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Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Navy **Date:** May 2021

Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604567N / <i>Ship Contract Design/ Live Fire T&E</i>
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COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
Total Program Element	819.527	44.972	63.531	54.829	-	54.829	-	-	-	-	-	-
1803: <i>Ship Contract Design</i>	141.921	1.863	3.220	3.102	-	3.102	-	-	-	-	-	-
2465: <i>LHA(R) FLT Design and Total Ship Integration</i>	274.655	2.218	3.970	7.400	-	7.400	-	-	-	-	-	-
3108: <i>CVN 80 Total Ship Integration</i>	93.036	23.003	22.990	25.177	-	25.177	-	-	-	-	-	-
3179: <i>CVN-79 Total Ship Integration</i>	232.616	13.993	14.690	14.908	-	14.908	-	-	-	-	-	-
4007: <i>CVN 21 LFT&E</i>	77.299	3.895	4.161	4.242	-	4.242	-	-	-	-	-	-
9999: <i>Congressional Adds</i>	0.000	0.000	14.500	0.000	-	0.000	-	-	-	-	-	-

Program MDAP/MAIS Code:
Project MDAP/MAIS Code(s): 333, 223

A. Mission Description and Budget Item Justification

The FY 2022 funding request was reduced by \$1.555 million to account for the availability of prior year execution balances.

This Program Element (PE) directly supports the Navy's Shipbuilding Plan by providing for the development of engineering, programmatic and acquisition documentation including ship specifications (including performance specifications) and contractual documentation associated with acquisition of Navy ships. This PE also supports the Congressionally mandated Live Fire Test and Evaluation (LFT&E) program for new ship designs.

Contract Design has traditionally been the engineering development of the technical and contractual definition of the ship design (including ship specifications and drawings) to a level of detail sufficient for shipbuilders to make a sound estimate of the construction cost and schedule. Additionally, the contract design package developed under this PE has provided the technical baseline from which the Navy selects the shipbuilder who then develops the detail design package required to support the construction and eventual delivery of the ship. This PE also supports the development of design methodologies/tools which facilitate and optimize the transition from ship design documents to efficient production of new ships and ship conversions, and supports engineering planning and ship affordability studies.

Under Acquisition Reform for new design ships, traditional distinct phasing of the design process has been replaced with a continuous concurrent engineering Integrated Product and Process Development (IPPD) process extending through and after contract award. This serves to maintain the focus of multi-discipline teams consisting of the government,

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shipbuilder, system programs, and suppliers. Government/Industry Integrated Product Team(s) (IPTs) will utilize the IPPD process to develop the design in an Integrated Product and Data Environment (IPDE). The design approach is part of an acquisition strategy that is based on commercial practices and incorporates a phased technical definition.

B. Program Change Summary (\$ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	46.809	51.853	57.336	-	57.336
Current President's Budget	44.972	63.531	54.829	-	54.829
Total Adjustments	-1.837	11.678	-2.507	-	-2.507
• Congressional General Reductions	-	-0.232			
• Congressional Directed Reductions	-	-2.590			
• Congressional Rescissions	-	-			
• Congressional Adds	-	14.500			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.002	0.000			
• SBIR/STTR Transfer	-1.834	0.000			
• Program Adjustments	0.000	0.000	-1.555	-	-1.555
• Rate/Misc Adjustments	-0.001	0.000	-0.952	-	-0.952

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

Project: 9999: *Congressional Adds*

Congressional Add: *DDG-51 Advanced Degaussing Mine Protection System*

Congressional Add: *ESB Pilot Program*

Congressional Add Subtotals for Project: 9999

Congressional Add Totals for all Projects

	FY 2020	FY 2021
	0.000	7.000
	0.000	7.500
Congressional Add Subtotals for Project: 9999	0.000	14.500
Congressional Add Totals for all Projects	0.000	14.500

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy **Date:** May 2021

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604567N / <i>Ship Contract Design/ Live Fire T&E</i>	Project (Number/Name) 1803 / <i>Ship Contract Design</i>
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COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
1803: <i>Ship Contract Design</i>	141.921	1.863	3.220	3.102	-	3.102	-	-	-	-	-	-
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

DDG Modernization:

The major effort is the engineering development of the technical and contractual definition of the ship's design (e.g. ship specifications and drawings), with sufficient details for the planning yard to make a sound estimate of cost and schedule. It also serves as the technical definition from which the planning yard develops the detailed design and testing package required to build and test the ship. It provides the Navy with a digital, ship design knowledge base, including lessons learned, required to ensure that a proper development, analysis and evaluation can be conducted of any current or future planned.

Another area this project funds is the development of specific Navy ship criteria and standards for newly developed technologies. Additionally, as new laws are passed, new safety regulations and environmental criteria are developed and other legal/Congressional requirements identified, this project funds the translation into Navy ship design criteria and standards. This project also funds the translation of the traditional Ship Specifications into performance-based criteria, which supports the development of design methodologies/tools which facilitate and optimize the transition from ship design documents to ship alterations. This project also supports ship survivability studies, superstructure integrity analysis, developmental and operational testing, gun weapon system software integration and next generation Machinery Control System (MCS) software integration.

Expeditionary Sea Base (ESB) (formerly MLP AFSB)

Prior year funding included the performance specification development and Dynamic Interface Testing for various airframes as part of the ESB Special Operations Forces (SOF) Backfit.

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

	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: Ship Contract Design	1.863	3.220	3.102	0.000	3.102
Articles:	-	-	-	-	-
<i>FY 2021 Plans:</i>					
Continue ship design and alteration development for service life extension and HM&E network upgrades in CG 47 and for DDG 51 Flt IIA ship design to include development of structural reliability and other alterations to include machinery control systems improvements in FY 2021.					
<i>FY 2022 Base Plans:</i>					

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604567N / Ship Contract Design/ Live Fire T&E	Project (Number/Name) 1803 / Ship Contract Design

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Continue ship design and alteration development for service life extension and HM&E network upgrades in CG 47 and for DDG 51 Flt IIA ship design to include development of structural reliability and other alterations to include machinery control systems improvements in FY 2022. FY 2022 OCO Plans: N/A FY 2021 to FY 2022 Increase/Decrease Statement: Minor decrease.					
Accomplishments/Planned Programs Subtotals	1.863	3.220	3.102	0.000	3.102

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022 Base</u>	<u>FY 2022 OCO</u>	<u>FY 2022 Total</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• OPN 0900: DDG Mod	564.966	512.155	583.136	-	583.136	-	-	-	-	-	-
• OPN 0960: CG Mod	193.990	87.978	156.951	-	156.951	-	-	-	-	-	-

Remarks

D. Acquisition Strategy
Continuing systems and software development for both development models and production machinery control units at Land Based Engineering Sites.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy												Date: May 2021			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
1319 / 5				PE 0604567N / Ship Contract Design/ Live Fire T&E				1803 / Ship Contract Design							
Product Development (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
CG Mod Electronics Systems Eng	C/CPAF	Lockheed : Martin, Moorestown, NJ	17.413	0.000		0.000		0.000		-		0.000	-	-	-
DON Energy Initiative - OEM	C/FPIF	L-3 Maritime Systems : Leesburg, VA	34.857	0.000		0.000		0.000		-		0.000	-	-	-
DON Energy Initiative	WR	NSWC/SSES : Philadelphia, PA	3.629	0.000		0.000		0.000		-		0.000	-	-	-
Engineering Development and Design	Various	COTF/NAVAIR/NSWCDD/NSWCDD/NSWCPC/NSWCPC/NSWCPC/NSWCSSSES : DC/MD/PA/CA	1.085	0.000		0.000		0.000		-		0.000	-	-	-
Preliminary and Contract Design	C/FPIF	NASSCO : San Diego, CA	6.500	0.000		0.000		0.000		-		0.000	-	-	-
Hybrid Electric Drive	C/CPIF	L-3 Maritime Systems : Leesburg, VA	6.911	0.000		0.000		0.000		-		0.000	-	-	-
Hybrid Electric Drive	C/CPAF	Rolls Royce : Walpole, MA	0.100	0.000		0.000		0.000		-		0.000	-	-	-
Hybrid Electric Drive	C/CR	General Atomics : San Diego, CA	0.040	0.000		0.000		0.000		-		0.000	-	-	-
Hybrid Electric Drive	C/CPAF	Herren Engineering : Alexandria, VA	0.600	0.000		0.000		0.000		-		0.000	-	-	-
Hybrid Electric Drive	C/CPAF	Syntek : Arlington, VA	0.099	0.000		0.000		0.000		-		0.000	-	-	-
Hybrid Electric Drive	WR	NSWC/SSES : Philadelphia, PA	0.750	0.000		0.000		0.000		-		0.000	-	-	-
Hybrid Electric Drive	Various	Not Specified : Not Specified	8.500	0.000		0.000		0.000		-		0.000	-	-	-
Subtotal			80.484	0.000		0.000		0.000		-		0.000	-	-	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy **Date: May 2021**

