Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Navy											Date: March 2019	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0604112N *I (U)Gerald R Ford Cl Nuc Aircraft Carrier CVN 78-80*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	226.160	82.549	83.121	121.310	-	121.310	99.418	72.213	69.704	54.440	Continuing	Continuing
2208: *CVN 21*	165.862	57.302	25.029	103.830	-	103.830	95.279	72.213	69.704	54.440	Continuing	Continuing
4004: *EMALS*	60.298	25.247	33.092	17.480	-	17.480	4.139	0.000	0.000	0.000	0.000	140.256
9999: *Congressional Adds*	0.000	0.000	25.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	25.000
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.

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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Navy	Date: March 2019
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604112N *I (U)Gerald R Ford Cl Nuc Aircraft Carrier CVN 78-80*

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	83.935	58.121	57.236	-	57.236
Current President's Budget	82.549	83.121	121.310	-	121.310
Total Adjustments	-1.386	25.000	64.074	-	64.074
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	25.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.386	0.000			
• Program Adjustments	0.000	0.000	64.318	-	64.318
• Rate/Misc Adjustments	0.000	0.000	-0.244	-	-0.244

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2018	FY 2019
Project: 9999: *Congressional Adds*		
Congressional Add: *CVN 78 Full Ship Shock Trial*	0.000	25.000
Congressional Add Subtotals for Project: 9999	0.000	25.000
Congressional Add Totals for all Projects	0.000	25.000

Change Summary Explanation

FY20 - PROJ 2208 CVN 21: Addition of CVN 78 Full Ship Shock Trials funding (+$17.5M)
FY20 - PROJ 2208 CVN 21: Addition of Integrated Digital Shipbuilding (iDS) funding (+$49.0M)
Schedule: EMALS Depot Planning End Date shifted from 1Q FY 2022 to 4Q FY 2021.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604112N / *(U)Gerald R Ford Cl Nuc Aircraft Carrier CVN 78-80*	Project (Number/Name) 2208 / *CVN 21*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
2208: *CVN 21*	165.862	57.302	25.029	103.830	-	103.830	95.279	72.213	69.704	54.440	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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: CVN 78 Class Advanced Technology Design & Development	36.004	11.597	14.767	0.000	14.767
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 2019 Plans: Continue providing support to resolve issues identified during Post Shakedown Availability (PSA) on CVN 78 developmental systems.					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604112N / *(U)Gerald R Ford Cl Nuc Aircraft Carrier CVN 78-80*	**Project (Number/Name)** 2208 / *CVN 21*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Cyber-security: Continue developing CVN 78 cyber-security processes, requirements and solutions. Establish boundary defense for tactical, wire-free communication and video systems. Develop and maintain certification and accreditation packages for system support. Develop land-based test sites to conduct testing. Continue to implement WIN10 upgrades, development of connect / disconnect procedures as well as continue to develop Security Technical Implementation Guides and Information Assurance Technical Authority Board in time for installation during the FY 2020 Planned Incremental Availability. Component Shock: Complete CVN 78 GFE component / system shock qualification requirements. This effort will allow necessary NAVSEA post-delivery shock hardening certification of CVN 78 prior to its operational deployment. Requirements in FY19 are for Raytheon to prepare and perform component shock testing of DBR elements, to include AN/SPY-4, AN/SPY-3, Receiver Exciter (REX), and processing rooms. NSWC Philadelphia will complete review of GFE shock test reports carried over from 4Q 2018 shock testing, provide guidance and approval for DBR test procedures, and review resulting DBR shock test reports. ***FY 2020 Base 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 certification and accreditation packages for system support. ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase is due to additional Cyber test requirements.					
Title: CVN 21 - Test & Evaluation (T&E)	4.872	13.432	22.563	0.000	22.563
Articles:	-	-	-	-	-
FY 2019 Plans: Complete PSA and achieve Initial Operational Capability (IOC). Continue PDT&T, DTWG and CITT efforts in support of DT/IT-5 integration testing. Continue DT/IT-5. The test events scheduled for DT/IT-5 in FY 19 include continuing DBR shipboard engineering and developmental testing; platform-level combat systems interoperability testing; platform-level C4I interoperability testing; CSSQT; structural test firings of Evolved Sea					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604112N / *(U)Gerald R Ford Cl Nuc Aircraft Carrier CVN 78-80*	**Project (Number/Name)** 2208 / *CVN 21*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Sparrow Missile (ESSM) and Rolling Airframe Missile (RAM); Radar Cross Section (RCS) and Infrared (IR) measurements; degaussing and de-perming; cyber-security inspection; platform-level Hull, Mechanical and Electrical (HM&E) interoperability testing; platform-level aviation systems interoperability testing; and aircraft compatibility testing. Continue planning of Operational Testing, to include Operational Test Phase C1 (OT-C1) planned testing and begin detailed planning of scheduled OT-C2 test events. ***FY 2020 Base Plans:*** Continue PDT&T, CTWG and CITT efforts in support of DT/IT-5 testing. The test events scheduled for DT/IT-5 in FY20 include continuing Dual Band Radar (DBR) shipboard engineering and developmental testing; platform-level combat systems interoperability testing; platform-level C4I interoperability testing; CSSQT; structural test firings of Evolved Sea Sparrow Missile and Rolling Airframe Missile; Radar Cross Section and infrared measurements; degaussing and de-perming; cyber-security inspection; platform-level Hull, Mechanical and Electrical interoperability testing; platform-level aviation systems interoperability testing; and aircraft compatibility testing. Continue planning of Operational Testing, to include Operational Test Phase C1 (OT-C1) and OT-C2 test events. Continue to collect reliability data on new and legacy systems. Continue to monitor corrective actions and track installation and performance on ship. Conduct system cyber vulnerability analysis; develop mitigations and solutions to address discovered vulnerabilities and known cyber-security risks. Conduct development and planning to support cyber-survivability testing during Initial Operational Test & Evaluation. ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increased to fund CVN 78 test efforts in support of DT/IT testing.					
Title: Integrated Digital Shipbuilding (iDS)	6.965	0.000	49.000	0.000	49.000
Articles:	-	-	-	-	-
Description: Transformation to Integrated Digital Shipbuilding (iDS). ***FY 2019 Plans:*** N/A ***FY 2020 Base Plans:*** Integrated Digital Shipbuilding (iDS): Begin iDS transformation, which is a critical affordability initiative to upgrade the shipbuilder's Ford Class Digital Data Environment to include development of applicable interfaces,					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604112N / *(U)Gerald R Ford Cl Nuc Aircraft Carrier CVN 78-80*	**Project (Number/Name)** 2208 / *CVN 21*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
business processes, supporting systems, and tools to support the construction of FORD Class Aircraft Carriers in a digital environment. The new process for CVN 80 and follow-on ships is to use the Digital Data Environment to develop three-dimensional work instructions which export out of the digital environment to be given to the craftsmen to build the ship. This process would render the overwhelming majority of paper drawings to be obsolete, and result in recurring savings for future FORD Class Aircraft Carriers. ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increased for iDS efforts, a critical affordability initiative to upgrade the shipbuilder's Ford Class Digital Data Environment.					
Title: CVN 78 Full Ship Shock Trial (FSST) ***Articles:*** ***FY 2019 Plans:*** N/A ***FY 2020 Base Plans:*** Finalize environmental, explosive operations, instrumentation, electrical power monitoring, and logistics planning in support of FSST execution. Finalize all planning documents (e.g., Shock Trial Plan, Shock Trial Procedure). Complete all technical and environmental risk mitigation activities. Secure all necessary support vessels (e.g., fleet assets, environmental monitoring and explosive operations). Complete all pre-trial activities including, but not limited to: explosive charge dry run, installing instrumentation cabling, removal and storage of non-shock qualified items, and conducting ship equipment baseline assessments. Execute the FSST. Begin any needed repairs in the FY20 Planned Incremental Availability (PIA). Begin data reduction and analysis. Begin development of the CVN 78 FSST report. ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:***	9.461 -	0.000 -	17.500 -	0.000 -	17.500 -

