5

R-1 Line #187

Volume 4 - 229

**UNCLASSIFIED**

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy											Date: February 2020			
Appropriation/Budget Activity					R-1 Program Element (Number/Name)									
1319: Research, Development, Test & Evaluation, Navy / BA 6: RDT&E Management Support					PE 0605873M / Marine Corps Program Wide Supt									
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	21.158	34.734	42.749	-	42.749	33.145	32.989	31.394	32.397	Continuing	Continuing		
0030: Studies & Analysis/MC	0.000	5.563	4.196	2.348	-	2.348	2.748	3.186	3.608	4.039	Continuing	Continuing		
0033: OT&E Support	0.000	14.090	14.333	14.906	-	14.906	15.291	15.585	15.953	16.289	Continuing	Continuing		
2330: Chem Bio Consequence Mgmt	0.000	1.505	1.591	1.620	-	1.620	1.654	1.687	1.721	1.755	Continuing	Continuing		
3009: Marine Corps Wargaming Capability	0.000	0.000	11.469	20.000	-	20.000	9.500	8.500	6.000	6.120	Continuing	Continuing		
3783: Information Environment Strategy, Policy and Governance	0.000	0.000	3.145	3.875	-	3.875	3.952	4.031	4.112	4.194	Continuing	Continuing		
<b>A. Mission Description and Budget Item Justification</b>														
This program element (PE) provides the analytical foundation for the Marine Corps Studies System (MCSS), including mandated Mission Area Analyses and Cost and Operational Effectiveness Analyses. The MCSS is the front end of the Marine Corps' acquisition system. This PE also supports the material acquisition process as follows: managing the Marine Corps Operational Test and Evaluations (OT&E); providing Chem Bio Consequence Management of capabilities for Weapons of Mass Destruction (WMD) incident response forces; and conducting Phase A activities to investigate potential material solutions that validate needs, program costs, business decisions, and prevent undue delays in pursuing priority requirements.														
<b>B. Program Change Summary (\$ in Millions)</b>				FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total						
Previous President's Budget				21.538	37.265	36.338	-	36.338						
Current President's Budget				21.158	34.734	42.749	-	42.749						
Total Adjustments				-0.380	-2.531	6.411	-	6.411						
• Congressional General Reductions				-	-									
• Congressional Directed Reductions				-	-2.531									
• Congressional Rescissions				-	-									
• Congressional Adds				-	-									
• Congressional Directed Transfers				-	-									
• Reprogrammings				-0.033	0.000									
• SBIR/STTR Transfer				-0.347	0.000									
• Program Adjustments				0.000	0.000	8.182	-	8.182						
• Rate/Misc Adjustments				0.000	0.000	-1.771	-	-1.771						

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<b>Exhibit R-2, RDT&amp;E Budget Item Justification:</b> PB 2021 Navy	<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy / BA 6: RDT&amp;E Management Support</i>	<b>R-1 Program Element (Number/Name)</b> PE 0605873M / <i>Marine Corps Program Wide Supt</i>
<p><b><u>Change Summary Explanation</u></b></p> <p>The FY 2021 funding request was reduced by \$2.000M to account for the availability of prior year execution balances.</p> <p>The net increase of \$8.015M from FY 2020 to FY 2021 is primarily due to increased scope of Marine Corps Wargaming Capabilities. Wargaming Capabilities increase of \$8.531M reflects multiple integrated prototyping competitive vendor awards to develop end-to-end, comprehensive/integrated prototypes for the entire life cycle of wargaming from design through execution through postgame analysis which follow with a competitive down select to one contractor in the first half of FY22. The integrated prototype contracting efforts begin in 4QFY20 and complete in 4QFY21. The contractor selected will then provide the production solution starting in FY23. The production system will link up with the new wargaming facility being built by the USMC in MILCON project P-719.</p>	

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020		
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0605873M / Marine Corps Program Wide Supt					Project (Number/Name) 0030 / Studies & Analysis/MC			
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	
0030: Studies & Analysis/MC	0.000	5.563	4.196	2.348	-	2.348	2.748	3.186	3.608	4.039	Continuing	Continuing	
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-			

**Note**  
Marine Corps Wargaming Capability Center transitions from Project 0030 to Project 3009 in FY20.

**A. Mission Description and Budget Item Justification**

Marine Corps Requirements Oversight Council (MROC) established Operations Analysis Directorate (OAD) as the sole operations research, analytic support, and studies management program for the Marine Corps Study System (MCSS). MCSS analysis is achieving greater efficiency, productivity, and innovation through operations research methodologies such as: operational analysis, statistical analysis, multi-objective decision methods, optimization, cost analysis, and a wide range of computer-based models and combat simulations insuring the optimization of resources now and in the future. Analyses spans the spectrum of conflict in a Joint, Interagency, Intergovernmental, and Multinational (JIIM) context to inform critical senior level decision makers of current and future national security issues and provides unique and distinct analytic capabilities that enable the collaboration and sharing of analyses that reduces the duplication of topics that are of broad interest. MCSS is an integral part of the Marine Corps and Joint Chiefs decision-making processes to organize, man, train, equip, sustain, and transform resources from the current to the future force.

This program element has been revised into two specialized analytical divisions: (1) External Analysis Division (EAD) - responsible for providing joint external analysis is the Marine Corps' sole representative in the joint modeling arenas. Provides deployed on site professional operations analysis support to Special Purpose MAGTFs in CENTCOM and AFRICOM. (2) Combat Development Analysis Division responsible for executing a select portfolio of studies for senior leadership, Capabilities Based Assessment (CBA) and Marine Corps Enterprise Integration Plan (MCEIP).

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

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<b>Title:</b> Studies & Analysis/MC  <b>Description:</b> The Marine Corps Studies System (MCSS), the sole responsibility of the Operations Analysis Directorate (OAD), Combat Development and Integration (CD&I), Marine Corps Combat Development Command (MCCDC), supports the Commandant's Planning Guidance (CPG) and Commanding General CD&I's Force Design Plan. Program provides research and analysis and findings to ensure a greater understanding of issues and alternatives concerning force design, tactics, wargaming, strategies, intelligence, weapon selection and retention, systems' programs, cyber intel, and resource allocation. Efforts are selected by the Studies Requirements Review Board (SRRB) and approved by the CG, Combat Development and Integration (CD&I).	5.563 -	4.196 -	2.348 -	0.000 -	2.348 -

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020		
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 0605873M / Marine Corps Program Wide Supt	Project (Number/Name) 0030 / Studies & Analysis/MC				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
with focus on current and future USMC mission requirements and the need for comprehensive analyses that meets the Commandant's Strategic Goals, supports and protects forces in theater, and utilizes funds efficiently.						
<b>FY 2020 Plans:</b> <ul style="list-style-type: none"><li>- Continued: Synthetic Operations Research Model (STORM) joint armed forces effort that supports modeling and simulation analyses involving irregular warfare missions and force design plans executed in a future Defense Planning Guidance scenario. These missions include information operations, offensive tactical and operational CYBER operations, foreign internal defense, special direct action arising from intelligence gathered from Human Intelligence (HUMINT) and technical (SIGINT, CYBER) means.</li><li>- Completed: Marine Air Ground Task Force (MAGTF) Requirements Analysis in response to Congressional inquiries. Space-Based Capabilities efforts which explored Joint Navigation Warfare Center (JNWC) databases and models to identify algorithms that can be built that define the effect on receivers and equipment. Improved Marine Corps Enterprise Network (MCEN) defensive cyber operations and provided recommendations to the Marine Corps Cyberspace Operations Group (MCCOG). Munitions Requirements Processes determined the projected inventory against future requirements. Intelligence without Satellite Communications documented intelligence analysts' reliance on SATCOM and the limitations to planning and operations jamming or other interference would cause.</li><li>- Completed: Studies and analysis requested adhoc by senior level leadership to support combat development and systems acquisition decisions. Core competencies include examination of Aviation, C4ISR, Maneuver, Logistics, and Seabasing capabilities in order to evaluate and identify operational deficiencies, and to explore potential solutions.</li><li>- Initiated: Studies and analysis submitted via the Marine Corps Studies System Call for Studies that support the Commandant's 2020-2025 Vision and Strategy Areas of concentration including: Force Development and Combat Readiness; National Security Environments Threats and Strategic Planning; Intelligence Information and Networks; Capability Integration; Weapons Systems; and Space Based capabilities. Provided focused analyses regarding force realignments, training, and equipment support that best meet the tactical needs of the Marine Corps while building a leaner better educated force</li><li>- Initiated and Completed: Provided combat analyst assessment teams for national emergencies and contingencies. Conducted baseline analysis to support Mission Capability Packages (MCPs), Investment</li></ul>						

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020		
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 0605873M / Marine Corps Program Wide Supt	Project (Number/Name) 0030 / Studies & Analysis/MC				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Strategy, Joint Capability Areas (JCAs), and the Naval Strategic Plan providing assessments for future force development. Provided analysis of tactical operations within the USMC and formulate ways to improve the effectiveness of the forces to win and minimize costs and lives lost.	- Update to Data Center equipment as required.					
<b>FY 2021 Base Plans:</b> <ul style="list-style-type: none"><li>- Continue: Analysis and studies in the areas of: Joint Capabilities Assessments; Naval Strategic Plan Assessments; equipment capabilities assessments to include aviation and tactical vehicles acquisitions, and studies analyzing threat assessments from changing hostile entities. These studies and analysis efforts require follow-on analysis or longer period of data analyses and metrics preparation to complete.</li><li>- Continue: Synthetic Operations Research Model Phase II (STORM) joint armed forces effort that supports modeling and simulation analyses involving irregular warfare missions and force design plans executed in a future Defense Planning Guidance scenario. These missions include information operations, offensive tactical and operational CYBER operations, foreign internal defense, special direct action arising from intelligence gathered from Human Intelligence (HUMINT) and technical (SIGINT, CYBER) means.</li><li>- Complete: Studies and analysis efforts initiated in FY20 in the areas of Fleet Logistics and Composition and Mission Capabilities Integration; Offensive Tactical and Operational CYBER Operations Weapons Systems and Space Based Capabilities; and Naval and Joint Services Strategic Planning studies.</li><li>- Continue: Studies and analysis submitted via the Marine Corps Studies System Call for Studies that support the Commandant's 2020-2025 Vision and Strategy Areas of concentration including: Force Development and Combat Readiness; National Security Environments Threats and Strategic Planning; Intelligence Information and Networks; Capability Integration; Weapons Systems and Space Based Capabilities. Provide focused analyses regarding force realignments, training and equipment support that best meet the tactical needs of the Marine Corps while building a leaner better educated force.</li><li>- Initiate: Studies and analysis requested adhoc by senior level leadership to support combat development and systems acquisition decisions. Core competencies include examination of Aviation, C4ISR, Maneuver, Logistics, and Seabasing capabilities in order to evaluate and identify operational deficiencies, and to explore potential solutions.</li></ul>						

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020		
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 0605873M / Marine Corps Program Wide Supt	Project (Number/Name) 0030 / Studies & Analysis/MC				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
- Initiate: Provide combat analyst assessment teams for national emergencies and contingencies. Conduct baseline analysis to support Mission Capability Packages (MCPs), Investment Strategy, Joint Capability Areas (JCAs), and the Naval Strategic Plan providing assessments for future force development. Provide analysis of tactical operations within the USMC and formulate ways to improve the effectiveness of the forces to win and minimize costs and lives lost.						
- Initiate: Studies directed by the Commandant Marine Corps (CMC) to invest in the advancement of Big-Data Analytics and the potential for Machine Learning as a means to ensure a cost effective roadmap for implementing progressive advancements for institutional, economic and evolutionary efficiencies.						
- Initiate: The Modeling and Simulation Analytical Toolkit (MSAT) Phase VI that supports analysis involving irregular warfare missions executed in a future Defense Planning Guidance scenario. These missions include information operations, offensive tactical and operational CYBER operations, foreign internal defense, special direct action arising from intelligence gathered from Human Intelligence (HUMINT) and technical (SIGINT, CYBER) means.						
- Initiate: Acquisition of new modeling and simulation tools that support changing and evolving analytical and techniques and allow for efficient collection of metrics.						
<b>FY 2021 OCO Plans:</b> N/A						
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Decrease of \$1.848M from FY20 to FY21 is due to the completion of Phase I STORM, joint armed forces effort that supports modeling and simulation analyses involving irregular warfare missions and force design plans executed in a future Defense Planning Guidance scenario. STORM Phase II is the continuing effort in FY21. Phase I costs were higher due to the complexity of initial research.	<b>Accomplishments/Planned Programs Subtotals</b>	5.563	4.196	2.348	0.000	2.348

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy										Date: February 2020		
Appropriation/Budget Activity			R-1 Program Element (Number/Name)				Project (Number/Name)					
1319 / 6			PE 0605873M / Marine Corps Program Wide Supt				0030 / Studies & Analysis/MC					
<b>C. Other Program Funding Summary (\$ in Millions)</b>												
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	
• 1109/4630: Marine Corps Wargaming Capability	0.000	0.000	2.000	-	2.000	28.000	9.000	6.991	7.131	Continuing	Continuing	

**Remarks****D. Acquisition Strategy**

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020		
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0605873M / Marine Corps Program Wide Supt				Project (Number/Name) 0033 / OT&E Support				
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	
0033: OT&E Support	0.000	14.090	14.333	14.906	-	14.906	15.291	15.585	15.953	16.289	Continuing	Continuing	
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-			

**A. Mission Description and Budget Item Justification**

The Marine Corps Operational Test and Evaluation Activity (MCOTEA) supports the material acquisition process by managing the Marine Corps Operational Test (OT) programs for Acquisition Categories (ACAT) I through ACAT IV (less OT of manned aircraft) and performs other functions that may be directed by the Commandant of the Marine Corps. The primary purpose of Operational Test and Evaluation (OT&E) is to provide information to the Milestone Decision Authority (MDA) regarding the Operational Effectiveness (OE) and Operational Suitability (OS) of the system addressed at a decision point. MCOTEA must ensure that the Marines in the Operating Forces receive the very best possible equipment and support. MCOTEA must also ensure each system proposed for acquisition is tested adequately, evaluated objectively, and reported independently.

Marine Corps Operational Test and Evaluation Activity (MCOTEA) is the only unit that provides the Marine Corps with required operational test and evaluation (OT&E) capability, ensuring the Marine Corps is compliant with laws and regulations, and ensuring that training and equipment are operationally effective, relevant, and suitable. Additionally, MCOTEA's early involvement, coordination, and oversight in developmental testing and evaluation of new combat and combat support systems ensures that our Marines are the best trained, and have the best equipment, with the lowest test costs for taxpayers. Finally, MCOTEA's support of rapid acquisitions ensures that Marines in the fight are supported with the newest and most advanced equipment and that the Marine Corps is compliant with regulations.

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

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<b>Title:</b> MCOTEA  <b>FY 2020 Plans:</b> Continue evaluating, quantifying, and reporting on programs for the operational effectiveness, suitability and survivability of planned acquisitions to meet warfighting capabilities and will be providing Milestone Decision Authority (MDAs) to programs that are inherently governmental and a comprehensive understanding of operational risk associated with ACAT programs.  <b>FY 2021 Base Plans:</b> Continue evaluating, quantifying, and reporting on programs for the operational effectiveness, suitability and survivability of planned acquisitions to meet warfighting capabilities and will be providing Milestone Decision	14.090  -  -	14.333  -  -	14.906  -  -	0.000  -  -	14.906  -  -

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy								<b>Date:</b> February 2020				
<b>Appropriation/Budget Activity</b> 1319 / 6			<b>R-1 Program Element (Number/Name)</b> PE 0605873M / Marine Corps Program Wide Supt			<b>Project (Number/Name)</b> 0033 / OT&E Support						
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>								<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
Authority (MDAs) to programs that are inherently governmental and a comprehensive understanding of operational risk associated with ACAT programs.												
<b>FY 2021 OCO Plans:</b> N/A												
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Increase of \$0.573M is a result of civilian pay/benefits/awards rate increases/assumptions.												
<b>Accomplishments/Planned Programs Subtotals</b>								14.090	14.333	14.906	0.000	14.906
<b>C. Other Program Funding Summary (\$ in Millions)</b>												
<b>Line Item</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	
• RDTEN/0606942M/4038: <i>Cyber Vulnerability Evaluation</i>	6.731	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	6.731	
<b>Remarks</b>												
<b>D. Acquisition Strategy</b> N/A												

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020	
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)			
1319 / 6					PE 0605873M / Marine Corps Program Wide Supt				2330 / Chem Bio Consequence Mgmt			
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
2330: Chem Bio Consequence Mgmt	0.000	1.505	1.591	1.620	-	1.620	1.654	1.687	1.721	1.755	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

The Family of Incident Response Systems (FIRS) consists of equipment, systems, and services designed to provide Weapons of Mass Destruction (WMD) incident response forces the capabilities needed to effectively respond to a terrorist attack using Chemical, Biological, Radiological, Nuclear, and High-Yield Explosives (CBRNE). FIRS meets the mission requirements for the detection; mass casualty decontamination; force protection; responder inter-agency interoperability; Command, Control, Communications, Computers & Intelligence (C4I); urban search and rescue; medical and general support requirements needed by these forces to mitigate the effects of a CBRNE terrorist attack. FIRS relies primarily on Commercial Off-The-Shelf/Non-Developmental Items (COTS/NDI) equipment and systems that meet the particular mission requirements of Consequence Management (CM). Nuclear, Biological, and Chemical (NBC) systems are adopted if they meet the CM mission requirements. FIRS Research & Development effort allows the program to keep abreast of emerging technologies in the commercial sector and address operational capability gaps that cannot be met by commercial items.