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604567N / Ship Contract Design/ Live Fire T&E	Project (Number/Name) 1803 / Ship Contract Design
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Support (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
DDG/CGM Program / Engineering Spt	WR	NSWC/DD : Dahlgren, VA	4.376	0.000		0.000		0.000		-		0.000	-	-	-
DDGM Program/ Engineering Spt	Various	SUPSHIP/BATH : Bath, ME	3.331	0.000		0.000		0.000		-		0.000	-	-	-
DDG/CGM Program / Engineering Spt	C/CPAF	CSC/BAE : Hampton, VA	4.713	0.000		0.000		0.000		-		0.000	-	-	-
DDG/CGM Program / Engineering Spt	WR	SPAWARSSYSCEN : Charleston, SC	2.004	0.000		0.000		0.000		-		0.000	-	-	-
CGM Program / Engineering Spt	WR	NRL : Washington, DC	0.617	0.000		0.000		0.000		-		0.000	-	-	-
CGM Program / Engineering Spt	C/CPAF	JJMA/ALION : Washington, DC	2.947	0.000		0.000		0.000		-		0.000	-	-	-
DDG/CGM Program / Engineering Spt	C/CPAF	Lockheed Martin : Moorestown, NJ	0.000	0.000		0.000		0.000		-		0.000	-	-	-
DDG/CGM Program / Engineering Spt	WR	NSWC/PHD : Port Hueneme, CA	2.889	0.000		0.000		0.000		-		0.000	-	-	-
Integrated Logistics Support	C/CPFF	CSC : Washington DC	0.085	0.000		0.000		0.000		-		0.000	-	-	-
CGM/DDG Program / Engineering Spt	WR	COMPTEVFOR : Norfolk, VA	0.420	0.000		0.000		0.000		-		0.000	-	-	-
DDGM/HED Program / Engineering Spt	WR	NSWC/SSES : Philadelphia, PA	4.900	0.000		0.000		0.000		-		0.000	-	-	-
DDGM Program / Engineering Spt	WR	NSWC/SSES : Philadelphia, PA	5.952	0.457	Jan 2020	0.907	Jan 2021	0.605	Jan 2022	-		0.605	-	-	-
HED Program / Engineering Spt	WR	NSWC/SSES : Philadelphia, PA	0.500	0.000		0.000		0.000		-		0.000	-	-	-
HED	C/CPAF	L-3 Maritime Systems : Leesburg, VA	1.048	0.000		0.000		0.000		-		0.000	-	-	-
CG Program / Engineering Spt	WR	NSWC/BETHESDA : Bethesda, MD	10.433	0.285	Jan 2020	0.475	Jan 2021	0.316	Jan 2022	-		0.316	-	-	-

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Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy **Date: May 2021**

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604567N / <i>Ship Contract Design/ Live Fire T&E</i>	Project (Number/Name) 1803 / <i>Ship Contract Design</i>
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Proj 1803	FY 2020				FY 2021				FY 2022			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Ship Contract Design												
	CGM Baseline 4 Mod Design											
	CG Class Design											
	DDG Technical Insertion 16 Mod Design											
	DDG FLT IIA Mod Design											
	CG Deliveries (CG 59,61,62,63-73)											
	DDGM Deliveries (DDG 61,80,81,84,87)											
	DDG Class Design											

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Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604567N / <i>Ship Contract Design/ Live Fire T&E</i>	Project (Number/Name) 1803 / <i>Ship Contract Design</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Proj 1803</i>				
Ship Contract Design: CGM Baseline 4 Mod Design	1	2020	4	2022
Ship Contract Design: CG Class Design	1	2020	4	2022
Ship Contract Design: DDG Technical Insertion 16 Mod Design	1	2020	4	2022
Ship Contract Design: DDG FLT IIA Mod Design	1	2020	4	2022
Ship Contract Design: CG Deliveries (CG 59,61,62,63-73)	1	2020	4	2022
Ship Contract Design: DDGM Deliveries (DDG 61,80,81,84,87)	1	2020	3	2022
Ship Contract Design: DDG Class Design	1	2020	4	2022

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy										Date: May 2021		
Appropriation/Budget Activity 1319 / 5					R-1 Program Element (Number/Name) PE 0604567N / Ship Contract Design/ Live Fire T&E				Project (Number/Name) 2465 / LHA(R) FLT Design and Total Ship Integration			
COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
2465: LHA(R) FLT Design and Total Ship Integration	274.655	2.218	3.970	7.400	-	7.400	-	-	-	-	-	-
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
Project MDAP/MAIS Code: 333												

A. Mission Description and Budget Item Justification

This project provides the contract design, development and testing efforts for the Amphibious Assault Ship Replacement Program LHA(R). The LHA(R) is a ship construction program designed to: (1) provide a functional replacement for the Amphibious Assault Ships which reached the end of their extended service lives (2) be a key platform in the Amphibious Readiness Group (ARG) of the future and (3) provide for an affordable and sustainable amphibious ship development program. LHA(R) ships will provide forward presence and power projection as an integral part of Joint, inter-agency, and multi-national maritime expeditionary forces. Additionally, LHA(R) will be designed to operate for sustained periods in transit to and operations in an Amphibious Objective Area to include the embarkation, deployment, and landing of a Marine Landing Force in an assault with landing craft, helicopters and tilt rotors (MV-22) supported by Joint Strike Fighters (F-35B).

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

	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: LHA (R) FLT 0 Design and Total Ship Integration - LHA 6	0.000	0.035	1.487	0.000	1.487
Articles:	-	-	-	-	-
FY 2021 Plans: Plan for LHA 6 Follow-on Operational Test and Evaluation (FOT&E). FOT&E to demonstrate the JSF/F-35B capacity Key Performance Parameter (KPP).					
FY 2022 Base Plans: Continue planning for LHA 6 FOT&E event to demonstrate the JSF/F-35B capacity KPP.					
FY 2022 OCO Plans: N/A					
FY 2021 to FY 2022 Increase/Decrease Statement: The increase from FY 2021 to FY 2022 reflects the ramp-up of planning efforts for the LHA 6 FOT&E event for F-35B/JSF KPP validation.					
Title: LHA (R) FLT 1 Design and Total Ship Integration - LHA 8	2.218	3.935	5.913	0.000	5.913
Articles:	-	-	-	-	-
FY 2021 Plans:					

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
<p>LHA 8 Complete Enterprise Air Search Radar ship integration efforts. LHA 8 Continue Reliability Maintainability Availability analysis. LHA 8 Continue Vulnerability Assessment Report. LHA 8 Continue Operational Test & Evaluation preparation for Operational Assessment. LHA 8 Initiate Cybersecurity Developmental Test & Evaluation efforts.</p> <p>FY 2022 Base Plans: LHA 8 Continue Reliability Maintainability Availability analysis. LHA 8 Continue Vulnerability Assessment Report. LHA 8 Continue Operational Test & Evaluation preparation for Operational Assessment. LHA 8 Continue Cybersecurity Developmental Test & Evaluation efforts. LHA 8 Initiate Dynamic Interface-Virtual Environment (DIVE) Modeling and Simulation.</p> <p>FY 2022 OCO Plans: N/A</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement: Increase supports 1) Cyber: Conduct development and planning to support cyber-survivability testing, conduct system cyber vulnerability testing at land-based test site in order to increase LHA(R) survivability in a cyber-contested environment, and test controls, attacks, kinetic effects to evaluate threats, 2) LFT&E Vulnerability Assessment Report (VAR) Electronic Signatures: Conduct electronic signatures analysis of the LHA 8 reduced island design evaluating the ship's radar detectability by subsurface-to-ship, surface-to-ship, and air-to-ship anti-ship threat missile systems to ensure the ship self defense system countermeasures are adequate. 3) LFT&E VAR Modeling: The VAR effort will increase as the ship's system and subsystem locations, distributed systems and ship structure are entered into the LFTE modeling and simulation tools, and 4) RMA: Create an LHA(R) Flight 1 specific RMA model using new reliability block diagrams, LHA(R) Flight 1 specific Authorized Parts Lists, and extant reliability databases reflecting changes from FLT 0 to include port and starboard main reduction gears, engines, radars, machinery control system, electrical</p>					

