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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Navy **Date:** April 2022

Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604112N / <i>GERALD R FORD CI NUC AIRCRAFT CARRIER CVN 78-80</i>
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	476.462	111.554	121.509	116.498	-	116.498	45.574	29.532	29.675	29.958	Continuing	Continuing
2208: <i>CVN 21</i>	338.510	103.647	109.056	99.243	-	99.243	42.876	24.949	25.290	25.537	Continuing	Continuing
4004: <i>EMALS</i>	137.952	4.048	12.453	17.255	-	17.255	2.698	4.583	4.385	4.421	Continuing	Continuing
9999: <i>Congressional Adds</i>	0.000	3.859	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3.859

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

A. Mission Description and Budget Item Justification

This Navy program addresses unique technologies on Ford Class carriers. The program includes:

- (2208) - Development of ship hull, mechanical, propulsion, electrical, aviation, and combat support systems, subsystems and components to significantly improve 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 existing and future aircraft carriers.

- (4004) - Development of an advanced technology aircraft launch system in support of the CVN 78 Class design and construction schedule. The Electro Magnetic Aircraft Launch System (EMALS) will replace the current steam catapult on CVN 78 Class ships. EMALS provides better control of applied forces, both peak and transient dynamic, improved reliability and maintainability, increased operational availability and reduced operator and maintainer workload.

- (9999) - Development of a CVN electronic personnel qualification standards system (EPQS).

This Program Element (PE) and associated projects represent a continuation of efforts previously funded under PE 0603512N projects 2208 and 4004 in FY 2014 and earlier.

UNCLASSIFIED

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B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	104.433	121.509	0.000	-	0.000
Current President's Budget	111.554	121.509	116.498	-	116.498
Total Adjustments	7.121	0.000	116.498	-	116.498
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	9.999	0.000			
• SBIR/STTR Transfer	-2.878	0.000			
• Program Adjustments	0.000	0.000	0.000	-	0.000
• Rate/Misc Adjustments	0.000	0.000	0.000	-	0.000
• Adjustments to Budget Year	-	-	116.498	-	116.498

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

Project: 9999: *Congressional Adds*

Congressional Add: *Electronic Personnel Qualification Standards System*

Congressional Add Subtotals for Project: 9999

Congressional Add Totals for all Projects

	FY 2021	FY 2022
	3.859	0.000
	3.859	0.000
	3.859	0.000

Change Summary Explanation

2208 CVN 21

The FY 2021 reprogramming of \$9.999 million was for Full Ship Shock Trials (FSST) on CVN 78.

4004 EMALS

Cost: The FY 2023 funding request was reduced by \$0.447 million to account for the availability of prior year execution balances.

The FY 2022 funding realigned from Depot Stand-Up to Depot Planning due to FY 2021 funding for depot planning being realigned to Integrated Test & Evaluation (IT&E) to address the top system safety issue for EMALS Block Switch Sensor (BSS), which was identified during CVN78 Post Delivery Test & Trials (PDT&T). Depot Planning efforts have been reprioritized through FY 2023 to align with Depot Stand-Up strategy, and will be performed concurrently with Depot Stand-Up to establish component repair and overhaul capability.

Technical: N/A

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604112N / <i>GERALD R FORD CI NUC AIRCRAFT CARRIER CVN 78-80</i>	
<p>Schedule: Updated to include additional detail for further clarification. Fleet Interim Training end date moved from 4Q FY2022 to 4Q FY2023 Phased Depot Stand-Up (Component and Overhaul) start moved from 1Q FY2022 to 2Q FY2022 EMALS Reliability Deadloads and EMALS Launch Control Subsystem (LCS) Environmental Qualification Testing (EQT) moved from 2Q FY2021 to 1Q FY2021 Renamed EMALS Training Development to EMALS Interim Training on R4A for consistency. ---</p> <p>FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.</p>		

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy **Date:** April 2022

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604112N / GERALD R FORD CI NUC AIRCRAFT CARRIER CVN 78-80	Project (Number/Name) 2208 / CVN 21
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
2208: CVN 21	338.510	103.647	109.056	99.243	-	99.243	42.876	24.949	25.290	25.537	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 223

A. Mission Description and Budget Item Justification

This project provides for the development of 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 transitions the most promising technologies from the Navy technology base, other government laboratories, and the private sector into specific advanced development efforts. 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 significantly improve 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 78 procurement, including, but not limited to engineering support, programmatic and program support, logistics support, modeling and simulation, test and evaluation, manpower and program related studies, and design support systems, such as the Integrated Digital Environment (IDE).

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

	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: CVN 78 Class Advanced Technology Design & Development	1.000	3.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: CVN 78 Class Advanced Technology Design & Development - Continue development and transition of technologies to support CVN 78 Class Key Performance Parameters (KPPs): maintain sortie generation rate, reductions in manpower, and further recovery of weight and stability service life margins. Continue design activities to integrate the new technologies, such as the new propulsion plant and Electromagnetic Aircraft Launch System into the ship. Complete shock qualification for components of all CVN 78 systems.					
FY 2022 Plans: Cyber-security: Continue developing CVN 78 cyber-security processes, requirements and solutions. Continue development efforts necessary to implement the Defense in Depth Functional Implementation Architecture standard, increasing CVN 78's survivability in a cyber-contested environment. Develop and maintain system authorization packages for Risk Management Framework (RMF).					
FY 2023 Base Plans:					