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

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<b>Title:</b> FIRS: Reconnaissance Mission Area	0.580	0.300	0.000	0.000	0.000
<b>Articles:</b>	-	-	-	-	-
<b>FY 2020 Plans:</b> -Completed: CALS FC-IS naval system integration.					
<b>FY 2021 Base Plans:</b> N/A					
<b>FY 2021 OCO Plans:</b> N/A					
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Decrease of \$.300M between FY20 and FY21 is due to RDT&E efforts transitioning under Family of Incident Response Systems to better reflect program plan.					
<b>Title:</b> FIRS: Force Protection Mission Area	0.925	1.291	0.000	0.000	0.000
<b>Articles:</b>	-	-	-	-	-
<b>FY 2020 Plans:</b>					

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy				<b>Date:</b> February 2020	
<b>Appropriation/Budget Activity</b> 1319 / 6		<b>R-1 Program Element (Number/Name)</b> PE 0605873M / Marine Corps Program Wide Supt	<b>Project (Number/Name)</b> 2330 / Chem Bio Consequence Mgmt		
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>					
	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
-Continue durability test of Chemical Biological Incident Response Force's (CBIRF's) CBRN personal protection equipment items, including Class 2 and Class 3 suits.					
<b>FY 2021 Base Plans:</b> N/A					
<b>FY 2021 OCO Plans:</b> N/A					
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Decrease of \$1.291M between FY20 and FY21 is due to RDT&E efforts transitioning under Family of Incident Response Systems to better reflect program plans.					
<b>Title:</b> FIRS: Family of Incident Response Systems	<b>Articles:</b>  -	0.000	0.000	1.620	0.000
<b>FY 2020 Plans:</b> N/A		-	-	-	-
<b>FY 2021 Base Plans:</b> -Continue durability test of Chemical Biological Incident Response Force's (CBIRF's) Chemical, Biological, Radiological and Nuclear (CBRN) personal protection equipment items, including Class 2 and Class 3 suits. -Initiate communication integration on improved Mobile Chemical Agent Detector (iMCAD) -Initiate Dismounted Reconnaissance Sets, Kits, and Outfits (DR SKO) training emulator device -Initiate development Dismounted Reconnaissance Sets, Kits, and Outfits (DR SKO) analytic, detection, and identification training devices. -Initiate Information Assurance (IA) / Cybersecurity accreditation for Dismounted Reconnaissance Sets, Kits, and Outfits (DR SKO) / Chemical Biological Incident Response Force (CBIRF) Equipment -Initiate development of Gas Chromatograph Mass Spectrometry (GCMS) replacement of Guardian. -Initiate development of the Chemical Biological Incident Response Force (CBIRF) standoff chemical agent detection.					
<b>FY 2021 OCO Plans:</b> N/A					
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b>					

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy										<b>Date:</b> February 2020												
<b>Appropriation/Budget Activity</b> 1319 / 6				<b>R-1 Program Element (Number/Name)</b> PE 0605873M / Marine Corps Program Wide Supt						<b>Project (Number/Name)</b> 2330 / Chem Bio Consequence Mgmt												
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>												FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total						
Increase of \$1.620M between FY20 to FY21 is due to Reconnaissance Mission Area and Force Protection Mission Area efforts transitioning under Family of Incident Response Systems to better reflect program plans.																						
<b>Accomplishments/Planned Programs Subtotals</b>												1.505	1.591	1.620	0.000	1.620						
<b>C. Other Program Funding Summary (\$ in Millions)</b>													<b>Cost To</b>									
<b>Line Item</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>Base</b>	<b>FY 2021</b>	<b>OCO</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Complete</b>	<b>Total Cost</b>									
• PMC/2220: Wpns & Cmbt Vehs under \$5 million	1.042	0.540	0.556	-	0.556		0.556	0.000	0.000	0.000	0.000	Continuing	Continuing									
<b>Remarks</b>																						
<b>D. Acquisition Strategy</b>																						
N/A																						

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020					
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)							
1319 / 6					PE 0605873M / Marine Corps Program Wide Supt				3009 / Marine Corps Wargaming Capability							
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				
3009: Marine Corps Wargaming Capability	0.000	0.000	11.469	20.000	-	20.000	9.500	8.500	6.000	6.120	Continuing	Continuing				
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-						
<b>Note</b> Previously executed within Proj 0030 Studies & Analysis/MC																
<b>A. Mission Description and Budget Item Justification</b> The Wargaming Capability (WGC) program office is unique from other programs in that the program office is responsible for the system of systems within the facility as well as coordinating the unique manpower requirements. The USMC Wargaming Capability (WGC) consists of Wargaming tools and systems, a Wargaming Center (MILCON Project P-719), and the necessary personnel supporting the new capability. This capability will facilitate force development, war plan assessment, and concept and combat development through an integrated purpose-built facility utilizing highly classified information embedded in all aspects of planning, execution, and analysis. WGC will provide an enhanced basis for analytically-informed decision support to capability development prioritization and resourcing. The WGC program acquisition strategy takes advantage of 10 U.S.C 2302 Middle Tier of Acquisition (MTA) and was designated a MTA for Rapid Prototyping in May 2019. The overarching strategy consists of three phases: Phase I: Risk Reduction Prototyping (FY19 - FY20); Phase II: Integrated Prototyping (FY20 - FY22); Phase III: Follow-on Production (FY23 - FY25+).																
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>											FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	
<b>Title:</b> Wargaming Capability  <b>FY 2020 Plans:</b> PM WGC was designated as a Middle Tier of Acquisition. In FY20 PM WGC continues efforts in Phase I: Risk Reduction Prototyping and executes Phase II: Integrated Prototyping through the use of Other Transaction Authority (OTA) agreements with traditional and non-traditional defense contractors. The OTAs awarded during Phase I Risk Reduction Prototyping will support and develop an informed performance specification for the Integrated Prototyping phase by establishing the feasibility/viability of current state-of-the-art technologies and capabilities. In Phase II: Integrated Prototyping, PM WGC will award OTAs to two or more vendors for the full representative wargaming solution in 4QFY20. Major milestones for Phase II, within FY20 are: planning and execution of an initial design review and technical interchange meeting and initial vendor deliverables including their software and product development strategy. These development efforts will take into account sustainability, maintainability, and training requirements for the USMC.											Articles:	0.000	11.469	20.000	0.000	20.000
												-	-	-	-	

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020			
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)					
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>							
		FY 2019	FY 2020	FY 2021 Base			
				FY 2021 OCO			
				FY 2021 Total			
Design and develop Information Technology (IT) and network infrastructure and identify and apply cybersecurity controls to specific technologies.							
<b>FY 2021 Base Plans:</b> Continue multiple vendor-built prototype efforts by focusing on solutions that combine four different capability sets: (1) wargame design and scenario generation; (2) scalable intelligent data services; (3) player interface and visualization; (4) advanced analytic tools. Major milestones for Phase II within FY21 are: (a) the creation of final allocated baselines based upon performance specification requirements for the system; (b) development and integration of multiple components of the proposed solutions; (c) Tailored Test Readiness Review to evaluate the readiness of the prototype to proceed into Developmental Testing; (d) Developmental Testing of each vendor's proposed solution. PM WGC will execute a final design review, developmental test, and cyber evaluation review of each vendor prototype. Developmental testing and cyber evaluation of the vendor-built prototypes in FY21 will lead to a single vendor selection in FY22. Prototypes support the development of the world class wargaming solution, built upon the four capability sets that incorporates data capture tools, data analysis tools, advanced models and simulations, cross domain solutions, dynamic 2-D to 3-D visualization, player interface tools, and scenario generation. Continue to document the allocated baseline and the follow-on system baseline. Continue development of cybersecurity measures and logistics elements (e.g. sustainability, maintainability, and training).							
Continue to design and develop Information Technology (IT) and network infrastructure.							
<b>FY 2021 OCO Plans:</b> N/A							
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> The increase of \$8.531M reflects multiple integrated prototyping competitive vendor awards to develop end-to-end, comprehensive/integrated prototypes for the entire life cycle of wargaming from design through execution through postgame analysis which follow with a competitive down select to one contractor in the first half of FY22. The integrated prototype contracting efforts begin in FY20 and complete in FY21. The contractor selected will then provide the production solution starting in FY23. The production system will link up with the new wargaming facility being built by the USMC in MILCON project P-719.							
<b>Accomplishments/Planned Programs Subtotals</b>		0.000	11.469	20.000	0.000	20.000	

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy										Date: February 2020		
Appropriation/Budget Activity			R-1 Program Element (Number/Name)				Project (Number/Name)					
1319 / 6			PE 0605873M / Marine Corps Program Wide Supt				3009 / Marine Corps Wargaming Capability					
<b>C. Other Program Funding Summary (\$ in Millions)</b>												
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	
• PMC/4630: Common Computer Resources	0.000	0.000	2.000	-	2.000	28.000	9.000	6.991	7.131	Continuing	Continuing	
<b>Remarks</b>												
<b>D. Acquisition Strategy</b>												
N/A												

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020				
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)						
1319 / 6					PE 0605873M / Marine Corps Program Wide Supt				3783 / Information Environment Strategy, Policy and Governance						
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			
3783: <i>Information Environment Strategy, Policy and Governance</i>	0.000	0.000	3.145	3.875	-	3.875	3.952	4.031	4.112	4.194	Continuing	Continuing			
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-					
<b>Note</b>															
This is a new Project in FY 2020.															
<b>A. Mission Description and Budget Item Justification</b>															
The Information Environment (IE) is a global, interconnected, complex, continuously changing eco-system that is increasingly connected across our war fighting functions. Given the complexity and the speed of changes in the IE and to address the significant role information now plays in current and future conflicts, a unifying operational and technical strategy must be developed to outpace our adversaries.															
Analysis will inform the development and integration of Marine Corps Information Environment Operations (IE Ops) that are guided by the Commandant's Strategic Plan, Marine Corps Operating Concepts (MOC). Research and analysis efforts support: design and coordinated implementation of an Objective Network to fight on and through a contested environment; design and collaboration on a Naval Tactical Grid and a Joint Tactical Grid; a threat estimate to inform capability development; and analysis to inform the development and fielding of an integrated information capability. These efforts will be accomplished leveraging analytic support from government Labs and Industry to dynamically exploit our National Defense Strategy (NDS) priority operational problems related to the Information Environment through limited user evaluations and functional capability assessments with Marines. In addition, rapid development of capabilities to address problems in the IE Ops will be developed utilizing the Accelerator process which utilizes best commercial practice of design thinking.															
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>											FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<i>Title:</i> Information Environment Strategy  <i>Articles:</i>											0.000	3.145	3.875	0.000	3.875
<i>FY 2020 Plans:</i>											-	-	-	-	
- Initiate innovation activities across the information domain to develop user centered capabilities for the future operating environment. - Implement a data science team to support the digital transformation of Marine Corps data stores to data and information across the Services and other DoD partners and position the Marine Corps to leverage DoD investments in Artificial Intelligence and Machine Learning.															

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy			<b>Date:</b> February 2020					
<b>Appropriation/Budget Activity</b> 1319 / 6		<b>R-1 Program Element (Number/Name)</b> PE 0605873M / Marine Corps Program Wide Supt	<b>Project (Number/Name)</b> 3783 / Information Environment Strategy, Policy and Governance					
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total		
<p>- Implementation of Accelerator Team and methods, scaling best commercial practices of Agile Development and Design Thinking tools, to support the rapid design and development of Minimally Viable Products (MVPs) with Marines/stakeholders for the information environment.</p> <p><b>FY 2021 Base Plans:</b></p> <ul style="list-style-type: none"> <li>- Continue to conduct innovation activities across the information domain to develop user centered capabilities for the future operating environment.</li> <li>- Development of an enterprise data environment and platform, define and implement a data architecture, and provide a mechanism to quickly assess and adopt Artificial Intelligence capabilities.</li> <li>- Continue rapid development of capabilities to address problems in Information operations utilizing the Accelerator and incubator processes which utilizes best commercial practice of design thinking, lean launch pad, and agile implementation. The Marine Corps Information Environment Enterprise (MCIEE) Accelerator team will develop and transition software and physical device/hardware minimally viable products.</li> </ul> <p><b>FY 2021 OCO Plans:</b></p> <p>N/A</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b></p> <p>Increase of \$0.730M from FY20 to FY21 required for scaling of MCIEE Accelerator methods to physical device/hardware environment.</p>								
<b>Accomplishments/Planned Programs Subtotals</b>				0.000	3.145	3.875	0.000	3.875
<b>C. Other Program Funding Summary (\$ in Millions)</b>								
N/A								
<b>Remarks</b>								
<b>D. Acquisition Strategy</b>								
N/A								

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy											Date: February 2020		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)								
1319: Research, Development, Test & Evaluation, Navy / BA 6: RDT&E Management Support					PE 0605898N / Management HQ - R&D								
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	40.165	39.673	41.094	-	41.094	41.559	41.619	42.495	43.373	Continuing	Continuing	
0223: Sub Combat System Improvement (ADV)	0.000	0.143	0.141	0.129	-	0.129	0.134	0.137	0.140	0.143	Continuing	Continuing	
0824: Science & Technology Management	0.000	0.000	0.000	24.439	-	24.439	25.175	25.414	25.948	26.466	Continuing	Continuing	
1447: Surf Combatant Combat System Imp	0.000	0.167	0.178	0.111	-	0.111	0.225	0.216	0.192	0.196	Continuing	Continuing	
3159: Naval Integrated Fire Control-Counter Air SE&I	0.000	0.166	0.177	0.110	-	0.110	0.224	0.215	0.191	0.195	Continuing	Continuing	
3186: Air and Missile Defense Radar	0.000	0.494	0.524	0.534	-	0.534	0.546	0.557	0.568	0.579	Continuing	Continuing	
3216: Tactical Support Center-Integration	0.000	0.026	0.025	0.015	-	0.015	0.034	0.032	0.029	0.030	Continuing	Continuing	
3345: ONR Management Headquarters	0.000	39.169	38.628	15.756	-	15.756	15.221	15.048	15.427	15.764	Continuing	Continuing	
<b>Program MDAP/MAIS Code:</b> <b>Project MDAP/MAIS Code(s): P384</b>													
<b>A. Mission Description and Budget Item Justification</b>													
The Management HQ - R&D program funds management headquarter civilian personnel salaries at the Office of Naval Research (ONR). These personnel support the management of the Naval Science and Technology (S&T) programs. This program also funds management headquarter contractor support for the Integrated Warfare Systems (IWS) Program Executive Office.													

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<b>Exhibit R-2, RDT&amp;E Budget Item Justification: PB 2021 Navy</b>					<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b>	<b>R-1 Program Element (Number/Name)</b>				
1319: <i>Research, Development, Test &amp; Evaluation, Navy / BA 6: RDT&amp;E Management Support</i>	PE 0605898N / <i>Management HQ - R&amp;D</i>				
<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
Previous President's Budget	41.765	39.673	41.064	-	41.064
Current President's Budget	40.165	39.673	41.094	-	41.094
Total Adjustments	-1.600	0.000	0.030	-	0.030
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-1.324	0.000			
• SBIR/STTR Transfer	-0.276	0.000			
• Program Adjustments	0.000	0.000	0.051	-	0.051
• Rate/Misc Adjustments	0.000	0.000	-0.021	-	-0.021
<b>Change Summary Explanation</b>					
Funding:	The FY 2021 funding increase is associated with the CIVPERS Pay Raise.				
Technical:	no significant change				
Schedule:	no significant change				

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020			
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0605898N / Management HQ - R&D					Project (Number/Name) 0223 / Sub Combat System Improvement (ADV)				
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		
0223: Sub Combat System Improvement (ADV)	0.000	0.143	0.141	0.129	-	0.129	0.134	0.137	0.140	0.143	Continuing	Continuing		
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-				
<b>A. Mission Description and Budget Item Justification</b>														
This project provides management headquarters contractor support to the Integrated Warfare Systems (IWS) Program Executive Office (PEO). This work supports Navy Acoustic Superiority and Technology Insertion Initiatives through the application of advanced development and testing of sensors and sensor processing systems supporting tactical control systems improvements. This addresses technology challenges to improve tactical control in littoral and open ocean environments for a variety of operational missions.														
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>														
<i>Title:</i> Management Headquarters Personnel  <i>Articles:</i>										FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
- Continue Advanced Processing Build (APB) development, integration, land-based testing, at-sea testing, and establishment of tactical scenarios.										0.143	0.141	0.129	0.000	0.129
<b>FY 2020 Plans:</b> - Continue APB development, integration, land-based testing, at-sea testing, and establishment of tactical scenarios.										-	-	-	-	-
<b>FY 2021 Base Plans:</b> - Continue APB development, integration, land-based testing, at-sea testing, and establishment of tactical scenarios.														
<b>FY 2021 OCO Plans:</b> N/A														
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> FY 2020 to FY 2021 decrease (\$-0.012M) reflects the incorporation of a DON directed contract services reform reduction in FY 2021.														
<b>Accomplishments/Planned Programs Subtotals</b>										0.143	0.141	0.129	0.000	0.129
<b>C. Other Program Funding Summary (\$ in Millions)</b>														
N/A														
<b>Remarks</b>														

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy	<b>Date:</b> February 2020	
<b>Appropriation/Budget Activity</b> 1319 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0605898N / <i>Management HQ - R&amp;D</i>	<b>Project (Number/Name)</b> 0223 / <i>Sub Combat System Improvement (ADV)</i>
<b>D. Acquisition Strategy</b> N/A		

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020	
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0605898N / Management HQ - R&D				Project (Number/Name) 0824 / Science & Technology Management			
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
0824: Science & Technology Management	0.000	0.000	0.000	24.439	-	24.439	25.175	25.414	25.948	26.466	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

**Note**

This project was created for a standalone non-labor project which was realigned out of project 3345. This is not a new start.

**A. Mission Description and Budget Item Justification**

This project funds all basic costs of Office of Naval Research Management Headquarters Activity (MHA) non-labor in support of the entire Navy Science & Technology (S&T) program. Through this support, the S&T enterprise pursues the technological advances that enable the Fleet's ability to operate from a position of technological superiority.

Specifically, funding facilitates the execution of the Navy's basic research, applied research, and advanced technology development programs at the nation's universities/colleges, Navy laboratories, Warfare Centers, and private industry.

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

FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
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**Title:** Science and Technology Management

**Articles:**

0.000	0.000	24.439	0.000	24.439
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-	-	-	-	-
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**FY 2020 Plans:**

N/A

**FY 2021 Base Plans:**

Provides corporate MHA Non-Labor support in facilitating the purchase of the S&T programs for the Navy to ensure consistent external reporting. All Non-Operational HQ is now Major Headquarters Activity (MHA).

**FY 2021 OCO Plans:**

N/A

**FY 2020 to FY 2021 Increase/Decrease Statement:**

The increase to this project reflects the breakout of non-labor costs into a standalone project within this Program Element.

