Exhibit R-2, RDT&E Budget Item Justification: PB 2015 Navy											Date: March 2014	
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 0603512N *I Carrier Systems Development*							
COST ($ in Millions)	**Prior Years**	**FY 2013**	**FY 2014**	**FY 2015 Base**	**FY 2015 OCO #**	**FY 2015 Total**	**FY 2016**	**FY 2017**	**FY 2018**	**FY 2019**	**Cost To Complete**	**Total Cost**
Total Program Element	1,581.491	97.668	80.899	5.959	-	5.959	6.368	5.570	5.566	5.702	Continuing	Continuing
2208: *CVN 21*	944.927	32.506	31.635	-	-	-	-	-	-	-	-	1,009.068
3216.: *Tactical Support Center-Integration*	16.398	8.521	4.546	4.185	-	4.185	4.139	4.304	4.288	4.385	Continuing	Continuing
4004: *EMALS*	602.647	55.067	43.003	-	-	-	-	-	-	-	-	700.717
4005: *In-Service Carrier Systems Development*	17.519	1.574	1.715	1.774	-	1.774	2.229	1.266	1.278	1.317	Continuing	Continuing
MDAP/MAIS Code: **Other MDAP/MAIS Code(s):** 223												

The FY 2015 OCO Request will be submitted at a later date.

A. Mission Description and Budget Item Justification

This Navy unique program addresses all technology areas associated with Navy/Marine Corps aircraft operations aboard ships. 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. Funding for this project continues in PE 0604112N in FY 15 and later.

- (3216) - The AN/SQQ-34 Aircraft Carrier Tactical Support Center (CV-TSC) contributes to Aircraft Carrier (CVN) self defense capabilities. The system provides shipboard support of multi-mission aircraft operating organic to the CVN or under control of the Carrier Strike Group (CSG), providing primary mission support for Anti-Submarine Warfare (ASW) and Surface Warfare (SUW). The AN/SQQ-34 also provides auxiliary support for secondary missions such as search and rescue. The system provides the capability to collect, process, analyze, display, and distribute sensor and tactical data in support of detection, classification, and localization of targets. The AN/SQQ-34 is incrementally upgraded to support new air platforms and their sensors, centrally integrate ASW capabilities on the CVN, transition maturing technologies, and maintain interoperability with interfacing systems. The system provides support for both rotary wing aircraft (SH-60F, MH-60R) and future support for fixed wing aircraft operating within the CSG (P-8, BAMS).

- (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. Funding for this project continues in PE 0604112N in FY 15 and later.

Exhibit R-2, RDT&E Budget Item Justification: PB 2015 Navy	Date: March 2014
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 0603512N *I Carrier Systems Development*

- (4005) - The In-Service Carrier Systems Development Demonstration and Validation program exploits available technologies to deliver an affordable, robust, operator-friendly automation control environment for Navy Aircraft Carrier shipboard equipment. The program provides the system architecture, requirements/specification development, technology selection, software development (including software baseline), as well as land-based and shipboard testing of new technologies to improve shipboard operations and to reduce workload, manpower requirements, and Total Ownership Costs (TOC).

B. Program Change Summary ($ in Millions)	FY 2013	FY 2014	FY 2015 Base	FY 2015 OCO	FY 2015 Total
Previous President's Budget	108.871	83.902	49.195	-	49.195
Current President's Budget	97.668	80.899	5.959	-	5.959
Total Adjustments	-11.203	-3.003	-43.236	-	-43.236
• Congressional General Reductions	-	-0.003			
• Congressional Directed Reductions	-	-3.000			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-2.130	-			
• Program Adjustments	-	-	-42.985	-	-42.985
• Rate/Misc Adjustments	0.001	-	-0.251	-	-0.251
• Congressional General Reductions Adjustments	-9.074	-	-	-	-

Change Summary Explanation

Cost: FY13 funding reduced to comply with sequestration reductions. FY15 decrease due to transfer of Project Units 2208 and 4004 funding to new Program Element 0604112N. FY 15 funding reduced due to eliminating classified effort.

Schedule:
Project 3216: AN/SQQ-34C(V)2 Software version 8.0 development delayed 3 quarters due to FY13 sequestration

Exhibit R-2A, RDT&E Project Justification: PB 2015 Navy												Date: March 2014
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603512N / *Carrier Systems Development*				Project (Number/Name) 2208 / *CVN 21*			
COST ($ in Millions)	**Prior Years**	**FY 2013**	**FY 2014**	**FY 2015 Base**	**FY 2015 OCO #**	**FY 2015 Total**	**FY 2016**	**FY 2017**	**FY 2018**	**FY 2019**	**Cost To Complete**	**Total Cost**
2208: *CVN 21*	944.927	32.506	31.635	-	-	-	-	-	-	-	-	1,009.068
Quantity of RDT&E Articles	0.000	-	-	-	-	-	-	-	-	-		

MDAP/MAIS Code: 223

The FY 2015 OCO Request will be submitted at a later date.

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). Funding for this project continues in PE 0604112N in FY 15 and later.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2013	FY 2014	FY 2015
Title: CVN 78 Class Advanced Technology Design & Development	26.763	21.330	-
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.			
FY 2013 Accomplishments: Continued design, development and transition of key technologies to support CVN 21 (CVN 78 Class) Key Performance Parameters (KPPs) which include sortie generation rate, reductions in manpower, and further recovery of weight and stability service life margins. Continued design activities to integrate new technologies, such as the new propulsion plant and Electromagnetic Aircraft Launch System (EMALS) into the ship. Continued existing studies and commenced new studies required for integrated warfare system and C4I design, integration, test and validation efforts. Developed and reviewed Pre-Planned Product Improvement (P3I) Technical Data Packages. Continued engineering and technical support of aircraft launch and recovery systems. Developed ship integration side studies to support NAVSEA documented class baseline changes. Continued			