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
distribution, and combat systems. DIVE is an M&S effort that supports Dynamic Interface Testing, which is required for Aviation Certification.					
Accomplishments/Planned Programs Subtotals	2.218	3.970	7.400	0.000	7.400

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

<u>Line Item</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022 Base</u>	<u>FY 2022 OCO</u>	<u>FY 2022 Total</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• SCN/3041: <i>LHA (R) Ships</i>	0.000	500.000	68.637	-	68.637	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

LHA 6 Advanced Procurement and Long Lead Time Material was awarded on a sole source basis to Huntington Ingalls Inc., formerly Northrop Grumman Shipbuilding, on 15 July 2005; LHA 6 Detail Design and Construction (DD&C) was awarded on 1 June 2007. The Advance Procurement and Long Lead Time Material efforts were subsumed by the Fixed Price Incentive, Firm Target DD&C contract.

LHA 7 Advanced Procurement and Long Lead Time Material was awarded on a sole source basis to Huntington Ingalls Inc., formerly Northrop Grumman Shipbuilding, on 30 June 2010; LHA 7 DD&C was awarded on 31 May 2012. The Advanced Procurement and Long Lead Time Material efforts were subsumed by the Fixed Price Incentive, Firm Target DD&C contract.

LHA 8 Planning, Advanced Engineering and Procurement of Long Lead Time Material (LLTM) for an LHA Replacement (LHA(R)) Flight 1 Amphibious Assault Ship was awarded on a competitive basis to Huntington Ingalls Inc. on 30 June 2016. The option for LHA 8 Detail Design and Construction was awarded on 16 June 2017. The Planning, Advanced Engineering and Procurement of Long Lead Time Material (LLTM) efforts were subsumed into this Fixed Price Incentive, Firm Target DD&C contract option.

LHA 9 Advance Procurement for Long Lead Time Material and associated Advance Engineering and Planning was awarded on 30 April 2020; Increment #2 awarded 24 February 2021.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy												Date: May 2021			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)					Project (Number/Name)						
1319 / 5				PE 0604567N / Ship Contract Design/ Live Fire T&E					2465 / LHA(R) FLT Design and Total Ship Integration						
Product Development (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Ship Design	WR	NSWC : Various	97.905	0.000		0.000		0.000		-		0.000	-	-	-
Ship Design	C/CPFF	HII : Pascagoula, MS	5.009	0.000		0.000		0.000		-		0.000	-	-	-
Ship Design	C/CPFF	Various : Various	44.087	0.000		0.000		0.000		-		0.000	-	-	-
Special Studies	WR	NSWC : Panama City, FL	4.800	0.000		0.000		0.000		-		0.000	-	-	-
Subtotal			151.801	0.000		0.000		0.000		-		0.000	-	-	N/A
Support (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Technical Engineering Services	Various	NSWC : Various	9.867	1.196	Dec 2019	0.895	Dec 2020	2.356	Dec 2021	-		2.356	-	-	-
Subtotal			9.867	1.196		0.895		2.356		-		2.356	-	-	N/A
Test and Evaluation (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	Various	NSWC, USS Secure : Various	4.559	0.000		1.118	Dec 2020	1.858	Dec 2021	-		1.858	-	-	-
Operational Test & Evaluation	WR	OPTEVFOR/ MCOTEA/NAVSUP : Norfolk, VA/ Quantico, VA	23.455	0.391	Dec 2019	0.356	Dec 2020	0.344	Dec 2021	-		0.344	-	-	-
Live Fire Test & Evaluation	WR	NSWC : Various	67.865	0.548	Dec 2019	1.481	Dec 2020	1.175	Dec 2021	-		1.175	-	-	-
Follow-on Operational Test and Evaluation	WR	OPTEVFOR / MCOTEA : Norfolk, VA / Quantico, VA	0.000	0.000		0.035	Dec 2020	1.582	Dec 2021	-		1.582	-	-	-
Subtotal			95.879	0.939		2.990		4.959		-		4.959	-	-	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy **Date:** May 2021

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604567N / Ship Contract Design/ Live Fire T&E	Project (Number/Name) 2465 / LHA(R) FLT Design and Total Ship Integration
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Test and Evaluation (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			

Remarks
Test and Evaluation increase from FY 2021 to FY 2022 reflects the ramp-up of planning efforts for the LHA 6 FOT&E event for F-35B/JSF KPP validation.

Management Services (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Management	C/CPFF	Various : Various	16.334	0.083	Dec 2019	0.085	Dec 2020	0.085	Dec 2021	-		0.085	-	-	-
Travel	Various	NAVSEA Travel : Washington, DC	0.763	0.000		0.000		0.000		-		0.000	-	-	-
Defense Acquisition Workforce	Various	Various : Various	0.011	0.000		0.000		0.000		-		0.000	-	-	-
Subtotal			17.108	0.083		0.085		0.085		-		0.085	-	-	N/A

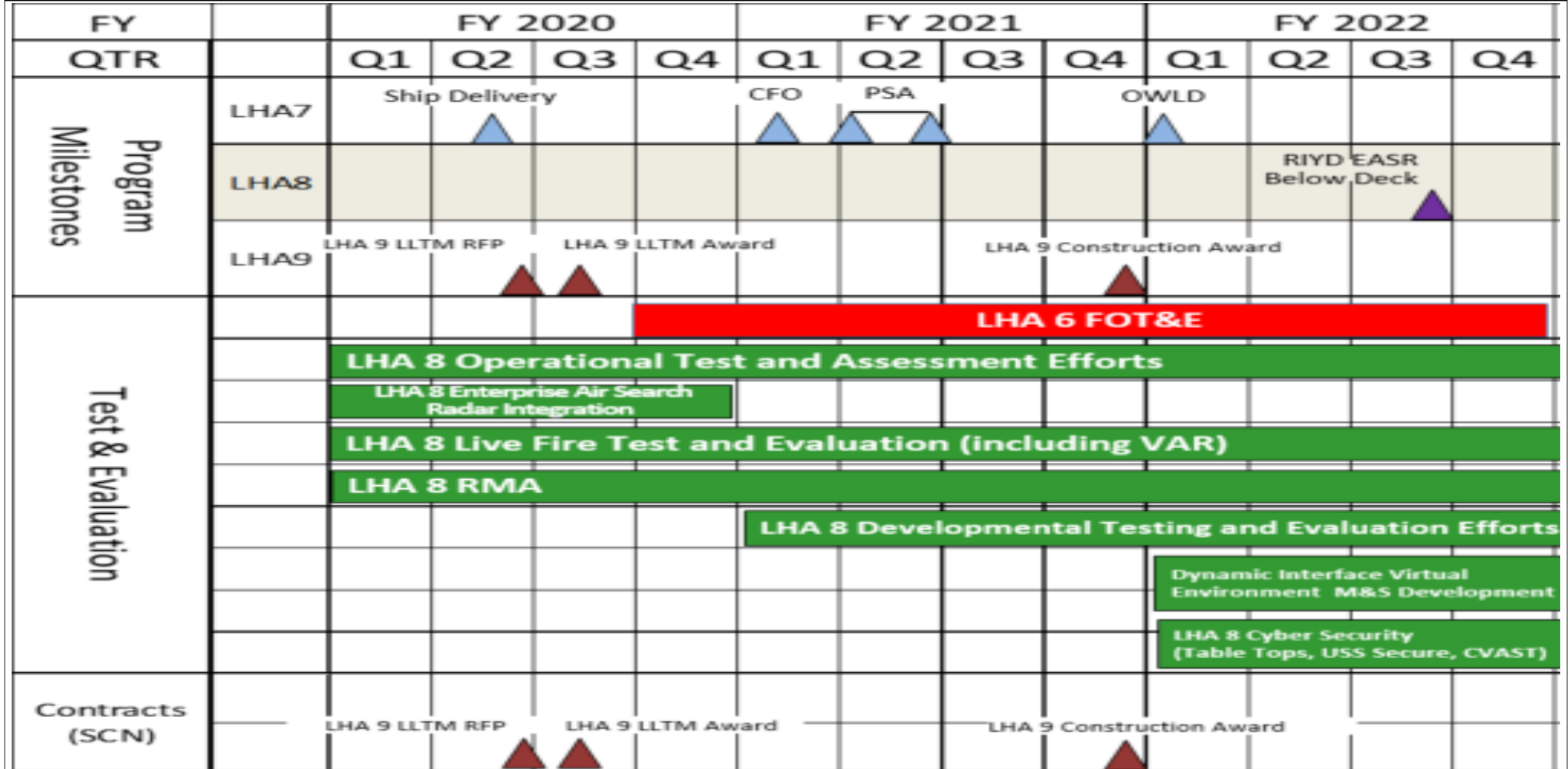
Project Cost Totals	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
	274.655	2.218	3.970	7.400	-	7.400	-	-	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy Date: May 2021