**Accomplishments/Planned Programs Subtotals**

0.000	0.000	24.439	0.000	24.439
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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0605898N / Management HQ - R&D	<b>Project (Number/Name)</b> 0824 / Science & Technology Management
<b>C. Other Program Funding Summary (\$ in Millions)</b>		
N/A		
<b>Remarks</b>		
<b>D. Acquisition Strategy</b>		
N/A		

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020				
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0605898N / Management HQ - R&D				Project (Number/Name) 1447 / Surf Combatant Combat System Imp						
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			
1447: Surf Combatant Combat System Imp	0.000	0.167	0.178	0.111	-	0.111	0.225	0.216	0.192	0.196	Continuing	Continuing			
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-					
<b>A. Mission Description and Budget Item Justification</b>															
This project provides management headquarters contractor support to the Integrated Warfare System (IWS) Program Executive Office (PEO). This work supports Cruiser and Destroyer AEGIS Combat System (ACS) upgrades and integrates new equipment and systems to pace the threat and capture advances in technology.															
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>											FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<i>Title:</i> Management Headquarter Personnel  <i>Articles:</i>											0.167	0.178	0.111	0.000	0.111
<i>FY 2020 Plans:</i> -Support Cruiser and Destroyer AEGIS Combat System (ACS) upgrades and integrate new equipment and systems to pace the threat and capture advances in technology.											-	-	-	-	
<i>FY 2021 Base Plans:</i> Continue to support Cruiser and Destroyer AEGIS Combat System (ACS) upgrades and integrate new equipment and systems to pace the threat and capture advances in technology.															
<i>FY 2021 OCO Plans:</i> N/A															
<i>FY 2020 to FY 2021 Increase/Decrease Statement:</i> FY 2020 to FY 2021 decrease (\$-0.067M) accounts for the availability of prior year execution balances.															
<b>Accomplishments/Planned Programs Subtotals</b>											0.167	0.178	0.111	0.000	0.111
<b>C. Other Program Funding Summary (\$ in Millions)</b>															
N/A															
<b>Remarks</b>															
<b>D. Acquisition Strategy</b>															
N/A															

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											<b>Date:</b> February 2020					
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0605898N / Management HQ - R&D					Project (Number/Name) 3159 / Naval Integrated Fire Control-Counter Air SE&I						
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				
3159: Naval Integrated Fire Control-Counter Air SE&I	0.000	0.166	0.177	0.110	-	0.110	0.224	0.215	0.191	0.195	Continuing	Continuing				
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-						
<b>A. Mission Description and Budget Item Justification</b>																
This project provides management headquarters contractor support to the Integrated Warfare System (IWS) Program Executive Office (PEO). This work supports Naval Integrated Fire Control - Counter Air (NIFC-CA) project. Through this support technological advances are being developed enabling PEO IWS to extend the Naval Theater Air and Missile Defense battlespace out to the maximum kinematic range of our weapons.																
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>											FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	
<b>Title:</b> Management Headquarter Personnel											<b>Articles:</b>	0.166	0.177	0.110	0.000	0.110
<b>FY 2020 Plans:</b> Support the Navy's research and development efforts for NIFC-CA's System Engineering, Integration and Test (SEI&T) project. -Provide system engineering to upgrade the White Sands Missile Range (WSMR) Desert Ship complex to an AEGIS Advanced Capability Build (ACB).												-	-	-	-	
<b>FY 2021 Base Plans:</b> Continue to support the Navy's research and development efforts for NIFC-CA's System Engineering, Integration and Test (SEI&T) project.																
<b>FY 2021 OCO Plans:</b> N/A																
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> FY 2020 to FY 2021 decrease (\$-0.067M) accounts for the availability of prior year execution balances.																
<b>Accomplishments/Planned Programs Subtotals</b>											0.166	0.177	0.110	0.000	0.110	
<b>C. Other Program Funding Summary (\$ in Millions)</b>																
N/A																
<b>Remarks</b>																

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0605898N / <i>Management HQ - R&amp;D</i>	<b>Project (Number/Name)</b> 3159 / <i>Naval Integrated Fire Control-Counter Air SE&amp;I</i>
<b>D. Acquisition Strategy</b> N/A		

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020				
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0605898N / Management HQ - R&D				Project (Number/Name) 3186 / Air and Missile Defense Radar						
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			
3186: Air and Missile Defense Radar	0.000	0.494	0.524	0.534	-	0.534	0.546	0.557	0.568	0.579	Continuing	Continuing			
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-					
<b>Project MDAP/MAIS Code:</b> P384															
<b>A. Mission Description and Budget Item Justification</b>															
This project provides management headquarters contractor support to the Integrated Warfare System (IWS) Program Executive Office (PEO). Through this support, technological advances are being developed, enabling PEO IWS to deliver "Enterprise" solutions for Naval Warfare Systems that operate seamlessly and effectively within the Fleet and Joint Forces.															
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>											FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<i>Title:</i> Management Headquarter Personnel  <i>Articles:</i>											0.494	0.524	0.534	0.000	0.534
<b>FY 2020 Plans:</b> - Continue risk reduction testing at ARDEL, including refinement of radar operation functions (calibration, fault detection/fault isolation, environmental adaptation), improving electronic protection capabilities, and continue data collection on ballistic missile defense targets of opportunity.											-	-	-	-	
<b>FY 2021 Base Plans:</b> Continue risk reduction testing at ARDEL, including refinement of radar operation functions (calibration, fault detection/fault isolation, environmental adaptation), improving electronic protection capabilities, and continue data collection on ballistic missile defense targets of opportunity.															
<b>FY 2021 OCO Plans:</b> N/A															
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> There is no significant change from FY20 to FY21.															
<b>Accomplishments/Planned Programs Subtotals</b>											0.494	0.524	0.534	0.000	0.534

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy											<b>Date:</b> February 2020																																								
<b>Appropriation/Budget Activity</b> 1319 / 6				<b>R-1 Program Element (Number/Name)</b> PE 0605898N / Management HQ - R&D						<b>Project (Number/Name)</b> 3186 / Air and Missile Defense Radar																																									
<b>C. Other Program Funding Summary (\$ in Millions)</b>																																																			
<table><thead><tr><th><u>Line Item</u></th><th><u>FY 2019</u></th><th><u>FY 2020</u></th><th><u>FY 2021</u></th><th><u>FY 2021</u></th><th><u>FY 2021</u></th><th><u>Cost To</u></th><th><u>FY 2022</u></th><th><u>FY 2023</u></th><th><u>FY 2024</u></th><th><u>FY 2025</u></th><th><u>Complete</u></th><th><u>Total Cost</u></th></tr><tr><th></th><th></th><th></th><th><u>Base</u></th><th><u>OCO</u></th><th><u>Total</u></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th></tr></thead><tbody><tr><td>• RDT&amp;E/0604522N: <i>Air and Missile Defense Radar (AMDR) System</i></td><td>26.079</td><td>55.349</td><td>78.141</td><td>-</td><td>78.141</td><td></td><td>87.931</td><td>80.404</td><td>79.835</td><td>81.433</td><td>Continuing</td><td>Continuing</td></tr></tbody></table>													<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2021</u>	<u>FY 2021</u>	<u>Cost To</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Complete</u>	<u>Total Cost</u>				<u>Base</u>	<u>OCO</u>	<u>Total</u>								• RDT&E/0604522N: <i>Air and Missile Defense Radar (AMDR) System</i>	26.079	55.349	78.141	-	78.141		87.931	80.404	79.835	81.433	Continuing	Continuing
<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2021</u>	<u>FY 2021</u>	<u>Cost To</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Complete</u>	<u>Total Cost</u>																																							
			<u>Base</u>	<u>OCO</u>	<u>Total</u>																																														
• RDT&E/0604522N: <i>Air and Missile Defense Radar (AMDR) System</i>	26.079	55.349	78.141	-	78.141		87.931	80.404	79.835	81.433	Continuing	Continuing																																							
<b>Remarks</b>																																																			
<b>D. Acquisition Strategy</b>																																																			
N/A																																																			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020		
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0605898N / Management HQ - R&D				Project (Number/Name) 3216 / Tactical Support Center-Integration				
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	
3216: <i>Tactical Support Center-Integration</i>	0.000	0.026	0.025	0.015	-	0.015	0.034	0.032	0.029	0.030	Continuing	Continuing	
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-			
<b>A. Mission Description and Budget Item Justification</b>													
This project provides management headquarters contractor support to the Integrated Warfare System (IWS) Program Executive Office (PEO). This supports AN/SQQ-34 Aircraft Carrier Tactical Support Center (CV-TSC) fulfillment of Anti-Submarine Warfare (ASW) and Surface Warfare (SUW) coordination functions utilizing data received from multiple sources to assess the threat and assist the Tactical Action Officer (TAO) and Composite Warfare Commander (CWC) in effectively applying available resources to support CVN self-defense. This supports CV-TSC functionality updates being implemented through an evolutionary acquisition approach, providing phased incremental builds that are developed, tested, certified and fielded.													
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>													
<i>Title:</i> Management Headquarter Personnel										<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>
<i>Articles:</i>										0.026	0.025	0.015	0.000
<i>FY 2020 Plans:</i>										-	-	-	-
- Continue CV-TSC Development/Integration including development of software builds and systems engineering efforts, conduct of incremental requirements, design, and test reviews.													
<i>FY 2021 Base Plans:</i>													
- Continue CV-TSC Development/Integration including development of software builds and systems engineering efforts, conduct of incremental requirements, design, and test reviews.													
<i>FY 2021 OCO Plans:</i>													
N/A													
<i>FY 2020 to FY 2021 Increase/Decrease Statement:</i>													
FY 2020 to FY 2021 decrease (\$-0.010M) accounts for the availability of prior year execution balances.													
<b>Accomplishments/Planned Programs Subtotals</b>										0.026	0.025	0.015	0.000
													0.015
<b>C. Other Program Funding Summary (\$ in Millions)</b>													
N/A													
<b>Remarks</b>													

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0605898N / <i>Management HQ - R&amp;D</i>	<b>Project (Number/Name)</b> 3216 / <i>Tactical Support Center-Integration</i>
<b>D. Acquisition Strategy</b> N/A		

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020				
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0605898N / Management HQ - R&D				Project (Number/Name) 3345 / ONR Management Headquarters						
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			
3345: ONR Management Headquarters	0.000	39.169	38.628	15.756	-	15.756	15.221	15.048	15.427	15.764	Continuing	Continuing			
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-					
<b>A. Mission Description and Budget Item Justification</b>															
This project funds all basic costs of Office of Naval Research Management Headquarters Activity (MHA) salaries and non-labor in support of the entire Navy Science & Technology (S&T) program. Through this support, the S&T enterprise pursues the technological advances that enable the Fleet's ability to operate from a position of technological superiority.															
Specifically, funding facilitates the execution of the Navy's basic research, applied research, and advanced technology development programs at the nation's universities/colleges, Navy laboratories, Warfare Centers, and private industry.															
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>											FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<i>Title:</i> Management Headquarters Personnel  <i>Description:</i> N/A											39.169 40	38.628 39	15.756 -	0.000 -	15.756 -
<b>FY 2020 Plans:</b> Provides corporate MHA personnel salaries and Non-Labor support in facilitating the purchase of the S&T programs for the Navy to ensure consistent external reporting. All Non-Operational HQ is now Major Headquarters Activity (MHA).  Continue to reduce auditability challenges to meet the mandate.															
<b>FY 2021 Base Plans:</b> Provides corporate MHA personnel salaries and Non-Labor support in facilitating the purchase of the S&T programs for the Navy to ensure consistent external reporting. All Non-Operational HQ is now Major Headquarters Activity (MHA).  Continue to reduce auditability challenges to meet the mandate.															
<b>FY 2021 OCO Plans:</b>															

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020		
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 0605898N / Management HQ - R&D	Project (Number/Name) 3345 / ONR Management Headquarters				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
N/A						
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> The decrease to this project reflects the breakout of non-labor costs into a standalone project (0824) within this Program Element						
<b>C. Other Program Funding Summary (\$ in Millions)</b>		Accomplishments/Planned Programs Subtotals	39.169	38.628	15.756	0.000
N/A						
<b>Remarks</b>						
<b>D. Acquisition Strategy</b>						
N/A						

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy											Date: February 2020	
Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
1319: Research, Development, Test & Evaluation, Navy / BA 6: RDT&E Management Support					PE 0606355N / Warfare Innovation Management							
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	40.722	28.750	37.022	-	37.022	43.675	45.814	48.144	49.023	Continuing	Continuing
0798: Allied/Coalition Maritime Environment (ACME)	0.000	1.059	1.114	1.194	-	1.194	1.226	1.274	1.297	1.324	Continuing	Continuing
2144: Space & Elec Warfare Engineering	0.000	21.513	14.535	22.165	-	22.165	27.491	29.295	30.703	31.231	Continuing	Continuing
2147: ISR Architecture	0.000	1.544	1.535	1.541	-	1.541	1.570	1.597	1.631	1.664	Continuing	Continuing
3319: Fleet Experimentation	0.000	8.790	9.281	9.783	-	9.783	11.000	11.213	12.028	12.269	Continuing	Continuing
3320: TRIDENT Warrior	0.000	2.213	2.285	2.339	-	2.339	2.388	2.435	2.485	2.535	Continuing	Continuing
3420: Expeditionary Submarine Fiber Optic Cable (SFOC)	0.000	5.603	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.603

**A. Mission Description and Budget Item Justification**

Allied/Coalition Maritime Environment (ACME) 0798:

This project promotes interoperability with allied and coalition forces by facilitating maritime interoperability in both processes and communication systems, including emerging capabilities, to counter growing high-end asymmetric threats.

Space & Electronic Warfare (SEW) Engineering 2144:

This project is a systems engineering non-acquisition program to develop, test, implement Technical Authority (TA) products, and validate Naval Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR), Business Information Technology (IT), and Space System architectures to support naval, Joint and Coalition missions across normal, contested, and degraded cyber/operational environments. The objective of this project is carried out by multiple tasks that ensure development and delivery of Naval Information Warfare (IW) capabilities that are well-integrated, interoperable, secure, and resilient to meet validated warfighting requirements.

The Intelligence, Surveillance, and Reconnaissance (ISR) Architecture 2147:

This project is intended to guide system of systems capability development and promote interoperability across Navy ISR programs, as well as interoperability and alignment with Department of Defense (DoD)-wide enterprise initiatives including Joint Information Environment (JIE) and Intelligence Community (IC) Information Technology Environment (ITE). This effort to develop integrated ISR architectures will also help instill systems engineering discipline and standardization across the Navy ISR Enterprise and provide a means by which to assess ISR Program of Record (POR) progress in conforming to a single Navy architecture.

Fleet Experimentation 3319:

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<b>Exhibit R-2, RDT&amp;E Budget Item Justification:</b> PB 2021 Navy				<b>Date:</b> February 2020																																																																														
<b>Appropriation/Budget Activity</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy / BA 6: RDT&amp;E Management Support</i>	<b>R-1 Program Element (Number/Name)</b> PE 0606355N / <i>Warfare Innovation Management</i>																																																																																	
The U.S. Navy's Fleet Experimentation (FLEX) project advances/augments operational and tactical warfighter capabilities through the experimentation of high payoff initiatives, technologies and concepts, Fleet Concepts of Operations (CONOPS), doctrine, and new tactics, techniques and procedures (TTP). The main focus of FLEX between 2018 and 2024 is to operationalize "A Design For Maintaining Maritime Superiority" Blue Line of Effort (LOE) through the execution of Fleet Design materiel/non-materiel capability employment.																																																																																		
<p>Trident Warrior Project 3320: The U.S. Navy's Trident Warrior (TW) experimentation campaign enables early delivery of capabilities to the warfighter via Fleet-directed Trident Warrior operational events with an emphasis on United States Fleet Forces/Commander Pacific Fleet (USFF/CPF) directed focus areas.</p> <p>Maritime Communications Demonstration Project 3420: Classified Project Maritime Communications Demonstration (MCD) is not a new start. Funding was realigned from project 3319 FLEX in FY18. The Expeditionary SFOC Communications is developing and experimenting innovative concepts designed to validate both materiel and non-materiel methodologies to provide resilient command and control within the maritime domain. Identified previous work done within Office of the Secretary of Defense (OSD) channels, and will leverage lessons learned.</p>																																																																																		
<table> <thead> <tr> <th><b>B. Program Change Summary (\$ in Millions)</b></th> <th><b>FY 2019</b></th> <th><b>FY 2020</b></th> <th><b>FY 2021 Base</b></th> <th><b>FY 2021 OCO</b></th> <th><b>FY 2021 Total</b></th> </tr> </thead> <tbody> <tr> <td>Previous President's Budget</td> <td>41.918</td> <td>28.750</td> <td>39.456</td> <td>-</td> <td>39.456</td> </tr> <tr> <td>Current President's Budget</td> <td>40.722</td> <td>28.750</td> <td>37.022</td> <td>-</td> <td>37.022</td> </tr> <tr> <td>Total Adjustments</td> <td>-1.196</td> <td>0.000</td> <td>-2.434</td> <td>-</td> <td>-2.434</td> </tr> <tr> <td>    • Congressional General Reductions</td> <td>-</td> <td>-</td> <td></td> <td></td> <td></td> </tr> <tr> <td>    • Congressional Directed Reductions</td> <td>-</td> <td>-</td> <td></td> <td></td> <td></td> </tr> <tr> <td>    • Congressional Rescissions</td> <td>-</td> <td>-</td> <td></td> <td></td> <td></td> </tr> <tr> <td>    • Congressional Adds</td> <td>-</td> <td>-</td> <td></td> <td></td> <td></td> </tr> <tr> <td>    • Congressional Directed Transfers</td> <td>-</td> <td>-</td> <td></td> <td></td> <td></td> </tr> <tr> <td>    • Reprogrammings</td> <td>0.050</td> <td>0.000</td> <td></td> <td></td> <td></td> </tr> <tr> <td>    • SBIR/STTR Transfer</td> <td>-1.246</td> <td>0.000</td> <td></td> <td></td> <td></td> </tr> <tr> <td>    • Program Adjustments</td> <td>0.000</td> <td>0.000</td> <td>-2.426</td> <td>-</td> <td>-2.426</td> </tr> <tr> <td>    • Rate/Misc Adjustments</td> <td>0.000</td> <td>0.000</td> <td>-0.008</td> <td>-</td> <td>-0.008</td> </tr> </tbody> </table>					<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	Previous President's Budget	41.918	28.750	39.456	-	39.456	Current President's Budget	40.722	28.750	37.022	-	37.022	Total Adjustments	-1.196	0.000	-2.434	-	-2.434	• Congressional General Reductions	-	-				• Congressional Directed Reductions	-	-				• Congressional Rescissions	-	-				• Congressional Adds	-	-				• Congressional Directed Transfers	-	-				• Reprogrammings	0.050	0.000				• SBIR/STTR Transfer	-1.246	0.000				• Program Adjustments	0.000	0.000	-2.426	-	-2.426	• Rate/Misc Adjustments	0.000	0.000	-0.008	-	-0.008
<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>																																																																													
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<p><b>Change Summary Explanation</b> The FY2021 funding request was decreased by \$1.577 million to account for the availability of prior year execution balances.</p>																																																																																		

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											<b>Date:</b> February 2020		
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0606355N / Warfare Innovation Management					Project (Number/Name) 0798 / Allied/Coalition Maritime Environment (ACME)			
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
0798: <i>Allied/Coalition Maritime Environment (ACME)</i>		0.000	1.059	1.114	1.194	-	1.194	1.226	1.274	1.297	1.324	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

The ACME program advances Information Warfare (IW) (to include Command, Control, Communications, Computers; Intelligence, Surveillance and Reconnaissance (C4ISR); Electronic Warfare (EW); and Cyber Warfare), interoperability with Australia, Canada, New Zealand, United Kingdom, United States (AUSCANNZUKUS), North Atlantic Treaty Organization (NATO), and other Allied and Coalition partners. The program determines maritime operational gaps with our allies, identifies Doctrine, Organization, Training, Material, Leadership, Personnel, and Facilities (DOTMLPF) solutions with the potential to fill those gaps, and assesses these solutions and associated concepts of operation in laboratory and at-sea environments. The ACME program includes integration and testing in support of joint and Allied war fighting capabilities, including interoperability testing of IW equipment. Allied and joint interoperability is critical for future maritime operations, especially as the United States Navy (USN) expands Internet Protocol (IP) networking throughout the fleet via Consolidated Afloat Networks and Enterprise Services (CANES), Next Generation Networks (NGEN), Mission Partner Environment/ Future Mission Networking (MPE/FMN), the U.S. Battlefield Information Collection and Exploitation System - eXtended (BICES-X), and with the Joint Information Environment (JIE).