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604112N / *(U)Gerald R Ford Cl Nuc Aircraft Carrier CVN 78-80*	**Project (Number/Name)** 2208 / *CVN 21*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Increased to fund CVN 78 test efforts in support of the planning/conduct of FSST.					
Accomplishments/Planned Programs Subtotals	57.302	25.029	103.830	0.000	103.830

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• RDTEN / 0604567N: *Project Units 3108, 3179, 4007, C295*	52.477	50.110	42.559	-	42.559	44.052	45.126	46.024	46.949	Continuing	Continuing
• SCN / 2001: *Carrier Replacement Program*	4,130.704	1,573.181	2,347.000	-	2,347.000	2,644.700	2,323.613	1,929.000	1,718.000	Continuing	Continuing
• SCN / 5300: *Completion of Prior Year Shipbuilding Programs*	20.000	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1,394.860
• OMN / 1B2B: *CVN 78 Ford Class Training and Sustainment (12BJ0)*	20.748	8.971	7.264	-	7.264	5.317	5.612	5.742	5.866	Continuing	Continuing
• OPN / 5664: *Surface Training Equipment*	12.010	7.942	1.412	-	1.412	4.715	2.796	2.773	2.834	Continuing	Continuing
• OPN / 0981: *Equipment Modernization*	0.000	32.900	8.561	-	8.561	5.849	10.699	5.210	0.883	0.000	64.102
• OMN / 1B5B: *CVN 78 Modernization*	0.000	0.000	6.440	-	6.440	1.784	5.366	17.578	32.224	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.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
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E. Performance Metrics

