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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 7: Operational Systems Development					R-1 Program Element (Number/Name) PE 0607658N I (U)Cooperative Engagement Capability							
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	676.349	88.088	128.815	127.924	-	127.924	161.162	182.355	151.318	162.413	Continuing	Continuing
2039: COOP Engagement	676.349	77.472	128.815	109.496	-	109.496	124.865	138.306	118.401	127.165	Continuing	Continuing
3240: CEC Increment II	0.000	0.000	0.000	18.428	-	18.428	36.297	44.049	32.917	35.248	Continuing	Continuing
9999: Congressional Adds	0.000	10.616	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	10.616
Program MDAP/MAIS Code: Project MDAP/MAIS Code(s): 582												
A. Mission Description and Budget Item Justification The FY 2020 funding request was reduced by \$12.900 million to account for the availability of prior year execution balances. Cooperative Engagement Capability (CEC) significantly improves Battle Force Anti-Air Warfare (AAW) capability by coordinating all Battle Force AAW sensors into a single, real-time, composite track picture to support integrated fire control. CEC distributes sensor data from each USMC Command Control Unit, US Navy Ship, and US Navy Aircraft, or Cooperating Unit (CU), to all other CUs in the battle force through a real-time, line of sight, high data-rate sensor and engagement data distribution network. CEC is highly resistant to jamming and provides accurate gridlocking between CUs. Each CU independently employs high capacity, parallel processing and advanced algorithms to combine all distributed sensor data into a fire control quality track picture which is the same for all CUs. CEC data is presented as a superset of the best AAW sensor capabilities from each CU, all of which are integrated into a single input to each CU's combat weapons system. CEC significantly improves our Battle Force defense in depth, including both local area and ship defense capabilities against current and future AAW threats. Moreover, CEC provides critical connectivity and integration of over-land air defense systems capable of countering emerging air threats, including land attack cruise missiles, in a complex littoral environment. The CEC Program Office oversees CEC development for all services with funding provided for their respective combat systems. CEC consists of the Data Distribution System (DDS), the Cooperative Engagement Processor (CEP), and interface with Combat Systems and sensors. The DDS encodes and distributes own-ship sensor and engagement data and is a high capacity, jam resistant, directional system providing high data throughput as well common time and common positional frame of reference. The CEP is a high capacity distributed processor that processes data from all integrated radars. The data is passed to the ship's combat system as a high quality, common, continuous, engageable track. The Navy implemented a Signal Data Processor (SDP) approach to modify the current equipment to meet reduced size, weight, cost, power and cooling objectives. This SDP approach also supports continuity for interoperability improvements and program protection, as well as supporting open architecture initiatives, and comms												

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independence. The SDP hardware complies with Category 3 Open Architecture Computing Environment (OACE) standards. The SDP-S is being fielded fleet-wide to all US Navy, USMC, US Army, and FMS CEC units.						
A family of antennas approach will be used to satisfy CEC requirements for obsolete components with lower life cycle costs (procurement, installation, and maintenance). These antennas enable future capability as well as providing a solution extensible to additional platforms. This effort for development and production of Common Array Block (CAB) antennas was competitively awarded in late FY2013.						
Network Enabled Electronic Defense System (NEEDS) modifies CEC software to add significant Electronic Warfare capability.						
CEC operates in increasingly contentious cyber-space. Measures are being taken to robustly mitigate, and where possible completely remediate cyber vulnerabilities.						
B. Program Change Summary (\$ in Millions)		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget		92.571	130.515	141.373	-	141.373
Current President's Budget		88.088	128.815	127.924	-	127.924
Total Adjustments		-4.483	-1.700	-13.449	-	-13.449
• Congressional General Reductions		-	-			
• Congressional Directed Reductions		-	-1.700			
• Congressional Rescissions		-	-			
• Congressional Adds		-	-			
• Congressional Directed Transfers		-	-			
• Reprogrammings		-7.320	0.000			
• SBIR/STTR Transfer		-3.064	0.000			
• Program Adjustments		0.000	0.000	-12.898	-	-12.898
• Rate/Misc Adjustments		0.001	0.000	-0.551	-	-0.551
• Congressional Directed Reductions		-5.100	-	-	-	-
Adjustments						
• Congressional Add Adjustments		11.000	-	-	-	-
Congressional Add Details (\$ in Millions, and Includes General Reductions)						
Project: 9999: Congressional Adds				FY 2018	FY 2019	
Congressional Add: CEC Identification Friend or Foe (IFF) Mode 5 Acceleration				10.616	0.000	
Congressional Add Subtotals for Project: 9999				10.616	0.000	
Congressional Add Totals for all Projects				10.616	0.000	

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Change Summary Explanation - FY 2018 decrease of -\$4.483M included: +\$11.000M for a Congressional add, -\$5.100M for a Congressionally directed reduction, -\$3.064M for Small Business Innovative Research (SBIR) transfer, and -\$7.320 below threshold reprogramming. - FY 2019 decrease of -\$1.700M reflects a Congressionally directed general reduction for Enterprise Air Surveillance Radar (EASR) Delayed New Start. - FY 2020 decrease of -\$13.449M included: -\$12.900M reduction to account for the availability of prior year execution balances, and -\$0.551M for various rate adjustments.		