Currently, IP connectivity with AUSCANNZUKUS and other Allied/Coalition forces is limited, requiring extensive backhaul through ashore infrastructure. Higher bandwidth solutions suitable for use over tactical networks require development and assessment for emerging coalition and joint interoperability requirements, such as Maritime Domain Awareness (MDA), Network Operations Without Shore (NOWS), Satellite Communications (SATCOM) Denied, Degraded, Intermittent and Low-bandwidth (DDIL) operations, and to counter Anti-Access Area Denial (A2/AD) threats. Increases in data throughput are required for the effective exchange of rich IW data sets and services via Service Oriented Architectures (SOA) within the limitations of High Frequency (HF), Ultra-High Frequency (UHF), and other portions of the radio frequency spectrum, coupled with appropriate Information Assurance and Computer Network Defense (IA/CND) mechanisms. Development and assessment of potential solutions will integrate improved IP capabilities with the Advanced Digital Network Systems (ADNS) and existing international standards (e.g. Allied Communications Publication 200, NATO Standardization Agreements 5066 and 4691). The continued development and refinement of advanced tactical networking technologies and protocols, to include Low Probability of Intercept (LPI), Low Probability of Detection (LPD), and Anti-Jam (AJ) capabilities as well as Automatic Link Establishment (ALE) standards, will provide for a significant improvement in secure data sharing within, and between, coalition maritime elements.

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

		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<b>Title:</b> Advanced Relay Capabilities	<b>Articles:</b>	1.059	1.114	1.194	0.000	1.194
<b>FY 2020 Plans:</b>		-	-	-	-	-

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy			<b>Date:</b> February 2020				
<b>Appropriation/Budget Activity</b> 1319 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0606355N / Warfare Innovation Management	<b>Project (Number/Name)</b> 0798 / Allied/Coalition Maritime Environment (ACME)					
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>			<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
Awareness, cross-domain and data labeling solutions in maritime tactical networking environments, and advanced Information Assurance and Computer Network Defense (IA/CND) solutions (with common and interoperable processes and technologies).  - Continue to evaluate technologies for interoperable maritime networking. Solutions will address higher bandwidth, Low Probability of Intercept (LPI)/Low Probability of Detection (LPD)/Anti-Jam (AJ) technologies across the Radio Frequency (RF) and Optical spectrum and include airborne capabilities. Evaluation of electromagnetic spectrum management and visualization technologies, force-level Electronic Warfare/Electromagnetic Maneuver Warfare (EW/EMW) will also enhance interoperable Information Warfare (IW). - Continue to enhance Allied IW interoperability with other joint and maritime multi-national forums, such as the Combined Communications Electronic Board (CCEB), Multinational Maritime Information-system Interoperability Steering Group (M2I2), MPE/FMN, and Joint Information Environment (JIE) forums. - Continue to assess and validate individual technologies, integrated solutions, and associated Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel and Facilities (DOTMLPF) through experimentation, trials and demonstrations with Australia, Canada, New Zealand, United Kingdom, United States (AUSCANNZUKUS) and other Allied/Coalition partners during operational venues, such as the United States Navy (USN) Rim of the Pacific (RIMPAC) or United Kingdom (UK) Joint Warrior exercise series.							
<b>FY 2021 Base Plans:</b> - Continue to develop and evaluate secure, interoperable technologies and capabilities supporting Denied, Degraded, Intermittent and Low-bandwidth (DDIL) operations including Allied/Coalition Shared Situational Awareness, cross-domain and data labeling solutions in maritime tactical networking environments, and advanced Information Assurance and Computer Network Defense (IA/CND) solutions (with common and interoperable processes and technologies).  - Continue to evaluate technologies for interoperable maritime networking. Solutions will address higher bandwidth, Low Probability of Intercept (LPI)/Low Probability of Detection (LPD)/Anti-Jam (AJ) technologies across the Radio Frequency (RF) and Optical spectrum and include airborne capabilities. Evaluation of electromagnetic spectrum management and visualization technologies, force-level Electronic Warfare/Electromagnetic Maneuver Warfare (EW/EMW) will also enhance interoperable Information Warfare (IW). - Continue to enhance Allied IW interoperability with other joint and maritime multi-national forums, such as the Combined Communications Electronic Board (CCEB), Multinational Maritime Information-system Interoperability Steering Group (M2I2), MPE/FMN, and Joint Information Environment (JIE) forums. - Continue to assess and validate individual technologies, integrated solutions, and associated Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel and Facilities (DOTMLPF) through							

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020		
<b>Appropriation/Budget Activity</b> 1319 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0606355N / <i>Warfare Innovation Management</i>	<b>Project (Number/Name)</b> 0798 / <i>Allied/Coalition Maritime Environment (ACME)</i>				
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	
experimentation, trials and demonstrations with Australia, Canada, New Zealand, United Kingdom, United States (AUSCANNZUKUS) and other Allied/Coalition partners during operational venues, such as the United States Navy (USN) Rim of the Pacific (RIMPAC) or United Kingdom (UK) Joint Warrior exercise series.						
<b>FY 2021 OCO Plans:</b> N/A						
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Increase of \$0.08 million from FY 2020 to FY 2021 is attributed to additional support required for Allied Information Warfare (IW) interoperability exercises with other joint and maritime multi-national forums.						
Accomplishments/Planned Programs Subtotals		1.059	1.114	1.194	0.000	1.194
C. Other Program Funding Summary (\$ in Millions)						
N/A						
Remarks						
D. Acquisition Strategy						
N/A						

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020	
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0606355N / Warfare Innovation Management				Project (Number/Name) 2144 / Space & Elec Warfare Engineering			
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
2144: Space & Elec Warfare Engineering	0.000	21.513	14.535	22.165	-	22.165	27.491	29.295	30.703	31.231	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

**Note**  
The FY2021 funding request was decreased by \$0.773 million to account for the availability of prior year execution balances.

**A. Mission Description and Budget Item Justification**  
To support Navy objectives in advancing Information Warfare (IW) capabilities, the Space and Electronic Warfare (SEW) Engineering project provides three main functions:

(1) Perform System of Systems (SoS) Cybersecurity Engineering; develop the architectures, specifications and standards, tools, and processes to support a single integrated Navy plan for cybersecurity. These engineering artifacts provide Navy specific guidance to drive common and consistent implementation of security controls across current and future Navy Programs of Record/projects. This eliminates redundancies and inefficiencies characteristic of previous stove-pipe development efforts in which each system addressed security individually. These efforts enable a standardized approach to move out faster to improve the Navy's cyber resiliency. Provide the cybersecurity vulnerability and functional test capability, which supports cybersecurity test requirements and the Command, Control, Communications, Computers, Intelligence (C4I) components of Naval Information Warfare Systems Command (NAVWARSYSCOM) Information Warfare (IW) Capability Testing Lab (formerly USS SECURE). NAVWAR Cyber Security Testing Capability/Labs is a cyber assessment program within the Navy. This SoS (Afloat, Aloft, C4I & Shore) capability in a test laboratory environment provides a rapidly re-configurable capability that integrates maritime hardware systems into a virtual platform. This platform level SoS provides cybersecurity research, development, test and evaluation, and training, not otherwise possible. This combination of Systems Commands (SYSCOM) laboratories, cyber ranges, and Red Teams simulating Navy platforms in operational maritime environments is critical for effectively evaluating cyber threats against specified mission threads.

(2) Perform System of Systems (SoS) Capability Roadmapping and Engineering; define an integrated Enterprise Architecture to support design, development and delivery of integrated Navy Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR), Business Information Technology (IT), and Space System capabilities. This architecture reflects current (as-is) and future (target) end states to support technical analyses, program planning, and enterprise-level investment decisions across IW capabilities. Perform mission based system of systems analysis to ensure integration and interoperability, and validate end-to-end warfighting capabilities to quickly address emerging threats. Provides engineering tools and processes to drive rigorous Systems Engineering discipline across the acquisition lifecycle to support rapid development and delivery of secure and interoperable C4ISR, Business IT, and Space Systems capabilities that meet Fleet requirements. Conduct Systems Engineering Technical Reviews (SETRs) to provide independent, objective assessments of technical maturity and compliance with applicable architectures, specifications and standards across IW capabilities. The Coalition Warrior Interoperability eXploration, eXperimentation, eXamination, eXercise (CWIX) provides a means to demonstrate and evaluate the interoperability of United States (US), North Atlantic Treaty Organization (NATO), and coalition information sharing systems.

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy			<b>Date:</b> February 2020																														
<b>Appropriation/Budget Activity</b> 1319 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0606355N / Warfare Innovation Management	<b>Project (Number/Name)</b> 2144 / Space & Elec Warfare Engineering																															
(3) Navy Additive Manufacturing (AM) technology aligns to CNO priorities to deliver revolutionary capabilities to improve fleet readiness. These enterprise solutions will provide the foundation to (a) enhance warfighter capability through new innovative system designs; (b) increase readiness through low volume production of hard to source items; and (c) improve warfighting capacity by enabling production at or near the point of need. Specific efforts include the development of an Enterprise Digital Manufacturing Architecture which addresses design and certification of AM capabilities for both afloat and ashore, development of Cyber Security Risk Management Profiles for devices and applications on operational networks, definition of a secure Technical Data Package to describe components that can be digitally manufactured, and the development of an overarching, enterprise-level Digital Manufacturing Thread (device management, digital rights management, licensing, configuration management, data storage rule/access and application programming interfaces).																																	
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"></th><th style="text-align: center;"><b>FY 2019</b></th><th style="text-align: center;"><b>FY 2020</b></th><th style="text-align: center;"><b>FY 2021 Base</b></th><th style="text-align: center;"><b>FY 2021 OCO</b></th><th style="text-align: center;"><b>FY 2021 Total</b></th></tr> </thead> <tbody> <tr> <td><b>Title:</b> Cybersecurity Architecture, Specifications and Standards  <b>Articles:</b></td><td style="text-align: center;">7.695</td><td style="text-align: center;">6.793</td><td style="text-align: center;">0.000</td><td style="text-align: center;">0.000</td><td style="text-align: center;">0.000</td></tr> <tr> <td><b>FY 2020 Plans:</b> - Continue to evaluate emerging threats, advances in technology, updates to National Institute of Standards and Technology (NIST) and DoD guidance, and results of Naval Information Warfare Systems Command (NAVWARSYSCOM) Information Warfare (IW) Capability Testing Lab (formerly USS SECURE) cyber test activities to inform the need for new technical artifacts that provide cybersecurity guidance to Navy Programs of Record (PoR) and projects. - Develop detailed design artifacts for PoRs to ensure integration between Navy Cyber Situational Awareness (NCSA) tools and the Defensive Cyber Operations (DCO) enclave to enable command and control of Navy networks under all cyber conditions. - Continue to assess Acquisition Category (ACAT) programs compliance with Information Technology (IT) and Cybersecurity (CS)/ Technology Authority (TA) architectures, specifications and standards. Refine the Cybersecurity Figure of Merit (CFOM) to assess Information Warfare programs and projects effectiveness in meeting cybersecurity requirements. - Continue to evaluate and provide feedback on Navy PoRs plans for implementation of cybersecurity controls. Support program reviews and milestones by assessing compliance with CS/TA cybersecurity architectures and standards, and perform risk assessments that articulate systems' ability to effectively support operational missions in various cyber conditions. - Drive implementation of CS/TA cybersecurity architectures and standards across programs and projects.</td><td style="text-align: center;">-</td><td style="text-align: center;">-</td><td style="text-align: center;">-</td><td style="text-align: center;">-</td></tr> <tr> <td><b>FY 2021 Base Plans:</b> - Beginning in FY21, funding has been consolidated into System of Systems (SoS) Cybersecurity Engineering.</td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td><b>FY 2021 OCO Plans:</b></td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table>						<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>Title:</b> Cybersecurity Architecture, Specifications and Standards  <b>Articles:</b>	7.695	6.793	0.000	0.000	0.000	<b>FY 2020 Plans:</b> - Continue to evaluate emerging threats, advances in technology, updates to National Institute of Standards and Technology (NIST) and DoD guidance, and results of Naval Information Warfare Systems Command (NAVWARSYSCOM) Information Warfare (IW) Capability Testing Lab (formerly USS SECURE) cyber test activities to inform the need for new technical artifacts that provide cybersecurity guidance to Navy Programs of Record (PoR) and projects. - Develop detailed design artifacts for PoRs to ensure integration between Navy Cyber Situational Awareness (NCSA) tools and the Defensive Cyber Operations (DCO) enclave to enable command and control of Navy networks under all cyber conditions. - Continue to assess Acquisition Category (ACAT) programs compliance with Information Technology (IT) and Cybersecurity (CS)/ Technology Authority (TA) architectures, specifications and standards. Refine the Cybersecurity Figure of Merit (CFOM) to assess Information Warfare programs and projects effectiveness in meeting cybersecurity requirements. - Continue to evaluate and provide feedback on Navy PoRs plans for implementation of cybersecurity controls. Support program reviews and milestones by assessing compliance with CS/TA cybersecurity architectures and standards, and perform risk assessments that articulate systems' ability to effectively support operational missions in various cyber conditions. - Drive implementation of CS/TA cybersecurity architectures and standards across programs and projects.	-	-	-	-	<b>FY 2021 Base Plans:</b> - Beginning in FY21, funding has been consolidated into System of Systems (SoS) Cybersecurity Engineering.						<b>FY 2021 OCO Plans:</b>					
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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy					<b>Date:</b> February 2020	
<b>Appropriation/Budget Activity</b>	<b>R-1 Program Element (Number/Name)</b>	<b>Project (Number/Name)</b>				
1319 / 6	PE 0606355N / Warfare Innovation Management	2144 / Space & Elec Warfare Engineering				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>						
		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
N/A						
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> FY21 decrease is due to the consolidation of this subproject into consolidated SoS Cybersecurity Engineering.						
<b>Title:</b> Cybersecurity Vulnerability & Functional Test Capability	<b>Articles:</b>	4.021	0.831	0.000	0.000	0.000
<b>FY 2020 Plans:</b> - Continue to utilize lab assets for cross-SYSCOM Naval Information Warfare Systems Command (NAVWARSYSCOM) Information Warfare (IW) Capability Testing Lab (formerly USS SECURE) serial test events.		-	-	-	-	-
<b>FY 2021 Base Plans:</b> - Beginning in FY21, funding has been consolidated into System of Systems (SoS) Cybersecurity Engineering.						
<b>FY 2021 OCO Plans:</b> N/A						
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> FY21 decrease is due to the consolidation of this subproject into System of Systems (SoS) Cybersecurity Engineering.						
<b>Title:</b> Enterprise Architecture	<b>Articles:</b>	0.728	0.668	0.000	0.000	0.000
<b>FY 2020 Plans:</b> - Support Navy digital requirements by continuing to grow the capabilities of the Architecture Data Repository to effectively share data across the Naval Information Warfare Systems Command (NAVWAR) enterprise and with other Naval Systems Commands (SYSCOMs). Provide the infrastructure critical to implementing an integrated Model Based Systems Engineering environment, and provide configuration management. - Continue development of Model Based System Engineering (MBSE) capabilities, processes and tools to support complex technical performance gap analysis and trade recommendations by identifying capability gaps and overlaps, interoperability issues, and cybersecurity risks between Navy System of Systems (SoS) capabilities.		-	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy					Date: February 2020	
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 0606355N / Warfare Innovation Management	Project (Number/Name) 2144 / Space & Elec Warfare Engineering				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
- Continue to refine the Integration and Interoperability (I&I) Integrated Capability Framework to support SoS analyses of how well systems operate together across the Naval enterprise to deliver validated warfighting capabilities.						
- Continue to use Command and Control (C2), Battlespace Awareness, and Integrated Fires (IF) Integrated Capabilities Technical Baseline (ICTBs) to perform analysis of mission performance, identify capability gaps, and perform engineering trade studies for prioritized missions, to better inform investment decisions and ensure alignment to all emerging warfighting objectives for increased interoperability and information sharing across weapons, sensors, and shooters.						
<b>FY 2021 Base Plans:</b> -Beginning in FY21, funding has been consolidated into System of Systems (SoS) Capability Roadmapping and Engineering.						
<b>FY 2021 OCO Plans:</b> N/A						
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> FY21 decrease is due to the consolidation of this subproject into System of Systems (SoS) Capability Roadmapping and Engineering.						
<b>Title:</b> SYSCOM Systems Engineering	<b>Articles:</b>	2.161	1.979	0.000	0.000	0.000
<b>FY 2020 Plans:</b> - As the Technical Authority (TA) for acquisition programs, continue to perform Systems Engineering Technical Reviews (SETRs) to ensure compliance with statutory and regulatory directives, as well as applicable Information Technology (IT) and Information Assurance (IA) TA architectures, specifications, standards and profiles. Provide an independent assessment of technical risk to support milestone decision authority and program manager decisions. - Continue to develop and perform technical reviews of formal acquisition and engineering documentation to ensure the application of sound systems engineering analysis and design principles to system planning requirements, design, testing, and supportability. Implement applicable current TA architectures, specifications, standards, policies and processes in documentation. Provide independent technical analyses to support Milestone Decisions.		-	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020		
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 0606355N / Warfare Innovation Management	Project (Number/Name) 2144 / Space & Elec Warfare Engineering				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
- Continue to conduct Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) certifications through design and testing analysis, ensuring interoperability with platform, force level, and joint/allied/coalition forces.						
- Continue engineering evaluations, assessments of compliance with authoritative architectures and technical standards, and address technical issues in the following domains: Command and Control (C2); Intelligence, Surveillance, & Reconnaissance/Information Operations (ISR/IO); Space Systems, Business IT; and Communications & Networks.						
<b>FY 2021 Base Plans:</b>						
- Beginning in FY21, funding has been consolidated into System of Systems (SoS) Capability Roadmapping and Engineering.						
<b>FY 2021 OCO Plans:</b>	N/A					
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b>						
FY21 decrease is due to the consolidation of this subproject into System of Systems (SoS) Capability Roadmapping and Engineering.						
<b>Title:</b> Coalition Warrior Interoperability eXploration, eXperimentation, eXamination, eXercise (CWIX)	<b>Articles:</b>	1.007	1.048	0.000	0.000	0.000
<b>FY 2020 Plans:</b>	-	-	-	-	-	-
- Continue to develop interoperability and information sharing through coalition engagement, technology, demonstrations, and assessments leading to improvements of Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) systems within the Navy and in conjunction with Joint Services and Coalition efforts.						
- Coordinate with the MultiNational Maritime Informational Technology and Interoperability Board (M2I2) to facilitate interaction between Resource Sponsor guidance and experimentation desires of Coalition Partner Nations.						
- Continue to pursue and utilize greater Pacific Command (PACOM) and Southern Command (SOUTHCOM) Partner Nation engagement by fostering a connected, distributed experimentation environment suitable for expanded experimentation in those areas.						
- Continue to enhance interoperability across North Atlantic Treaty Organization (NATO) and affiliated Coalition Partners by participating in the planning and execution of Coalition Warrior Interoperability eXploration, eXperimentation, eXamination, eXercise (CWIX).						