Exhibit R-2A, RDT&E Project Justification: PB 2015 Navy		Date: March 2014
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603512N / *Carrier Systems Development*	**Project (Number/Name)** 2208 / *CVN 21*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2013	FY 2014	FY 2015
shipbuilder system and cost engineering support to assess ship impacts from selected Engineering Change Requests (ECRs) and changes to the GFE/CFE equipment split. ***FY 2014 Plans:*** Continue design, development and transition of key technologies to support CVN 21 (CVN 78 Class) KPPs which include sortie generation rate, reductions in manpower, and further recovery of weight and stability service life margins. Continue design activities to integrate new technologies, such as the new propulsion plant and EMALS into the ship. Continue existing studies and commence new studies required for integrated warfare system and C4I design, integration, test and validation efforts. Develop and review Pre-Planned Product Improvement (P3I) Technical Data Packages. Continue engineering and technical support of aircraft launch and recovery systems. Develop ship integration side studies to support NAVSEA documented class baseline changes. Continue shipbuilder system and cost engineering support to assess ship impacts from selected Engineering Change Requests (ECRs) and changes to the GFE/CFE equipment split. ***FY 2015 Plans:*** N/A			
Title: CVN 21 - Test & Evaluation (T&E)	5.743	10.305	-
Articles:	-	-	-
Description: - CVN 21 - Test & Evaluation (T&E) ***FY 2013 Accomplishments:*** Completed development of the TEMP 1610, Rev C and route for signature. Continued conducting the semi-annual Post Delivery Tests and Trials (PDT&T) workshops to facilitate the exchange of information, the identification of areas of potential schedule/ resource conflicts and the update / maintenance of the notional PDT&T schedule. Stood up the Developmental Test Working Group (DTWG), which initially focused on identifying appropriate DT metrics and reported on the status of the DT contributions toward satisfying the Measures of Effectiveness (MoEs) and Measures of Suitability (MoSs). Completed Developmental Test / Integrated Test Phase 1 (DT/IT-1), which includes completing Operational Test Phase B3 (OT-B3) and producing the OT-B3 Report. Commenced DT/IT-2, which included: (1) completing PEO C4I TIF testing; and Sortie Generation Rate Assessment (SGRA) 12; (2) conducting the Aqueous Film Forming Foam (AFFF) land-based system performance test; and Aircraft Fueling Station (AFS) land-based testing; (3) continuing NAVAIR Production Integration Facility (PIF) testing; HII-NNS Production Integration Center (PIC) testing; Electromagnetic Environmental Effects (E3) testing and spiral development of the VCVN Model; and (4) commencing Dual Band Radar (DBR) land-based testing; DBR to TPX-42 land-based integration testing; SGRA 13; and Information Assurance (IA) testing on Contractor-Furnished Equipment (CFE) during PIC testing. ***FY 2014 Plans:***			

Exhibit R-2A, RDT&E Project Justification: PB 2015 Navy		Date: March 2014
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603512N / *Carrier Systems Development*	**Project (Number/Name)** 2208 / *CVN 21*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2013	FY 2014	FY 2015
Continue conducting the semi-annual PDT&T workshops and updating / maintaining the notional PDT&T schedule. Continue the DTWG efforts, focusing on the continued development / refinement of the DTDB and the collection / analysis of the DT metrics. Stand-up the CVN 78 Integrated Test Team (CITT), which will be co-chaired by the Program Office and Commander, Operational Test & Evaluation (COMOPTEVFOR). Complete DT/IT-2 and commence DT/IT-3, which includes: (1) completing SGRA 13; the analysis / report on the AFFF land-based system performance test; the analysis / report on the AFS land-based testing; and NAVAIR PIF testing; (2) conducting Combat System Test (CST) Phase 1; and Navigation Integration Testing; and (3) continuing DBR land-based testing; DBR to TPX-42 land-based integration testing; HII-NNS PIC testing; IA testing on CFE during PIC testing; E3 testing; and spiral development of the VCVN Model. ***FY 2015 Plans:*** N/A			
Accomplishments/Planned Programs Subtotals	32.506	31.635	-

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2013	FY 2014	FY 2015 Base	FY 2015 OCO	FY 2015 Total	FY 2016	FY 2017	FY 2018	FY 2019	Cost To Complete	Total Cost
• RDTEN / 0604567N: *Project Units 3179, 4007*	12.197	15.572	18.867	-	18.867	19.830	21.440	18.682	19.108	Continuing	Continuing
• RDTEN / 0603570N: *Propulsion Plant Development (PU 2692)*	58.193	57.499	60.459	-	60.459	-	-	-	-	-	1,526.813
• SCN / 2001: *Carrier Replacement Program*	490.960	917.553	1,300.000	-	1,300.000	2,876.183	2,290.837	2,849.342	1,864.514	Continuing	Continuing
• SCN / 5300: *Completion of Prior Year Shipbuilding Programs*	-	588.100	663.000	-	663.000	124.000	-	-	-	-	1,375.100
• RDTEN / 0604112N: *Project Units 2208, 4004*	-	-	43.613	-	43.613	38.373	35.662	34.156	25.650	-	177.454
• OMN / 1B2B: *CVN 78 Ford Class Training (12BJ0)*	-	-	4.907	-	4.907	12.872	2.396	-	-	-	20.175

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

Exhibit R-2A, RDT&E Project Justification: PB 2015 Navy		Date: March 2014
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603512N / *Carrier Systems Development*	**Project (Number/Name)** 2208 / *CVN 21*

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 development of TEMP 1610, Rev C and route for signature. Successfully complete all PEO C4I TIF testing. Successfully execute SGRA 12 and SGRA 13. Gain acceptance of the FSST Alternative Process as a technically-feasible and cost-effective alternative to the traditional FSST. Successfully complete the NAVAIR PIF testing and the Consolidated Afloat Networks and Enterprise Services (CANES) testing. 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.