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604567N / Ship Contract Design/ Live Fire T&E	Project (Number/Name) 2465 / LHA(R) FLT Design and Total Ship Integration
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Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604567N / <i>Ship Contract Design/ Live Fire T&E</i>	Project (Number/Name) 2465 / <i>LHA(R) FLT Design and Total Ship Integration</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 2465				
LHA (R) FLT Design and Total Ship Integration	1	2020	4	2022

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy										Date: May 2021		
Appropriation/Budget Activity 1319 / 5					R-1 Program Element (Number/Name) PE 0604567N / Ship Contract Design/ Live Fire T&E				Project (Number/Name) 3108 / CVN 80 Total Ship Integration			
COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
3108: CVN 80 Total Ship Integration	93.036	23.003	22.990	25.177	-	25.177	-	-	-	-	-	-
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
Project MDAP/MAIS Code: 223												

A. Mission Description and Budget Item Justification

Development and related testing of CVN 78 Class aircraft carrier specific technologies, the infusion of the ship technology base into existing and future aircraft carriers, and the potential realization of subsystem design capabilities not currently feasible. This project also funds the Contract Design efforts for the CVN 80. This project transitions the minimum sustaining technologies required to address obsolescence, critical survivability shortfalls as identified in CVN 78 Class testing, future requirements, and technologies which did not mature in time to support the CVN 78 or CVN 79. All systems developed in this project have the potential to support emerging requirements and other promising system technologies for insertion into new aircraft carrier designs. The emphasis is directed toward developing ship hull, mechanical, propulsion, electrical, aviation, warfare systems, and combat support systems, sub-systems and components to maintain aircraft carrier affordability, manpower requirements, survivability, and operational capabilities and to meet the requirements of existing and pending regulations and statutes critical to the operation of future aircraft carriers. This project also encompasses those tasks required to support CVN 80 procurement, including, but not limited to engineering support, programmatic and program support, modeling and simulation, manpower and program related studies, and design support systems, such as the Integrated Digital Environment.

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

	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: Enterprise Radar Suite (ERS)/ Warfare Systems Development and Integration	5.566	5.000	4.000	0.000	4.000
Articles:	-	-	-	-	-
FY 2021 Plans: Continue to conduct ship integration studies for Government Furnished Information (GFI) vetting, tracking and delivery. Continue conducting onboard and off-board Electromagnetic Interference/Control (EMI/EMC) studies due to new the radar sensor suite. Continue analyzing / performing integrated topside design due to the new radar sensor suite. Continue ERS integration testing with the combat system. Continue conducting system integration studies related to the TEMP; platform impacts & updates to Test and Evaluation Master Plan (TEMP); cybersecurity analysis. Continue conducting Reliability Maintainability Availability (RMA) and Integrated Logistics Support (ILS) studies, to include trade studies and identification of investment opportunities / requirements. Continue preparing / updating acquisition support documents and cost estimates. Continue operation of the Integrated Product Team to include vendor, shipbuilder and Government.					
FY 2022 Base Plans:					

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604567N / <i>Ship Contract Design/ Live Fire T&E</i>	Project (Number/Name) 3108 / <i>CVN 80 Total Ship Integration</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
<p>Continue to conduct ship integration studies for GFI vetting, tracking and delivery. Continue conducting onboard and offboard EMI / EMC studies due to new the radar sensor suite. Continue analyzing / performing integrated topside design due to the new radar sensor suite and systems associated with Joint Strike Fighter (JSF) capabilities. Continue ERS integration testing with the combat system. Continue conducting system integration studies related to the TEMP; platform impacts & updates to TEMP; cybersecurity analysis. Continue conducting RMA and ILS studies, to include trade studies and identification of investment opportunities / requirements. Continue preparing / updating acquisition support documents and cost estimates. Continue operation of the Integrated Product Team to include vendor, shipbuilder and Government.</p> <p>FY 2022 OCO Plans: N/A</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement: Decrease due to planned remaining work decreasing.</p>					
<p>Title: CVN 78 Class Design for Affordability (DFA) and Systems Integration</p> <p align="right">Articles:</p> <p>FY 2021 Plans: Continue conducting and supporting feasibility and tradeoff studies on new and modified shipboard systems and equipment. Identify and resolve Government Furnished Equipment and Contractor Furnished Equipment obsolescence issues to support construction. Continue to discover and assess CVN 78 Class DFA initiatives. Continue development of cost-saving initiatives, business case analyses, and DFA initiatives to continue to drive affordability into the carrier program. Continue performing CVN 80-specific engineering calculations and technical analysis in the areas of technical performance measures; system component calculations; environmental safety and health, and human factors engineering; survivability and vulnerability; automation systems software; shock and vibration; and engineered components support.</p> <p>FY 2022 Base Plans: Continue conducting and supporting feasibility and tradeoff studies on new and modified shipboard systems and equipment. Identify and resolve Government Furnished Equipment and Contractor Furnished Equipment obsolescence issues to support construction. Continue to technically resolve CVN 78 class system integration issues in support of CVN 80 and CVN 81 construction. Continue development of cost saving initiatives, business case analyses, and DFA initiatives to continue to drive affordability into the carrier program. Continue performing CVN 80-specific engineering calculations and technical analysis in the areas of technical performance measures; system component calculations; environmental safety and health, and human factors engineering;</p>	17.437	17.990	21.177	0.000	21.177
	-	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604567N / <i>Ship Contract Design/ Live Fire T&E</i>	Project (Number/Name) 3108 / <i>CVN 80 Total Ship Integration</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
survivability and vulnerability; automation systems software; shock and vibration; and engineered components support. Support Integrated Enterprise Plan (IEP) initiatives including Affordability Process Improvement (API) initiatives and Supplier Illumination studies to support CVN 80 and CVN 81 construction. FY 2022 OCO Plans: N/A FY 2021 to FY 2022 Increase/Decrease Statement: Increase from FY 2021 to FY 2022 is due to ramp up in engineering and technical analysis related to technical resolution of obsolescence and system integration issues.					
Accomplishments/Planned Programs Subtotals	23.003	22.990	25.177	0.000	25.177

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

<u>Line Item</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022 Base</u>	<u>FY 2022 OCO</u>	<u>FY 2022 Total</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• SCN / 2001: <i>Carrier Replacement Program</i>	1,062.000	1,029.933	1,359.705	-	1,359.705	-	-	-	-	-	-
• RDTEN / 0604112N: <i>Project Units 2208, 4004, 9999</i>	106.381	104.433	121.509	-	121.509	-	-	-	-	-	-
• OMN / 1B2B: <i>CVN 78 Ford Class Training and Sustainment (12BJ0)</i>	6.871	5.026	5.513	-	5.513	-	-	-	-	-	-
• RDTEN / 0604501N: <i>Project Unit 3236 Advanced Radar Technology</i>	1.933	0.000	0.000	-	0.000	-	-	-	-	-	-
• OPN / 5664: <i>Surface Training Equipment</i>	1.412	4.457	2.475	-	2.475	-	-	-	-	-	-
• SCN 5300: <i>Completion of PR Shpblgd Progr</i>	0.000	71.000	291.000	-	291.000	-	-	-	-	-	-
• SCN / 2004: <i>CVN 81</i>	1,214.500	1,606.432	1,299.764	-	1,299.764	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

The CVN 80 is the third ship of the CVN 78 Class of aircraft carriers designed to replace USS ENTERPRISE and the ships of the NIMITZ Class Carriers. The CVN 80 is a modified repeat of the CVN 78, which features a new nuclear propulsion and electrical generation / distribution system, electromagnetic aircraft launching

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy **Date:** May 2021

Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)
1319 / 5	PE 0604567N / <i>Ship Contract Design/ Live Fire T&E</i>	3108 / <i>CVN 80 Total Ship Integration</i>

system, advanced arresting gear system, electric auxiliaries, warfare system improvements, survivability enhancements, improved weapons handling, and improved aircraft servicing. These design features will result in lower manpower and total ownership costs as compared to the NIMITZ Class. Additionally, the following war-fighting benefits will be realized: increased sortie generation rate, improved ship self-defense capability, increased launch and recovery capability / flexibility, increased operational availability, and increased flexibility to support future upgrades.