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020		
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 0606355N / Warfare Innovation Management	Project (Number/Name) 2144 / Space & Elec Warfare Engineering				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
- Continue to assess Coalition Interoperability assurance, validation, and verification as related to the engineering and execution of the Mission Partner Environment (MPE) in the appropriate venues. - Continue to utilize connected environments such as the Combined Federated Battle Laboratories Network (CFBLNet) to experiment with innovative technical solutions in order to evaluate their value in fostering enhanced interoperability across Coalition Partner Nations and the United States (US).						
<b>FY 2021 Base Plans:</b> - Beginning in FY21, funding has been consolidated into System of Systems (SoS) Capability Roadmapping and Engineering.						
<b>FY 2021 OCO Plans:</b> N/A						
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> FY21 decrease is due to the consolidation of this subproject into System of Systems (SoS) Capability Roadmapping and Engineering.						
<b>Title:</b> Additive Manufacturing	<b>Articles:</b>	5.901	3.216	4.117	0.000	4.117
<b>FY 2020 Plans:</b> - Utilize the Additive Manufacturing (AM) Test-Bed to develop specifications, standards, and architecture to drive interoperability across the Navy Enterprise Digital Thread for Additive Manufacturing. - Continue development of Risk Management Framework (RMF) Profiles for the various components and interfaces required to network AM hardware and software assets. - Define a Defense-in-Depth Functional Implementation Architecture Network Transformation(DFIANT) architecture for additive manufacturing. - Initiate an additive manufacturing data strategy.		-	-	-	-	-
<b>FY 2021 Base Plans:</b> - Complete development of Risk Management Framework (RMF) Profiles for the various components and interfaces required to network AM hardware and software assets. - Continue utilizing the Additive Manufacturing Test-Bed to develop specifications, standards, and architecture to drive interoperability across the Navy Enterprise Digital Thread for Additive Manufacturing. - Define a Defense-in-Depth Functional Implementation Architecture Network Transformation(DFIANT) architecture for additive manufacturing.						

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020		
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 0606355N / Warfare Innovation Management	Project (Number/Name) 2144 / Space & Elec Warfare Engineering				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
- Complete the Additive Manufacturing data strategy. - Define the Digital Manufacturing Strategy for integration into logistics Digital transformation plan. - Create Off-Shore deployable Data Repository and digital architecture for Afloat Units.						
<b>FY 2021 OCO Plans:</b> N/A						
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Increase of \$0.901 million from FY 2020 to FY 2021 is attributed to Digital Architecture expansion required to achieve higher levels of data and cyber security postures. Funds will create additional off-shore deployable data repositories to support afloat units.						
<b>Title:</b> System of Systems (SoS) Cybersecurity Engineering  <b>FY 2020 Plans:</b> - Funding in FY20 and prior resides in (a) Cybersecurity Architecture, Specifications & Standards, and (b) Cybersecurity Vulnerability & Functional Test Capability.	<b>Articles:</b> -  <b>FY 2021 Base Plans:</b> - Continue to evaluate emerging threats, advances in technology, updates to National Institute of Standards and Technology (NIST) and DoD guidance, and results of Naval Information Warfare Systems Command (NAVWARSYSCOM) Information Warfare (IW) Capability Testing Lab (formerly USS SECURE) cyber test activities to inform the need for new technical artifacts that provide cybersecurity guidance to Navy Programs of Record (PoR) and projects.  - Continue to develop the architectures, specifications, and standards that provide the technical foundation of the single, integrated Navy plan for cybersecurity, and drive implementation of Information Technology (IT) and Cybersecurity (CS)/Technology Authority (TA) architectures, specifications and standards across programs and projects. Support program reviews and milestones via risk assessments that articulate systems' ability to support operational missions in various cyber conditions and refining the Cybersecurity Figure of Merit (CFOM) to assess Information Warfare programs and projects effectiveness in meeting cybersecurity requirements.  - Develop detailed design artifacts for PoRs to ensure integration between Navy Cyber Situational Awareness (NCSA) tools and the Defensive Cyber Operations (DCO) enclave to enable command and control of Navy networks under all cyber conditions.	0.000	0.000	12.290	0.000	12.290

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy					<b>Date:</b> February 2020	
<b>Appropriation/Budget Activity</b> 1319 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0606355N / Warfare Innovation Management	<b>Project (Number/Name)</b> 2144 / Space & Elec Warfare Engineering				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
-Continue to utilize lab assets for cross-SYSCOM NAVWAR Cybersecurity Testing Capability serial test events.						
<b>FY 2021 OCO Plans:</b> N/A						
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> FY21 increase from FY20 is due to consolidated efforts totaling \$7.624 million. The additional \$4.666 million is due to increased Navy demand for systems that have robust cybersecurity whether they be business or C4ISR systems and capabilities, and that those capabilities have been tested in a virtual environment prior to deployment. Funds support increased labor costs needed to keep assets cyber secure in an ever-changing and complex threat environment.						
<b>Title:</b> System of Systems (SoS) Capability Roadmapping and Engineering  <b>Articles:</b>		0.000	0.000	5.758	0.000	5.758
<b>FY 2020 Plans:</b> - Funding in FY20 and prior resides in (a) Enterprise Architecture, (b) SYSCOM Systems Engineering, and (c) Coalition Warrior Interoperability eXploration, eXperimentation, eXamination, eXercise (CWIX) programs.		-	-	-	-	-
<b>FY 2021 Base Plans:</b> - Continue supporting Navy digital engineering requirements by continuing to grow the capabilities of the Architecture Data Repository to effectively share data across the NAVAL INFORMATION WARFARE SYSTEMS COMMAND (NAVWARSYSCOM) enterprise and with other Naval Systems Commands (SYSCOMs). Provide the infrastructure critical to implementing an integrated Model Based Systems Engineering environment, and provide configuration management.  - Continue development of Model Based System Engineering (MBSE) capabilities, processes and tools to support development and delivery of recommendations to address capability gaps, overlaps, interoperability issues and cybersecurity risks across complex Navy System of Systems (SoS) to ensure effective end-to-end mission performance.  - Continue to refine the Integration and Interoperability (I&I) Integrated Capability Framework (ICF) to support SoS analyses of how well systems operate together across the Naval enterprise to deliver validated warfighting capabilities.						

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020		
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 0606355N / Warfare Innovation Management	Project (Number/Name) 2144 / Space & Elec Warfare Engineering				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
- Perform Systems Engineering Technical Reviews (SETRs) across Command and Control (C2); Intelligence, Surveillance, & Reconnaissance/Information Operations (ISR/IO); Space Systems, Business IT; and Communications & Networks to ensure compliance with statutory and regulatory directives, as well as implementing applicable Information Technology (IT) and Cybersecurity (CS) Technology Authority (TA) architectures, specifications, standards, policies, processes and profiles.	- Continue to conduct Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance(C4ISR) certifications and technical reviews of formal acquisition and engineering documentation through design and testing analysis, ensuring interoperability with platform, force level, and joint/allied/coalition forces.	- Resume Competency Development Model (CDM) development by defining roles and appropriate Knowledge Skills and Abilities (KSAs) for the Naval Information Warfare Systems Command (NAVWARSYSCOM) Engineering Competency required to meet evolving mission requirements.	- Continue to promote improved interoperability and information sharing through coalition engagement, technology, demonstrations, and assessments leading to improvements of Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) systems within the Navy and in conjunction with Joint Services and Coalition efforts. Partners include the MultiNational Maritime Informational Technology and Interoperability Board (M2I2), Pacific Command (PACOM) and Southern Command (SOUTHCOM), and North Atlantic Treaty Organization (NATO). Partner feedback is for the planning and execution of Coalition Warrior Interoperability eXploration, eXperimentation, eXamination, eXercise (CWIX) and execution of the Mission Partner Environment (MPE) in the appropriate venues.			
<b>FY 2021 OCO Plans:</b> N/A	<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> FY21 increase from FY20 is due to consolidated efforts totaling \$3.695 million. The additional \$2.063 million is due to increased fleet demand for operational architectures and roadmapping to build robust information					

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<b>Appropriation/Budget Activity</b> 1319 / 6		<b>R-1 Program Element (Number/Name)</b> PE 0606355N / <i>Warfare Innovation Management</i>		<b>Project (Number/Name)</b> 2144 / <i>Space &amp; Elec Warfare Engineering</i>				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>								
	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total			
warfare systems capable of being supported by or supporting the fleet. Funds will expand and develop system architectures able to meet new standards and expectations from fleet users.								
<b>Accomplishments/Planned Programs Subtotals</b>				21.513	14.535	22.165	0.000	22.165
<b>C. Other Program Funding Summary (\$ in Millions)</b>								
N/A								
<b>Remarks</b>								
<b>D. Acquisition Strategy</b>								
N/A								

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											<b>Date:</b> February 2020	
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0606355N / Warfare Innovation Management				Project (Number/Name) 2147 / ISR Architecture			
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
2147: ISR Architecture	0.000	1.544	1.535	1.541	-	1.541	1.570	1.597	1.631	1.664	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

Integrated architectures provide a technical framework for assessing capability gaps and performance of individual systems and System of Systems (SoS) and their ability to effectively provide the desired effects to support warfighting missions. They also serve as a means to influence and drive Programs of Record (PoR) toward a common, more efficient state that promotes interoperability and security.

The Naval Intelligence, Surveillance, and Reconnaissance (ISR) Reference Architecture project is intended to guide system of systems capability development and promote interoperability across Navy ISR programs, as well as interoperability and alignment with Department of Defense (DoD)-wide enterprise initiatives including Joint Information Environment and Intelligence Community Information Technology Environment and Space & Naval Warfare Systems Command-wide Enterprise Architecture policies. This effort to develop integrated ISR architectures will instill systems engineering discipline and standardization across the Navy ISR Enterprise and provide a means by which to assess ISR PoR progress in conforming to a single Navy architecture. These efforts will reduce Information Technology/ISR infrastructure complexity and variances, making it easier to manage, operate and defend our ISR capabilities, and help inform investment decisions across the Navy's ISR enterprise to support Assured Command and Control, Battlespace Awareness and Integrated Fires.

This effort will encompass the documentation and analysis of current ISR enterprise architectures to inform and guide requirements for target architecture development and performance requirements to support full use and incorporation of ISR capabilities to advance Navy operations afloat. The associated studies will produce both technical and non-technical implementation guidance across the Doctrine, Organization, Training, Material, Leadership, Personnel and Facilities spectrum.

<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>					<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
<b>Title:</b> Intelligence, Surveillance, and Reconnaissance (ISR) Architecture					1.544	1.535	1.541	0.000	1.541
<b>Articles:</b>					-	-	-	-	-

**FY 2020 Plans:**

- Continue to analyze the current ISR capabilities of afloat, ashore, joint, and national systems within mission contexts to demonstrate gaps and overlaps in Information Warfare capabilities and document in engineering artifacts and architectures. Perform trade space analysis and develop and quantify solutions using technical and operational performance parameters.
- Continue to build on the documentation and analysis of the enterprise ISR capabilities to support System of Systems engineering assessments to identify integration and interoperability gaps, trades, and solutions to support investment decision-making across the ISR portfolio.

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<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
- Continue to integrate the National, Joint, and Naval ISR architectures within mission contexts to identify functional capacities, materiel integration and interoperability gaps and overlaps, as well as any policy and doctrine impacts.						
- Continue to perform verification and validation (V&V) to ensure ISR architecture and analytic products accurately capture system performance specifications.						
- Continue to capture all architectural data in the Naval Information Warfare Systems Command (NAVMAR) analysis tool suite to support rigorous engineering assessments and architecture excursions against solution alternatives.						
- Continue to ensure alignment and interoperability between ISR Architectures and Joint Information Enterprise, Intelligence Community Information Technology Enterprise and NAVWAR Enterprise Architectures.						
<b>FY 2021 Base Plans:</b>						
- Continue to analyze the current ISR capabilities of afloat, ashore, joint, and national systems within mission contexts to demonstrate gaps and overlaps in Information Warfare capabilities and document in engineering artifacts and architectures. Perform trade space analysis and develop and quantify solutions using technical and operational performance parameters.						
- Continue to build on the documentation and analysis of the enterprise ISR capabilities to support System of Systems engineering assessments to identify integration and interoperability gaps, trades, and solutions to support investment decision-making across the ISR portfolio.						
- Continue to integrate the National, Joint, and Naval ISR architectures within mission contexts to identify functional capacities, materiel integration and interoperability gaps and overlaps, as well as any policy and doctrine impacts.						
- Continue to perform V&V to ensure ISR architecture and analytic products accurately capture system performance specifications.						
- Continue to capture all architectural data in the NAVWAR analysis tool suite to support rigorous engineering assessments and architecture excursions against solution alternatives.						
- Continue to ensure alignment and interoperability between ISR Architectures and Joint Information Enterprise, Intelligence Community Information Technology Enterprise and NAVWAR Enterprise Architectures.						
<b>FY 2021 OCO Plans:</b>						
N/A						
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b>						

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020				
<b>Appropriation/Budget Activity</b> 1319 / 6		<b>R-1 Program Element (Number/Name)</b> PE 0606355N / <i>Warfare Innovation Management</i>		<b>Project (Number/Name)</b> 2147 / <i>ISR Architecture</i>				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>								
	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total			
The \$0.006M increase is attributed to additional V&V support required to ensure ISR architecture and analytic products accurately capture system performance specifications.								
<b>Accomplishments/Planned Programs Subtotals</b>				1.544	1.535	1.541	0.000	1.541
<b>C. Other Program Funding Summary (\$ in Millions)</b>								
N/A								
<b>Remarks</b>								
<b>D. Acquisition Strategy</b>								
N/A								

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											<b>Date:</b> February 2020	
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0606355N / Warfare Innovation Management				Project (Number/Name) 3319 / Fleet Experimentation			
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
3319: Fleet Experimentation	0.000	8.790	9.281	9.783	-	9.783	11.000	11.213	12.028	12.269	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

**Note**

The FY2021 funding request was decreased by \$0.804 million to account for the availability of prior year execution balances.

**A. Mission Description and Budget Item Justification**

Chief of Naval Operations Fragmented Order (FRAGO) 01/2019 signed December 2019, focuses on improved warfighting using experiments and exercises in venues such as Large Scale Exercises (LSE) and Fleet Battle Problems to assess implementation progress for concepts like Distributed Maritime Operations (DMO). Fleet Experimentation (FLEX) funds are used to implement Fleet Design through foundational warfighting concepts like DMO and is a proven and efficient approach to improving warfighting effectiveness. FLEX resources the experimentation venues - operationally representative environments - to focus solutions on to solving warfighting problems and maturing foundational warfighting concepts. Through experimentation, concept solutions are tested, refined, and used to support acquisition strategy and inform procurement decisions. The FLEX program addresses warfighting gaps identified in: Integrated Prioritized Capability Lists (IPCL) generated by Warfighting Development Centers (WDC), Fleet Integrated Priorities Letter (IPL), Fleet Commanders' FLEX Guidance, Navy Urgent Operational Needs Statements, Fleet Design, DMO, and other concepts. Additionally, through experimentation activities such as workshops, war simulations, live at-sea events, and experimentation campaigns, the FLEX program examines potential materiel and non-materiel solutions that will enhance the Fleet's ability to execute assigned missions. FLEX events and campaigns are comprised of all facets of experimentation including design, planning, systems engineering and integration, execution, data collection, analysis, assessment, and the delivery of tangible products. While Naval-centric, FLEX efforts include joint, coalition, Science and Technology (S&T), academia, and industry partners.

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

	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
<b>Title:</b> Fleet Experimentation (FLEX)	8.790	9.281	9.783	0.000	9.783
<b>Articles:</b>	-	-	-	-	-

**Description:** Fleet Experimentation (FLEX) is a collaborative effort with multiple partners designed to address prioritized capability gaps to produce Doctrine, Organization, Training, Materiel, Leadership, Personnel, Facilities, and Policy (DOTMLPF-P) actions. FLEX deliverables are focused on operational and tactical warfighting capabilities in the near term (within the Future Years Defense Plan) and prioritized by annual Fleet (CUSFF, CPF, CNE-AF) Commanders' guidance to enhance warfighting capability across all warfare areas. FLEX is the enabler to Fleet Design and its experimentation initiatives support delivery of Navy Operational Architecture (NOA), Fleet Warfighting Training Continuum (FWTC) and Distributed Maritime Operations (DMO).

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020		
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 0606355N / Warfare Innovation Management	Project (Number/Name) 3319 / Fleet Experimentation				
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
	FLEX supports efforts for workshops, in-port and at-sea experiments, and war simulations. FLEX provides venues and the expertise to identify DOTMLPF-P gaps for sponsored programs/technologies prior to delivery to the Fleet, with the goal of delivering capability wholeness to the warfighter. FLEX is vital to continuously improving critical naval warfighting capabilities identified in the Navy's Concept for Distributed Maritime Operations (DMO) signed by CNO Feb 2019 and "A Design for Maintaining Maritime Superiority 2.0" signed by CNO Dec 2018					
<b>FY 2020 Plans:</b>  Commander U.S. Fleet Forces Command, Commander Pacific Fleet and Commander Naval Forces Europe - Africa, approve the Fleet Experimentation (FLEX) Execution Plan every two (2) years. Highlighted in this submission is the FY20/21 plan. The Navy's FY20 FLEX plan aligns to the U.S. Navy Fleet Design campaign plan and its implementation by 2023. The following FLEX efforts will build upon prior year efforts in either a workshop, at-sea event, or war simulation:  <b>OPERATIONAL COMMAND AND CONTROL (C2) OF MINE WARFARE (MIW)</b> This tabletop experiment will examine, compare, and contrast the merits of several courses of action proposed to modify the existing MIW C2 construct. The results will be used to support a Fleet Commander decision on the way-ahead for MIW C2.  <b>FLEET BATTLE PROBLEM 19-4</b> FBP 19-4 will examine an Amphibious Readiness Group's (ARG) capability to execute specified tasks during an extended duration transit in restrictive Emissions Control (EMCON) conditions, including flight operations, replenishments at sea, and casualty evacuations. FLEX will focus on Information Warfare Commander concept of operations and own force monitoring capabilities during EMCON.  <b>FAST AGILE NAVAL TECHNOLOGY MUNITIONS (FANTOM) TECHNOLOGY INNOVATION GAME (TIG) WORKSHOP</b> TIG workshops, executed in conjunction with ONR, give Fleet operators the opportunity to examine emerging capabilities and determine potential concepts of employment to effectively incorporate innovative capabilities into Fleet warfighting missions and tasks. The FANTOM workshop will provide fleet feedback on potential employment of emerging torpedo technology.  <b>FLEET BATTLE PROBLEM 20-1E</b>						

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020		
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 0606355N / Warfare Innovation Management	Project (Number/Name) 3319 / Fleet Experimentation				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
FLEX during this Fleet Battle Problem will focus on Information Warfare Commander concept of operations and enabling doctrine, alternate communication paths, and enhancing communication flexibility and battle awareness for the Maritime Operations Center (MOC).						
<b>NAVAL INTEGRATED FIRES CAMPAIGN KINETIC WAR SIMULATION</b> This effort builds upon prior year experiments to further examine US Navy Carrier Strike Group (CSG) capability to successfully employ Navy Integrated Fires capabilities.						
<b>SILENT ECHO</b> During this Commander, Sixth Fleet exercise, FLEX will examine Navy Tactical Exploitation of National Capabilities (TENCAP) sponsored capabilities focused on electromagnetic maneuver warfare enablers.						
<b>JUNIPER COBRA 20-2</b> During this Commander, Sixth Fleet exercise, FLEX will examine capabilities focused on electromagnetic maneuver warfare enablers such as maneuver decision aids and alternative communication paths/methods.						
<b>ADVANCED LONG RANGE TARGETING (ALRT) TECHNOLOGY INNOVATION GAME (TIG) WORKSHOP</b> TIG workshops, executed in conjunction with ONR, give Fleet operators the opportunity to examine emerging capabilities and determine potential concepts of employment to effectively incorporate innovative capabilities into Fleet warfighting missions and tasks. The ALRT workshop will provide fleet feedback on potential employment of battle management decision tools incorporating artificial intelligence capabilities.						
<b>PACIFIC BATTLE LAB</b> This Pacific at-sea experiment will employ a two-ship task group with an opposition force to examine alternative communication paths in a contested environment.						
<b>JOINT WARRIOR 201</b> During this at-sea exercise, FLEX will examine Navy TENCAP-sponsored capabilities focused on electromagnetic maneuver warfare enablers.						
<b>LARGE SCALE EXERCISE 2020</b>						