Exhibit R-4, RDT&E Schedule Profile: PB 2015 Navy		Date: March 2014
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603512N / *Carrier Systems Development*	**Project (Number/Name)** 2208 / *CVN 21*

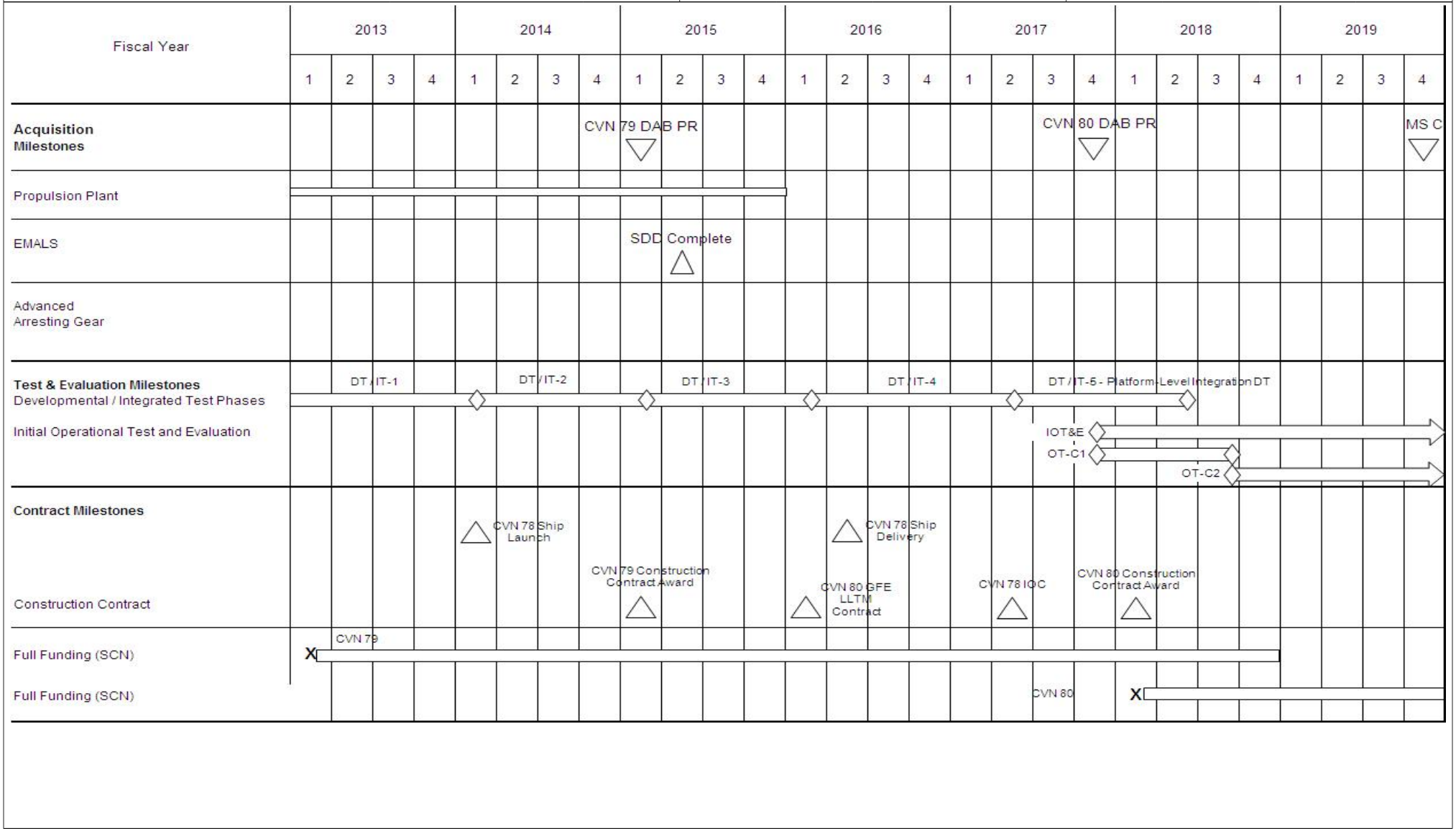

Exhibit R-2A, RDT&E Project Justification: PB 2015 Navy			Date: March 2014
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603512N / *Carrier Systems Development*	Project (Number/Name) 3216. / *Tactical Support Center-Integration*	

COST ($ in Millions)	Prior Years	FY 2013	FY 2014	FY 2015 Base	FY 2015 OCO #	FY 2015 Total	FY 2016	FY 2017	FY 2018	FY 2019	Cost To Complete	Total Cost
3216.: *Tactical Support Center-Integration*	16.398	8.521	4.546	4.185	-	4.185	4.139	4.304	4.288	4.385	Continuing	Continuing
Quantity of RDT&E Articles	0.000	-	-	-	-	-	-	-	-	-		

The FY 2015 OCO Request will be submitted at a later date.

A. Mission Description and Budget Item Justification

The AN/SQQ-34 Aircraft Carrier Tactical Support Center (CV-TSC) contributes to Aircraft Carrier (CVN) self defense capabilities. The system provides shipboard support of multi-mission aircraft operating organic to the CVN or under control of the Carrier Strike Group (CSG), providing primary mission support for Anti-Submarine Warfare (ASW) and Surface Warfare (SUW). The AN/SQQ-34 also provides auxiliary support for secondary missions such as search and rescue. The system provides the capability to collect, process, analyze, display, and distribute sensor and tactical data in support of detection, classification, and localization of targets. The AN/SQQ-34 is incrementally upgraded to support new air platforms and their sensors, centrally integrate ASW capabilities on the CVN, transition maturing technologies, and maintain interoperability with interfacing systems. The system provides support for both rotary wing aircraft (SH-60F, MH-60R) and future support for fixed wing aircraft operating within the CSG (P-8, BAMS).

Additionally, this project will mature the development of low-cost multi-beam Ku-Band planar phased arrays and associated integrated radio systems, and addresses the major cost drivers of planar arrays and their associated radios. This effort will be the first spiral of a major cost reduction effort for multi-beam arrays, with the goal of showing a path to a production cost of less than one third the cost of existing array technologies. This development will produce key integrated components needed to reduce the cost of arrays and will provide prototype multi-beam Ku-Band receiving and transmitting arrays/radios using these components. The effort will also emphasize advances in technologies associated with multi-path interference, scan angle losses and networking waveforms.
(Speed to Fleet) The CV-TSC program provides increased situational awareness to the Carrier Strike Group (CSG) in support of force protection, primarily in the area of Anti-Submarine Warfare (ASW). A portion of this program will focus on maturing low-cost multi-beam Ku-Band planar phased arrays and associated integrated radio systems that will be used to support data links to multiple MH-60Rs. This specific effort will address the need for low cost communications security (COMSEC) devices that are compatible with phased array systems, and that are needed to secure these data links.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2013	FY 2014	FY 2015
Title: MH-60R Integration Development for CV-TSC	6.726	3.570	4.185
Articles:	-	-	-
FY 2013 Accomplishments: - Initiated development efforts on software version 8.0. Software version 8.0 is the baseline being developed to support CVN-78, which includes a new combat system architecture. Efforts included requirements specification revisions, architecture requirements revisions, and early developmental software builds modifying infrastructure to support the CVN-78 combat system. Software version 8.0 will include acoustic signal processing and analysis improvements, sensor performance predictions and mission			