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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
2039: COOP Engagement	676.349	77.472	128.815	109.496	-	109.496	124.865	138.306	118.401	127.165	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
Project MDAP/MAIS Code: 582												
A. Mission Description and Budget Item Justification												
Cooperative Engagement Capability (CEC) significantly improves Battle Force Anti-Air Warfare (AAW) capability by coordinating all Battle Force AAW sensors into a single, real-time, composite track picture to support integrated fire control.												
CEC distributes sensor data from each USMC Command Control Unit, US Navy Ship, and US Navy Aircraft, or Cooperating Unit (CU), to all other CUs in the battle force through a real-time, line of sight, high data-rate sensor and engagement data distribution network. CEC is highly resistant to jamming and provides accurate gridlocking between CUs. Each CU independently employs high capacity, parallel processing and advanced algorithms to combine all distributed sensor data into a fire control quality track picture which is the same for all CUs. CEC data is presented as a superset of the best AAW sensor capabilities from each CU, all of which are integrated into a single input to each CU's combat weapons system.												
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The CEC Program Office oversees CEC development for all services with funding provided for their respective combat systems. CEC consists of the Data Distribution System (DDS), the Cooperative Engagement Processor (CEP), and interface with Combat Systems and sensors. The DDS encodes and distributes own-ship sensor and engagement data and is a high capacity, jam resistant, directional system providing high data throughput as well common time and common positional frame of reference. The CEP is a high capacity distributed processor that processes data from all integrated radars. The data is passed to the ship's combat system as a high quality, common, continuous, engageable track.												
The Navy implemented a Signal Data Processor (SDP) approach to modify the current equipment to meet reduced size, weight, cost, power and cooling objectives. This SDP approach also supports continuity for interoperability improvements and program protection, as well as supporting open architecture initiatives, and comms independence. The SDP hardware complies with Category 3 Open Architecture Computing Environment (OACE) standards. The SDP-S is being fielded fleet-wide to all US Navy, USMC, US Army, and FMS CEC units.												
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Network Enabled Electronic Defense System (NEEDS) modifies CEC software to add significant Electronic Warfare capability.						
CEC operates in increasingly contentious cyber-space. Measures are being taken to robustly mitigate, and where possible completely remediate cyber vulnerabilities.						
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: E-2D		3.043	4.017	3.874	0.000	3.874
Articles:		-	-	-	-	-
FY 2019 Plans: Complete E-2D DSSC 3 CEC Independent Verification and Validation (IV&V) Testing and the Product Certification Panel (PCP). Continue lab test data analysis and development and implementation of fixes to high priority discrepancy reports. Conduct software fleet release preparations. Begin E-2D DSSC 4 CEC development and integration to incorporate Dynamic CEP ID with Platform Registration and Network Enabled Electronic Defense System (NEEDS) Increment 1. Support interface and software changes related to select DSSC 4 capabilities driven by E-2D program requirements. Draft E-2D DSSC 5 Requirements and support E-2D platform requirements development.						
FY 2020 Base Plans: Continue CEC software development and test in support of the E-2D DSSC 4 software upgrade program. Support test event planning and conduct, analyze test data and identify, prioritize, and implement trouble report corrective actions in CEC software. Prepare for DSSC 4 CEC software FQT. Perform detailed design efforts for E-2D DSSC 5 CEC software, including interface development and integration of CEC capabilities, Signal Data Processor-Sierra (SDP-S) processor upgrade, Surface Tracking), and of E-2D networking and sensor capability and performance improvements included in DSSC 5 software and associated hardware.						
FY 2020 OCO Plans: N/A						
FY 2019 to FY 2020 Increase/Decrease Statement: Decrease is due to completion of DSSC-3 Software testing late in FY 2019.						
Title: B/L 2.1 INTEGRATION AND FOT&E TESTING		9.845	11.330	10.925	0.000	10.925
Articles:		-	-	-	-	-
FY 2019 Plans: Complete testing of CEC AN/USG-3B with E-2D DSSC-3. Continue Developmental Testing (DT-D2) of AN/USG-2B with CVN 78. Conduct three Underway tracking events onboard USS GERALD R FORD. Conduct						

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
<p>6 tracking events and 6 live fire events onboard Self Defense Test Ship (SDTS). Support E-2D DSSC-3 Operational Testing (OT) preparation and test execution. Conduct NIFC-CA Live Fire Test #7 (two live fire events) at White Sands Missile Range (WSMR) and two at-sea live fire test events. Conduct tracking events prior to each live fire event. Continue CEC Developmental Test (DT-D3) of AN/USG-2B with DDG 1000 combat system. Complete remaining live-fire (six) and six remaining tracking events onboard SDTS. Conduct multiple tracking events and the first ever live-fire test onboard DDG 1000. Continue CEC Developmental Test (DT-D4) of AN/USG-2B with Aegis Advanced Capability Build (ACB) 16 at the Wallops Island Land Based Test Sites and at sea onboard USN Ships. Conduct CSSQT aboard USS OSCAR AUSTIN (DDG 79), USS HOWARD (DDG 83), USS COWPENS (CG 63), and USS GETTYSBURG (CG 64). Continue testing of NEEDS at LBTS and conduct testing onboard USN Ships. Continue testing of CET and CTT at Land Based Test Site (LBTS) and commence CET and CTT testing onboard USN Ships.</p> <p>FY 2020 Base Plans: Continue Developmental Testing (DT-D2) of AN/USG-2B with CVN 78. Conduct 3 Underway tracking events onboard USS GERALD R FORD. Complete live fire testing for CVN 78 combat system configuration onboard Self Defense Test Ship (SDTS). Commence testing of CEC AN/USG-3B with E-2D DSSC-4. Conduct underway NIFC-CA Live Fire Test and live fire test at White Sands Missile Range (WSMR). Conduct tracking ents prior to each live fire. Continue CEC Developmental Test (DT-D3) of AN/USG-2B with DDG 1000 combat system. Conduct multiple tracking events and multiple live fire test events onboard USS ZUMWALT (DDG 1000), including first testing in a multi-node CEC Network environment. Continue CEC Developmental Test (DT-D4) of AN/USG-2B with Aegis ACB 16 at the Wallops Island Land Based Test Sites and at sea onboard USN Ships. Conduct CSSQT aboard USS OSCAR AUSTIN (DDG 79), USS HOWARD (DDG 83), USS COWPENS (CG 63), and USS GETTYSBURG (CG 64). Commence testing of Common Array Block antenna - Shipboard (CAB-S) at the Wallops Island Land Based Test Site. Continue testing of NEEDS on multiple USN Ships. Continue testing of CET and CTT on multiple USN Ships.</p> <p>FY 2020 OCO Plans: N/A</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Decrease is due to completion of NIFC-CA Increment 1 Testing at the end of FY2019.</p>						
Title: SYSTEM IMPROVEMENTS		21.243	23.799	20.472	0.000	20.472
Articles:		-	-	-	-	-