CVN 80 will use late integration of Government Furnished Equipment (GFE) to provide the latest combat system and C4I suite applications within the planned system baseline. CVN 80 will improve upon processes used on CVN 78 and CVN 79 to gain efficiencies during the CVN 80 Construction Preparation and Construction periods.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy **Date:** May 2021

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604567N / Ship Contract Design/ Live Fire T&E	Project (Number/Name) 3108 / CVN 80 Total Ship Integration
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Product Development (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Advanced Design & Development	C/CPAF	HII : VA	45.107	11.607	Nov 2019	15.026	Nov 2020	11.425	Nov 2021	-		11.425	-	-	-
Advanced Design & Development	C/CPFF	GRYPHON (SEI&T) : IN	4.579	0.958	Nov 2019	0.000		0.000		-		0.000	-	-	-
Advanced Design & Development	WR	NSWC DAHLGREN : VA	8.576	2.182	Nov 2019	1.250	Feb 2021	3.552	Nov 2021	-		3.552	-	-	-
Advanced Design & Development	WR	NSWC CARDEROCK : MD	4.733	1.919	Nov 2019	0.000		1.500	Nov 2021	-		1.500	-	-	-
Advanced Design & Development	WR	NSWC PHILADELPHIA : PA	2.585	1.116	Nov 2019	0.000		1.300	Nov 2021	-		1.300	-	-	-
Advanced Design & Development	C/CPFF	NAVSEA SEAPORT : VARIOUS	16.725	3.205	Nov 2019	0.000		3.000	Nov 2021	-		3.000	-	-	-
Advanced Design & Development	C/BA	NAWCAD PAX RIVER : MD	3.746	0.891	Nov 2019	0.926	Feb 2021	1.000	Nov 2021	-		1.000	-	-	-
Advanced Design & Development	WR	NAWCAD LAKEHURST : NJ	0.312	0.000		0.000		0.000		-		0.000	-	-	-
Advanced Design & Development	WR	SPAWAR : VARIOUS	1.728	0.605	Nov 2019	0.714	Feb 2021	0.900	Nov 2021	-		0.900	-	-	-
Advanced Design & Development	Various	NSRP : VARIOUS	0.835	0.000		1.670	Feb 2021	1.500	Nov 2021	-		1.500	-	-	-
Advanced Design & Development	Various	MISCELLANEOUS : VARIOUS	4.110	0.520	Nov 2019	3.404	Feb 2021	1.000	Nov 2021	-		1.000	-	-	-
Subtotal			93.036	23.003		22.990		25.177		-		25.177	-	-	N/A

	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	93.036	23.003	22.990	25.177	-	25.177	-	-	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy

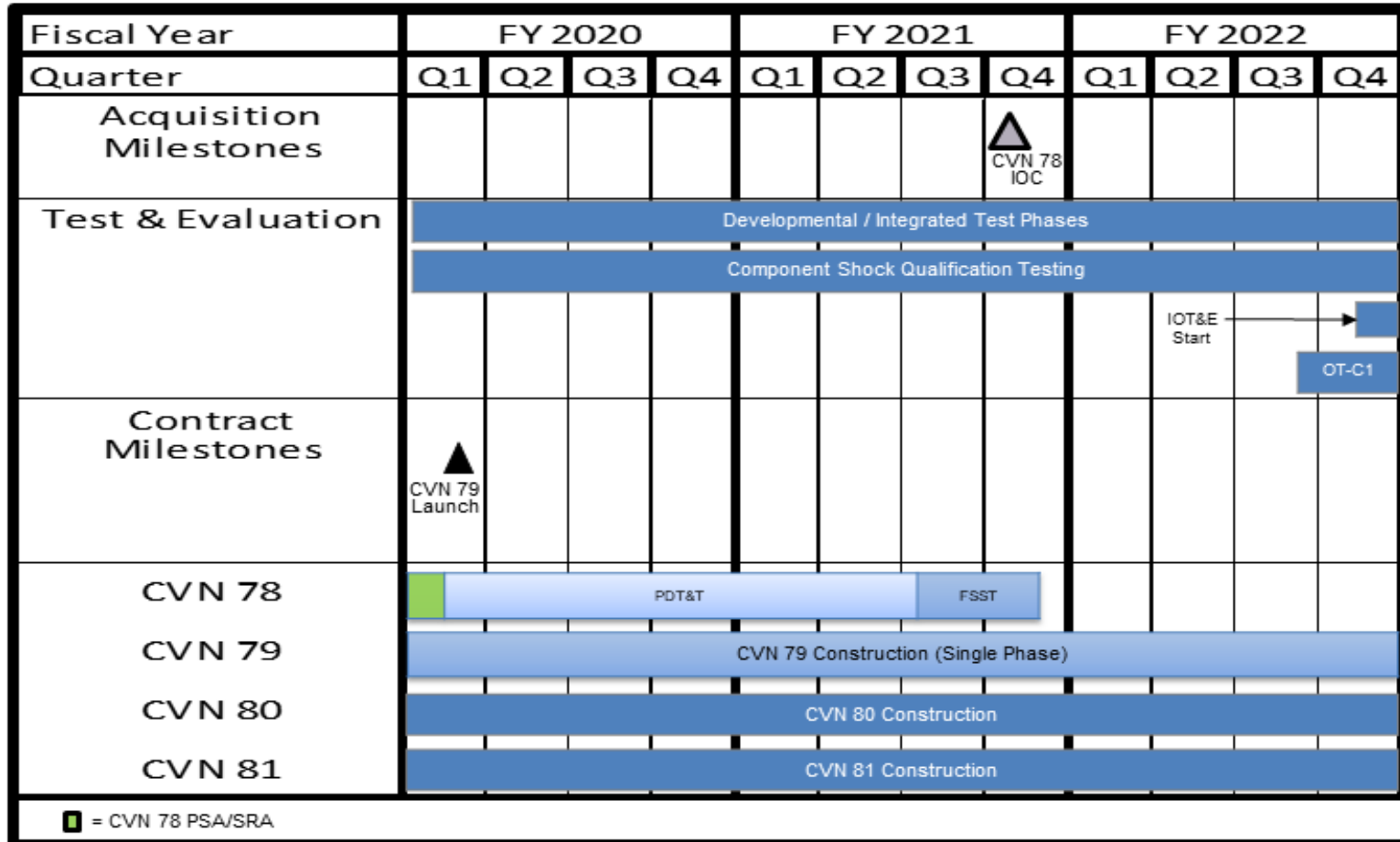
Date: May 2021

Appropriation/Budget Activity
1319 / 5

R-1 Program Element (Number/Name)
PE 0604567N / Ship Contract Design/ Live
Fire T&E

Project (Number/Name)
3108 / CVN 80 Total Ship Integration

Gerald R. Ford Class Carriers



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Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604567N / <i>Ship Contract Design/ Live Fire T&E</i>	Project (Number/Name) 3108 / <i>CVN 80 Total Ship Integration</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 3108				
CVN 80 Total Ship Integration	1	2020	4	2022

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy										Date: May 2021		
Appropriation/Budget Activity 1319 / 5					R-1 Program Element (Number/Name) PE 0604567N / Ship Contract Design/ Live Fire T&E				Project (Number/Name) 3179 / CVN-79 Total Ship Integration			
COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
3179: CVN-79 Total Ship Integration	232.616	13.993	14.690	14.908	-	14.908	-	-	-	-	-	-
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
Project MDAP/MAIS Code: 223												