Exhibit R-2A, RDT&E Project Justification: PB 2015 Navy		Date: March 2014
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603512N / *Carrier Systems Development*	**Project (Number/Name)** 3216. / *Tactical Support Center-Integration*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2013	FY 2014	FY 2015
planning support for the MH-60R acoustic sensor suite, embedded training for shipboard operators, and interoperability changes to support the Ship-Self Defense System (SSDS) and Common Data Link (CDL). - Conducted incremental technical reviews. - Completed Technology Transition Agreement (TTA) between the Office of Naval Research (ONR), OPNAV N980C, and PEO IWS 5 for low cost planar arrays to support multiple MH-60R datalinks through installation of a CV-TSC system at the Navy Surface Aviation and Interoperability Laboratory (SAIL). ***FY 2014 Plans:*** - Continue development of software version 8.0 to include: acoustic signal processing and analysis improvements, sensor performance predictions and mission planning support for the MH-60R acoustic sensor suite, embedded training for shipboard operators, and interoperability changes to support the SSDS and CDL. Focus will be on transition and integration efforts associated with existing acoustic signal processing capabilities modified for CV-TSC supported sensors, and maturing science and technology efforts associated with data analysis automation/fusion and embedded training products. - Conduct incremental requirements, design, and test reviews. - Continue incremental software development engineering releases to support initial Combat System Test events for CVN-78 in 1Q15. Final builds will be completed in FY15. ***FY 2015 Plans:*** - Complete development of software version 8.0. - Conduct final incremental requirements, design, and test reviews. - Deliver final software version to Combat System Test facility to support certification events in 2Q-4Q15. - Begin initial system engineering efforts on software version 9.0.			
Title: Phased Array COMSEC	1.795	0.976	-
Articles:	-	-	-
Description: The CV-TSC program provides increased situational awareness to the Carrier Strike Group (CSG) in support of force protection, primarily in the area of Anti-Submarine Warfare (ASW). A portion of this program will focus on maturing low-cost multi-beam Ku-Band planar phased arrays and associated integrated radio systems that will be used to support data links to multiple MH-60Rs. This specific effort will address the need for low cost communications security (COMSEC) devices that are compatible with phased array systems, and that are needed to secure these data links. ***FY 2013 Accomplishments:*** - Develop low cost COMSEC suitable for use with phased array-based Ku-band data links to MH-60R. ***FY 2014 Plans:*** - Complete development of low cost COMSEC suitable for use with phased array-based Ku-band data links to MH-60R.			

Exhibit R-2A, RDT&E Project Justification: PB 2015 Navy		Date: March 2014
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603512N / *Carrier Systems Development*	**Project (Number/Name)** 3216. / *Tactical Support Center-Integration*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2013	FY 2014	FY 2015
- Initiate and complete testing and certification activities associated with COMSEC end units. ***FY 2015 Plans:*** N/A			
Accomplishments/Planned Programs Subtotals	8.521	4.546	4.185

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2013	FY 2014	FY 2015 Base	FY 2015 OCO	FY 2015 Total	FY 2016	FY 2017	FY 2018	FY 2019	Cost To Complete	Total Cost
• OPN/2176: *Undersea Support Equipment (CV-TSC/CDL portion)*	7.590	0.342	0.299	-	0.299	0.338	0.347	0.352	0.357	Continuing	Continuing

Remarks

D. Acquisition Strategy

CV-TSC utilizes an incremental development approach that aims to deliver required capability updates on two-year intervals to the Fleet. This approach allows required capability to be delivered in a timely manner and provides frequent opportunities to ensure interoperability is synchronized with the Ship Self Defense System (SSDS) Advanced Capability Builds (ACBs). The acquisition strategy places heavy emphasis on the use of open architecture best practices to ensure ease of upgrades and to make developed products available to other platforms.

In support of MH-60R, COMSEC development and certification will be conducted under the auspices of the Naval Center for High Assurance Computer Systems at the Naval Research Laboratory (NRL).

E. Performance Metrics

- Achieve Configuration Control Board (CCB) certification for installation of CV-TSC software version 8.0.
- Achieve Platform Information Technology (PIT) Information Assurance (IA) accreditation on CV-TSC software version 8.0.
- Achieve Consolidate Afloat Network Enterprise System (CANES) interoperability certification for CV-TSC software version 8.0.
- Achieve element certification on CV-TSC software version 8.0.
- Achieve Combat System test certification on CV-TSC software version 8.0.

Successfully complete Certification requirements for COMSEC being developed.

Exhibit R-4, RDT&E Schedule Profile: PB 2015 Navy		Date: March 2014
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603512N / *Carrier Systems Development*	**Project (Number/Name)** 3216. / *Tactical Support Center-Integration*