UNCLASSIFIED

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Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604112N / GERALD R FORD CI NUC AIRCRAFT CARRIER CVN 78-80		Project (Number/Name) 2208 / CVN 21	
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)					
N/A					
FY 2023 OCO Plans: N/A					
FY 2022 to FY 2023 Increase/Decrease Statement: The decrease in FY 2023 is due to the transition of the unique CVN 78 technology and ramp down in the efforts.					
Title: CVN 21 - Test & Evaluation (T&E)					
Articles:					
	4.748	41.056	13.000	0.000	13.000
	-	-	-	-	-
FY 2022 Plans: Continue Consolidated Test Working Group (CTWG), and Carrier Integrated Test Team (CITT) efforts in support of the completion of DT/IT-5 testing. FY 22 activities will include: execution of the Combat Systems Operational Rehearsal Event (CSORE) Phase II, completion of the CVN 78 ship model updates for use in the Probability of Rain Annihilation (PRA) testbed, and continue platform-level Electronic Warfare assessments. Begin the first phase of Operational Testing, Operational Test Phase C1 (OT-C1). Continue planning for the second phase of Operational Testing, OT-C2. Continue to collect reliability data on new and legacy systems. Continue to monitor corrective actions and track installation and performance on ship. Conduct the Joint Mission Interoperability Test (JMIT).					
FY 2023 Base Plans: Conclude CTWG and CITT efforts upon completion of the final phase of Developmental Testing (DT/IT-5). Conduct the first phase of Operational Testing (OT-C1). OT-C1 test events include lab-based cyber survivability testing, interoperability data collection, and collection of OT data. Begin planning to support the Sortie Generation Rate demonstration event. Continue to collect reliability data on new and legacy systems. Continue to monitor corrective actions and track installation and performance on ship.					
FY 2023 OCO Plans: N/A					
FY 2022 to FY 2023 Increase/Decrease Statement: The decrease from FY 2022 to FY 2023 aligns and supports the program's Test and Evaluation plan as CVN 78 transitions from Developmental Testing to Operational Testing.					
Title: Integrated Digital Shipbuilding (iDS)					
	47.000	53.000	86.243	0.000	86.243
	-	-	-	-	-

UNCLASSIFIED

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
<p>Description: Transformation to Integrated Digital Shipbuilding (iDS).</p> <p>FY 2022 Plans: Continue CVN 80/81 FY22 Integrated Digital Shipbuilding implementation plan and execute \$53M of the total contract by the Navy. This effort will continue each year through FY 2027 to enable HII-NNS to achieve 2-ship-buy savings. These efforts are directly tied to the construction trade products needed to support the build sequence in the shops and on the waterfront. Failure to fully fund installment clause would result in a change to the contract as funding requirements would not be met. Continue to apply upgrades to the shipbuilders Product Lifecycle Management (PLM) methodology, Product Data Management (PDM), and Software toolsets to support developing interfaces, new business processes, shipyard systems, and overall shipbuilding efficiency increase. Continue to support engineering efforts to define and add product manufacturing information into the Product Model to allow design disclosure to the Navy and digital disclosure of work instructions and related technical references on tablet computers for the mechanics to use in the construction of CVN 80/81. Continue planning efforts to develop visual work instructions for manufacturing and constructions Trades. Continue to develop visual build management plans and Critical Chain Project Plans (CCPP) that will enable development of efficiently sequenced build plans.</p> <p>FY 2023 Base Plans: Continue CVN 80/81 FY23 Integrated Digital Shipbuilding implementation plan and execute the installment plan of the total contract by the Navy. This effort will continue each year through FY 2027 to enable HII-NNS to achieve 2-ship-buy savings. These efforts are directly tied to the construction trade products needed to support the build sequence in the shops and on the waterfront. Failure to fully fund installment clause would result in a change to the contract as funding requirements would not be met. HII-NNS will continue to apply upgrades to their Product Lifecycle Management (PLM) toolsets, Product Data Management (PDM) methodology, and other resource planning software in order to support developing toolset integration, new business processes, and overall shipbuilding efficiency increase. Continue to support engineering efforts to define and add product manufacturing information into the Product Model to allow design disclosure to the Navy and digital disclosure of work instructions and related technical references on tablet computers for the trades to use in the construction of CVN 80/81. Continue planning efforts to develop visual work instructions for manufacturing and constructions Trades. Continue to develop visual build management plans and Critical Chain Project Plans (CCPP) that will enable development of efficiently sequenced build plans.</p> <p>FY 2023 OCO Plans:</p>					

UNCLASSIFIED

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
N/A					
FY 2022 to FY 2023 Increase/Decrease Statement: The increase in FY 2023 is required due to shipbuilder overrun on the iDS contract for a first of kind effort.					
Title: CVN 78 Full Ship Shock Trial (FSST)	50.899	12.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2022 Plans: Complete reduction and analysis of data collected during FSST. Complete CVN 78 FSST results summary and finalize the CVN 78 FSST Report. Complete all needed FSST-related ship repairs.					
FY 2023 Base Plans: N/A					
FY 2023 OCO Plans: N/A					
FY 2022 to FY 2023 Increase/Decrease Statement: No funding is required for FSST in FY 2023. All post-trial repairs and FSST reporting are scheduled to be completed in FY 2022.					
Accomplishments/Planned Programs Subtotals	103.647	109.056	99.243	0.000	99.243

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• RD TEN / 0604567N: Project Units 3108, 3179, 4007	40.668	44.327	45.717	-	45.717	47.044	34.141	33.285	33.636	Continuing	Continuing
• SCN / 2001: Carrier Replacement Program	958.933	1,062.205	1,481.530	-	1,481.530	1,119.726	2,416.628	1,159.211	1,810.540	Continuing	Continuing
• OMN / 1B2B: CVN 78 Ford Class Training and Sustainment	5.256	5.314	5.767	-	5.767	6.020	6.042	6.096	6.113	Continuing	Continuing
• OPN / 5664: Surface Training Equipment	4.457	2.475	2.468	-	2.468	2.485	2.628	2.641	2.693	Continuing	Continuing
• SCN / 5300: Completion of PY Shipblgd Progr	71.000	291.000	461.700	-	461.700	624.600	0.000	0.000	0.000	0.000	1,448.300