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
FY 2019 Plans: Continue integration and software updates to support AEGIS ACB 16, including NEEDS capability integration. Conduct Product Release Panel (PRP) to support DDG and CG ACB 16. Modernization Combat System Ship Qualification and Trials (CSSQT) and PCP for software delivery to support ACB 16 Combat System Certification Panel (CSCP) in FY20. Continue software development for AN/SPY-6(V)1 and AEGIS ACB 20 integration. Develop and test SW Build Releases (SBR) #2, #3, and #4 and conduct two Software Build Reviews (SBRs) for AEGIS ACB 20. Develop and test SW Build Release #5 for final CEC system integration with CAB Family of Antennas (FoA). Develop critical Product Trouble Report (PTR) fixes that are discovered from CVN 78 at-sea testing to support CEC integration with Dual Band Radar (DBR) and SSDS MK2 Mod 6C combat system. For CEC Enhanced Networks (CEN) continue development of features in the Data Distribution System (DDS) software, including delivery of software components to the Office of Naval Research (ONR), to support the Mission Based Networking for DDS (MiND) Technology Readiness Level (TRL) 6 demonstration scheduled for FY20 in support of the Communications and Interoperability for Integrated Fires (CIIF) Future Naval Capability (FNC) project.						
FY 2020 Base Plans: Continue integration and software updates to support AEGIS ACB 16. Conduct Product Release Panel (PRP) to support DDG and CG ACB 16. Modernization Combat System Ship Qualification and Trials (CSSQT) and PCP for software delivery to support ACB 16 Combat System Certification Panel (CSCP) in FY20. Continue software development for AN/SPY-6(V)1 and AEGIS ACB 20 integration. Develop and test SW Build Releases (SBR) #2, #3, and #4 and conduct two Software Build Reviews (SBRs) for AEGIS ACB 20. Develop and test SW Build Release #5 for final CEC system integration with CAB Family of Antennas (FoA). Develop critical Product Trouble Report (PTR) fixes that are discovered from CVN 78 at-sea testing to support CEC integration with Dual Band Radar (DBR) and SSDS MK2 Mod 6C combat system.						

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)				FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
For CEC Enhanced Networks (CEN) continue development of features in the Data Distribution System (DDS) software, including delivery of software components to the Office of Naval Research (ONR), to support the Mission Based Networking for DDS (MiND) Technology Readiness Level (TRL) 6 demonstration scheduled for FY20 in support of the Communications and Interoperability for Integrated Fires (CIIF) Future Naval Capability (FNC) project. FY 2020 OCO Plans: N/A FY 2019 to FY 2020 Increase/Decrease Statement: Decrease is due to reduction of the number of PTR fixes for CVN 78 software.								
Title: NETWORK ENABLED ELECTRONIC DEFENSE SYSTEM (NEEDS) Articles:				3.312 -	4.610 -	2.080 -	0.000 -	2.080 -
FY 2019 Plans: Conduct Integration Verification and Validation at Raytheon Development Facility. Conduct government Independent Verification and Validation (IV&V) and Final Qualification Testing (FQT). Develop critical Product Trouble Report (PTR) fixes that are discovered during testing conducted at Land Based Test Site (LBTS), onboard USN Ships, or during IV&V and FQT testing. Conduct Product Certification Panel (PCP) for software delivery to support Aegis Light Off (ALO) of DDG 79 near the beginning of FY19 and Combat System Shipboard Qualification Trial (CSSQT) near the end of FY19. FY 2020 Base Plans: Develop critical Product Trouble Report (PTR) fixes that are discovered during testing conducted at LBTS, onboard USN Ships, or during Independent Verification and Validation (IV&V) testing in support of Combat System Certification Panel (CSCP) for AWS 9.2.1, and CSSQT for LHD-6. Support early Operational Test (OT) preparation for DSSC 4 on Advanced Hawkeye (AHE). FY 2020 OCO Plans: N/A FY 2019 to FY 2020 Increase/Decrease Statement:								

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Decrease is due to completion of development and integration and transition to test support/maintenance at the end of FY 2019.						
Title: FIELD ACTIVITIES Articles: FY 2019 Plans: Continue field activity support of CEC development and fielding efforts (including Software Engineering / Integration Agent(SE/IA), Technical Direction Agent, In-Service Engineering Agent, Integrated Logistics Support planning) and program management support. Facilitate fielding or systems improvements and maintenance efforts. FY 2020 Base Plans: Continue field activity support of CEC development and fielding efforts (including Software Engineering / Integration Agent (SE/IA), Technical Direction Agent, In-Service Engineering Agent, Integrated Logistics Support planning) and program management support. Facilitate fielding or systems improvements and maintenance efforts. FY 2020 OCO Plans: N/A FY 2019 to FY 2020 Increase/Decrease Statement: Decrease is due to retirement of AN/USG-2A early in FY 2020 and completion of Software Maintenance Build installations at the end of FY 2019.		7.697 -	9.373 -	8.774 -	0.000 -	8.774 -
Title: COMMON ARRAY BLOCK (CAB) ANTENNA Articles: FY 2019 Plans: Complete EDM development and test. Complete Antenna Power Supply Unit (APSU) build and test. Fabricate CAB-S and CAB-E Pre-Production Units (PPU). Begin build and test of CAB Pre-Production Units (PPU). Conduct risk reduction barge shock test on CAB-S. Develop CAB software Build 4, and commence development of CAB final software Build 5. Develop and deliver CAB Interactive Electronic Technical Manuals, Corrective Maintenance Exercises, and Product Structure Engineering Change Proposals. FY 2020 Base Plans:		14.700 -	9.649 -	7.746 -	0.000 -	7.746 -