Successfully complete development of TEMP 1610, Rev C and route for signature. Successfully complete all PEO C4I Test Integration Facility (TIF) testing. Successfully execute Sortie Generation Rate Assessment (SGRA) 12 and SGRA 13. Successfully conduct and support feasibility and tradeoff studies and data packages on new and modified shipboard systems, technologies and proposed modification. Data packages shall include information to support program decisions to integrate these efforts into the whole ship design efforts. Successfully conduct IDC shock testing and reporting in order to finalize IDC R&D efforts. Successfully complete Advanced Weapons Elevator Shock and Electromagnetic Interference (EMI) Test qualifications. Successfully complete Plasma Arc Waste Destruction System (PAWDS) Land-Based Test. Successfully create and deliver 21 Decision Memorandums (DM) for Bents/Bays 1-21 on the 03 Level (Gallery Deck) with Layer 31 information. Successfully develop the baseline Technical Data Packages for 39 systems and mature packages in preparation for final GFI arrival. Successfully complete component shock testing.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy			Date: March 2019
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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Advanced Design & Development	C/CPAF	HII : VA	18.596	11.751	Nov 2017	0.000		1.919	Oct 2019	-		1.919	Continuing	Continuing	Continuing
Advanced Design & Development	WR	NSWC CARDEROCK : MD	3.682	0.769	Nov 2017	0.500	Oct 2018	0.000		-		0.000	Continuing	Continuing	Continuing
Advanced Design & Development	WR	NAWC PATUXENT RIVER : MD	5.106	0.569	Nov 2017	0.250	Oct 2018	0.000		-		0.000	Continuing	Continuing	Continuing
Advanced Design & Development	WR	NSWC DAHLGREN : VA	5.186	2.095	Nov 2017	0.500	Oct 2018	0.000		-		0.000	Continuing	Continuing	Continuing
Advanced Design & Development	C/CPAF	RAYTHEON : VA	9.095	3.674	Mar 2018	9.479	Oct 2018	7.064	Oct 2019	-		7.064	Continuing	Continuing	Continuing
Advanced Design & Development	C/CPFF	NAVSEA SEAPORT : VARIOUS	21.087	2.862	Nov 2017	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Advanced Design & Development	Various	MISCELLANEOUS : VARIOUS	1.944	0.683	Nov 2017	0.250	Nov 2018	0.740	Nov 2019	-		0.740	Continuing	Continuing	Continuing
Advanced Design & Development	WR	NSWC PHILADELPHIA : PA	13.825	2.235	Nov 2017	0.618	Oct 2018	5.044	Oct 2019	-		5.044	Continuing	Continuing	Continuing
Advanced Design & Development	WR	SPAWAR : VARIOUS	2.640	4.000	Nov 2017	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Advanced Design & Development	WR	NSWC CORONA : CA	1.367	0.235	Nov 2017	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Advanced Design & Development	WR	NAWC LAKEHURST : NJ	1.239	0.099	Nov 2017	0.000		0.000		-		0.000	0.000	1.338	-
Advanced Design & Development	WR	NSWC PORT HUENEME : CA	0.372	0.483	Nov 2017	0.000		0.000		-		0.000	0.000	0.855	-
Advanced Design & Development	C/CPFF	BECHTEL : PA	0.000	6.400	Nov 2017	0.000		0.000		-		0.000	0.000	6.400	-
Integrated Digital Shipbuilding	C/CPAF	HII : VA	0.000	6.965	Aug 2018	0.000		49.000	Oct 2019	-		49.000	0.000	55.965	-
Advanced Design & Development	C/CPFF	GRYPHON (SEI&T) : IN	0.203	0.149	Jun 2018	0.000		0.000		-		0.000	0.000	0.352	-
		Subtotal	84.342	42.969		11.597		63.767		-		63.767	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy			Date: March 2019
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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract

Remarks

- Increases for HII, miscellaneous performing activities and NSWC Philadelphia due to increased CVN 78 cybersecurity efforts.
- HII increased for iDS efforts, a critical affordability initiative to upgrade the shipbuilder's Ford Class Digital Data Environment.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Test & Evaluation	C/CPAF	HII : VA	10.267	0.000		0.165	Nov 2018	0.882	Nov 2019	-		0.882	Continuing	Continuing	Continuing
Development Test & Evaluation	WR	NAWC PATUXENT RIVER : MD	2.941	0.155	Nov 2017	0.403	Nov 2018	0.893	Oct 2019	-		0.893	Continuing	Continuing	Continuing
Development Test & Evaluation	WR	NSWC DAHLGREN : VA	9.363	0.891	Dec 2017	1.648	Nov 2018	3.132	Oct 2019	-		3.132	Continuing	Continuing	Continuing
Development Test & Evaluation	WR	NSWC CARDEROCK : MD	0.436	0.138	Nov 2017	0.533	Nov 2018	1.367	Oct 2019	-		1.367	Continuing	Continuing	Continuing
Development Test & Evaluation	WR	SPAWAR : VARIOUS	8.381	0.000		0.040	Nov 2018	0.000		-		0.000	Continuing	Continuing	Continuing
Development Test & Evaluation	C/CPAF	RAYTHEON : VARIOUS	5.643	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Development Test & Evaluation	Various	MISCELLANEOUS : VARIOUS	1.062	0.078	Nov 2017	1.366	Oct 2018	4.235	Oct 2019	-		4.235	Continuing	Continuing	Continuing
Development Test & Evaluation	C/CPFF	NAVSEA SEAPORT : VARIOUS	1.269	0.477	Jan 2018	1.469	Nov 2018	1.200	Nov 2019	-		1.200	Continuing	Continuing	Continuing
Development Test & Evaluation	C/BA	NSWC PORT HUENEME : CA	0.086	0.000		0.799	Oct 2018	2.500	Oct 2019	-		2.500	Continuing	Continuing	Continuing
Development Test & Evaluation	C/BA	NSWC CORONA : CA	0.263	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Development Test & Evaluation	WR	NAWC LAKEHURST : NJ	9.771	0.910	Nov 2017	0.200	Nov 2018	1.300	Nov 2019	-		1.300	Continuing	Continuing	Continuing

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Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Test & Evaluation	WR	NSWC PHILADELPHIA : PA	1.670	0.000		3.124	Nov 2018	3.880	Nov 2019	-		3.880	Continuing	Continuing	Continuing
Operational Test & Evaluation	WR	COMOPTEVFOR : VA	6.148	2.223	Dec 2017	2.904	Nov 2018	3.174	Nov 2019	-		3.174	Continuing	Continuing	Continuing
Operational Test & Evaluation	WR	NAWC PATUXENT RIVER : MD	0.063	0.000		0.150	Oct 2018	0.000		-		0.000	Continuing	Continuing	Continuing
Development Test & Evaluation	C/CPFF	GRYPHON (SEI&T) : IN	0.533	0.000		0.631	Dec 2018	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	-
Full Ship Shock Trial	C/CPFF	BECHTEL : PA	4.600	1.900	Nov 2017	0.000		1.132	Oct 2019	-		1.132	0.000	7.632	-
Full Ship Shock Trial	WR	NAWC PATUXENT RIVER : MD	0.208	0.427	Nov 2017	0.000		1.445	Oct 2019	-		1.445	0.000	2.080	-
Full Ship Shock Trial	WR	NSWC DAHLGREN : VA	0.299	0.152	Dec 2017	0.000		0.887	Oct 2019	-		0.887	0.000	1.338	-
Full Ship Shock Trial	WR	NSWC CARDEROCK : MD	6.711	4.981	Nov 2017	0.000		9.534	Oct 2019	-		9.534	0.000	21.226	-
Full Ship Shock Trial	WR	NSWC PHILADELPHIA : PA	0.098	1.161	Nov 2017	0.000		4.502	Oct 2019	-		4.502	0.000	5.761	-
Full Ship Shock Trial	C/CPAF	HII : VA	0.000	0.600	Aug 2018	0.000		0.000		-		0.000	0.000	0.600	-
Full Ship Shock Trial	WR	SPAWAR : VARIOUS	0.000	0.240	Aug 2018	0.000		0.000		-		0.000	0.000	0.240	-
		Subtotal	81.520	14.333		13.432		40.063		-		40.063	Continuing	Continuing	N/A