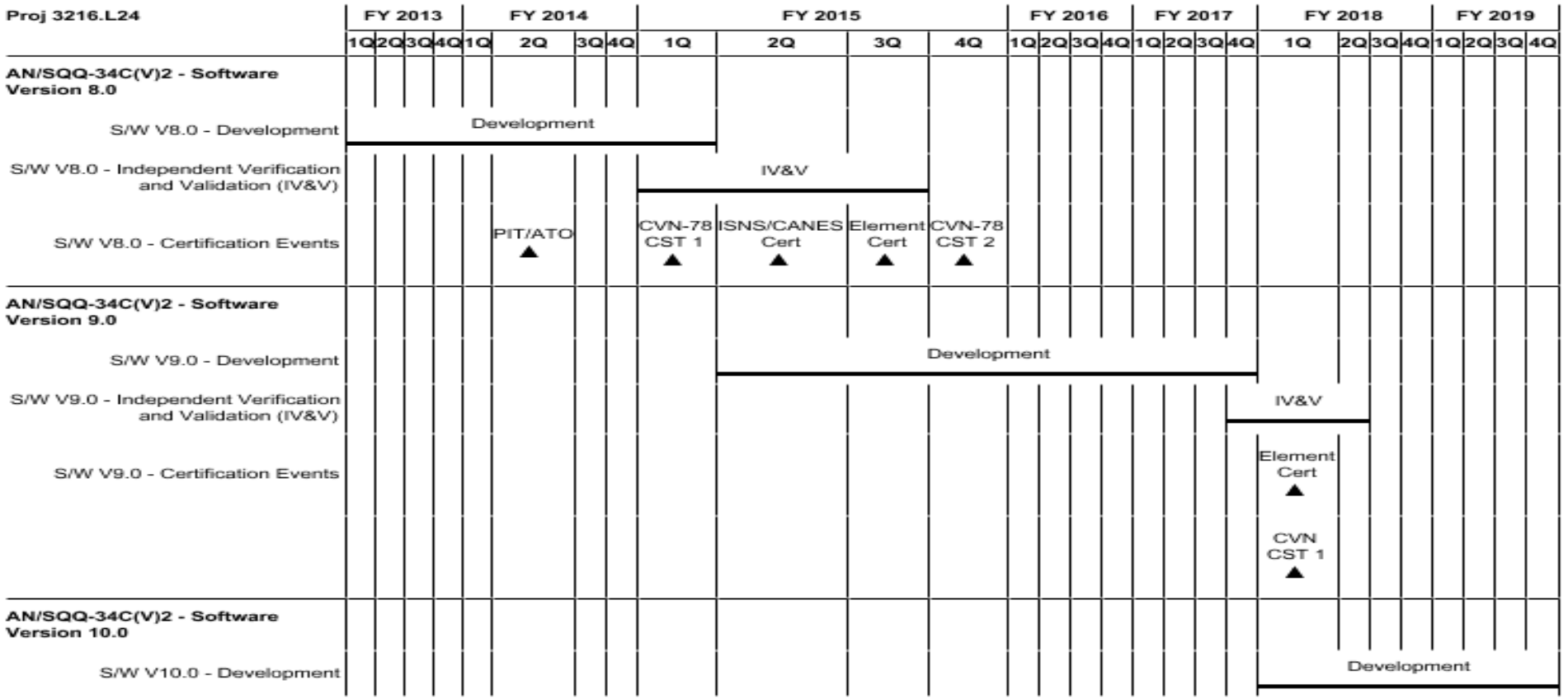

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Exhibit R-4, RDT&E Schedule Profile: PB 2015 Navy		Date: March 2014
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603512N / *Carrier Systems Development*	**Project (Number/Name)** 3216. / *Tactical Support Center-Integration*

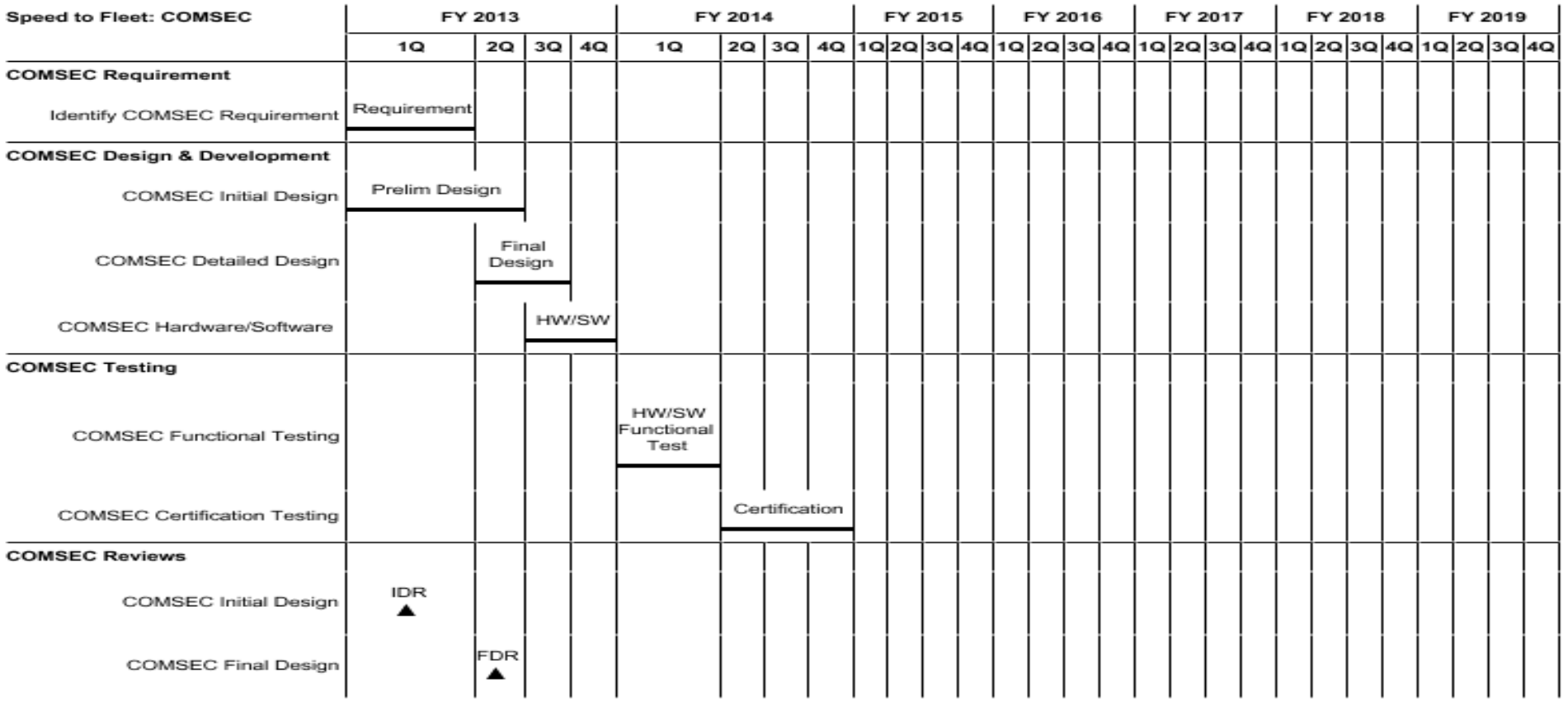

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Exhibit R-2A, RDT&E Project Justification: PB 2015 Navy			Date: March 2014
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603512N / *Carrier Systems Development*	Project (Number/Name) 4004 / *EMALS*	

COST ($ in Millions)	Prior Years	FY 2013	FY 2014	FY 2015 Base	FY 2015 OCO #	FY 2015 Total	FY 2016	FY 2017	FY 2018	FY 2019	Cost To Complete	Total Cost
4004: *EMALS*	602.647	55.067	43.003	-	-	-	-	-	-	-	-	700.717
Quantity of RDT&E Articles	0.000	-	-	-	-	-	-	-	-	-		

MDAP/MAIS Code: 223

The FY 2015 OCO Request will be submitted at a later date.