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)				FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Perform Physical Configuration Audit for Pre-Production Units (PPUs). Complete PPU Qualification Tests. Complete unit test and deliver CAB software Build 5. Deliver CAB-E and CAB-S PPUs for DT. FY 2020 OCO Plans: N/A FY 2019 to FY 2020 Increase/Decrease Statement: Decrease is due to completion of software development and transition to test support/sustainment.								
Title: NAVAL INTEGRATED FIRE CONTROL-COUNTER AIR (NIFC-CA) Articles:				0.000 -	6.871 -	6.625 -	0.000 -	6.625 -
FY 2019 Plans: Complete Software Integration of NIFC-CA Increment 2. Conduct Product Certification Panel (PCP) in support of final delivery of NIFC-CA Increment 2. Support Land Based Test Site and At Sea Developmental Testing (DT) of NIFC-CA Increment 2. Conduct analysis of Land Based Test Site and at-sea test data in support of future NIFC capabilities. Continue requirements development for NIFC Increment 3. FY 2020 Base Plans: Begin Robust Systems engineering for NIFC Increment 3 in close conjunction with other NIFC Pillars. Conduct Modeling and Simulation (M&S) to inform Requirements and conduct element SRR. FY 2020 OCO Plans: N/A FY 2019 to FY 2020 Increase/Decrease Statement: Decrease is due to completion of software development and transition to test support/sustainment.								
Title: FIRE CONTROL LOOP IMPROVEMENT INITIATIVE (FCLIP) PHASE 2 Articles:				6.623 -	8.700 -	4.453 -	0.000 -	4.453 -
FY 2019 Plans: Develop Software Build Release (SBR) and MK-9 Multi-Target Tracker (MTT) testing and data analysis. Conduct Engineering Verification Tests (EVT) and Product Release Panels (PRP) to support Combat System Lite Off (CSLO) and testing on SSDS ships. Conduct CEC Final Qualification Test (FQT) prior to software								

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delivery to the government. Conduct government Independent Verification and Validation (IV&V) testing and Product Certification Panel (PCP) for software delivery to support Combat System Certification Panel. FY 2020 Base Plans: Perform baseline certification efforts for the FCLIP product baseline in support Combat System events including CVN 70 Composite Surface Track (CST), CVN 70 Combat System Light Off (CSLO), LHD 6 CSLO & Combat System Shipboard Qualification Trial (CSSQT) and LPD 23 CSLO. FY 2020 OCO Plans: N/A FY 2019 to FY 2020 Increase/Decrease Statement: Decrease is due to completion of software development and transition to test support/sustainment.						
Title: PROGRAM PROTECTION <div>Articles:</div>		7.518 -	8.527 -	9.205 -	0.000 -	9.205 -
FY 2019 Plans: Provide CEC Program Protection support to manage risks from foreign intelligence collection threats to CEC hardware, software, or supply chain exploitation. The CEC DoD unique or critical technologies are required to be protected using threat resistant anti-tamper technologies. The effort will further the use of the threat resistant anti-tamper technologies within the program. CEC will work closely with the Cyber Assessment Agency and Defense Assessment Management Office to access impacts to the program from exploitation. FY 2020 Base Plans: Provide CEC Program Protection support to manage risks from foreign intelligence collection threats to CEC hardware, software, or supply chain exploitation. The CEC DoD unique or critical technologies are required to be protected using threat resistant anti-tamper technologies. The effort will further the use of the threat resistant anti-tamper technologies within the program. CEC will work closely with the Cyber Assessment Agency and Defense Assessment Management Office to access impacts to the program from exploitation. FY 2020 OCO Plans:						

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N/A						
FY 2019 to FY 2020 Increase/Decrease Statement: Increase is due to starting integration and qualification phase of development.						
Title: CEC INCREMENT 2		1.253	3.300	1.818	0.000	1.818
Articles:		-	-	-	-	-
Description: CEC Increment 2 refers to initial efforts to expand CEC tracking capabilities to include surface tracking and other experimental / proof of concept efforts. CEC Increment 2 does not cover efforts associated with CEC Increment II. CEC Increment II is covered under PE 0607658N / (U)Cooperative Engagement Capability Project 3240 / CEC Increment II starting in FY20.						
FY 2019 Plans: Complete Close In Weapon System (CIWS) dual mount integration, continue testing of advanced CEC kernel functions informed by Fire Control Loop Improvement Project (FCLIP) Phase 2 test events. Continue development of prototype tactical software in preparation for a 2020 demonstration of ABMA (electronic warfare coordination and sensors weapons coordination) in close coordination with the ONR Coordinated RF for Electronic Warfare (CRFEW) project.						
FY 2020 Base Plans: In close alignment with FCLIP Phase 2, complete Product Certification Panel (PCP) and begin fielding of surface sensors in CEC Continue experimentation for ABMA and participate in both Land Based Testing, and conduct an at-sea Demonstration of advanced warfare coordination for Electronic Warfare (EW) features in conjunction with the CRFEW project.						
FY 2020 OCO Plans: N/A						
FY 2019 to FY 2020 Increase/Decrease Statement: Decrease is due to completion of surface sensor integration and transition to test support/sustainment.						
Title: ENTERPRISE AIR SURVEILLANCE RADAR (EASR)		2.238	5.200	7.452	0.000	7.452
Articles:		-	-	-	-	-
FY 2019 Plans: Continue technical documentation analysis of EASR, NGSSR and SSDS ACB 20 combat system in support of SETR milestones and Agile software development Sprint reviews. Continue CEC requirements capture,						