Remarks

- NSWC Port Hueneme is expected to be the lead in the planning and performance of the Combat Systems test. The Combat Systems test will test the operational impacts of configuration changes that will occur between the conduct of CSSQT and the beginning of OT-C2. These funds will be needed for FY20 planning activities, such as finalizing test scenarios, test plan development, ammo/target/range allocation, and development of the Data Management Analysis Plan.
- NAWC Lakehurst is the lead in developing the Seastrike Seabasing Aviation Model (SSAM). Originally intended for use in making a DT assessment of the CVN 78's Sortie Generation Rate (SGR), the model also has potential for use in OT assessments of SGR. The additional funds will go toward collecting operational data post-PSA for use in validating the SSAM model.
- The FSST event will occur in FY20. All performing activities will be engaged in completing planning efforts and supporting the execution of this event.
- NSWC Dahlgren will conduct additional test scheduling, planning, and results analyses which will take place during the post-PSA test and trials period.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604112N / *(U)Gerald R Ford Cl Nuc Aircraft Carrier CVN 78-80*	**Project (Number/Name)** 2208 / *CVN 21*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
- MISC activities will perform the planning and conduct of live integrated testing to assess the CVN 21 ORD Probability of Mission Kill (PMK) requirement on low-slow flyers and small boats, currently scheduled for FY20. Additional funding is required to cover such costs as: missile/gunnery range time, low-slow flyer and small boat targets, ammo, test execution, data analysis, and report writing.															

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	165.862	57.302		25.029		103.830		-		103.830	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604112N / *(U)Gerald R Ford Cl Nuc Aircraft Carrier CVN 78-80*	**Project (Number/Name)** 2208 / *CVN 21*