UNCLASSIFIED

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

<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>		<u>FY 2023</u>		<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To</u>	
			<u>Base</u>	<u>OCO</u>	<u>Total</u>	<u>Complete</u>					<u>Total Cost</u>	
• SCN / 2004: <i>CVN 81</i>	1,606.432	1,287.719	1,052.024	-	1,052.024	774.268	634.080	1,959.244	2,035.477	1,711.206	12,917.950	
• OMN / 1B5B: <i>Ford Class PCU Housing</i>	0.000	0.000	13.000	-	13.000	4.600	0.100	0.800	10.600	Continuing	Continuing	

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, 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.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy												Date: April 2022			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)					Project (Number/Name)						
1319 / 4				PE 0604112N / GERALD R FORD CI NUC AIRCRAFT CARRIER CVN 78-80					2208 / CVN 21						
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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
Advanced Design & Development	C/CPAF	HII : VA	32.266	0.000		0.230	Nov 2021	0.000		-		0.000	0.000	32.496	-
Advanced Design & Development	WR	NSWC CARDEROCK : MD	4.951	0.000		0.000		0.000		-		0.000	0.000	4.951	-
Advanced Design & Development	WR	NAWC PATUXENT RIVER : MD	5.925	0.000		0.000		0.000		-		0.000	0.000	5.925	-
Advanced Design & Development	WR	NSWC DAHLGREN : VA	7.781	0.000		1.300	Nov 2021	0.000		-		0.000	0.000	9.081	-
Advanced Design & Development	C/CPAF	RAYTHEON : VA	29.109	0.000		0.000		0.000		-		0.000	0.000	29.109	-
Advanced Design & Development	C/CPFF	NAVSEA SEAPORT : VARIOUS	23.949	0.000		0.000		0.000		-		0.000	0.000	23.949	-
Advanced Design & Development	Various	MISCELLANEOUS : VARIOUS	3.617	0.000		0.000		0.000		-		0.000	0.000	3.617	-
Advanced Design & Development	WR	NSWC PHILADELPHIA : PA	21.495	1.000	Feb 2021	1.120	Nov 2021	0.000		-		0.000	0.000	23.615	-
Advanced Design & Development	WR	SPAWAR : VARIOUS	6.640	0.000	Feb 2021	0.000		0.000		-		0.000	0.000	6.640	-
Advanced Design & Development	WR	NSWC CORONA : CA	1.602	0.000		0.000		0.000		-		0.000	0.000	1.602	-
Advanced Design & Development	WR	NAWC LAKEHURST : NJ	1.338	0.000		0.000		0.000		-		0.000	0.000	1.338	-
Advanced Design & Development	WR	NSWC PORT HUENEME : CA	0.855	0.000		0.000		0.000		-		0.000	0.000	0.855	-
Advanced Design & Development	C/CPFF	BECHTEL : PA	6.400	0.000		0.000		0.000		-		0.000	0.000	6.400	-
Advanced Design & Development	C/CPFF	GRYPHON : DC	0.352	0.000		0.350	Nov 2021	0.000		-		0.000	0.000	0.702	-
Integrated Digital Shipbuilding	C/CPAF	HII : VA	46.965	47.000	Nov 2020	53.000	Nov 2021	86.243	Nov 2022	-		86.243	Continuing	Continuing	Continuing
Subtotal			193.245	48.000		56.000		86.243		-		86.243	Continuing	Continuing	N/A

UNCLASSIFIED

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Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604112N / GERALD R FORD CI NUC AIRCRAFT CARRIER CVN 78-80	Project (Number/Name) 2208 / CVN 21
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Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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
The decrease in FY 2023 for Advanced Design & Development is due to the transition of the unique CVN 78 technology and ramp down in the efforts. The increase in FY 2023 for iDS is due to shipbuilder overrun on the iDS contract line item.

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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			
Development Test & Evaluation	C/CPAF	HII : VA	11.057	0.000		1.131	Nov 2021	0.000		-		0.000	0.000	12.188	-
Development Test & Evaluation	WR	NAWC PATUXENT RIVER : MD	4.132	0.021	Nov 2020	0.174	Nov 2021	0.000		-		0.000	0.000	4.327	-
Development Test & Evaluation	WR	NSWC DAHLGREN : VA	14.124	0.943	Nov 2020	3.742	Nov 2021	2.700	Nov 2022	-		2.700	0.000	21.509	-
Development Test & Evaluation	WR	NSWC CARDEROCK : MD	2.076	0.405	Nov 2020	1.166	Nov 2021	0.400	Nov 2022	-		0.400	0.000	4.047	-
Development Test & Evaluation	WR	SPAWAR : VARIOUS	8.421	0.342	Feb 2021	0.000		0.000		-		0.000	0.000	8.763	-
Development Test & Evaluation	C/CPAF	RAYTHEON : VARIOUS	5.643	0.000		0.000		0.000		-		0.000	0.000	5.643	-
Development Test & Evaluation	Various	MISCELLANEOUS : VARIOUS	5.510	0.338	Feb 2021	2.385	Nov 2021	0.380	Nov 2022	-		0.380	0.000	8.613	-
Development Test & Evaluation	C/CPFF	NAVSEA SEAPORT : VARIOUS	4.066	0.173	Feb 2021	0.000		0.000		-		0.000	0.000	4.239	-
Development Test & Evaluation	C/BA	NSWC PORT HUENEME : CA	2.658	0.276	Feb 2021	10.199	Nov 2021	0.000		-		0.000	0.000	13.133	-
Development Test & Evaluation	C/BA	NSWC CORONA : CA	0.263	0.000		0.592	Nov 2021	0.000		-		0.000	0.000	0.855	-
Development Test & Evaluation	WR	NAWC LAKEHURST : NJ	11.803	0.555	Feb 2021	1.741	Nov 2021	1.300	Nov 2022	-		1.300	0.000	15.399	-