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020		
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 0606355N / Warfare Innovation Management	Project (Number/Name) 3319 / Fleet Experimentation				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
During this two-week globally integrated large scale fleet exercise, FLEX will examine multiple initiatives focused on advancing critical Expeditionary Advanced Base Operations (EABO) and Distributed Maritime Operations (DMO) capabilities in support of Fleet Design.						
<b>BALTIC OPERATIONS (BALTOPS) 2020</b> During this annual NATO exercise, FLEX will examine several initiatives focused on electromagnetic maneuver warfare enablers and employment of unmanned systems in support of mine warfare.						
<b>RIM OF THE PACIFIC (RIMPAC) 2020</b> During this biennial coalition exercise, FLEX will examine manned-unmanned teaming, employment of unmanned systems in support of DMO, and employment of emerging technologies in support of Full Spectrum Undersea Warfare (USW).						
<b>VALIANT SHIELD 2020</b> During this biennial joint exercise, FLEX will primarily examine the employment of long range maritime fires.						
<b>COUNTER-UNMANNED SYSTEMS</b> This at-sea experiment will build upon previous efforts to examine emerging technologies in support of the detection, tracking, and engagement of Unmanned Systems (UxS) in a maritime environment.						
<b>FY 2021 Base Plans:</b> Commander U.S. Fleet Forces Command, Commander Pacific Fleet and Commander Naval Forces Europe - Africa, approve the Fleet Experimentation (FLEX) Execution Plan every two (2) years. Highlighted in this submission is the FY20/21 plan. The Navy's FY21 FLEX plan aligns to the U.S. Navy Fleet Design campaign plan and its implementation by 2023. The following FLEX efforts will build upon prior year efforts in either a workshop, at-sea event, or war simulation:						
<b>COUNTER-INTELLIGENCE, SURVEILLANCE, RECONNAISSANCE AND TARGETING (ISRT)</b> Experiments will build upon EMW-related experiments completed in recent years to explore technologies and associated Training Tactic and Procedure (TTP) designed to counter adversary ISRT capabilities.						
<b>RESILIENT COMMUNICATIONS AND MISSION COMMAND</b>						

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020		
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 0606355N / Warfare Innovation Management	Project (Number/Name) 3319 / Fleet Experimentation				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Experiments will build upon technologies and associated TTP designed to provide the Fleet with alternative communication capabilities that can be relied upon in communication contested environments.						
<b>LOGISTICS MOBILITY, CAPACITY, AND PROTECTION</b> Experiments will build upon technologies and associated TTP designed to enhance fleet logistics capabilities to support operations in contested environments.						
<b>SPACE AND CYBERSPACE INTEGRATION</b> Experiments will build upon technologies and associated TTP designed to enhance the fleet's capability to integrate space and cyberspace operations in support of Distributed Maritime Operations (DMO).						
<b>REMOTE AND PASSIVE SENSING INTEGRATION</b> Experiments will build upon technologies and associated TTP designed to enhance the fleet's capability to take advantage of all available sensor data in support of DMO.						
<b>LONG RANGE FIRES</b> Experiments will build upon technologies and associated TTP designed to enhance fleet long range fires capabilities in support of DMO.						
<b>POINT DEFENSE</b> Experiments will build upon technologies and associated TTP designed to enhance the fleet's capability to provide "last line" of defense against adversary manned and unmanned threats.						
<b>NAVAL OPERATIONAL ARCHITECTURE</b> Experiments will build upon Large Scale Exercise (LSE) 2020 and continue to explore technologies and associated TTP designed to provide the fleet with an integrated operational architecture capable of supporting all facets of DMO.						
<b>FY 2021 OCO Plans:</b> N/A						
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> FY21 \$0.502 million increase supports additional experimentation venues and initiatives including Fleet Battle Problems (FBP) and Large Scale Exercises (LSE) in support of the Distributed Maritime Operations (DMO)						

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020		
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 0606355N / Warfare Innovation Management	Project (Number/Name) 3319 / Fleet Experimentation				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
concept and as directed in FRAGO 01/2019: "A Design for Maintaining Maritime Superiority 2.0", and faster introduction of the capabilities identified in these documents.						
The FY 2021 funding request was reduced by \$0.804 million to account for the availability of prior year execution balances.						
<b>Accomplishments/Planned Programs Subtotals</b>		8.790	9.281	9.783	0.000	9.783
<b>C. Other Program Funding Summary (\$ in Millions)</b>						
N/A						
<b>Remarks</b>						
<b>D. Acquisition Strategy</b>						
N/A						

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020				
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)						
1319 / 6					PE 0606355N / Warfare Innovation Management				3320 / TRIDENT Warrior						
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			
3320: TRIDENT Warrior	0.000	2.213	2.285	2.339	-	2.339	2.388	2.435	2.485	2.535	Continuing	Continuing			
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-					
<b>A. Mission Description and Budget Item Justification</b>															
U.S. Navy's Trident Warrior (TW) experiment campaign enables early delivery of Information Warfare (IW) capabilities to the warfighter via Fleet-directed TW operational events. Integrates stand-alone systems and efforts to achieve substantially enhanced capability, demonstrates/tests these capabilities in both laboratory and operational environments, and evaluates their effectiveness. Develops supporting concepts and Concept of Operations to improve warfighting effectiveness. Coordinates IW efforts with other Service/Joint/Department of Defense/National efforts to ensure Joint/Interagency/ Allied/Coalition applicability and interoperability.															
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>															
Title: Trident Warrior											FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Articles:											2.213	2.285	2.339	0.000	2.339
<b>FY 2020 Plans:</b>											-	-	-	-	
<ul style="list-style-type: none"> <li>- Evaluate Trident Warrior 2019 (TW19) executed experiments and recommend next steps to all stakeholders.</li> <li>- Promote broad participation in Trident Warrior (TW) by researching advanced technology solution candidates, in conjunction with other services, and academic research in order to fill Information Warfare (IW) technology gaps.</li> <li>- In accordance with standardized procedures, lead TW participant efforts with the following: specific goal identification; risk identification; experiment plans (to include data requirements and collection); and required installation and security certifications, accreditations, and approvals.</li> <li>- Provide Subject Matter Expertise (SME) for core ship services during the experimentation period.</li> <li>- Provide independent experts to ensure compliance with experiment plans, lead analysis effort, and deliver unbiased assessments.</li> <li>- Provide Subject Matter Expertise to ensure initiative readiness and compliance in the following areas: Information Assurance, Naval Modernization Process, Experimentation Design, Data Collection and Analysis, Report writing and dissemination.</li> <li>- Provide results to government sponsors to support the program's engineering recommendations.</li> <li>- Plan and execute Trident Warrior 2020 (TW20) experiments to accelerate the transition of IW capability to the Fleet.</li> <li>- Begin Trident Warrior 2021 (TW21) planning, taking into consideration identified Naval Capability Gaps.</li> </ul>															
<b>FY 2021 Base Plans:</b>															

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy			<b>Date:</b> February 2020		
<b>Appropriation/Budget Activity</b> 1319 / 6		<b>R-1 Program Element (Number/Name)</b> PE 0606355N / <i>Warfare Innovation Management</i>		<b>Project (Number/Name)</b> 3320 / <i>TRIDENT Warrior</i>	
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>					
FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	
<ul style="list-style-type: none"> <li>- Evaluate TW20 executed experiments and recommend next steps to all stakeholders.</li> <li>- Promote broad participation in TW by researching advanced technology solution candidates, in conjunction with other services, and academic research in order to fill IW technology gaps.</li> <li>- In accordance with standardized procedures, lead TW participant efforts with the following: specific goal identification; risk identification; experiment plans (to include data requirements and collection); and required installation and security certifications, accreditations, and approvals.</li> <li>- Provide independent experts and SME to ensure compliance with experiment plans, lead analysis effort, and deliver unbiased assessments and results to government sponsors to support the program's engineering recommendations.</li> <li>- Plan and execute TW20 experiments to accelerate the transition of IW capability to the Fleet.</li> <li>- Begin Trident Warrior 2022 (TW22) planning, taking into consideration identified Naval Capability Gaps.</li> </ul>					
<b>FY 2021 OCO Plans:</b> N/A					
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Increase of \$0.054 million from FY 2020 to FY 2021 is attributed to additional Subject Matter Expertise (SME) support for core ship services during the experimentation period.					
<b>Accomplishments/Planned Programs Subtotals</b>					
2.213      2.285      2.339      0.000      2.339					
<b>C. Other Program Funding Summary (\$ in Millions)</b>					
N/A					
<b>Remarks</b>					
<b>D. Acquisition Strategy</b>					
N/A					

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)				
1319 / 6					PE 0606355N / Warfare Innovation Management				3420 / Expeditionary Submarine Fiber Optic Cable (SFOC)				
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	
3420: <i>Expeditionary Submarine Fiber Optic Cable (SFOC)</i>	0.000	5.603	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.603	
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

Maritime Communications Demonstration (MCD) project is a classified program responsible for developing concepts designed to validate material and non-material solutions providing resilient Command and Control (C2) within the maritime domain. The focus is to demonstrate capabilities leveraging existing DOD investments and infrastructure to move data and information. Demonstration will include maritime assets, experimental methodologies, and current backhaul architecture for data movement. The key deliverable will be a series of at sea demonstrations to validate maritime segment components in an operationally representative environment. This is not a new start. In FY17 \$2.8M of funding was managed from within the Fleet Experimentation (FLEX) program and used for MCD project tasking for transparency. This effort is part of Secretary of Defense's (SECDEF) third offset initiative and was identified as a required operational capability by USEUCOM, USNORTHCOM, USPACOM, and USSTRATCOM. This effort will fund limited technical development and a series of at-sea demonstrations raising the technical readiness levels of various components with a cable handling and deployment system in an operationally representative environment, with the intent to rapidly transition to an operational capability.

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

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<p><b>Title:</b> Expeditionary Submarine fiber Optic Cable (SFOC)</p> <p><b>Articles:</b></p> <p><b>Description:</b> Classified Project - the Maritime Communications Demonstration (MCD) project is developing and experimenting innovative concepts designed to validate both materiel and non-materiel methodologies to provide resilient command and control within the maritime and littoral domains. The project focus is to demonstrate capabilities that leverage existing industry and DOD investments and infrastructure using non-traditional means to move data and information. The key deliverable will be a series of at-sea demonstrations to validate maritime segment components in an operationally representative environment.</p> <p><b>FY 2020 Plans:</b> N/A</p> <p><b>FY 2021 Base Plans:</b> N/A</p> <p><b>FY 2021 OCO Plans:</b></p>	5.603	0.000	0.000	0.000	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020
<b>Appropriation/Budget Activity</b> 1319 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0606355N / <i>Warfare Innovation Management</i>	<b>Project (Number/Name)</b> 3420 / <i>Expeditionary Submarine Fiber Optic Cable (SFOC)</i>		
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>  N/A  <b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> The last year of funding for this project is FY19 RDT&E		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>
	<b>Accomplishments/Planned Programs Subtotals</b>	5.603	0.000	0.000
<b>C. Other Program Funding Summary (\$ in Millions)</b> N/A <b>Remarks</b>				<b>FY 2021 OCO</b>
<b>D. Acquisition Strategy</b> Maritime Communications Demonstration is a non-acquisition program that promotes DoD interoperability to achieve resilient C2 data flows by facilitating maritime architectures in both processes and communications systems, including emerging capabilities, to counter growing high-end asymmetric threats, and is a key enabler of the Combatant Commanders C2 functionality.				<b>FY 2021 Total</b>

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy											Date: February 2020					
Appropriation/Budget Activity					R-1 Program Element (Number/Name)											
1319: Research, Development, Test & Evaluation, Navy / BA 6: RDT&E Management Support					PE 0606942M I (U)Assessments and Evals Cyber Vulnerabilities											
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	6.731	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	6.731				
4038: Cyber Vulnerability Evaluation	0.000	6.731	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	6.731				

**Note**

Efforts in this PE were previously funded (FY18) in PE 0605873M, PRJ 0033.

**A. Mission Description and Budget Item Justification**

This effort provides an OT&E approach to protect Marine Corps critical Cyber information and intelligence through vulnerability evaluations of all major DoD weapons systems and critical military installations; as directed by Section 1650 of Public Law 114-328 (NDAA for FY2017) and Section 1647 of Public Law 114-92 (NDAA FY2016). This will be accomplished through protection, detection, response, restoration, remediation, and mitigation. Testing and evaluation will be completed at Marine Corps facilities and Government Labs, to include the Marine Corps Cyber Range, Naval Air Systems Command (NAVAIR) and Marine Corps Tactical Systems Support Activity (MCTSSA).

Sec. 1647 of the FY16 NDAA directs the Secretary of Defense to complete an evaluation of the cyber vulnerabilities of each major weapon system of the Department of Defense by not later than December 31, 2019. Funded vulnerability assessments will build upon existing efforts regarding the identification and mitigation of cyber vulnerabilities of major weapons systems, and shall not duplicate similar ongoing efforts such as Task Force Cyber Awakening or conduct redundant assessment on systems that have already been evaluated.

Sec. 1647 assessment will be formalized in Vulnerability Assessment Reports (VARs), Cyber Table Top Exercises (CTTXs), Cyber Risk Analysis (CRAs) and other reporting.

Sec. 1650 of the FY17 NDAA directs the Secretary of Defense to submit a plan for assessing the cyber vulnerability of critical defense infrastructure and begin assessment of this infrastructure during a preliminary pilot program that will assess no fewer than two installations by December, 31 2019. Assessments will end in 2020 with the submission of the final report. Strategies mitigating the risk of cyber vulnerabilities should be identified during the course of evaluation.

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<b>Exhibit R-2, RDT&amp;E Budget Item Justification: PB 2021 Navy</b>					<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b>	<b>R-1 Program Element (Number/Name)</b> PE 0606942M I (U)Assessments and Evals Cyber Vulnerabilities				
<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
Previous President's Budget	7.000	0.000	0.000	-	0.000
Current President's Budget	6.731	0.000	0.000	-	0.000
Total Adjustments	-0.269	0.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.269	0.000			
• Rate/Misc Adjustments	0.000	0.000	0.000	-	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020	
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0606942M I (U)Assessments and Evals Cyber Vulnerabilities				Project (Number/Name) 4038 I Cyber Vulnerability Evaluation			
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
4038: Cyber Vulnerability Evaluation	0.000	6.731	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	6.731
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

**Note**  
Efforts in this PRJ were previously funded (FY18) in PE 0605873M, PRJ 0033.

**A. Mission Description and Budget Item Justification**  
This effort provides an OT&E approach to protect Marine Corps critical Cyber information and intelligence through vulnerability evaluations of all major DoD weapons systems and critical military installations; as directed by Section 1650 of Public Law 114-328 (NDAA for FY2017) and Section 1647 of Public Law 114-92 (NDAA FY2016). This will be accomplished through protection, detection, response, restoration, remediation, and mitigation. Testing and evaluation will be completed at Marine Corps facilities and Government Labs, to include the Marine Corps Cyber Range, Naval Air Systems Command (NAVAIR) and Marine Corps Tactical Systems Support Activity (MCTSSA).

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<b>Title:</b> Cyber Assessments/Cyber Awareness Red Team Support <b>Articles:</b>	6.731	0.000	0.000	0.000	0.000
<b>Description:</b> In Section 1650 of Public Law 114-328, the NDAA for FY2017, the Congress mandated that the DoD conduct Cyber Vulnerability evaluations of critical military installations by December 31,2019. In section 1647 of Public Law 114-92, the NDAA for FY2016, the Congress mandated that DoD conduct cyber vulnerability evaluations of all major DoD weapons systems by 31 December 2019.	-	-	-	-	-
<b>FY 2020 Plans:</b> N/A					
<b>FY 2021 Base Plans:</b> N/A					
<b>FY 2021 OCO Plans:</b> N/A					
<b>Accomplishments/Planned Programs Subtotals</b>	6.731	0.000	0.000	0.000	0.000

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy	<b>Date:</b> February 2020	
<b>Appropriation/Budget Activity</b> 1319 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0606942M I (U)Assessments and Evals <i>Cyber Vulnerabilities</i>	<b>Project (Number/Name)</b> 4038 I <i>Cyber Vulnerability Evaluation</i>
<b>C. Other Program Funding Summary (\$ in Millions)</b>		
N/A		
<b>Remarks</b>		
<b>D. Acquisition Strategy</b>		
N/A		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy											Date: February 2020	
Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
1319: Research, Development, Test & Evaluation, Navy / BA 6: RDT&E Management Support					PE 0606942N / Assessments & Evals Cyber Vulnerabilities							
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	42.285	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	42.285
4038: Cyber Vulnerability Evaluation	0.000	42.285	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	42.285

**A. Mission Description and Budget Item Justification**

The Cyber Vulnerability Assessments and Evaluations program funds for cyber vulnerability assessments of major Navy weapons systems and cyber vulnerability assessments of critical shore infrastructure as directed by Sec. 1647 of the FY16 National Defense Authorization Act (NDAA) and Sec. 1650 of the FY17 NDAA, respectively. Funding will be used for assessments and non-recurring engineering for mitigations related to the Navy's major weapons systems identified in Joint Requirements Oversight Committee Memorandum (JROCM) 039-16 and on prioritized critical shore infrastructure prioritized.

Sec. 1647 of the FY16 NDAA directs the Secretary of Defense to complete an evaluation of the cyber vulnerabilities of each major weapon system of the Department of Defense by not later than December 31, 2019. Funded vulnerability assessments will build upon existing efforts regarding the identification and mitigation of cyber vulnerabilities of major weapons systems, and shall not duplicate similar ongoing efforts such as Task Force Cyber Awakening or conduct redundant assessment on systems that have already been evaluated.

Sec. 1647 assessment will be formalized in Vulnerability Assessment Reports (VARs), Cyber Table Top Exercises (CTTXs), Cyber Risk Analysis (CRAs) and other reporting.

Sec. 1650 of the FY17 NDAA directs the Secretary of Defense to submit a plan for assessing the cyber vulnerability of critical defense infrastructure and begin assessment of this infrastructure during a preliminary pilot program that will assess no fewer than two installations by December, 31 2019. Funded vulnerability assessments will end by calendar year 2020 and will build upon existing mission assurance, blue team, and red team capabilities. As instructed by the Congressional language, the assessments will utilize Department of Energy (DoE) and Department of Defense (DOD) national laboratory partnerships. Assessments will end with the submission of a final report to Congress. Strategies and procedures for mitigating the risk of cyber vulnerabilities should be identified during the course of evaluation.