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Appropriation/Budget Activity 1319 / 7		R-1 Program Element (Number/Name) PE 0607658N / (U)Cooperative Engagement Capability	Project (Number/Name) 2039 / COOP Engagement			
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
<p>architecture design and software development for the CEC adaptive layers for Rotator and Fixed variants of EASR, NGSSR and SSDS ACB 20 combat system for CVN and L-Class ships. Continue integration testing with the EASR Simulator and commence integration testing with the EASR Emulator. Conduct one CEC-EASR-SSDS Software Build TIM (SBT) in FY19. Conduct SSDS ACB 20 System Requirement Review (SRR).</p> <p>FY 2020 Base Plans: Continue CEC Agile software development, coding and integration of the CEC adaptive layers for each of the EASR variants (Rotator & Fixed Array), NGSSR and SSDS ACB 20 combat system for CVN and L-Class ships. Commence Combat System Integration testing with the SSDS ACB 20 baseline and EASR variant 1 Engineering Development Model (EDM) at the Wallops Island Land Based Test Site (LBTS). Continue integration testing with the EASR Simulator and Emulator with the EDM at the LBTS, Wallops Island. Commence CEC Software Baseline Development (2.1.11) for SSDS ACB 20 and EASR. Support NGSSR testing at LBTSs and at sea. Conduct CEC EASR SFR and two CEC/EASR Software Build Reviews. Support SSDS ACB 20 PDR and CDR and NGSSR Test Readiness Review (TRR). Continue support for Technical Interchange Meetings (TIM), CEC SSDS In Process Reviews (IPRs) and EASR, NGSSR and ACB 20 Working Groups.</p> <p>FY 2020 OCO Plans: N/A</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Increase is due to increased test schedule at Land Based Test Sites and commencement of At-sea testing.</p> <p>.</p>						
<p>Title: CEC FAR-TERM INTEROPERABILITY IMPROVEMENT PROJECT (FTIIP)</p> <p>Articles:</p> <p>FY 2019 Plans: Complete integration and certification of Identification Friend or Foe (IFF) improvements (including Mode 5 related software trouble report corrections and IFF processing design changes) for AEGIS Baseline 7.2, 9.2.0, SSDS Blds 6 and 9, E-2D Delta System Software Configuration 3 (DSSC 3) and USMC configurations. Commence development of CEC integration with IFF Mode S and Automatic Dependent Surveillance - Broadcast (ADS-B) systems. Coordinate system and subsystem requirements and integration with Aegis, Ship Self Defense System (SSDS), and E-2D Advanced Hawkeye Programs. Conduct System Requirements Review (SRR)</p>		0.000 -	6.500 -	0.000 -	0.000 -	0.000 -

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy				Date: March 2019		
Appropriation/Budget Activity 1319 / 7		R-1 Program Element (Number/Name) PE 0607658N / (U)Cooperative Engagement Capability		Project (Number/Name) 2039 / COOP Engagement		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
and System Functional Review (SFR). FY 2020 Base Plans: CEC FTIIP efforts transition to PE 0607658N / (U)Cooperative Engagement Capability Project 3240 / CEC Increment II in FY20. FY 2020 OCO Plans: N/A FY 2019 to FY 2020 Increase/Decrease Statement: CEC FTIIP efforts transition to PE 0607658N / (U)Cooperative Engagement Capability Project 3240 / CEC CDD Increment II in FY20.						
Title: DIGITAL WARFARE TACTICAL NETWORKING INITIATIVE IMPLEMENTATION <div>Articles:</div> FY 2019 Plans: Lead a Cross Functional Team (CFT) with participation from key naval tactical network organizations and fleet representation to conduct initial systems engineering and experimentation for improving tactical data dissemination to support further development of Integrated Fire Control concepts. Assist Office of Naval Research (ONR) in Communication-as-a-Service (CaaS) technology maturation. This includes early investigation of CaaS implementation across multiple radios, waveforms, and network architectures; develop early Model Based System Engineering (MBSE) SysML models; and Software-in-the-Loop (SIL) and Land Base Test Site (LBTS) experimentation to formulate the solution toward the development of Fleet Tactical Grid and Distributed Maritime Operations. FY 2020 Base Plans: Continue leading a Cross Functional Team (CFT) with participation from key naval tactical network organizations and fleet representation to conduct initial systems engineering and experimentation for improving tactical data dissemination to support further development of Integrated Fire Control concepts. Continue Communication-as-a-Service (CaaS) technology maturation and experimentation. This includes further investigation of CaaS implementation across multiple radios, waveforms, and network architectures; continue development of Model Based System Engineering (MBSE) SysML models; and prepare for and conduct At-Sea experimentation to formulate the solution toward the development of Fleet Tactical Grid and Distributed Maritime Operations. Begin		0.000 -	17.900 -	23.100 -	0.000 -	23.100 -