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. Funding for this project continues in PE 0604112N in FY 15 and later.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2013	FY 2014	FY 2015
Title: EMALS	55.067	43.003	-
Articles:	-	-	-

Description: EMALS

FY 2013 Accomplishments:

(1) EMALS System Design and Development (SDD) - Completed Shared Energy Storage Subsystem (ESS) Testing, Shared Inverter Testing and initiated Aircraft Compatibility Testing (ACT) Phase 2 at the System Functional Demonstration (SFD) site. The shared ESS Test included no-load and deadload launches with multiple ESS motor generators feeding multiple launchers representative of the shipboard configuration. The shared inverter testing executed no-load and deadload launches with inverters in a shipboard master/two slave configuration vice the SFD master/one slave configuration that has already been demonstrated. ACT 2 includes >300 aircraft launches at the SFD site for requirements verification and the development of the aircraft launch bulletins for shipboard operations. ACT 2 will complete Qtr 2 FY14. Continued Environmental Qualification Testing of EMALS components, including the completion of several General Environment Tests and Electromagnetic Interference Susceptibility Tests.

(2) EMALS Basic Ordering Agreement (BOA) ILS Order - Continued the execution of the EMALS ILS Development Program. Conducted annual logistics reviews, training in process reviews (IPRs) and Organizational and Intermediate (O & I) Technical Manual (TM) IPRs. Developed / updated Failure Mode Effectiveness and Criticality Analyses (FMECAs), the Logistics Management Information (LMI) Database, Reliability-Centered Maintenance (RCM) Analyses, Calibration Analysis, Calibration/ Measurements Requirements Summary / Instrument Calibration Procedures (CMRS/ICP), Manpower Analyses, O&I Maintenance

Exhibit R-2A, RDT&E Project Justification: PB 2015 Navy		Date: March 2014
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603512N / *Carrier Systems Development*	**Project (Number/Name)** 4004 / *EMALS*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2013	FY 2014	FY 2015
Plans, task analyses / narratives, provisioning documentation, Post Production Support Planning / Diminishing Manufacturing Sources & Material Shortages (PPSP/DMSMS) Screening and Analyses, and support equipment identification and technical data. Continued to develop and complete O&I Level Interactive Electronic Technical Manuals for both the operators and maintainers. Initiated development of training documents and the Navy Formal Training Course. Initiated development of the Maintenance Demonstration (M-Demo) Plan, Shipboard Facility Requirements Document (FRD) and the Training FRD. ***FY 2014 Plans:*** (1) EMALS SDD - Complete ACT 2. Conduct full system and risk mitigation testing at the SFD site by completing repeated cycles with deadload testing. Run multiple cycles with deadloads to bring the EMALS system up to 4000 total deadload and aircraft launches as part of the reliability growth program. Maintain and replenish test spares for the Lakehurst, NJ test site. (2) EMALS BOA ILS Order - Continue the execution of the EMALS ILS Development Program. Conduct annual logistics reviews, training IPR and O & I Level TM IPRs. Based on the development and availability of engineering source data for each of the six EMALS subsystems and allocated resources, develop / update FMECAs, the LMI database, CMRS/ICP, manpower analyses, O&I maintenance plans, provisioning documentation, PPSP/DMSMS screening and analyses, and support equipment identification and technical data. Continue to develop training documents, the Navy Formal Training Course. Develop the Shipboard FRD and the Training FRD. ***FY 2015 Plans:*** N/A			
Accomplishments/Planned Programs Subtotals	55.067	43.003	-

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2013	FY 2014	FY 2015 Base	FY 2015 OCO	FY 2015 Total	FY 2016	FY 2017	FY 2018	FY 2019	Cost To Complete	Total Cost
• RDTEN / 0604567N: *Project Units 3179, 4007*	12.197	15.572	18.867	-	18.867	19.830	21.440	18.682	19.108	Continuing	Continuing
• RDTEN / 0603570N: *Propulsion Plant Development (PU 2692)*	58.193	57.499	60.459	-	60.459	-	-	-	-	-	1,526.813
• SCN / 2001: *Carrier Replacement Program*	490.960	917.553	1,300.000	-	1,300.000	2,876.183	2,290.837	2,849.342	1,864.514	Continuing	Continuing
• SCN / 5300: *Completion of Prior Year Shipbuilding Programs*	-	588.100	663.000	-	663.000	124.000	-	-	-	-	1,375.100

Exhibit R-2A, RDT&E Project Justification: PB 2015 Navy		Date: March 2014
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603512N / *Carrier Systems Development*	**Project (Number/Name)** 4004 / *EMALS*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2013	FY 2014	FY 2015 Base	FY 2015 OCO	FY 2015 Total	FY 2016	FY 2017	FY 2018	FY 2019	Cost To Complete	Total Cost
• RDTEN / 0604112N: *Project Units 2208, 4004*	-	-	43.613	-	43.613	38.373	35.662	34.156	25.650	Continuing	Continuing
• OMN / 1B2B: *CVN 78 Ford Class Training (12BJ0)*	-	-	4.907	-	4.907	12.872	2.396	-	-	-	20.175

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.

E. Performance Metrics

Successfully complete Highly Accelerated Life Test (HALT) Phase II. Successfully complete System Functional Demonstration (SFD) testing. Successfully complete Environmental Qualification Testing (EQT). Successfully complete Shipset Controls Lab testing.