Gerald R. Ford Class Carriers

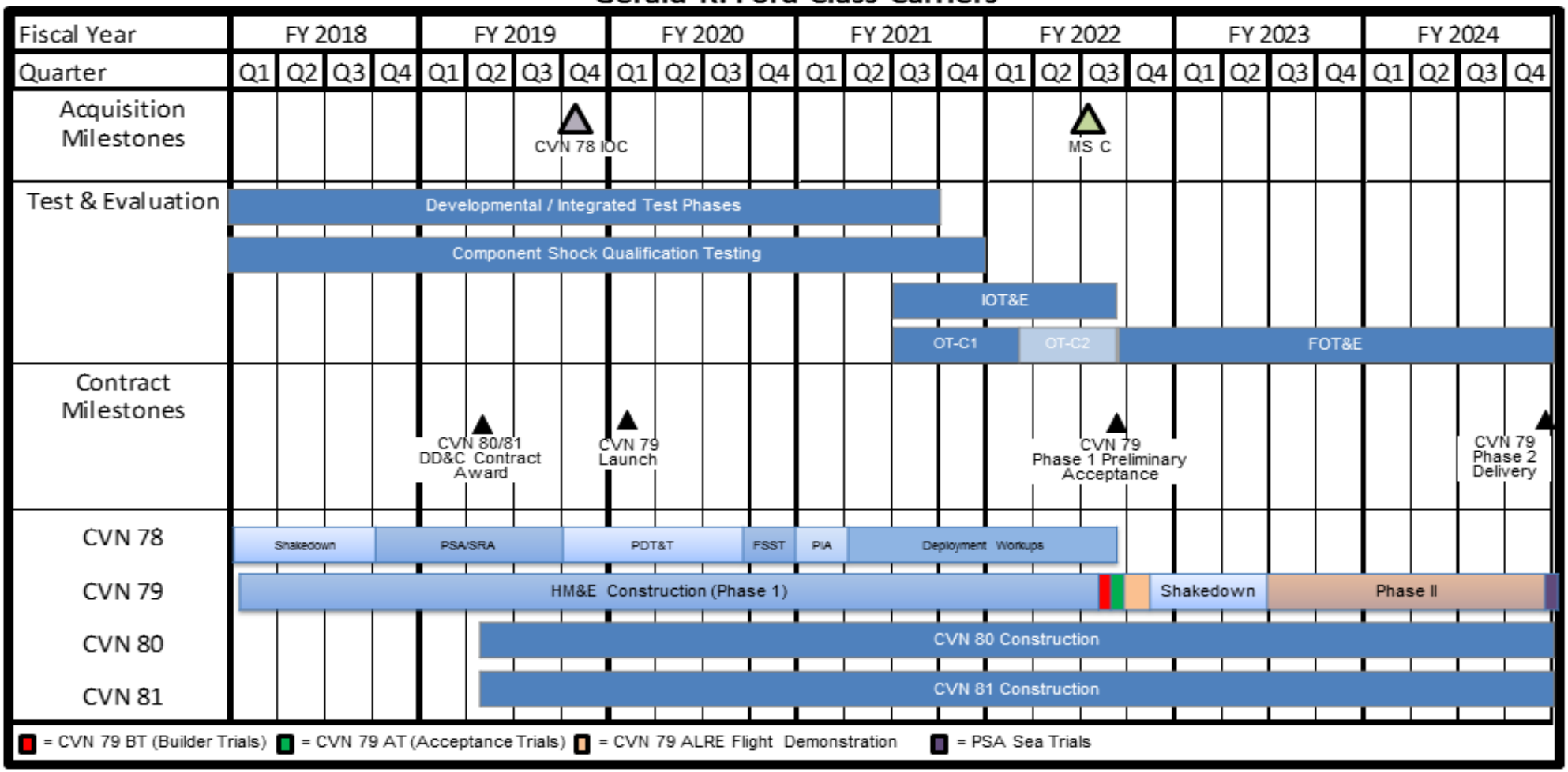

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604112N / *(U)Gerald R Ford Cl Nuc Aircraft Carrier CVN 78-80*	**Project (Number/Name)** 2208 / *CVN 21*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2208				
CVN 21	1	2018	4	2024

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604112N / *(U)Gerald R Ford Cl Nuc Aircraft Carrier CVN 78-80*	Project (Number/Name) 4004 / *EMALS*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
4004: *EMALS*	60.298	25.247	33.092	17.480	-	17.480	4.139	0.000	0.000	0.000	0.000	140.256
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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: EMALS	25.247	33.092	17.480	0.000	17.480
Articles:	-	-	-	-	-
Description: EMALS					
FY 2019 Plans: Continue EMALS Integrated Test & Evaluation (IT&E) land-based testing using deadloads for the correction of deficiencies. Complete Environmental Qualification Testing (EQT) for Launch Control Subsystem (LCS) components deferred from System Development & Demonstration (SDD) and EMALS component shock testing. Maintain EMALS shore-based test site to support: engineering investigations, software integration, deficiency resolution, component obsolescence regression test, and cyber security assessment/mitigation. Complete the development of schoolhouse training systems for Ford Class Aircraft Carrier personnel. Provide interim training for crews until formal schoolhouse training is established. Begin the development of the required processes and procedures to plan for Depot Level activities. Initiate the planning and analysis necessary to standup EMALS Depot Level maintenance, overhaul and repair facility/facilities for EMALS components.					
FY 2020 Base Plans: Complete EMALS Integrated Test & Evaluation (IT&E) land-based testing using deadloads for the correction of deficiencies. Provide interim training for crews until formal schoolhouse training is established. Stand up training facility and achieve Ready For Training. Continue development of the required processes and procedures to					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604112N / *(U)Gerald R Ford Cl Nuc Aircraft Carrier CVN 78-80*	**Project (Number/Name)** 4004 / *EMALS*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
plan for Depot Level activities. Continue the planning and analysis necessary to standup EMALS Depot Level maintenance, overhaul and repair facility/facilities for EMALS components. ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** The decrease from FY 2019 to FY 2020 is due to the completion of the EMALS Integrated Test & Evaluation (IT&E) land-based testing.					
Accomplishments/Planned Programs Subtotals	25.247	33.092	17.480	0.000	17.480

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• RDTEN / 0604567N: *Project Units 3108, 3179, 4007, C295*	52.477	50.110	42.559	-	42.559	44.052	45.126	46.024	46.949	Continuing	Continuing
• SCN / 2001: *Carrier Replacement Program*	4,130.704	1,573.181	2,347.000	-	2,347.000	2,644.700	2,323.613	1,929.000	1,718.000	8,634.858	47,989.632
• SCN / 5300: *Completion of Prior Year Shipbuilding Programs*	20.000	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1,394.860
• OMN / 1B2B: *CVN 78 Ford Class Training and Sustainment (12BJ0)*	20.748	8.971	7.264	-	7.264	5.317	5.612	5.742	5.866	0.000	103.953
• OPN / 5664: *Surface Training Equipment*	12.010	7.942	1.412	-	1.412	4.715	2.796	2.773	2.834	Continuing	Continuing
• OPN / 4213: *Aircraft Support Equipment*	103.340	105.943	145.601	13.420	159.021	119.366	120.849	143.300	134.933	Continuing	Continuing

Remarks

OPN 4213 includes a portion of line item funding for Electro Magnetic Aircraft Launch System (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

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604112N / *(U)Gerald R Ford Cl Nuc Aircraft Carrier CVN 78-80*	**Project (Number/Name)** 4004 / *EMALS*

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.