UNCLASSIFIED

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Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
1319 / 4				PE 0604112N / GERALD R FORD CI NUC AIRCRAFT CARRIER CVN 78-80				2208 / CVN 21							
Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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
Development Test & Evaluation	WR	NSWC PHILADELPHIA : PA	6.547	0.216	Feb 2021	0.000		0.000		-		0.000	0.000	6.763	-
Development Test & Evaluation	C/CPFF	GRYPHON (SEI&T) : IN	1.164	0.000		0.000		0.000		-		0.000	0.000	1.164	-
Development Test & Evaluation	C/CPFF	GENERAL ATOMICS : CA	11.708	0.000		0.000		0.000		-		0.000	0.000	11.708	-
Operational Test & Evaluation	WR	COMOPTEVFOR : VA	13.532	1.479	Nov 2020	19.926	Nov 2021	5.400	Nov 2022	-		5.400	Continuing	Continuing	Continuing
Operational Test & Evaluation	WR	NAWC PATUXENT RIVER : MD	0.213	0.000		0.000		0.400	Nov 2022	-		0.400	Continuing	Continuing	Continuing
Operational Test & Evaluation	Various	MISCELLANEOUS : VARIOUS	0.000	0.000		0.000		0.500	Nov 2022	-		0.500	Continuing	Continuing	Continuing
Operational Test & Evaluation	WR	NSWC PHILADELPHIA : PA	0.000	0.000		0.000		1.120	Nov 2022	-		1.120	Continuing	Continuing	Continuing
Operational Test & Evaluation	C/CPFF	GRYPHON : DC	0.000	0.000		0.000		0.300	Nov 2022	-		0.300	Continuing	Continuing	Continuing
Operational Test & Evaluation	WR	NSWC CORONA : CA	0.000	0.000		0.000		0.500	Nov 2022	-		0.500	Continuing	Continuing	Continuing
Full Ship Shock Trial	C/CPFF	BECHTEL : PA	7.632	1.500	Nov 2020	0.400	Nov 2021	0.000		-		0.000	0.000	9.532	-
Full Ship Shock Trial	WR	NAWC PATUXENT RIVER : MD	2.080	3.864	Nov 2020	0.330	Nov 2021	0.000		-		0.000	0.000	6.274	-
Full Ship Shock Trial	WR	NSWC DAHLGREN : VA	1.338	0.506	Nov 2020	0.150	Nov 2021	0.000		-		0.000	0.000	1.994	-
Full Ship Shock Trial	WR	NSWC CARDEROCK : MD	21.226	16.658	Nov 2020	1.116	Nov 2021	0.000		-		0.000	0.000	39.000	-
Full Ship Shock Trial	WR	NSWC PHILADELPHIA : PA	4.761	7.873	Nov 2020	0.204	Nov 2021	0.000		-		0.000	0.000	12.838	-
Full Ship Shock Trial	C/CPAF	HII : VA	5.071	13.658	Nov 2020	9.800	Nov 2021	0.000		-		0.000	0.000	28.529	-
Full Ship Shock Trial	WR	SPAWAR : VARIOUS	0.240	1.404	Nov 2020	0.000		0.000		-		0.000	0.000	1.644	-
Full Ship Shock Trial	Various	MISCELLANEOUS : VARIOUS	0.000	5.436	Nov 2020	0.000		0.000		-		0.000	0.000	5.436	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy **Date:** April 2022

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604112N / GERALD R FORD CI NUC AIRCRAFT CARRIER CVN 78-80	Project (Number/Name) 2208 / CVN 21
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Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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			
Subtotal			145.265	55.647		53.056		13.000		-		13.000	Continuing	Continuing	N/A

Remarks
 The decrease from FY 2022 to FY 2023 aligns and supports the program's Test and Evaluation plan as CVN 78 transitions from Developmental Testing to Operational Testing. No funding is required for FSST in FY 2023. All post-trial repairs and FSST reporting are scheduled to be completed in FY 2022.