A. Mission Description and Budget Item Justification

Development and related testing of CVN 78 Class aircraft carrier specific technologies, the infusion of the ship technology base into existing and future aircraft carriers, and the potential realization of subsystem design capabilities not currently feasible. This project also funds the Contract Design efforts for the CVN 79. This project transitions the minimum sustaining technologies required to address obsolescence, critical survivability shortfalls as identified in CVN 78 Class testing, future requirements, and technologies which did not mature in time to support the CVN 78. All systems developed in this project have the potential to support emerging requirements and other promising systems technologies for insertion into new aircraft carrier designs. The emphasis is directed toward developing ship hull, mechanical, propulsion, electrical, aviation, warfare systems, and combat support systems, sub-systems and components to maintain aircraft carrier affordability, manpower requirements, survivability, and operational capabilities and to meet the requirements of existing and pending regulations and statutes critical to the operation of future aircraft carriers. This project also encompasses those tasks required to develop the contract data package necessary to support CVN 79 procurement, including, but not limited to, engineering support, programmatic and program support, logistics support, modeling and simulation, manpower and program related studies, and design support systems, such as the Integrated Digital Environment. In addition, this project focuses on significant procurement and life cycle cost reduction compared to the first ship of the class. Cost reductions are sought, developed and implemented in the areas of design, labor and material.

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

	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: CVN-79 Total Ship Integration	13.993	14.690	14.908	0.000	14.908
Articles:	-	-	-	-	-
FY 2021 Plans: Continue to address design and construction issues based on the results of CVN 78 testing and initial operations. Continue to manage fact-of-life obsolescence changes on government-furnished equipment systems, challenges encountered on contractor-furnished equipment and material analysis. Expand development of labor savings initiatives, specifically within Steel Fabrication and Assembly (SFA) area to solidify efficiency and capacity improvements previously identified. Continue to evaluate SFA improvement initiatives for additional areas of applicability in Final Assembly Platen (FAP) and drydock. Refine the acquisition plan for CVN 79 Phase II planning and execution to transition and/or compress Phase I construction work with as many Phase II requirements as able to ease scheduled pressure for final delivery of CVN 79. Refine system integration and testing strategies for implementation in CVN 79 testing program to support on time 2022 preliminary acceptance					

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604567N / <i>Ship Contract Design/ Live Fire T&E</i>	Project (Number/Name) 3179 / <i>CVN-79 Total Ship Integration</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
<p>of CVN 79 by evaluating improvements needed to capitalize on CVN 78 lessons learned. Implement a tailored Integrated Test Plan for CVN 79 and CVN 80 leveraging the Submarine Integration and Test Support System (SIATSS) used by Virginia Class Submarine program to manage Alteration Installation Team (AIT). The CVN-specific tool will be the Carrier Integration and Test Support System (CIATSS).</p> <p>FY 2022 Base Plans: Continue to address design and construction issues based on the results of CVN 78 testing and initial operations. Continue to manage fact-of-life obsolescence changes on government-furnished equipment systems, challenges encountered on contractor-furnished equipment and material analysis. Continue to evaluate Steel Fabrication and Assembly (SFA), Component Fabrication and Assembly (CFA) improvement initiatives for additional areas of applicability in Final Assembly Platen (FAP) and onboard at the outfitting pier for CVN 79 as well as to inform same for CVN 80 in the drydock and CVN 81 in the shops. Complete CVN 79 Single Phase proposal impacts and refine the strategy to efficiently consolidate Phase I and Phase II construction and final delivery of CVN 79 with Joint Strike Fighter (JSF) compatibility. Refine system integration and testing strategies for implementation in CVN 79 testing of CVN 79 by evaluating improvements needed to capitalize on CVN 78 lessons learned. Continue to develop and implement a tailored Integrated Test Plan for CVN 79 and CVN 80 leveraging the Submarine Integration and Test Support System (SIATSS) used by Virginia Class Submarine program to manage Alteration Installation Team (AIT) - conducted testing.</p> <p>FY 2022 OCO Plans: N/A</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement: Increase attributed to escalation.</p>					
Accomplishments/Planned Programs Subtotals	13.993	14.690	14.908	0.000	14.908

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• SCN / 2001: <i>Carrier Replacement Program</i>	1,062.000	1,029.933	1,359.705	-	1,359.705	-	-	-	-	-	-
• RDTEN / 0604112N: <i>Project Units 2208, 4004, 9999</i>	106.381	104.433	121.509	-	121.509	-	-	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy	Date: May 2021
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Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604567N / Ship Contract Design/ Live Fire T&E	Project (Number/Name) 3179 / CVN-79 Total Ship Integration
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C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u> <u>Base</u>	<u>FY 2022</u> <u>OCO</u>	<u>FY 2022</u> <u>Total</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• OMN / 1B2B: CVN 78 Ford Class Training and Sustainment (12BJ0)	6.871	5.026	5.513	-	5.513	-	-	-	-	-	-
• OPN / 5664: Surface Training Equipment	1.412	4.457	2.475	-	2.475	-	-	-	-	-	-
• SCN 5300: Completion of PY Shpbdg Progr	0.000	71.000	291.000	-	291.000	-	-	-	-	-	-
• SCN / 2004: CVN 81	1,214.500	1,606.432	1,299.764	-	1,299.764	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

The CVN 78 is the first ship of the CVN 78 Class of aircraft carriers designed to replace USS ENTERPRISE and the ships of the NIMITZ Class. The CVN 78 class will feature a new nuclear propulsion and electrical generation/distribution system, new electromagnetic aircraft launching system (EMALS), advanced arresting gear (AAG) system, all electric auxiliaries, warfare system improvements, survivability enhancements, improved weapons handling, and improved aircraft servicing. These design features will result in lower manpower and total ownership costs as compared to the NIMITZ Class. Additionally, the following war fighting benefits will be realized: increased sortie generation rate, improved ship self-defense capability, increased launch and recovery capability / flexibility, increased operational availability, and increased flexibility to support future upgrades.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy **Date:** May 2021