E. Performance Metrics

Successfully complete System Functional Demonstration (SFD) testing. Successfully complete Environmental Qualification Testing (EQT). Successfully complete Shipset Controls Lab testing. Successfully complete Integrated Test and Evaluation (IT&E) including Environmental Qualification Testing (EQT), correction of deficiencies, reliability growth and shock testing.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604112N / *(U)Gerald R Ford Cl Nuc Aircraft Carrier CVN 78-80*	Project (Number/Name) 4004 / *EMALS*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary HW Development - SDD	C/CPFF	General Atomics : San Diego, CA	22.746	9.200	Nov 2017	0.000		0.000		-		0.000	0.000	31.946	31.946
Training Development	C/FFP	Pro-Active Technologies, Inc : Oviedo, FL	5.200	1.865	Jul 2018	0.000		0.000		-		0.000	0.000	7.065	7.065
Primary HW Development	WR	NAWCAD Lakehurst : Lakehurst, NJ	3.220	2.110	Nov 2017	1.264	Dec 2018	0.000		-		0.000	0.000	6.594	-
Prior Year Cost No Longer Funded in FYDP	Various	Various : Various	19.020	0.000		0.000		0.000		-		0.000	0.000	19.020	-
		Subtotal	50.186	13.175		1.264		0.000		-		0.000	0.000	64.625	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Engineering Support	WR	Various : Various	0.144	0.115	Nov 2017	0.000		0.000		-		0.000	0.000	0.259	-
Training Support	WR	NAWCAD TSD : Orlando, FL	0.296	0.355	Nov 2017	0.295	Dec 2018	0.000		-		0.000	0.000	0.946	-
Training Support	WR	NAWCAD Lakehurst : Lakehurst, NJ	0.000	1.749	Nov 2017	0.695	Nov 2018	0.000		-		0.000	0.000	2.444	-
Depot Logistics Development	C/CPFF	General Atomics : San Diego, CA	0.000	0.000		15.936	Jan 2019	16.369	Jan 2020	-		16.369	3.015	35.320	35.325
Government Eng Support	WR	NAWCAD Lakehurst : Lakehurst, NJ	0.000	0.000		1.116	Dec 2018	1.111	Nov 2019	-		1.111	1.157	3.384	-
		Subtotal	0.440	2.219		18.042		17.480		-		17.480	4.172	42.353	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604112N / *(U)Gerald R Ford Cl Nuc Aircraft Carrier CVN 78-80*	**Project (Number/Name)** 4004 / *EMALS*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated Test & Evaluation	WR	NAWC Lakehurst : Lakehurst, NJ	3.232	5.919	Nov 2017	1.699	Dec 2018	0.000		-		0.000	0.000	10.850	-
Integrated Test & Evaluation	C/CPFF	General Atomics : San Diego, CA	0.000	3.934	Sep 2018	12.087	Jan 2019	0.000		-		0.000	0.000	16.021	16.021
Prior Year Cost No Longer Funded in FYDP	Various	Various : Various	6.440	0.000		0.000		0.000		-		0.000	0.000	6.440	-
		Subtotal	9.672	9.853		13.786		0.000		-		0.000	0.000	33.311	N/A

Remarks

FY18 updated for actuals. The decrease from FY 2019 to FY 2020 is due to the completion of the EMALS Integrated Test & Evaluation (IT&E) land-based testing.

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	60.298	25.247		33.092		17.480		-		17.480	4.172	140.289	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604112N / *(U)Gerald R Ford Cl Nuc Aircraft Carrier CVN 78-80*	**Project (Number/Name)** 4004 / *EMALS*