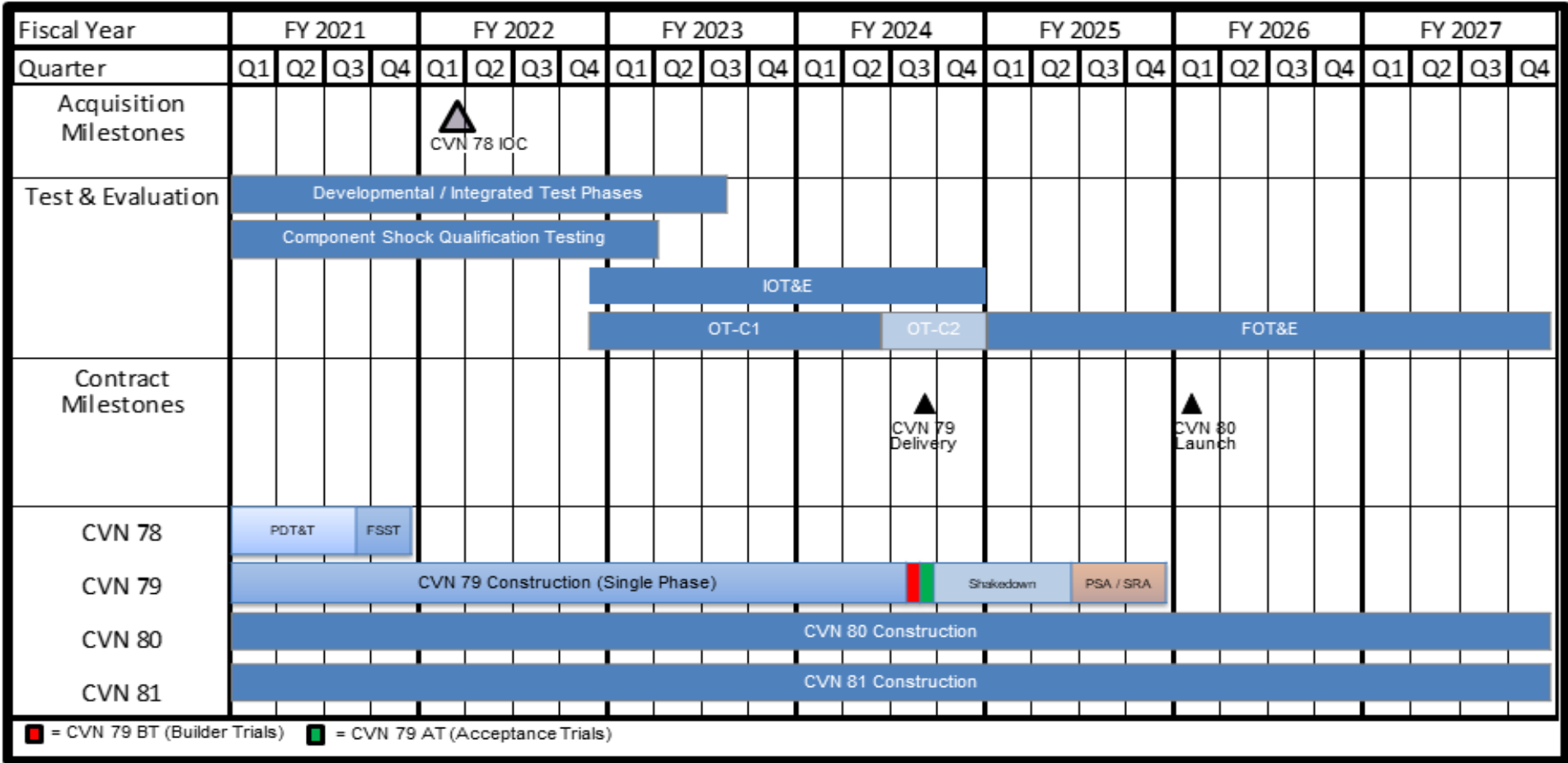
	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	338.510	103.647	109.056	99.243	-	99.243	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604112N / GERALD R FORD CI NUC AIRCRAFT CARRIER CVN 78-80	Project (Number/Name) 2208 / CVN 21

Gerald R. Ford Class Carriers



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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604112N / <i>GERALD R FORD CI NUC AIRCRAFT CARRIER CVN 78-80</i>	Project (Number/Name) 2208 / CVN 21

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 2208				
CVN 21	1	2021	4	2027

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy										Date: April 2022		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604112N / GERALD R FORD CI NUC AIRCRAFT CARRIER CVN 78-80				Project (Number/Name) 4004 / EMALS			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
4004: EMALS	137.952	4.048	12.453	17.255	-	17.255	2.698	4.583	4.385	4.421	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
Project MDAP/MAIS Code: 223												

A. Mission Description and Budget Item Justification

This project provides for the development of an advanced technology aircraft launch system in support of the CVN 78 design and construction schedule, as well as Engineering and Life Cycle System (E&LCS) design. The Electromagnetic Aircraft Launch System (EMALS) will be the aircraft catapult for CVN 78 Class ships. EMALS provides better control of applied forces, both peak and transient dynamic, improved reliability and maintainability, increased operational availability, and reduced operator and maintainer workload.

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

	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: EMALS	4.048	12.453	17.255	0.000	17.255
Articles:	-	-	-	-	-
Description: EMALS					
FY 2022 Plans: Continue phased Ready for Training. Continue depot planning and analysis, and commence standup of EMALS Depot Level maintenance, overhaul and repair facility/facilities for EMALS components.					
FY 2023 Base Plans: Complete Ready for Training. Complete depot planning and analysis, and continue phased standup of EMALS Depot Level maintenance, overhaul and repair facility/facilities for EMALS components.					
FY 2023 OCO Plans: N/A					
FY 2022 to FY 2023 Increase/Decrease Statement: The increase from FY 2022 to FY 2023 supports the phased standup of the EMALS Depot capability.					
Accomplishments/Planned Programs Subtotals	4.048	12.453	17.255	0.000	17.255