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<b>Exhibit R-2, RDT&amp;E Budget Item Justification: PB 2021 Navy</b>					<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b>	<b>R-1 Program Element (Number/Name)</b>				
1319: <i>Research, Development, Test &amp; Evaluation, Navy / BA 6: RDT&amp;E Management Support</i>	PE 0606942N / Assessments & Evals Cyber Vulnerabilities				
<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
Previous President's Budget	48.800	0.000	0.000	-	0.000
Current President's Budget	42.285	0.000	0.000	-	0.000
Total Adjustments	-6.515	0.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-4.808	0.000			
• SBIR/STTR Transfer	-1.709	0.000			
• Rate/Misc Adjustments	0.002	0.000	0.000	-	0.000
<b>Change Summary Explanation</b>	The funding decrease from FY 2019 to FY 2020 is due to the completion of the one year Cyber Vulnerability assessments of major Navy weapon systems and critical infrastructure.				
Technical: Not applicable.					
Schedule: Not applicable.					

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020	
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)			
1319 / 6					PE 0606942N / Assessments & Evals Cyber Vulnerabilities				4038 / Cyber Vulnerability Evaluation			
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
4038: Cyber Vulnerability Evaluation	0.000	42.285	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	42.285
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

The Cyber Vulnerability Assessments and Evaluations program funds for cyber vulnerability assessments of major Navy weapons systems and cyber vulnerability assessments of critical shore infrastructure as directed by Sec. 1647 of the FY16 National Defense Authorization Act (NDAA) and Sec. 1650 of the FY17 NDAA, respectively. Funding will be used for assessments and non-recurring engineering for mitigations related to the Navy's major weapons systems identified in Joint Requirements Oversight Committee Memorandum (JROCM) 039-16 and on prioritized critical shore infrastructure.

Sec. 1647 of the FY16 NDAA directs the Secretary of Defense to complete an evaluation of the cyber vulnerabilities of each major weapon system of the Department of Defense by not later than December 31, 2019. Funded vulnerability assessments will build upon existing efforts regarding the identification and mitigation of cyber vulnerabilities of major weapons systems, and shall not duplicate similar ongoing efforts such as Task Force Cyber Awakening or conduct redundant assessment on systems that have already been evaluated.

Sec. 1647 assessment will be formalized in Vulnerability Assessment Reports (VARs), Cyber Table Top Exercises (CTTXs), Cyber Risk Analysis (CRAs) and other reporting.

Sec. 1650 of the FY17 NDAA directs the Secretary of Defense to submit a plan for assessing the cyber vulnerability of critical defense infrastructure and begin assessment of this infrastructure during a preliminary pilot program that will assess no fewer than two installations by December, 31 2019. Funded vulnerability assessments will end by calendar year 2020 and will build upon existing mission assurance, blue team, and red team capabilities. As instructed by the Congressional language, the assessments will utilize DoE and DoD national laboratory partnerships. Assessments will end with the submission of a final report to Congress. Strategies and procedures for mitigating the risk of cyber vulnerabilities should be identified during the course of evaluation.

Program is to support Cyber Vulnerability Evaluations Assessments of E6B and Other Aviation Platforms.

The Cyber Vulnerability Assessments and Evaluations program funds for cyber vulnerability assessments of major Navy weapons systems and cyber vulnerability assessments of critical shore infrastructure as directed by Sec. 1647 of the FY16 National Defense Authorization Act (NDAA) and Sec. 1650 of the FY17 NDAA, respectively. Funding will be used for assessments and non-recurring engineering for mitigations related to the Navy's major weapons systems identified in Joint Requirements Oversight Committee Memorandum (JROCM) 039-16 and on prioritized critical shore infrastructure prioritized.

Sec. 1647 of the FY16 NDAA directs the Secretary of Defense to complete an evaluation of the cyber vulnerabilities of each major weapon system of the Department of Defense by not later than December 31, 2019. Funded vulnerability assessments will build upon existing efforts regarding the identification and mitigation of cyber vulnerabilities of major weapons systems, and shall not duplicate similar ongoing efforts such as Task Force Cyber Awakening or conduct redundant assessment on systems that have already been evaluated.

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0606942N / Assessments & Evals Cyber Vulnerabilities	<b>Project (Number/Name)</b> 4038 / Cyber Vulnerability Evaluation
Sec. 1647 assessment will be formalized in Vulnerability Assessment Reports (VARs), Cyber Table Top Exercises (CTTXs), Cyber Risk Analysis (CRAs) and other reporting.		
Sec. 1650 of the FY17 NDAA directs the Secretary of Defense to submit a plan for assessing the cyber vulnerability of critical defense infrastructure and begin assessment of this infrastructure during a preliminary pilot program that will assess no fewer than two installations by December, 31 2019. Funded vulnerability assessments will end by calendar year 2020 and will build upon existing mission assurance, blue team, and red team capabilities. As instructed by the Congressional language, the assessments will utilize Department of Energy (DoE) and Department of Defense (DoD) national laboratory partnerships. Assessments will end with the submission of a final report to Congress. Strategies and procedures for mitigating the risk of cyber vulnerabilities should be identified during the course of evaluation. The Cyber Vulnerability Assessments and Evaluations program funds for cyber vulnerability assessments of major Navy weapons systems and cyber vulnerability assessments of critical shore infrastructure as directed by Sec. 1647 of the FY16 National Defense Authorization Act (NDAA) and Sec. 1650 of the FY17 NDAA, respectively. Funding will be used for assessments and non-recurring engineering for mitigations related to the Navy's major weapons systems identified in Joint Requirements Oversight Committee Memorandum (JROCM) 039-16 and on prioritized critical shore infrastructure.		
Sec. 1647 of the FY16 NDAA directs the Secretary of Defense to complete an evaluation of the cyber vulnerabilities of each major weapon system of the Department of Defense (DoD) by no later than December 31, 2019. Funded vulnerability assessments will build upon existing efforts regarding the identification and mitigation of cyber vulnerabilities of major weapons systems, and shall not duplicate similar ongoing efforts such as Task Force Cyber Awakening or conduct redundant assessment on systems that have already been evaluated.		
Sec. 1647 assessment will be formalized in Vulnerability Assessment Reports (VARs), Cyber Table Top Exercises (CTTXs), Cyber Risk Analysis (CRAs) and other reporting.		
Sec. 1650 of the FY17 NDAA directs the Secretary of Defense to submit a plan for assessing the cyber vulnerability of critical defense infrastructure and begin assessment of this infrastructure during a preliminary pilot program that will assess no fewer than two installations by December, 31 2019. Funded vulnerability assessments will end by calendar year 2020 and will build upon existing mission assurance, blue team, and red team capabilities. As instructed by the Congressional language, the assessments will utilize Department of Energy (DoE) and DoD national laboratory partnerships. Assessments will end with the submission of a final report to Congress. Strategies and procedures for mitigating the risk of cyber vulnerabilities should be identified during the course of evaluation. The Cyber Vulnerability Assessments and Evaluations program funds for cyber vulnerability assessments of major Navy weapons systems and cyber vulnerability assessments of critical shore infrastructure as directed by Sec. 1647 of the FY16 National Defense Authorization Act (NDAA) and Sec. 1650 of the FY17 NDAA, respectively. Funding will be used for assessments and non-recurring engineering for mitigations related to the Navy's major weapons systems identified in Joint Requirements Oversight Committee Memorandum (JROCM) 039-16 and on prioritized critical shore infrastructure.		
Sec. 1647 of the FY16 NDAA directs the Secretary of Defense to complete an evaluation of the cyber vulnerabilities of each major weapon system of the Department of Defense by not later than December 31, 2019. Funded vulnerability assessments will build upon existing efforts regarding the identification and mitigation of cyber		

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy					Date: February 2020				
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)							
1319 / 6	PE 0606942N / Assessments & Evals Cyber Vulnerabilities	4038 / Cyber Vulnerability Evaluation							
vulnerabilities of major weapons systems, and shall not duplicate similar ongoing efforts such as Task Force Cyber Awakening or conduct redundant assessment on systems that have already been evaluated.									
Sec. 1647 assessment will be formalized in Vulnerability Assessment Reports (VARs), Cyber Table Top Exercises (CTTXs), Cyber Risk Analysis (CRAs) and other reporting.									
Sec. 1650 of the FY17 NDAA directs the Secretary of Defense to submit a plan for assessing the cyber vulnerability of critical defense infrastructure and begin assessment of this infrastructure during a preliminary pilot program that will assess no fewer than two installations by December, 31 2019. Funded vulnerability assessments will end by fiscal year 2020 and will build upon existing mission assurance, blue team, and red team capabilities. As instructed by the Congressional language, the assessments will utilize DoE and DoD national laboratory partnerships. Assessments will end with the submission of a final report to Congress. Strategies and procedures for mitigating the risk of cyber vulnerabilities should be identified during the course of evaluation.									
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)			FY 2019	FY 2020	FY 2021 Base				
<b>Title:</b> Cyber Vulnerability Evaluation for Ship Weapons Systems:			4.612	0.000	0.000				
<b>FY 2020 Plans:</b> N/A			-	-	-				
<b>FY 2021 Base Plans:</b> N/A									
<b>FY 2021 OCO Plans:</b> N/A									
<b>Title:</b> Cyber Vulnerability Assessments of Other Aviation Platforms			FY 2019	FY 2020	FY 2021 OCO				
<b>FY 2020 Plans:</b> N/A			2.889	0.000	0.000				
<b>FY 2021 Base Plans:</b> N/A			-	-	-				
<b>FY 2021 OCO Plans:</b> N/A									
<b>Title:</b> E6B			FY 2019	FY 2020	FY 2021 Total				
<b>Articles:</b>			2.092	0.000	0.000				
			-	-	-				

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy					Date: February 2020	
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 0606942N / Assessments & Evals Cyber Vulnerabilities	Project (Number/Name) 4038 / Cyber Vulnerability Evaluation				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<b>FY 2020 Plans:</b> N/A						
<b>FY 2021 Base Plans:</b> N/A						
<b>FY 2021 OCO Plans:</b> N/A						
<b>Title:</b> SWS Cyber Evaluations	<b>Articles:</b>	3.500	0.000	0.000	0.000	0.000
<b>FY 2020 Plans:</b> N/A		-	-	-	-	-
<b>FY 2021 Base Plans:</b> N/A						
<b>FY 2021 OCO Plans:</b> N/A						
<b>Title:</b> Trident System Cyber Hardening	<b>Articles:</b>	5.154	0.000	0.000	0.000	0.000
<b>FY 2020 Plans:</b> N/A		-	-	-	-	-
<b>FY 2021 Base Plans:</b> N/A						
<b>FY 2021 OCO Plans:</b> N/A						
<b>Title:</b> Cyber Vulnerability Assessments of Information Warfare Weapons Systems	<b>Articles:</b>	4.808	0.000	0.000	0.000	0.000
<b>FY 2020 Plans:</b> N/A		-	-	-	-	-
<b>FY 2021 Base Plans:</b>						

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)		
1319 / 6	PE 0606942N / Assessments & Evals Cyber Vulnerabilities	4038 / Cyber Vulnerability Evaluation		
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		FY 2019	FY 2020	FY 2021 Base
N/A				FY 2021 OCO
<b>FY 2021 OCO Plans:</b>				FY 2021 Total
N/A				
<b>Title:</b> Cyber Vulnerability Assessments of Critical Infrastructure	<b>Articles:</b>	19.230	0.000	0.000
<b>Description:</b> The Cyber Vulnerability Assessments and Evaluations program funds cyber vulnerability assessments of critical shore infrastructure as directed by Section 1650 of the FY17 National Defense Authorization Act (NDAA). Funding will be used for assessments of prioritized critical shore infrastructure. Sec. 1650 of the FY17 NDAA directs the Secretary of Defense to submit a plan for assessing the cyber vulnerability of critical defense infrastructure and begin assessment of this infrastructure during a preliminary pilot program that will assess no fewer than two installations by December, 31 2019. Funded vulnerability assessments will end by calendar year 2020 and will build upon existing mission assurance, blue team, and red team capabilities. As instructed by the Congressional language, the assessments will utilize DoE and DoD national laboratory partnerships. Assessments will end with the submission of a final report to Congress. Strategies and procedures for mitigating the risk of cyber vulnerabilities should be identified during the course of evaluation.		0.000	0.000	0.000
<b>FY 2020 Plans:</b>				
N/A				
<b>FY 2021 Base Plans:</b>				
N/A				
<b>FY 2021 OCO Plans:</b>				
N/A				
<b>Accomplishments/Planned Programs Subtotals</b>		42.285	0.000	0.000
0.000				
<b>C. Other Program Funding Summary (\$ in Millions)</b>				
N/A				
<b>Remarks</b>				
<b>D. Acquisition Strategy</b>				
N/A				

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy											Date: February 2020	
Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
1319: Research, Development, Test & Evaluation, Navy / BA 6: RDT&E Management Support					PE 0305327N / Insider Threat							
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	1.682	2.645	2.310	-	2.310	2.676	2.568	2.536	2.586	Continuing	Continuing
3442: Insider Threat	0.000	1.682	2.645	2.310	-	2.310	2.676	2.568	2.536	2.586	Continuing	Continuing
<b>A. Mission Description and Budget Item Justification</b>												
Executive Order 13587 and the National Insider Threat Policy mandate all United States Government departments and agencies to implement insider threat programs that monitor user activity on all classified networks and provide an insider threat analytical and response capability. The Counter Insider Threat Capability (CITC) is the Department of the Navy's implementation of this requirement. CITC's mission is to deter, detect, and respond to the threat from witting and unwitting insiders. The Personnel Risk Indicator Detection Enterprise (PRIDE) is the materiel solution required to support the CITC mission, and it will consist of two parts: (1) User Activity Monitoring (UAM), which will monitor user activity on Navy networks, and (2) an Integrated Tool Suite (ITS), which will provide the Information Technology platform for the analytic and response capabilities. The PRIDE system will provide the technology required by the Department of the Navy Insider Threat Hub to comply with the National mandates and to protect Navy data, equipment, and personnel from insider threats. RDT&E,N funding is required to develop, integrate, and perform testing and evaluation of this capability.												
<b>B. Program Change Summary (\$ in Millions)</b>												
Previous President's Budget				1.682		2.645		2.500		-		2.500
Current President's Budget				1.682		2.645		2.310		-		2.310
Total Adjustments				0.000		0.000		-0.190		-		-0.190
• Congressional General Reductions				-		-						
• Congressional Directed Reductions				-		-						
• Congressional Rescissions				-		-						
• Congressional Adds				-		-						
• Congressional Directed Transfers				-		-						
• Reprogrammings				-		-						
• SBIR/STTR Transfer				-		-						
• Program Adjustments				0.000		0.000		-0.190		-		-0.190
<b>Change Summary Explanation</b>												
The FY2021 funding request was reduced by \$0.208M to account for the availability of prior year execution balances.												

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy										Date: February 2020			
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0305327N / Insider Threat				Project (Number/Name) 3442 / Insider Threat				
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	
3442: <i>Insider Threat</i>	0.000	1.682	2.645	2.310	-	2.310	2.676	2.568	2.536	2.586	Continuing	Continuing	
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-			

**A. Mission Description and Budget Item Justification**

Executive Order 13587 and the National Insider Threat Policy mandate all United States Government departments and agencies to implement insider threat programs that monitor user activity on all classified networks and provide an insider threat analytical and response capability. The Counter Insider Threat Capability (CITC) is the Department of the Navy's implementation of this requirement. CITC's mission is to deter, detect, and respond to the threat from witting and unwitting insiders. The Personnel Risk Indicator Detection Enterprise (PRIDE) is the materiel solution required to support the CITC mission, and it will consist of two parts: (1) User Activity Monitoring (UAM), which will monitor user activity on Navy networks, and (2) an Integrated Tool Suite (ITS), which will provide the Information Technology platform for the analytic and response capabilities. The PRIDE system will provide the technology required by the Department of the Navy Insider Threat Hub to comply with the National mandates and to protect Navy data, equipment, and personnel from insider threats. RDT&E,N funding is required to develop, integrate, and perform testing and evaluation of this capability.

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

FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
1.682	2.645	2.310	0.000	2.310

**Title:** Counter Insider Threat Capability (CITC)

**Articles:**

**FY 2020 Plans:**

- Develop and integrate the new capability to identify a specific type of person, as required by the Counter Insider Threat Capability (CITC) Mission.
- Continue to research and design a Hub to receive, analyze and appropriately report data from User Activity Monitoring (UAM), Random Polygraph program, Law Enforcement, Counter Intelligence, Travel/Border data, Hotline tips, Identity Matching Engine for Security and Analysis (IMESA), Inspector General (IG) and others.
- Expand the UAM tool into the software baselines of Navy Secret Internet Protocol Router Network (SIPRnet), including Consolidated Afloat Networks and Enterprise Services (CANES), Navy Marine Corps Intranet (NMCI), Outside the Continental United States (OCONUS) Navy Enterprise Network (ONE-Net), and additional Joint Worldwide Intelligence Communications System (JWICS) domains.
- Perform developmental testing of the Integrated Tool Suite (ITS) and afloat UAM installations.
- Evaluate Defense Information Systems Agency' (DISA) Big Data Platform (BDP) and Defense Security Services (DSS) Federal Vetting Enterprise (FVE) solutions as potential replacements for the commercial ITS in future increments of the Personnel Risk Indicator Detection Enterprise (PRIDE).
- Investigate commercial cloud environments for future increments of PRIDE capability on SIPRnet.