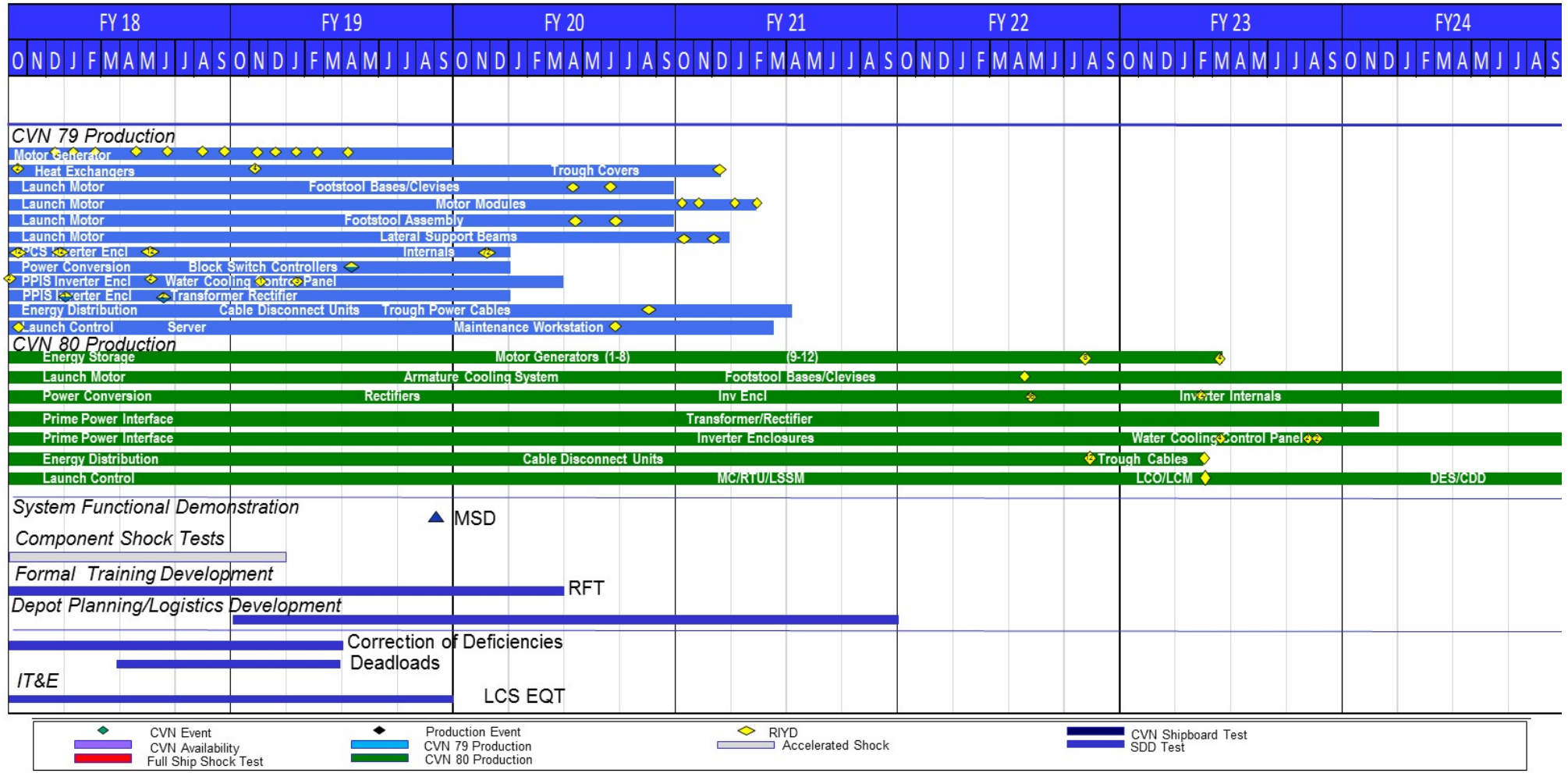

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604112N / *(U)Gerald R Ford Cl Nuc Aircraft Carrier CVN 78-80*	**Project (Number/Name)** 4004 / *EMALS*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 4004				
EMALS Integrated Test & Evaluation (IT&E)	1	2018	1	2020
EMALS Component Shock Test	1	2018	1	2019
EMALS Training Development	1	2018	2	2020
EMALS Launch Control Subsystem (LCS) Environmental Qualification Testing (EQT)	1	2018	4	2019
EMALS Depot Level Planning	1	2019	1	2022

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604112N / *(U)Gerald R Ford Cl Nuc Aircraft Carrier CVN 78-80*	Project (Number/Name) 9999 / *Congressional Adds*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
9999: *Congressional Adds*	0.000	0.000	25.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	25.000
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project provides for planning for the Full Ship Shock Trial (FSST) for the USS Gerald Ford (CVN 78).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019
Congressional Add: CVN 78 Full Ship Shock Trial	0.000	25.000
FY 2018 Accomplishments: N/A		
FY 2019 Plans: Full Ship Shock Trial (FSST) - Continue planning for a CVN 78 FSST to be conducted in FY20. Continue developing the DRAFT CVN 78 FSST Plan and provide to stakeholders for review and comment. Continue the Modeling & Simulation effort supporting the CVN 78 FSST pre-trial predictions. Continue planning to mitigate potential environmental impacts. Continue working with support activities to coordinate transport and storage of explosive charges. Continue modeling effort to characterize the charge behavior while being towed by the explosive ops vessel. Develop explosive operations procedures and conduct explosive operations rehearsal. Begin logistics planning to develop FSST spares strategy and storage of planned offloaded equipment. Develop list of post-shock check-out procedures and integrate into a single timeline for system checks between shots. Develop risk mitigation strategies for all identified equipment / systems risks. Component Shock Qualification - Continue component shock qualification of CVN 78 Government-Furnished Equipment components / systems. Successful component shock qualification will support the required NAVSEA post-delivery shock certification of CVN 78 prior to the operational deployment ready date of 3QFY22. Major systems scheduled for component shock testing in FY19 include Electromagnetic Aircraft Launch System, Advanced Arresting Gear, AN/SLQ-25C - Dual Surface Ship Torpedo Defense System (NIXIE), and Ship Self Defense System. Procurement of long-lead Dual Band Radar components to support shock qualification testing is also planned for FY19.		
Congressional Adds Subtotals	0.000	25.000

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604112N / *(U)Gerald R Ford Cl Nuc Aircraft Carrier CVN 78-80*	**Project (Number/Name)** 9999 / *Congressional Adds*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• RDTEN / 0604567N: *Project Units 3108, 3179, 4007, C295*	52.477	50.110	42.559	-	42.559	44.052	45.126	46.024	46.949	Continuing	Continuing
• SCN / 2001: *Carrier Replacement Program*	4,130.704	1,573.181	2,347.000	-	2,347.000	2,644.700	2,323.613	1,929.000	1,718.000	Continuing	Continuing
• SCN / 5300: *Completion of Prior Year Shipbuilding Programs*	20.000	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1,394.860
• OMN / 1B2B: *CVN 78 Ford Class Training and Sustainment (12BJ0)*	20.748	8.971	7.264	-	7.264	5.317	5.612	5.742	5.866	Continuing	Continuing
• OPN / 5664: *Surface Training Equipment*	12.010	7.942	1.412	-	1.412	4.715	2.796	2.773	2.834	Continuing	Continuing
• OPN / 0981: *Equipment Modernization*	0.000	32.900	8.561	-	8.561	5.849	10.699	5.210	0.883	Continuing	Continuing
• OMN / 1B5B: *CVN 78 Modernization*	0.000	0.000	6.440	-	6.440	1.784	5.366	17.578	32.224	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, new electromagnetic aircraft launch 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.