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy **Date:** April 2022

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604112N / GERALD R FORD CI NUC AIRCRAFT CARRIER CVN 78-80	Project (Number/Name) 4004 / EMALS
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C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u> <u>Base</u>	<u>FY 2023</u> <u>OCO</u>	<u>FY 2023</u> <u>Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• RD TEN / 0604567N: <i>Project Units 3108, 3179, 4007</i>	40.668	44.327	45.717	-	45.717	47.044	34.141	33.285	33.636	Continuing	Continuing
• SCN / 2001: <i>Carrier Replacement Program</i>	958.933	1,062.205	1,481.530	-	1,481.530	1,119.726	2,416.628	1,159.211	1,810.540	0.000	40,370.845
• OMN / 1B2B: <i>CVN 78 Ford Class Training and Sustainment (12BJ0)</i>	5.256	5.314	5.767	-	5.767	6.020	6.042	6.096	6.113	Continuing	Continuing
• OPN / 5664: <i>Surface Training Equipment</i>	4.457	2.475	2.468	-	2.468	2.485	2.628	2.641	2.693	Continuing	Continuing
• OPN / 4213: <i>Aircraft Support Equipment</i>	236.655	175.439	275.461	-	275.461	134.713	133.408	128.740	132.767	Continuing	Continuing
• SCN / 2004: <i>CVN 81</i>	1,606.432	1,287.719	1,052.024	-	1,052.024	774.268	634.080	1,959.244	2,035.477	1,723.251	12,929.995
• SCN / 5300: <i>Completion of PY Shipbldg Progr</i>	71.000	291.000	461.700	-	461.700	624.600	0.000	0.000	0.000	0.000	1,448.300
• OMN / 1B5B: <i>Ford Class PCU Housing</i>	0.000	0.000	13.000	-	13.000	4.600	0.100	0.800	10.600	Continuing	Continuing
• OPN/4219: <i>Electromagnetic Aircraft Launch System (EMALS)</i>	0.000	0.000	18.594	-	18.594	7.492	7.399	7.095	7.226	37.112	84.918

Remarks

OPN 4213 includes a portion of line item funding for EMALS.

D. Acquisition Strategy

The CVN 78 is the first ship of the CVN 78 Class of aircraft carriers designed to replace 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 2023 Navy **Date:** April 2022

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604112N / GERALD R FORD CI NUC AIRCRAFT CARRIER CVN 78-80	Project (Number/Name) 4004 / EMALS
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Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Primary HW Development - SDD	C/CPFF	General Atomics : San Diego, CA	40.875	0.000		0.000		0.000		-		0.000	0.000	40.875	40.875
Primary HW Development	WR	NAWCAD Lakehurst : Lakehurst, NJ	7.362	0.000		0.000		0.000		-		0.000	0.000	7.362	7.362
Prior Year Cost No Longer Funded in FYDP	Various	Various : Various	24.589	0.000		0.000		0.000		-		0.000	0.000	24.589	24.589
Subtotal			72.826	0.000		0.000		0.000		-		0.000	0.000	72.826	N/A

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Government Engineering Support	WR	Various : Various	0.216	0.000		0.000		0.000		-		0.000	0.000	0.216	-
Training Support	WR	NAWCAD TSD : Orlando, FL	1.194	0.087	Nov 2020	0.196	Nov 2021	0.000		-		0.000	0.000	1.477	-
Training Support	WR	NAVFAC : Norfolk, VA	1.103	0.000		0.000		0.000		-		0.000	0.000	1.103	1.103
Depot Logistics Development	C/CPFF	General Atomics : San Diego, CA	18.069	0.250	Nov 2020	6.500	Nov 2021	2.440	Nov 2022	-		2.440	0.000	27.259	25.231
Government Eng Support	WR	NAWCAD Lakehurst : Lakehurst, NJ	2.227	1.048	Nov 2020	1.646	Nov 2021	2.413	Nov 2022	-		2.413	Continuing	Continuing	Continuing
Depot Stand-Up Support	C/CPFF	General Atomics : San Diego, CA	0.000	0.000		4.111	Apr 2022	11.313	Nov 2022	-		11.313	Continuing	Continuing	Continuing
Training Support	C/FFP	General Atomics : San Diego, CA	0.000	0.000		0.000		0.367	Nov 2022	-		0.367	0.000	0.367	-
Training Support	WR	NAWCAD Lakehurst : Lakehurst, NJ	0.000	0.000		0.000		0.722	Nov 2022	-		0.722	0.000	0.722	-
Subtotal			22.809	1.385		12.453		17.255		-		17.255	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy **Date:** April 2022

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604112N / GERALD R FORD CI NUC AIRCRAFT CARRIER CVN 78-80	Project (Number/Name) 4004 / EMALS
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Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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
The increase from FY 2022 to FY 2023 supports the phased standup of the EMALS Depot capability.

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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			
Integrated Test & Evaluation	WR	NAWC Lakehurst : Lakehurst, NJ	10.337	0.652	Nov 2020	0.000		0.000		-		0.000	0.000	10.989	-
Integrated Test & Evaluation	C/CPFF	General Atomics : San Diego, CA	26.796	2.011	Mar 2021	0.000		0.000		-		0.000	0.000	28.807	29.057
Prior Year Cost No Longer Funded in FYDP	Various	Various : Various	5.184	0.000		0.000		0.000		-		0.000	0.000	5.184	-
Subtotal			42.317	2.663		0.000		0.000		-		0.000	0.000	44.980	N/A

	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	137.952	4.048	12.453	17.255	-	17.255	Continuing	Continuing	N/A