Exhibit R-4, RDT&E Schedule Profile: PB 2015 Navy		Date: March 2014
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603512N / *Carrier Systems Development*	**Project (Number/Name)** 4004 / *EMALS*

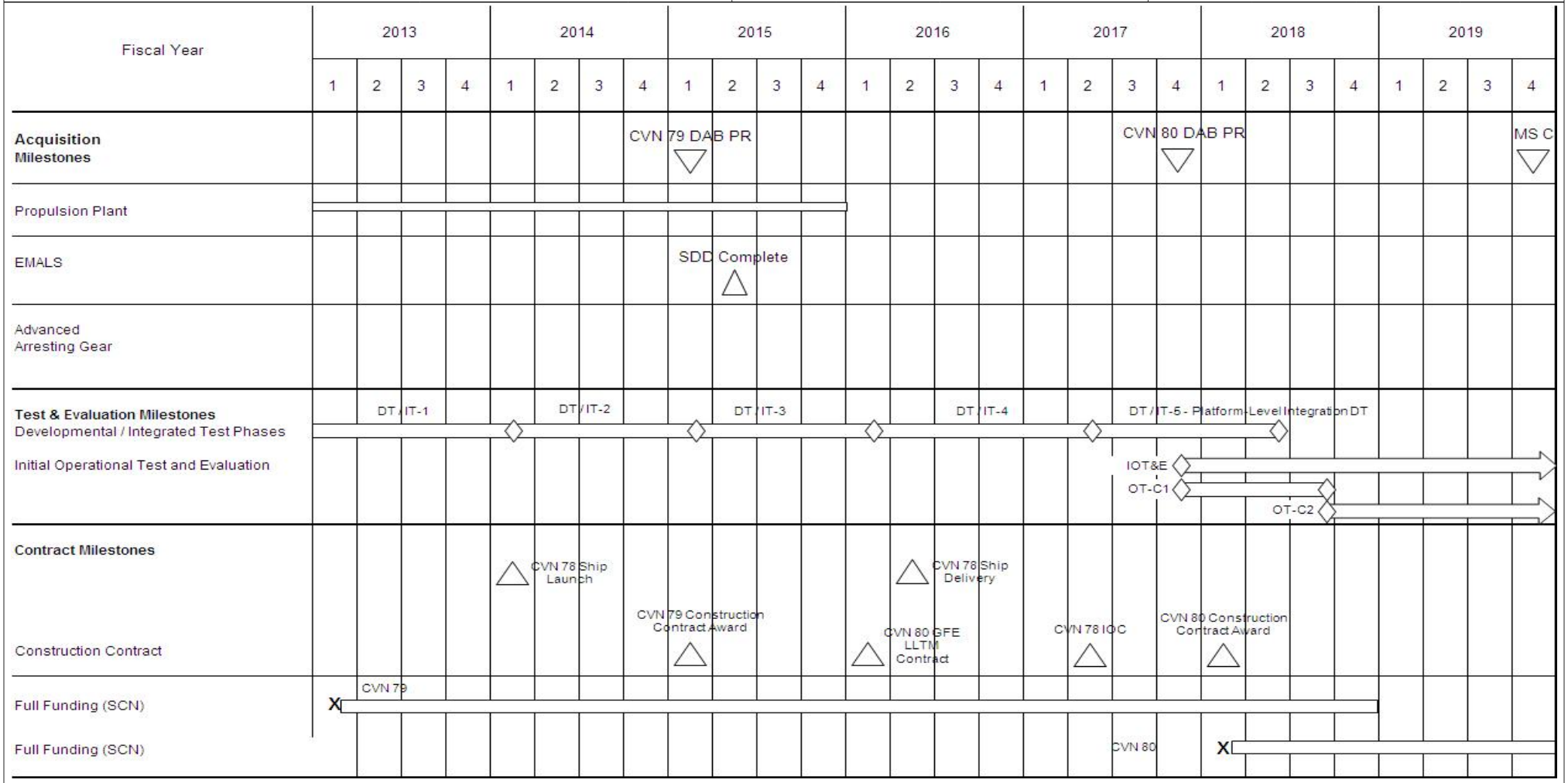


Exhibit R-2A, RDT&E Project Justification: PB 2015 Navy											Date: March 2014	
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603512N / *Carrier Systems Development*				Project (Number/Name) 4005 / *In-Service Carrier Systems Development*			
COST ($ in Millions)	**Prior Years**	**FY 2013**	**FY 2014**	**FY 2015 Base**	**FY 2015 OCO #**	**FY 2015 Total**	**FY 2016**	**FY 2017**	**FY 2018**	**FY 2019**	**Cost To Complete**	**Total Cost**
4005: *In-Service Carrier Systems Development*	17.519	1.574	1.715	1.774	-	1.774	2.229	1.266	1.278	1.317	Continuing	Continuing
Quantity of RDT&E Articles	0.000	-	-	-	-	-	-	-	-	-		

The FY 2015 OCO Request will be submitted at a later date.

A. Mission Description and Budget Item Justification

The In-Service Carrier Systems Demonstration and Validation program exploits available technologies to deliver an affordable, robust, operator-friendly automation control environment for Navy Aircraft Carrier shipboard equipment. The program provides the system architecture, requirements/specification development, technology selection, software development (including software baseline), as well as land-based and shipboard testing of new technologies to improve shipboard operations and to reduce workload, manpower requirements, and Total Ownership Costs. Initial technologies include the Ship Control System Governor Software Development, Tank Preservation, Uninterruptible Power Supply (UPS) Replacements, Advanced Damage Control System (ADCS), Weapons Elevator Control Accumulator Replacement, and the Integrated Condition Assessment System. Demonstration technologies include Advanced Damage Control System (ADCS) software improvements, A/C Plant Model, Input/Output Controller (IOC) Replacement, Fleet Wireless Personal digital Assistant (PDA), Weapons Elevator Laser Positioning System, Legacy Steering Interface upgrades, CVN Integrated Topside Design (ITD) location option evaluation tools, Antenna to Antenna coupling analysis tools. Wireless systems, smart sensors, lighting systems, knowledge-based systems, automated casualty control, automated technology for workload reduction, linked smart devices, common software tools for interoperability, and self-healing network are technologies being considered for future applications including the following: Integrated Bridge control Data Logger, C4I Network Performance Modeling and Analysis, NCDS Packet Filtering Device, Network Data Logger Device, Portable Communication System (PCS) proof of concept, Ship Control System (SCS) Onboard trainer, Universal Portable Command and Control Unit (PCCU).