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy				Date: March 2019		
Appropriation/Budget Activity 1319 / 7		R-1 Program Element (Number/Name) PE 0607658N / (U)Cooperative Engagement Capability		Project (Number/Name) 2039 / COOP Engagement		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
development of hardware requirements and conduct preparation for element level System Requirements Review (SRR) to incorporate CaaS across multiple radios waveforms, and network architectures. FY 2020 OCO Plans: N/A FY 2019 to FY 2020 Increase/Decrease Statement: Increase is due to At-Sea experimentation and preparation for element level System Requirements Review (SRR) in FY 2020.						
Title: CEC CYBER RESILIENCY Articles:		0.000 -	4.487 -	1.452 -	0.000 -	1.452 -
FY 2019 Plans: Address and retire interface issues between CEC and host Combat Systems including AEGIS Advanced Capability Build (ACB) 16, CVN 78 and Land Based and Airborne platforms. Incorporate a limited subset of planned CEC system hardware and software changes identified via the cyber accreditation process as well as required Information Assurance Vulnerability Management (IAVM) updates into incremental CEC system software builds. Prepare for Final Qualification and Verification and Validation testing events of CEC system baselines with hardware and software changes addressing cyber high risk issues, though on a reduced scope basis, so not all planned corrective actions may be incorporated. FY 2020 Base Plans: Conduct Final Qualification Tests (FQTs), Independent Verification and Validation (IV&V), and Product Certification Panels (PCPs), for cyber functionality developed in FY 19 for Aegis Weapons System (AWS) 6.3/7.2/9.2.0. Commence addressing CEC Cyber requirements in AEGIS ACB 20 and SSDS ACB 20. FY 2020 OCO Plans: N/A FY 2019 to FY 2020 Increase/Decrease Statement: Decrease is result of reduction in funding for Cyber Resiliency to support higher priority efforts. Plans to conduct Ship Self Defense System (SSDS) Final Qualification Tests (FQTs), Independent Verification and Validation (IV&V), and Product Certification Panels (PCPs) for cyber functionality was removed in FY 20.						
Title: CRYPTO MODERNIZATION Articles:		0.000 -	4.552 -	0.000 -	0.000 -	0.000 -

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy				Date: March 2019		
Appropriation/Budget Activity 1319 / 7		R-1 Program Element (Number/Name) PE 0607658N / (U)Cooperative Engagement Capability		Project (Number/Name) 2039 / COOP Engagement		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
FY 2019 Plans: The CEC Program will continue a cryptographic modernization effort for the Signal Data Processor (SDP) that is being developed to support the significant increase in cryptographic processor capability that is required to protect the CEC network. Conduct Modeling and Simulation to inform requirements definition. Complete system requirements review.						
FY 2020 Base Plans: CEC Crypto Modernization efforts transition to PE 0607658N / (U)Cooperative Engagement Capability Project 3240 / CEC CDD Increment II in FY20.						
FY 2020 OCO Plans: N/A						
FY 2019 to FY 2020 Increase/Decrease Statement: CEC Crypto Modernization efforts transition to PE 0607658N / (U)Cooperative Engagement Capability Project 3240 / CEC Increment II in FY20.						
Title: ELEKTRA Articles:		0.000 -	0.000 -	1.520 -	0.000 -	1.520 -
FY 2019 Plans: N/A						
FY 2020 Base Plans: In close coordination with IWS 2, PMA 231, IWS 1, ONR, and NRL, begin experimentation with prototype systems in Modeling and Simulation (M&S) environment to inform Program of Record (PoR) feature providing Artificial Intelligence for coordination phase of combat.						
FY 2020 OCO Plans: N/A						
FY 2019 to FY 2020 Increase/Decrease Statement: Increase is due to start of development in FY 2020.						
Accomplishments/Planned Programs Subtotals		77.472	128.815	109.496	0.000	109.496

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy										Date: March 2019		
Appropriation/Budget Activity 1319 / 7				R-1 Program Element (Number/Name) PE 0607658N / (U)Cooperative Engagement Capability				Project (Number/Name) 2039 / COOP Engagement				
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	
• SCN: Navy, SCN	28.027	23.018	35.481	-	35.481	33.063	42.679	49.640	72.577	232.834	900.219	
• APN/0204152N: Navy, APN	16.924	13.810	14.086	-	14.086	14.368	18.319	26.160	0.000	15.223	389.008	
• OPN/2606: CEC	23.891	39.076	35.128	-	35.128	34.457	34.745	33.909	34.654	31.641	1,096.020	
• RDT&E/0206313M: USMC	2.600	1.279	1.317	-	1.317	1.357	1.398	1.440	1.483	0.000	24.024	
• O&M,N/0206626M: USMC	1.958	2.378	2.970	-	2.970	3.059	3.162	3.257	3.290	0.000	20.074	
• PMC/0206313M: USMC	0.178	5.808	8.142	-	8.142	12.307	0.000	0.000	0.000	0.000	30.983	
• OPN/0960: CG MOD	4.650	1.869	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	840.819	
Remarks												
D. Acquisition Strategy												
Full Rate Production for CEC AN/USG-3B variant approved April 2014. Latest revision of CEC Acquisition Strategy (AS) approved by ASN (RDA) on 2 November 2017. Latest revision of CEC Acquisition Plan (AP) was approved in July 2018.												
Contracts:												
Common Array Block (CAB) antenna - contract competitively awarded 4Qtr FY2013.												
CEC Design Agent/Engineering Services (DA/ES) follow-on sole source contract awarded 4Qtr FY2013. A sole source 15 month contract extension will be awarded in 4Qtr FY2018.												
CEC DA/ES contract will be competitively awarded 4Qtr FY2019. For DA, the contractor will maintain the CEC hardware and software development environment and testing infrastructure including; Systems and Software Laboratories, the external RF Range, the Compact Antenna Range, and the CEC Classified Development LAN. For ES, the contractor												
CEC Production - Contract competitively awarded in 2Qtr FY2015.												
CEC SDP-S Production - Contract competitively awarded in 4Qtr FY2017.												
CEC PAAA Competitive - RFP was issued in 4Qtr FY2018. Contract award is scheduled for 1Qtr FY2020.												
E. Performance Metrics												
CEC metrics per year in support of all budget lines:												
- Maintain 3 CEC software baselines and 19 software versions												
- Conduct 3 Software Build Reviews												
- Conduct 3 Software Product Certification Panels and 5 Product Review Panels												
- Deliver 78 software builds												
- Conduct 10 Technical Interchange Meetings (TIM) with the Design Agent												