**FY 2021 Base Plans:**

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy										Date: February 2020																																						
<b>Appropriation/Budget Activity</b> 1319 / 6			<b>R-1 Program Element (Number/Name)</b> PE 0305327N / <i>Insider Threat</i>						<b>Project (Number/Name)</b> 3442 / <i>Insider Threat</i>																																							
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>						<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>																																						
<ul style="list-style-type: none"> <li>- Complete UAM tool integration into the software baselines of SIPRnet including CANES, NMCI, OCONUS ONE-Net, and additional JWICS domains.</li> <li>- Continue efforts to expand the UAM tool into the software baselines of additional Navy networks including additional JWICS domains and additional SIPRnet networks.</li> <li>- Continue evaluation of alternate technologies for future increments of UAM and ITS capability including proof of concept for DISA BPD and/or DCS FVE.</li> <li>- Perform testing and evaluation of UAM capability on SIPRnet.</li> <li>- Perform integration of additional data feeds to the ITS.</li> <li>- Investigate commercial cloud environments for future increments of PRIDE capability on Non-classified Internet Protocol Router System (NIPRnet).</li> </ul>																																																
<b>FY 2021 OCO Plans:</b> N/A																																																
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> No significant changes from FY20 to FY21.																																																
<b>Accomplishments/Planned Programs Subtotals</b>										1.682	2.645	2.310	0.000	2.310																																		
<b>C. Other Program Funding Summary (\$ in Millions)</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"><b>Line Item</b></th> <th align="right"><b>FY 2019</b></th> <th align="right"><b>FY 2020</b></th> <th align="right"><b>FY 2021 Base</b></th> <th align="right"><b>FY 2021 OCO</b></th> <th align="right"><b>FY 2021 Total</b></th> <th align="right"><b>FY 2022</b></th> <th align="right"><b>FY 2023</b></th> <th align="right"><b>FY 2024</b></th> <th align="right"><b>FY 2025</b></th> <th align="right"><b>Cost To Complete</b></th> <th align="right"><b>Total Cost</b></th> </tr> </thead> <tbody> <tr> <td>• OPN/8106: <i>Command Support Equipment/Insider Threat</i></td> <td align="right">1.707</td> <td align="right">0.000</td> <td align="right">0.000</td> <td align="right">-</td> <td align="right">0.000</td> <td align="right">0.000</td> <td align="right">0.000</td> <td align="right">0.000</td> <td align="right">0.000</td> <td align="right">0.000</td> <td align="right">2.707</td> </tr> <tr> <td>• OPN/3415: <i>Info Systems Security Program (ISSP)</i></td> <td align="right">0.000</td> <td align="right">2.619</td> <td align="right">0.000</td> <td align="right">-</td> <td align="right">0.000</td> <td align="right">0.000</td> <td align="right">0.000</td> <td align="right">0.000</td> <td align="right">0.000</td> <td align="right">0.000</td> <td align="right">2.619</td> </tr> </tbody> </table>													<b>Line Item</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	• OPN/8106: <i>Command Support Equipment/Insider Threat</i>	1.707	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	2.707	• OPN/3415: <i>Info Systems Security Program (ISSP)</i>	0.000	2.619	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	2.619
<b>Line Item</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>																																					
• OPN/8106: <i>Command Support Equipment/Insider Threat</i>	1.707	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	2.707																																					
• OPN/3415: <i>Info Systems Security Program (ISSP)</i>	0.000	2.619	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	2.619																																					
<b>Remarks</b>																																																
<b>D. Acquisition Strategy</b> N/A																																																

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy											Date: February 2020				
Appropriation/Budget Activity					R-1 Program Element (Number/Name)										
1319: Research, Development, Test & Evaluation, Navy / BA 6: RDT&E Management Support					PE 0902498N / Management HQ - Departmental Spt Acts										
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	1.568	1.460	1.536	-	1.536	1.566	1.592	1.632	1.667	Continuing	Continuing			
0831: OPTEVFOR Support	0.000	1.568	1.460	1.536	-	1.536	1.566	1.592	1.632	1.667	Continuing	Continuing			
<b>A. Mission Description and Budget Item Justification</b>															
This program element (PE) provides Commander, Operational Test and Evaluation Force (COMOPTEVFOR) general support funding and operating costs for Management Headquarter Activity (MHA) functions that support COMOPTEVFOR compliance with Secretary of Defense (SECDEF) and Secretary of the Navy (SECNAV) directives to conduct independent operational testing and evaluation as described in PE 0605865N Operational Test & Evaluation Capability.															
<b>B. Program Change Summary (\$ in Millions)</b>					FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total						
Previous President's Budget					1.579	1.460	1.484	-	1.484						
Current President's Budget					1.568	1.460	1.536	-	1.536						
Total Adjustments					-0.011	0.000	0.052	-	0.052						
• Congressional General Reductions					-	-									
• Congressional Directed Reductions					-	-									
• Congressional Rescissions					-	-									
• Congressional Adds					-	-									
• Congressional Directed Transfers					-	-									
• Reprogrammings					-	-									
• SBIR/STTR Transfer					-0.011	0.000									
• Program Adjustments					0.000	0.000	0.052	-	0.052						
• Rate/Misc Adjustments					0.000	0.000	0.000	-	0.000						
<b>Change Summary Explanation</b>															
Beginning in Fiscal Year 2018, Management Headquarter Activity (MHA) labor and operating costs in support of 14 Full Time Equivalents (FTEs) has been realigned from 0605865N Operational Test and Evaluation Capability into this program element 0902498N Management Headquarters (Departmental Support Accounts) to identify all MHA costs separately. The FY 2021 increase is due to the 1.9% CIVPERS pay raise.															

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020				
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0902498N / Management HQ - Departmental Spt Acts				Project (Number/Name) 0831 / OPTEVFOR Support						
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			
0831: OPTEVFOR Support	0.000	1.568	1.460	1.536	-	1.536	1.566	1.592	1.632	1.667	Continuing	Continuing			
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-					
<b>A. Mission Description and Budget Item Justification</b>															
This program element (PE) provides Commander, Operational Test and Evaluation Force (COMOPTEVFOR) general support funding and operating costs for Management Headquarter Activity (MHA) functions that support COMOPTEVFOR compliance with Secretary of Defense (SECDEF) and Secretary of the Navy (SECNAV) directives during the conduct independent operational testing and evaluation as described in PE 0605865N Operational Test & Evaluation Capability.															
Beginning in Fiscal Year 2018, MHA labor and operating costs in support of 14 Full Time Equivalents (FTEs) has been realigned from 0605865N Operational Test and Evaluation Capability into this newly established program element 0902498N Management Headquarters (Departmental Support Accounts) as a result of SECDEF and SECNAV direction to identify all MHA costs separately.															
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>											FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<b>Title:</b> OPTEVFOR Support  <b>Description:</b> Beginning in Fiscal Year 2018, MHA labor and operating costs in support of 14 FTE has been realigned from 0605865N Operational Test and Evaluation Capability into this program element 0902498N Management Headquarters (Departmental Support Accounts) to identify all MHA costs separately.  <b>FY 2020 Plans:</b> This project will provide for the basic costs of the COMOPTEVFOR headquarters activities. Specifically, it will pay for salaries and support costs of civilian personnel who support COMOPTEVFOR compliance with directives during the conduct of independent operational testing and evaluation to determine the operational effectiveness, suitability, and cyber survivability of new and improved systems.  <b>FY 2021 Base Plans:</b> This project will provide for the basic costs of the COMOPTEVFOR headquarters activities. Specifically, it will pay for salaries and support costs of civilian personnel who support COMOPTEVFOR compliance with directives during the conduct of independent operational testing and evaluation to determine the operational effectiveness, suitability, and cyber survivability of new and improved systems.  <b>FY 2021 OCO Plans:</b>											1.568	1.460	1.536	0.000	1.536
											-	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020
<b>Appropriation/Budget Activity</b> 1319 / 6		<b>R-1 Program Element (Number/Name)</b> PE 0902498N / Management HQ - Departmental Spt Acts	<b>Project (Number/Name)</b> 0831 / OPTEVFOR Support	
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>				
FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
N/A				
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> The FY2020 to FY2021 increase was due to the CIVPERS pay raise.				
<b>Accomplishments/Planned Programs Subtotals</b>				1.568    1.460    1.536    0.000    1.536
<b>C. Other Program Funding Summary (\$ in Millions)</b>				
N/A				
<b>Remarks</b>				
<b>D. Acquisition Strategy</b>				
N/A				

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy											Date: February 2020				
Appropriation/Budget Activity					R-1 Program Element (Number/Name)										
1319: Research, Development, Test & Evaluation, Navy / BA 6: RDT&E Management Support					PE 0909980N / Judgment Fund Reimbursement										
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	0.049	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.049			
0000: UNDIST	0.000	0.049	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.049			
<b>A. Mission Description and Budget Item Justification</b>															
Funds to reimburse the U.S. Treasury for judgement fund invoices.															
<b>B. Program Change Summary (\$ in Millions)</b>				FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total							
Previous President's Budget				0.000	0.000	0.000	-	0.000							
Current President's Budget				0.049	0.000	0.000	-	0.000							
Total Adjustments				0.049	0.000	0.000	-	0.000							
• Congressional General Reductions				-	-										
• Congressional Directed Reductions				-	-										
• Congressional Rescissions				-	-										
• Congressional Adds				-	-										
• Congressional Directed Transfers				-	-										
• Reprogrammings				0.049	0.000										
• SBIR/STTR Transfer				-	-										
• Rate/Misc Adjustments				0.000	0.000	0.000	-	0.000							
<b>Change Summary Explanation</b>															
Technical: Not applicable.															
Schedule: Not applicable.															

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020		
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0909980N / Judgment Fund Reimbursement				Project (Number/Name) 0000 / UNDIST				
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	
0000: UNDIST		0.000	0.049	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.049	
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-	-		
<b>A. Mission Description and Budget Item Justification</b>													
Funds to reimburse the U.S. Treasury for judgement fund invoices.													
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>													
<i>Title:</i> Judgment Fund Reimbursement  <i>Articles:</i>													
<i>FY 2020 Plans:</i> N/A													
<i>FY 2021 Base Plans:</i> N/A													
<i>FY 2021 OCO Plans:</i> N/A													
Accomplishments/Planned Programs Subtotals										0.049	0.000	0.000	0.000
<b>C. Other Program Funding Summary (\$ in Millions)</b>													
N/A													
<b>Remarks</b>													
<b>D. Acquisition Strategy</b>													
N/A													

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy											Date: February 2020		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)								
1319: Research, Development, Test & Evaluation, Navy / BA 6: RDT&E Management Support					PE 0909999N / Cancelled Account Adjustments								
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	0.759	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.759	
0000: UNDIST	0.000	0.759	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.759	
<b>A. Mission Description and Budget Item Justification</b>													
Funding is to reimburse the Department of the Treasury for cancelled account liabilities.													
<b>B. Program Change Summary (\$ in Millions)</b>					FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total				
Previous President's Budget					0.000	0.000	0.000	-	0.000				
Current President's Budget					0.759	0.000	0.000	-	0.000				
Total Adjustments					0.759	0.000	0.000	-	0.000				
<ul style="list-style-type: none"> <li>• Congressional General Reductions</li> <li>• Congressional Directed Reductions</li> <li>• Congressional Rescissions</li> <li>• Congressional Adds</li> <li>• Congressional Directed Transfers</li> <li>• Reprogrammings</li> <li>• SBIR/STTR Transfer</li> <li>• Rate/Misc Adjustments</li> </ul>					-	-	-	-	-				
					0.759	0.000	0.000	-	0.000				
					0.000	0.000	0.000	-	0.000				
<b>Change Summary Explanation</b>													
FY19 increase due to receipt and payment of cancelled account invoices.													
Technical: Not applicable.													
Schedule: Not applicable.													

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020		
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0909999N / Cancelled Account Adjustments				Project (Number/Name) 0000 / UNDIST				
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	
0000: UNDIST		0.000	0.759	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.759	
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-	-		
<b>A. Mission Description and Budget Item Justification</b>													
Funding is to reimburse the Department of the Treasury for cancelled account liabilities.													
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>													
<i>Title:</i> Cancelled Account Adjustment  <i>Articles:</i>													
<i>FY 2020 Plans:</i> N/A													
<i>FY 2021 Base Plans:</i> N/A													
<i>FY 2021 OCO Plans:</i> N/A													
Accomplishments/Planned Programs Subtotals										0.759	0.000	0.000	0.000
<b>C. Other Program Funding Summary (\$ in Millions)</b>													
N/A													
<b>Remarks</b>													
<b>D. Acquisition Strategy</b>													
N/A													

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy											Date: February 2020	
Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
1319: Research, Development, Test & Evaluation, Navy / BA 6: RDT&E Management Support					PE 1206867N / (U)SEW Surveillance/Reconnaissance Support							
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	8.676	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	8.676
1034: TAC SAT Recon Office	0.000	8.676	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	8.676

**Note**

Efforts previously funded under PE 0605867N, Space & Elec War Surv/Recon. In FY18 and FY19 is funded under PE 1206867N SEW Surveillance/Reconnaissance Support. Beginning in FY20 is funded under PE 0605867N Space & Elec War Surv/Recon.

**A. Mission Description and Budget Item Justification**

(U) Link Crimson (Navy Tactical Exploitation of National Capabilities (TENCAP)) is a congressionally directed program to rapidly develop (12-18 months) systems, processes, and training that leverages and exploits National Technical Means (NTM) and Intelligence Community (IC) resources to meet fleet tactical warfighting gaps. This is done through innovative research and development of capabilities aligned with Navy Programs of Record (PoR), while influencing national systems support and development. These efforts include advanced sensors, platform and ground processing, and integrated national-to-tactical information fusion capabilities. Link Crimson supports all Navy mission areas, including Anti-Submarine Warfare (ASW), Integrated Air and Missile Defense, Mine Warfare (MIW), Power projection/Precision Strike, Maritime Domain Awareness (MDA), and Intelligence, Surveillance, and Reconnaissance (ISR), in support of the Navy's Information Dominance pillars: Assured Command and Control (AC2), Battlespace Awareness (BA) and Integrated Fires (IF).

(U) This program is funded under Budget Activity 6 because it supports the operations and installations required for general research and development. Program baseline addresses research and development on specific capabilities to support these mission areas such as signals collection and exploitation, acoustic and electronic signal detection, countering Unmanned Air Systems, Processing, Exploitation, and Dissemination (PED) processes, Commercial Maritime Navigation Radar (CMNR) detection and exploitation, open-ocean surveillance, and hostile threat geo-location. Link Crimson fields both prototypes to demonstrate new capabilities in real world environments in coordination with operational users, and develops warfighting capabilities for insertion into Navy, joint, and national agency programs of record. Additional detailed information is available at higher levels of classification.

(U) Project 1034: Established to exploit all National and Service sensor systems to improve tactical support to Fleet operational commanders. Project also supports equipment upgrades, training and Fleet exercises which provide the venue for testing modifications to existing programs.

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<b>Exhibit R-2, RDT&amp;E Budget Item Justification: PB 2021 Navy</b>					<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b>	<b>R-1 Program Element (Number/Name)</b>				
1319: <i>Research, Development, Test &amp; Evaluation, Navy / BA 6: RDT&amp;E Management Support</i>	PE 1206867N / (U)SEW Surveillance/Reconnaissance Support				
<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
Previous President's Budget	8.684	0.000	0.000	-	0.000
Current President's Budget	8.676	0.000	0.000	-	0.000
Total Adjustments	-0.008	0.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.008	0.000			
• SBIR/STTR Transfer	-	-			
• Rate/Misc Adjustments	0.000	0.000	0.000	-	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)				
1319 / 6					PE 1206867N I (U)SEW Surveillance/ Reconnaissance Support				1034 I TAC SAT Recon Office				
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	
1034: TAC SAT Recon Office	0.000	8.676	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	8.676	
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

(U) Link Crimson (Navy Tactical Exploitation of National Capabilities (TENCAP)) is a congressionally directed program to rapidly develop (12-18 months) systems, processes, and training that leverages and exploits National Technical Means (NTM) and Intelligence Community (IC) resources to meet fleet tactical warfighting gaps. This is done through innovative research and development of capabilities aligned with Navy Programs of Record (PoR), while influencing national systems support and development. These efforts include advanced sensors, platform and ground processing, and integrated national-to-tactical information fusion capabilities. Link Crimson supports all Navy mission areas, including Anti-Submarine Warfare (ASW), Integrated Air and Missile Defense, Mine Warfare (MIW), Power projection/Precision Strike, Maritime Domain Awareness (MDA), and Intelligence, Surveillance, and Reconnaissance (ISR), in support of the Navy's Information Dominance pillars: Assured Command and Control (AC2), Battlespace Awareness (BA) and Integrated Fires (IF).

(U) This program is funded under Budget Activity 6 because it supports the operations and installations required for general research and development. Program baseline addresses research and development on specific capabilities to support these mission areas such as signals collection and exploitation, acoustic and electronic signal detection, countering Unmanned Air Systems, Processing, Exploitation, and Dissemination (PED) processes, Commercial Maritime Navigation Radar (CMNR) detection and exploitation, open-ocean surveillance, and hostile threat geo-location. Link Crimson fields both prototypes to demonstrate new capabilities in real world environments in coordination with operational users, and develops warfighting capabilities for insertion into Navy, joint, and national agency programs of record. Additional detailed information is available at higher levels of classification.

(U) Project 1034: Established to exploit all National and Service sensor systems to improve tactical support to Fleet operational commanders. Project also supports equipment upgrades, training and Fleet exercises which provide the venue for testing modifications to existing programs.

<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>						<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
<b>Title:</b> Assured Command and Control						0.713	0.000	0.000	0.000	0.000
<b>Description:</b> The Navy must assure its ability to command and control forces. This requires capabilities that enable commanders to rapidly and with certainty: 1) exchange orders and responses with subordinates; 2) understand the disposition of friendly and adversarial forces, as well as uninvolved/neutral elements in the area of operations; 3) have access to target quality intelligence at the right time to conduct strikes as part of the joint force; and 4) assess the result of those strikes. Sensing the environment, understanding our adversaries, and operating and defending our communications and networked systems are inextricably linked to the assurance of C2.										

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020		
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 1206867N I (U)SEW Surveillance/ Reconnaissance Support	Project (Number/Name) 1034 I TAC SAT Recon Office				
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<b>FY 2020 Plans:</b> FY20 efforts will be funded under PE 0605867N, Space & Elec War Surv/Recon. Additional details with respect to this line item are held at a higher classification.						
<b>FY 2021 Base Plans:</b> N/A						
<b>FY 2021 OCO Plans:</b> N/A						
<b>Title:</b> Battlespace Awareness	<b>Articles:</b>	5.831	0.000	0.000	0.000	0.000
<b>Description:</b> This is the traditional mission of the Navy's Information Warfare and the constituent components of meteorology, oceanography, intelligence, cryptology, communications, networks, space, and electronic warfare (EW). It includes: 1) persistent surveillance of the maritime and information battlespace; 2) knowledge of how to employ existing and emerging collection capabilities to great effectiveness to gather critical intelligence; 3) penetrating knowledge of the capabilities and intent of our adversaries to hold our successful operations at risk; and 4) expertise within the electromagnetic spectrum. Automation in data extraction and alignment and machine learning algorithms can significantly enhance the human analyst's ability to achieve battlespace awareness in the face of vast data repositories and numerous collection platforms/opportunities.		-	-	-	-	-
<b>FY 2020 Plans:</b> FY20 efforts will be funded under PE 0605867N, Space & Elec War Surv/Recon. Additional details with respect to this line item are held at a higher classification.						
<b>FY 2021 Base Plans:</b> N/A						
<b>FY 2021 OCO Plans:</b> N/A						
<b>Title:</b> Integrated Fires	<b>Articles:</b>	2.132	0.000	0.000	0.000	0.000
<b>Description:</b> Integration of the right combination of kinetic and/or non-kinetic fires to achieve the desired effect on the target and on the adversary's decision calculus requires: 1) in-depth understanding of the adversary's		-	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy				Date: February 2020		
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 1206867N I (U)SEW Surveillance/ Reconnaissance Support	Project (Number/Name) 1034 I TAC SAT Recon Office				
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
centers of gravity and vulnerabilities; 2) the right fidelity of the target's location, movement, and window of vulnerability; 3) commander's confidence that the weapon is postured to achieve the desired effect; and 4) the ability to provide this information to the weapon system(s) and weapon release authority(ies) before the target can employ effective defensive measures.						
<b>FY 2020 Plans:</b> FY20 efforts will be funded under PE 0605867N, Space & Elec War Surv/Recon. Additional details with respect to this line item are held at a higher classification.						
<b>FY 2021 Base Plans:</b> N/A						
<b>FY 2021 OCO Plans:</b> N/A						
<b>Accomplishments/Planned Programs Subtotals</b>		8.676	0.000	0.000	0.000	0.000
<b>C. Other Program Funding Summary (\$ in Millions)</b>						
N/A						
<b>Remarks</b>						
<b>D. Acquisition Strategy</b> Not applicable						

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