Remarks

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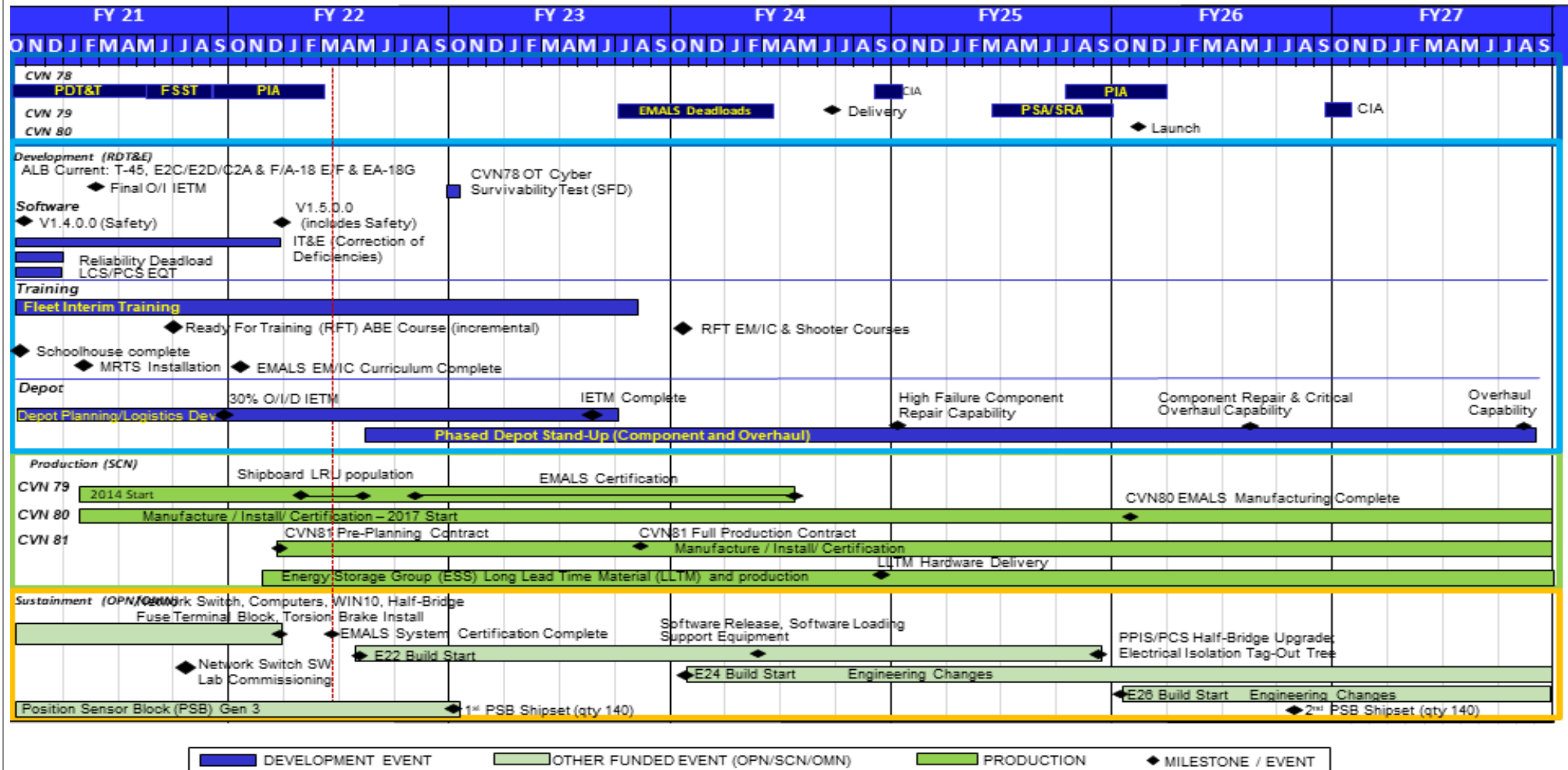
Exhibit R-4, RDT&E Schedule Profile: PB 2023 Navy

Date: April 2022

Appropriation/Budget Activity
1319 / 4

R-1 Program Element (Number/Name)
PE 0604112N / GERALD R FORD CI NUC
AIRCRAFT CARRIER CVN 78-80

Project (Number/Name)
4004 / EMALS



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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604112N / GERALD R FORD CI NUC AIRCRAFT CARRIER CVN 78-80	Project (Number/Name) 4004 / EMALS

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 4004				
Training: EMALS Interim Training	1	2022	4	2023
Depot Development: EMALS Depot Level Planning	1	2021	4	2023
Depot Development: EMALS Depot Standup	2	2022	4	2027
Test and Evaluation: EMALS Integrated Test & Evaluation (IT&E)	1	2021	1	2022
Test and Evaluation: EMALS Reliability Deadloads	1	2021	1	2021
Test and Evaluation: EMALS Launch Control Subsystem (LCS) Environmental Qualification Testing (EQT)	1	2021	1	2021

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy **Date:** April 2022

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604112N / GERALD R FORD CI NUC AIRCRAFT CARRIER CVN 78-80	Project (Number/Name) 9999 / Congressional Adds
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
9999: Congressional Adds	0.000	3.859	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3.859
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project provides for development of a CVN electronic personnel qualification standards system (EPQS).

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022
Congressional Add: Electronic Personnel Qualification Standards System	3.859	0.000
FY 2021 Accomplishments: Develop a digital twin of a single hull and develop game-based PQS training. Assist and support CVN digital transformation. Identify data sources and cloud environment solutions.		
FY 2022 Plans: N/A		
Congressional Adds Subtotals	3.859	0.000

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

<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• RD TEN / 0604567N: Project Units 3108, 3179, 4007	40.668	44.327	45.717	-	45.717	47.044	34.141	33.285	33.636	Continuing	Continuing
• SCN / 2001: Carrier Replacement Program	958.933	1,062.205	1,481.530	-	1,481.530	1,119.726	2,416.628	1,159.211	1,810.540	Continuing	Continuing
• OMN / 1B2B: CVN 78 Ford Class Training and Sustainment	5.256	5.314	5.767	-	5.767	6.020	6.042	6.096	6.113	Continuing	Continuing
• OPN / 5664: Surface Training Equipment	4.457	2.475	2.468	-	2.468	2.485	2.628	2.641	2.693	Continuing	Continuing
• SCN / 5300: Completion of PY Shipbldg Progr	71.000	291.000	461.700	-	461.700	624.600	0.000	0.000	0.000	0.000	1,448.300
• SCN / 2004: CVN 81	1,606.432	1,287.719	1,052.024	-	1,052.024	774.268	634.080	1,959.244	2,035.477	1,711.206	12,917.950
• OMN / 1B5B: Ford Class PCU Housing	0.000	0.000	13.000	-	13.000	4.600	0.100	0.800	10.600	Continuing	Continuing