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604567N / Ship Contract Design/ Live Fire T&E	Project (Number/Name) 3179 / CVN-79 Total Ship Integration
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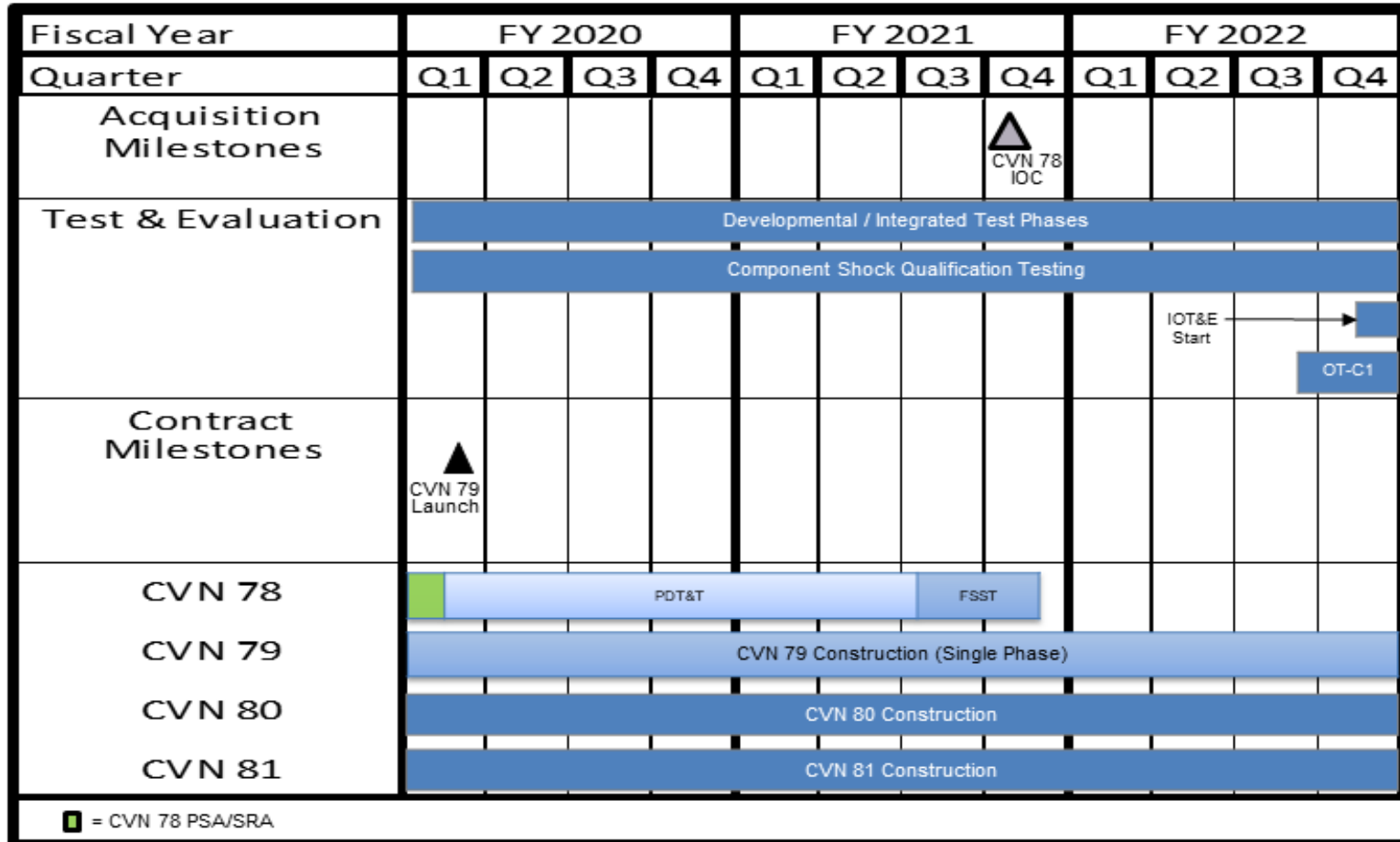
Product Development (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Total Ship Integration	C/CPAF	HII : VA	103.650	5.126	Nov 2019	13.390	Nov 2020	13.908	Nov 2021	-		13.908	-	-	-
Total Ship Integration	WR	NSWC CARDEROCK : MD	18.082	0.772	Nov 2019	0.000		0.000		-		0.000	-	-	-
Total Ship Integration	WR	NSWC DAHLGREN : VA	16.883	1.105	Nov 2019	0.200	Feb 2021	0.000		-		0.000	-	-	-
Total Ship Integration	WR	NSWC PHILADELPHIA : PA	4.093	0.528	Nov 2019	0.000		0.000		-		0.000	-	-	-
Total Ship Integration	WR	NAWCAD PAX RIVER : MD	8.564	0.859	Nov 2019	0.000		0.000		-		0.000	-	-	-
Total Ship Integration	WR	SPAWAR : CA	6.071	0.415	Nov 2019	0.000		0.000		-		0.000	-	-	-
Total Ship Integration	C/CPFF	NAVSEA SEAPORT : Various	33.780	1.681	Dec 2019	0.000		0.000		-		0.000	-	-	-
Total Ship Integration	C/CPAF	RAYTHEON : MA	9.784	0.000		0.000		0.000		-		0.000	-	-	-
Total Ship Integration	WR	NIWC LANT : SC	1.139	0.272	Nov 2019	0.000		0.000		-		0.000	-	-	-
Total Ship Integration	C/CPFF	SAIC : VA	1.445	0.000		0.000		0.000		-		0.000	-	-	-
Total Ship Integration	Various	NSRP : Various	18.101	1.670	Dec 2019	0.000		0.000		-		0.000	-	-	-
Total Ship Integration	C/CPFF	GRYPHON (SEI&T) : IN	2.709	1.031	Dec 2019	0.000		0.000		-		0.000	-	-	-
Total Ship Integration	MIPR	NIST : Various	0.000	0.000		1.000	May 2021	1.000	Nov 2021	-		1.000	-	-	-
Total Ship Integration	WR	NUWC NEWPORT : RI	0.000	0.000		0.000		0.000		-		0.000	-	-	-
Subtotal			224.301	13.459		14.590		14.908		-		14.908	-	-	N/A

Test and Evaluation (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Developmental Test & Evaluation	WR	NSWC CARDEROCK : MD	4.721	0.000		0.000		0.000		-		0.000	-	-	-
Developmental Test & Evaluation	WR	NUWC NEWPORT : RI	0.123	0.000		0.000		0.000		-		0.000	-	-	-

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Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604567N / Ship Contract Design/ Live Fire T&E	Project (Number/Name) 3179 / CVN-79 Total Ship Integration

Gerald R. Ford Class Carriers



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Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604567N / <i>Ship Contract Design/ Live Fire T&E</i>	Project (Number/Name) 3179 / <i>CVN-79 Total Ship Integration</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 3179				
CVN 79 Total Ship Integration	1	2020	4	2022

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy **Date:** May 2021

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604567N / <i>Ship Contract Design/ Live Fire T&E</i>	Project (Number/Name) 4007 / CVN 21 LFT&E
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COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
4007: CVN 21 LFT&E	77.299	3.895	4.161	4.242	-	4.242	-	-	-	-	-	-
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 223

A. Mission Description and Budget Item Justification

This project encompasses Live Fire Test and Evaluation (LFT&E) efforts for the CVN 78 Class. Title 10, US Code, Section 2366, CVN 21 Operational Requirements Document (ORD) and the CVN 78 Class Test and Evaluation Master Plan (TEMP) 1610 prescribe requirements for LFT&E. The purpose of LFT&E is to evaluate covered systems in a realistic combat environment before proceeding beyond low-rate initial production. Since the application of the survivability testing required by 10 USC 2366 to a CVN 78 Class ship would be unreasonably expensive and impractical, the Secretary of Defense waived the live fire testing requirement in 2004 and submitted a certification of that determination to Congress. The CVN 78 Class LFT&E Management Plan details the testing, modeling and simulation, and engineering analyses that are being used to determine whether CVN 78 Class ships will be able to survive and carry out their missions against the threat weapons identified in the Surface Ship Capstone System Threat Assessment Report (CSTAR) that are likely to be encountered in combat. The results of these tests and analyses are documented in periodic Vulnerability Assessment Reports (VARs).

The CVN 78 Class VAR 3 was completed in the summer of 2007 and the CVN 78 Class VAR 4 is scheduled to be completed in FY 18.

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

	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: CVN 21 LFT&E	3.895	4.161	4.242	0.000	4.242
Articles:	-	-	-	-	-
FY 2021 Plans: Continue planning for the CVN 78 Total Ship Survivability Trial (TSST) with the development of the TSST drill guides and implementation sheets. Perform cold checks on CVN 78 in support of TSST planning. Continue table-top exercises of individual TSST scenarios with subject matter experts (SMEs). Finalize the Damage Control section of the FSST Report. Continue survivability modeling improvements, analyses and documentation for the final Survivability Assessment Report (SAR).					
FY 2022 Base Plans: Continue planning for the CVN 78 TSST with maturation of the TSST drill guides and implementation sheets. Continue with cold checks of CVN 78 systems in support of TSST planning. Continue maturation of table-top					

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy **Date:** May 2021

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604567N / <i>Ship Contract Design/ Live Fire T&E</i>	Project (Number/Name) 4007 / CVN 21 LFT&E
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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
exercises of individual TSST scenarios with support from subject matter experts. Continue survivability modeling improvements, analyses and documentation for the final SAR. FY 2022 OCO Plans: N/A FY 2021 to FY 2022 Increase/Decrease Statement: Increase due to refined planned cost.					
Accomplishments/Planned Programs Subtotals	3.895	4.161	4.242	0.000	4.242

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022 Base</u>	<u>FY 2022 OCO</u>	<u>FY 2022 Total</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• SCN / 2001: <i>Carrier Replacement Program</i>	1,062.000	1,029.933	1,359.705	-	1,359.705	-	-	-	-	-	-
• RDTEN / 0604112N: <i>Project Units 2208, 4004, 9999</i>	106.381	104.433	121.509	-	121.509	-	-	-	-	-	-
• OMN / 1B2B: <i>CVN 78 Ford Class Training and Sustainment (12BJ0)</i>	6.871	5.026	5.513	-	5.513	-	-	-	-	-	-
• OPN / 5664: <i>Surface Training Equipment</i>	1.412	4.457	2.475	-	2.475	-	-	-	-	-	-
• SCN 5300: <i>Completion of PY Shpbldg Progr</i>	0.000	71.000	291.000	-	291.000	-	-	-	-	-	-
• SCN / 2004: <i>CVN 81</i>	1,214.500	1,606.432	1,299.764	-	1,299.764	-	-	-	-	-	-