E. Performance Metrics

Successfully accomplish pre-shock trial planning and preparations in support of the CVN 78 Class FSST scheduled for FY20. Conduct shock qualification testing on unqualified components not scheduled for removal prior to deployment. Complete procurement of Dual Band Radar components for shock testing in FY20/21.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604112N / *(U)Gerald R Ford Cl Nuc Aircraft Carrier CVN 78-80*	Project (Number/Name) 9999 / *Congressional Adds*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Component Shock	WR	NSWC PHILADELPHIA : PA	0.000	0.000		0.890	Dec 2018	0.000		-		0.000	0.000	0.890	-
Component Shock	WR	NUWC NEWPORT : RI	0.000	0.000		0.859	Dec 2018	0.000		-		0.000	0.000	0.859	-
Component Shock	Various	SPAWAR SAN DIEGO : CA	0.000	0.000		1.372	Nov 2018	0.000		-		0.000	0.000	1.372	-
Component Shock	C/CPAF	RAYTHEON : MA	0.000	0.000		11.853	Mar 2019	0.000		-		0.000	0.000	11.853	-
Component Shock	Various	NAWC LAKEHURST : NJ	0.000	0.000		0.530	Dec 2018	0.000		-		0.000	0.000	0.530	-
Component Shock	WR	NSWC CARDEROCK : MD	0.000	0.000		0.260	Dec 2018	0.000		-		0.000	0.000	0.260	-
Full Ship Shock Trial	WR	NSWC CARDEROCK : MD	0.000	0.000		4.260	Jan 2019	0.000		-		0.000	0.000	4.260	-
Full Ship Shock Trial	WR	NSWC DAHLGREN : VA	0.000	0.000		0.270	Nov 2018	0.000		-		0.000	0.000	0.270	-
Full Ship Shock Trial	WR	NSWC PHILADELPHIA : PA	0.000	0.000		2.167	Dec 2018	0.000		-		0.000	0.000	2.167	-
Full Ship Shock Trial	WR	NAWC PATUXENT RIVER : MD	0.000	0.000		0.308	Jan 2019	0.000		-		0.000	0.000	0.308	-
Full Ship Shock Trial	C/CPAF	HII-NNS : VA	0.000	0.000		0.031	Jan 2019	0.000		-		0.000	0.000	0.031	-
Full Ship Shock Trial	C/BA	FLUOR MARINE PROPULSION : PA	0.000	0.000		2.200	Jan 2019	0.000		-		0.000	0.000	2.200	-
		Subtotal	0.000	0.000		25.000		0.000		-		0.000	0.000	25.000	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		25.000		0.000		-		0.000	0.000	25.000	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604112N / *(U)Gerald R Ford Cl Nuc Aircraft Carrier CVN 78-80*	**Project (Number/Name)** 9999 / *Congressional Adds*

Gerald R. Ford Class Carriers

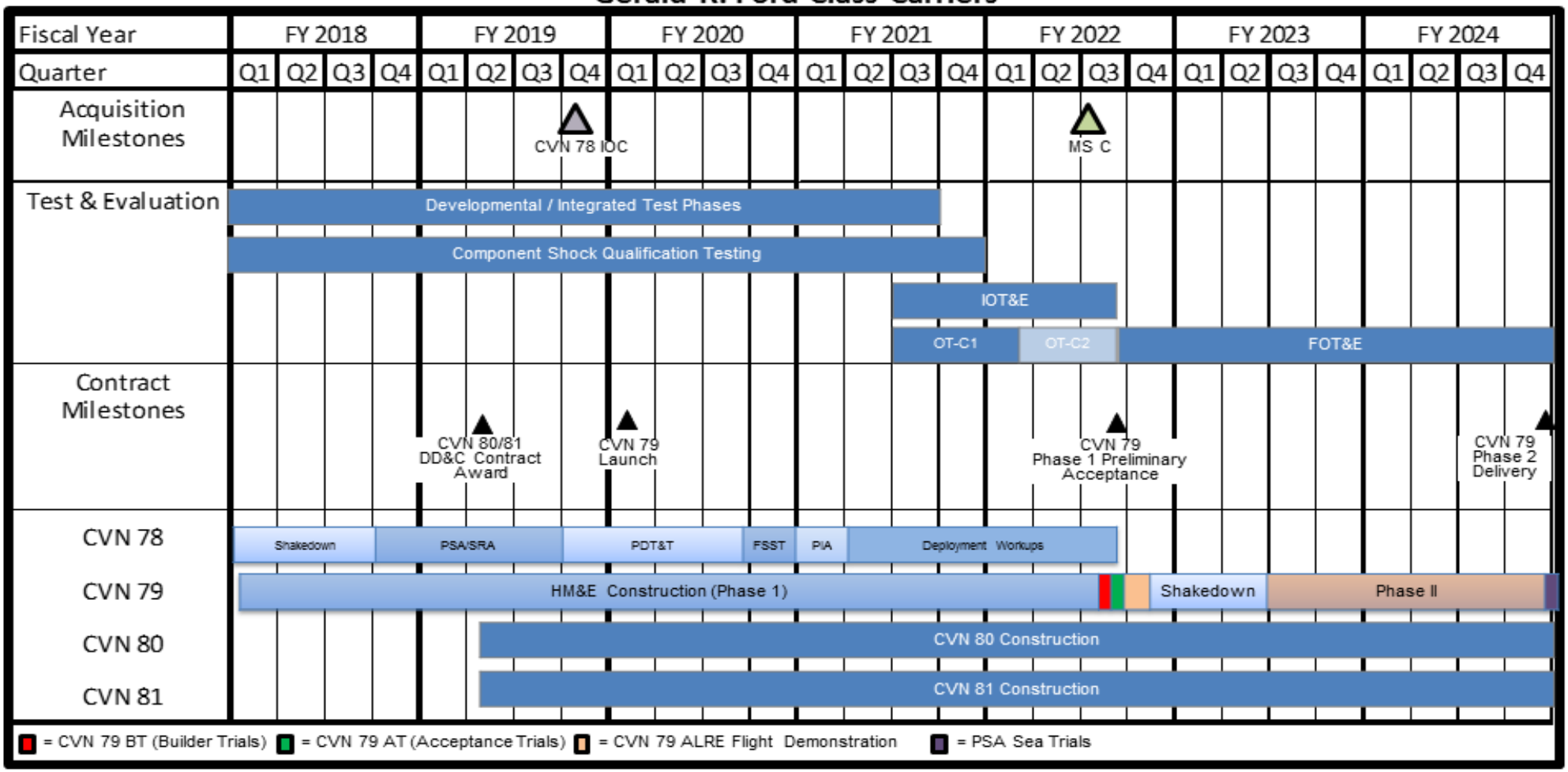

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604112N / *(U)Gerald R Ford Cl Nuc Aircraft Carrier CVN 78-80*	**Project (Number/Name)** 9999 / *Congressional Adds*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 9999				
CVN 21	1	2018	4	2024