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	**FY 2013**	**FY 2014**	**FY 2015**
Title: In-Service Carrier Systems Development	1.574	1.715	1.774
Articles:	-	-	-
FY 2013 Accomplishments: Continued support of technologies with modifications, upgrades and development of systems and software support of In-Service aircraft carrier modernization initiatives.			
FY 2014 Plans: Continue support to technologies with modifications, upgrades and development of systems and software support of In-Service aircraft carrier modernization initiatives.			
FY 2015 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2015 Navy		Date: March 2014
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603512N / *Carrier Systems Development*	**Project (Number/Name)** 4005 / *In-Service Carrier Systems Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2013	FY 2014	FY 2015
Fiscal Year 2015 plans include support to Aircraft Carrier technologies. Modifications, upgrades and development of systems and software will be ongoing in support of In-Service aircraft carrier modernization initiatives and TOC reduction initiatives.			
Accomplishments/Planned Programs Subtotals	1.574	1.715	1.774

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

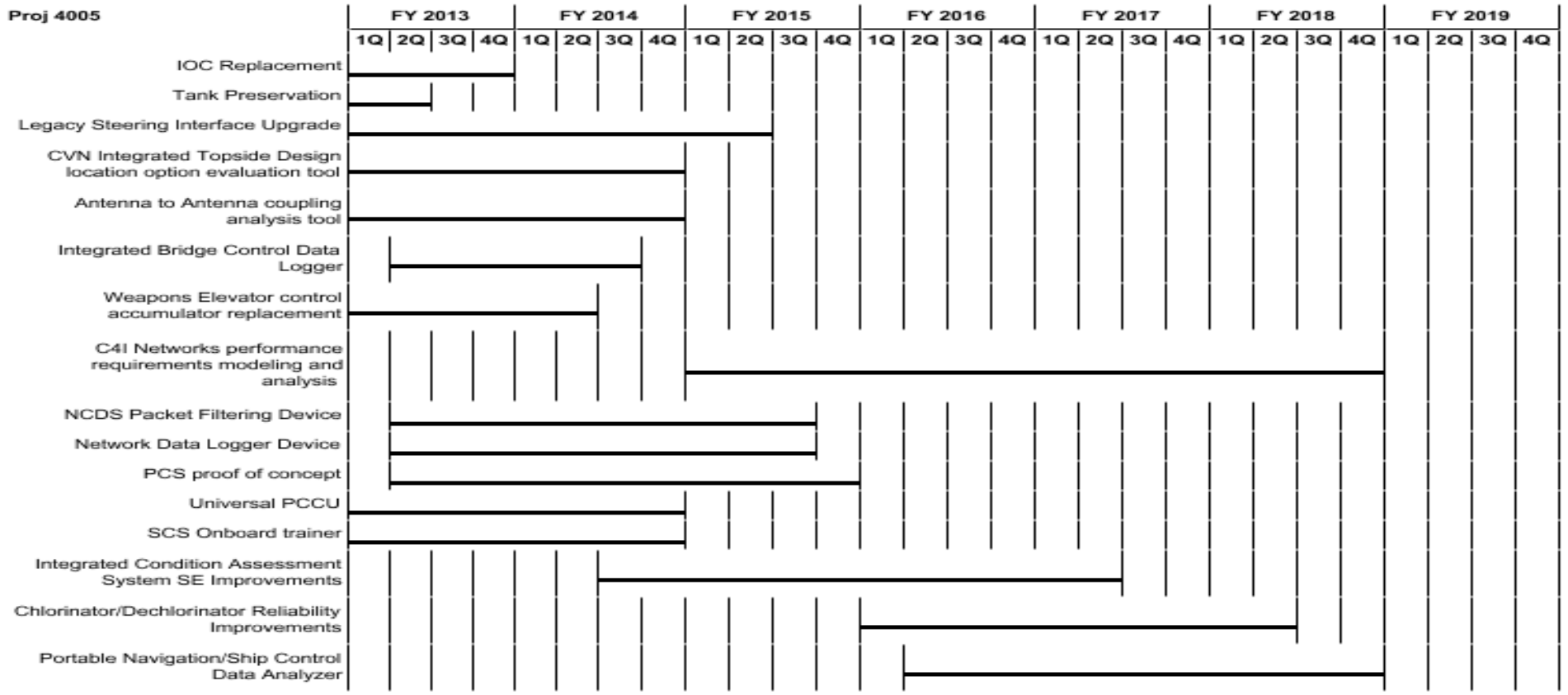
D. Acquisition Strategy

Investigate, demonstrate, and implement available technologies to deliver a robust, operator-friendly automation control environment for Navy Aircraft Carrier shipboard equipment to reduce workload, manpower requirements, and Total Ownership Costs (TOC).

E. Performance Metrics

Successfully complete Ship Control System Governor Software Development, AC Plant Model Capacity Optimization, Uninterruptible Power Supply (UPS) Replacements, Advanced Damage Control System (ADCS) Software Improvements, Automatic Fire Sensing and Suppression System/Flooding and Casualty Control Software (AFSSS/FCCS) Software Development Test, Input/Output Controller (IOC) replacement demonstration, Tank Preservation models, Weapons Elevator Laser Positioning demonstration, Legacy Steering Interface Upgrades, CVN Integrated Topside Design (ITD) location option evaluation tool development, Antenna to Antenna coupling analysis tool development, Universal Portable Command and Control Unit (PCCU) development, Ship Control System (SCS) Trainer, Integrated Bridge Control Data Logger, Weapons Elevator Control Accumulator Replacement, and C4I Network Performance Requirements Modeling and Analysis.

Exhibit R-4, RDT&E Schedule Profile: PB 2015 Navy		Date: March 2014
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603512N / *Carrier Systems Development*	**Project (Number/Name)** 4005 / *In-Service Carrier Systems Development*



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