Remarks

D. Acquisition Strategy
The CVN 78 is the first ship of the CVN 78 Class of aircraft carriers designed to replace USS ENTERPRISE and the ships of the NIMITZ Class. The CVN 78 will feature a new nuclear propulsion and electrical generation/distribution system, new electromagnetic aircraft launching system (EMALS), advanced arresting gear (AAG) system, all electric auxiliaries, warfare system improvements, survivability enhancements, improved weapons handling, and improved aircraft servicing. These design features will result in lower manpower and total ownership costs as compared to the NIMITZ Class. Additionally, the following war fighting benefits will be realized: increased sortie generation rate, improved ship self-defense capability, increased launch and recovery capability/flexibility, increased operational availability, and increased flexibility to support future upgrades.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy **Date:** May 2021

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604567N / Ship Contract Design/ Live Fire T&E	Project (Number/Name) 4007 / CVN 21 LFT&E
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Test and Evaluation (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Live Fire Test & Evaluation	WR	NSWC Carderock : MD	64.561	3.243	Nov 2019	3.175	Nov 2020	3.355	Nov 2021	-		3.355	-	-	-
Live Fire Test & Evaluation	C/CPAF	HII : VA	12.018	0.575	Nov 2019	0.906	May 2021	0.887	Nov 2021	-		0.887	-	-	-
Live Fire Test & Evaluation	WR	NSWC Dahlgren : VA	0.509	0.077	Nov 2019	0.080	Feb 2021	0.000		-		0.000	-	-	-
Live Fire Test & Evaluation	C/CPFF	NAVSEA SEAPORT : DC	0.201	0.000		0.000		0.000		-		0.000	-	-	-
Subtotal			77.289	3.895		4.161		4.242		-		4.242	-	-	N/A

Management Services (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Defense Acquisition Workforce	TBD	Various : Various	0.010	0.000		0.000		0.000		-		0.000	-	-	-
Subtotal			0.010	0.000		0.000		0.000		-		0.000	-	-	N/A

Project Cost Totals	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
	77.299	3.895	4.161	4.242	-	4.242	-	-	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy

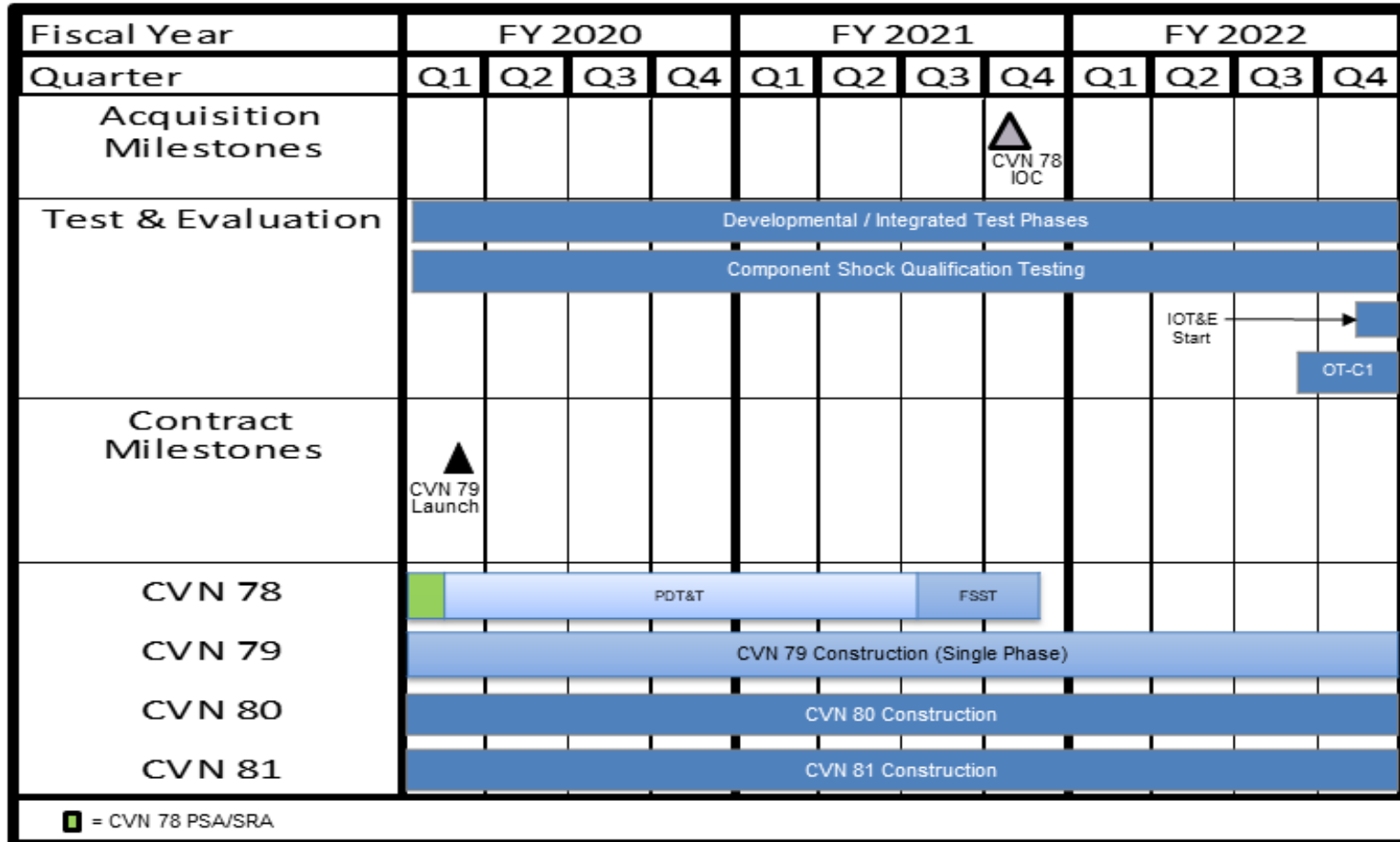
Date: May 2021

Appropriation/Budget Activity
1319 / 5

R-1 Program Element (Number/Name)
PE 0604567N / Ship Contract Design/ Live
Fire T&E

Project (Number/Name)
4007 / CVN 21 LFT&E

Gerald R. Ford Class Carriers



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Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604567N / <i>Ship Contract Design/ Live Fire T&E</i>	Project (Number/Name) 4007 / CVN 21 LFT&E

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 4007				
CVN 21 LFT&E	1	2020	4	2022

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy **Date:** May 2021

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604567N / Ship Contract Design/ Live Fire T&E	Project (Number/Name) 9999 / Congressional Adds
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COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
9999: <i>Congressional Adds</i>	0.000	0.000	14.500	0.000	-	0.000	-	-	-	-	-	-
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification
Congressional Add for DDG-51 Advanced Degaussing Mine Protection System.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2020	FY 2021
Congressional Add: DDG-51 Advanced Degaussing Mine Protection System <i>FY 2020 Accomplishments:</i> N/A <i>FY 2021 Plans:</i> Conduct feasibility study of the potential for incorporating Advanced Degaussing into the DDG-51 Class design	0.000	7.000
Congressional Add: ESB Pilot Program <i>FY 2020 Accomplishments:</i> N/A <i>FY 2021 Plans:</i> Modify the existing DoD Ordinance Technology Consortium (DOTC) contract with MSI Defense to procure hardware and spares for the MK38 MOD4 GWS. Perform the design and complete ship drawings and technical/ILS documentation. Install and test MK38 MOD4 on ESB.	0.000	7.500
Congressional Adds Subtotals	0.000	14.500

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

Remarks

D. Acquisition Strategy
N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604567N / <i>Ship Contract Design/ Live Fire T&E</i>	Project (Number/Name) 9999 / <i>Congressional Adds</i>

FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

Proj 9999	
Ship Contract Design: Congressional Add	████████████████████

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Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604567N / <i>Ship Contract Design/ Live Fire T&E</i>	Project (Number/Name) 9999 / <i>Congressional Adds</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 9999				
Ship Contract Design: Congressional Add	3	2021	4	2022