Remarks

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604112N / <i>GERALD R FORD CI NUC AIRCRAFT CARRIER CVN 78-80</i>	Project (Number/Name) 9999 / <i>Congressional Adds</i>

D. Acquisition Strategy
N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy **Date:** April 2022

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604112N / GERALD R FORD CI NUC AIRCRAFT CARRIER CVN 78-80	Project (Number/Name) 9999 / Congressional Adds
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Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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 and Deveopment	TBD	TBD : TBD	0.000	3.759	Jul 2021	0.000		0.000		-		0.000	0.000	3.759	-
Advanced Design and Deveopment	WR	NSWC PHILADELPHIA : PA	0.000	0.100	Jul 2021	0.000		0.000		-		0.000	0.000	0.100	-
Subtotal			0.000	3.859		0.000		0.000		-		0.000	0.000	3.859	N/A

Remarks
Congressional add funding programmed in FY21.

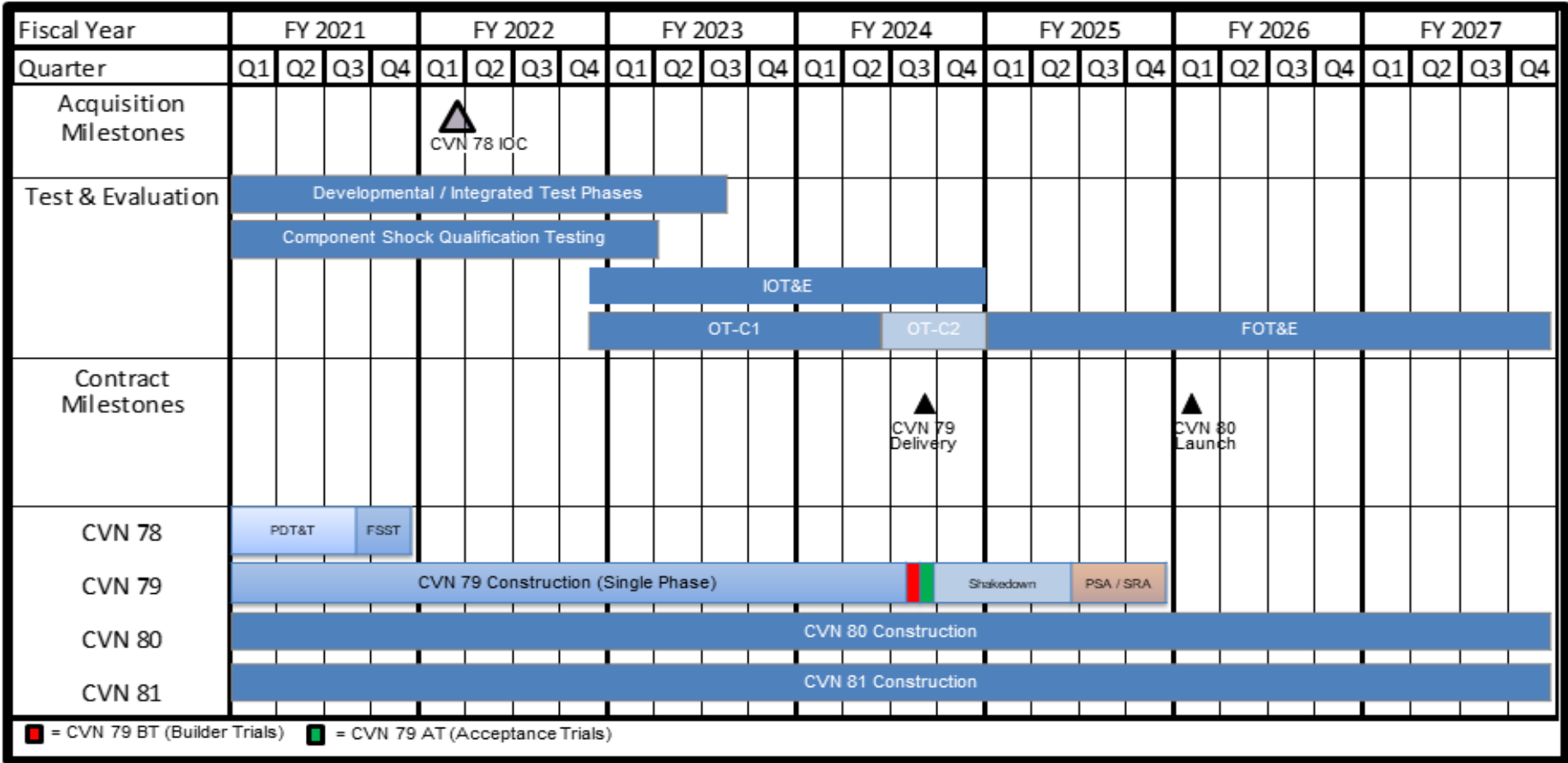
	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	3.859	0.000	0.000	-	0.000	0.000	3.859	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604112N / GERALD R FORD CI NUC AIRCRAFT CARRIER CVN 78-80	Project (Number/Name) 9999 / Congressional Adds

Gerald R. Ford Class Carriers



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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604112N / GERALD R FORD CI NUC AIRCRAFT CARRIER CVN 78-80	Project (Number/Name) 9999 / Congressional Adds

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 9999				
Electronic Personnel Qualification Standards System	1	2021	4	2022