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0607658N / (U)Cooperative Engagement Capability	Project (Number/Name) 2039 / COOP Engagement
<ul style="list-style-type: none">- Conduct 10 Systems Engineering Integrated Product Team (SEIPT) meetings- Conduct 12 In Process Reviews (IPR)- Execute 48 Developmental and Operational Test (DT/OT) or At-Sea test events		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy												Date: March 2019			
Appropriation/Budget Activity 1319 / 7						R-1 Program Element (Number/Name) PE 0607658N / (U)Cooperative Engagement Capability				Project (Number/Name) 2039 / COOP Engagement					
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
AN/USG-2/3 Design Agent/Engineering Services	C/CPFF	Raytheon : St. Petersburg, FL	136.461	11.238	Oct 2017	12.579	Oct 2018	12.294	Oct 2019	-		12.294	Continuing	Continuing	Continuing
TDA	C/CPFF	JHU/APL : Laurel, MD	86.885	11.635	Oct 2017	12.157	Oct 2018	12.217	Oct 2019	-		12.217	Continuing	Continuing	Continuing
SI/DA	C/CPAF	General Dynamics : Fairfax, VA	23.979	0.000		0.000		0.000		-		0.000	0.000	23.979	-
SI/DA	C/CPAF	Award Fees : Not Specified	2.903	0.000		0.000		0.000		-		0.000	0.000	2.903	-
DDG 1000	C/CPAF	Raytheon : Massachusetts	10.983	0.000		0.000		0.000		-		0.000	0.000	10.983	-
DDG 1000	C/CPAF	Award Fees : Not Specified	0.447	0.000		0.000		0.000		-		0.000	0.000	0.447	-
NIFC-CA Integration	Various	Various : Various	47.499	0.000	Oct 2017	6.871	Oct 2018	6.625	Oct 2019	-		6.625	Continuing	Continuing	Continuing
In-Service Engineering Activity	WR	NSWC : Port Hueneme, CA	8.088	2.305	Oct 2017	3.435	Oct 2018	1.745	Oct 2019	-		1.745	Continuing	Continuing	Continuing
Software Support Activity/ SEIA	WR	NSWC : Dahlgren, VA	21.433	2.367	Oct 2017	3.478	Oct 2018	1.478	Oct 2019	-		1.478	Continuing	Continuing	Continuing
Production Engineering Activity	WR	NSWC : Crane, IN	5.952	0.395	Oct 2017	0.523	Oct 2018	0.512	Oct 2019	-		0.512	0.000	7.382	-
JTRS	Various	Various : Various	8.500	0.000		0.000		0.000		-		0.000	0.000	8.500	-
Various	WR	Various : Various	31.873	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
NAVSSI	WR	SPAWAR : San Diego, CA	0.368	0.000		0.000		0.000		-		0.000	0.000	0.368	-
Certification	MIPR	NSA : Fort Meade, MD	1.200	0.000		0.000		0.000		-		0.000	0.000	1.200	-
Certification	WR	SPAWAR : Charleston, SC	0.930	0.000		0.000		0.000		-		0.000	0.000	0.930	-
Joint Exercises	WR	Various : Various	3.744	0.000		0.000		0.000		-		0.000	0.000	3.744	-
LBTS Testing	WR	CDSA Dam Neck : Virginia Beach, VA	7.995	0.500	Oct 2017	0.500	Oct 2018	0.500	Oct 2019	-		0.500	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy												Date: March 2019			
Appropriation/Budget Activity 1319 / 7						R-1 Program Element (Number/Name) PE 0607658N / (U)Cooperative Engagement Capability				Project (Number/Name) 2039 / COOP Engagement					
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
LBTs Testing	WR	SCSC : Wallops Island, VA	7.583	0.500	Oct 2017	0.500	Oct 2018	0.500	Oct 2019	-		0.500	Continuing	Continuing	Continuing
E-2D Integration	Various	Various : Various	50.580	3.043	Oct 2017	4.017	Oct 2018	3.874	Oct 2019	-		3.874	Continuing	Continuing	Continuing
MSI/NCCT	MIPR	Wright Patterson AFB : Dayton, OH	1.228	0.000		0.000		0.000		-		0.000	0.000	1.228	-
Common Array Block Development	C/CPFF	Raytheon : St. Petersburg, FL	50.761	14.700	Oct 2017	9.649	Oct 2018	7.746	Oct 2019	-		7.746	Continuing	Continuing	Continuing
NEEDS	Various	Various : Various	38.530	3.312	Oct 2017	4.610	Oct 2018	2.080	Oct 2019	-		2.080	Continuing	Continuing	Continuing
AMDR	Various	Various : Various	17.308	0.000	Oct 2017	0.000	Oct 2018	0.000		-		0.000	Continuing	Continuing	Continuing
JTMC	C/CPFF	Raytheon : St. Petersburg, FL	1.000	0.000		0.000		0.000		-		0.000	0.000	1.000	-
FCLIP	Various	Various : Various	16.500	6.623	Oct 2017	8.700	Oct 2018	4.453	Oct 2019	-		4.453	Continuing	Continuing	Continuing
CEC Increment 2	Various	Various : Various	0.237	1.253	Oct 2017	3.300	Oct 2018	1.818	Oct 2019	-		1.818	Continuing	Continuing	Continuing
Program Protection	C/BA	NSMA : Washington, DC	4.345	7.518	Oct 2017	8.527	Oct 2018	9.205	Oct 2019	-		9.205	Continuing	Continuing	Continuing
EASR	Various	Various : Various	0.000	2.238	Oct 2017	5.200	Oct 2018	7.452	Oct 2019	-		7.452	0.000	14.890	-
Crypto Modernization	Various	Various : Various	0.000	0.000		4.552	Oct 2018	0.000		-		0.000	0.000	4.552	-
Digital Warfare Tactical Networking Initiative Implementation	Various	Various : Various	0.000	0.000		17.900	Oct 2018	23.100	Oct 2019	-		23.100	0.000	41.000	-
FTIIP	Various	Various : Various	0.000	0.000		6.500	Oct 2018	0.000		-		0.000	0.000	6.500	-
Cyber Resiliency	Various	Various : Various	0.000	0.000		4.487	Oct 2018	1.452	Oct 2019	-		1.452	0.000	5.939	-
ELEKTRA	Various	Various : Various	0.000	0.000		0.000		1.520	Oct 2019	-		1.520	0.000	1.520	-
Subtotal			587.312	67.627		117.485		98.571		-		98.571	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy												Date: March 2019			
Appropriation/Budget Activity 1319 / 7						R-1 Program Element (Number/Name) PE 0607658N / (U)Cooperative Engagement Capability					Project (Number/Name) 2039 / COOP Engagement				
Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Test/ACB Support	C/CPFF	Raytheon : St. Petersburg, FL	6.127	1.143	Oct 2017	1.379	Oct 2018	1.321	Oct 2019	-		1.321	Continuing	Continuing	Continuing
Test/ACB Support	C/CPFF	JHU/APL : Laurel, MD	3.734	1.651	Oct 2017	1.835	Oct 2018	1.777	Oct 2019	-		1.777	Continuing	Continuing	Continuing
Test Support	WR	NRL : Washington, DC	0.313	0.000		0.000		0.000		-		0.000	0.000	0.313	-
Test/ACB Support	WR	NSWC : Port Hueneme, CA	25.781	1.982	Oct 2017	2.163	Oct 2018	2.105	Oct 2019	-		2.105	Continuing	Continuing	Continuing
Air Operations Test Support	WR	NAVAIR (PMA207) : Patuxent River, MD	11.234	1.066	Oct 2017	1.247	Oct 2018	1.190	Oct 2019	-		1.190	Continuing	Continuing	Continuing
Test Data Reduction Analysis	WR	NSWC : Corona, CA	19.168	1.376	Oct 2017	1.641	Oct 2018	1.583	Oct 2019	-		1.583	Continuing	Continuing	Continuing
Test Support	WR	COMOPTEVFOR : Norfolk, VA	13.682	1.204	Oct 2017	1.452	Oct 2018	1.394	Oct 2019	-		1.394	Continuing	Continuing	Continuing
Test/ACB Support	WR	NSWC : Dahlgren, VA	3.568	1.423	Oct 2017	1.613	Oct 2018	1.555	Oct 2019	-		1.555	Continuing	Continuing	Continuing
Subtotal			83.607	9.845		11.330		10.925		-		10.925	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Program Management Support	C/FFP	Booz Allen & Hamilton : Washington, DC	5.070	0.000		0.000		0.000		-		0.000	0.000	5.070	-
Program Management Support	C/FFP	Tech Marine : Washington, DC	0.360	0.000		0.000		0.000		-		0.000	0.000	0.360	-
Subtotal			5.430	0.000		0.000		0.000		-		0.000	0.000	5.430	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy											Date: March 2019				
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0607658N / (U)Cooperative Engagement Capability					Project (Number/Name) 2039 / COOP Engagement					
			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			676.349	77.472		128.815		109.496		-		109.496	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy

Date: March 2019

Appropriation/Budget Activity

1319 / 7

R-1 Program Element (Number/Name)

PE 0607658N / (U)Cooperative
Engagement Capability

Project (Number/Name)

2039 / COOP Engagement

Fiscal Year	FY18				FY19				FY20				FY21				FY22				FY23				FY24			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Acquisition Milestones	◆ AS Approval				◇ CSB/Gate 6 FY19				◇ CSB/Gate 6 FY20				◇ CSB/Gate 6 FY21				◇ CSB/Gate 6 FY22				◇ CSB/Gate 6 FY23				◇ CSB/Gate 6 FY24			
	◆ Updated APB		◆ AP Approval				◇ CDD Approval																					
Program Milestones																												
CEC Enhanced Network (CEN)		◆ SBR 18.1			◆ SBR 18.3	◇ SBR 19.1		◇ SBR 19.2	◇ SBR 19.3			◇ SBR 20.2	◇ SBR 20.3	◇ SBR 21.1		◇ SBR 21.2	◇ SBR 21.3	◇ SBR 22.1		◇ SBR 22.2	◇ SBR 22.3	◇ FSBR						
CEC Technical Training (CTT)	◆ TIM	◆ SBR 18.1	◆ SBR 18.2	◆ SBR 18.3	◆ SBR 18.3																							
CEC Aegis Weapon System (AWS) ACB 20			◆ TIM 18.2	◆ TIM 18.3	◆ TIM 18.3	◇ TIM 19.1		◇ TIM 19.2	◇ TIM 19.3			◇ SBR 20.2	◇ SBR 20.3	◇ SBR 21.1		◇ SBR 21.2	◇ FSBR											
Fire Control Loop Improvement Project (FCLIP)	◆ FCLIP Ph 2 SBR 2		◆ FCLIP Ph 2 SBR 18.2																									
CEC ELEKTRA															◇ SRR			◇ SFR		◇ SBR 22.2	◇ SBR 22.3	◇ SBR 23.1	◇ SBR 23.2	◇ SBR 23.3	◇ SBR 24.1		◇ SBR 24.2	
Enterprise Radar Suite		◆ ERS/EASR SRR/SFR/SWBRL		◆ SBT 18.2		◇ SBT 19.1			◇ SBT 19.3																			
CEC SSDS ACB 20							◇ SRR				◇ Delta SFR	◇ SBR 20.2	◇ SBR 20.3	◇ SBR 21.1		◇ SBR 21.2	◇ SBR 21.3	◇ FSBR										
Digital Warfare Tactical Networking Initiative Implementation				◆ IPR 1				◇ IPR 2				◇ IPR 3			◇ IPR 4	◇ Demc												
CEC Sustainment			◆ ILA Self Assessment		◆ SSWG FY19		◇ PSWG FY19		◇ SSWG FY20		◇ PSWG FY20		◇ SSWG FY21		◇ PSWG FY21		◇ SSWG FY22		◇ PSWG FY22		◇ SSWG FY23		◇ PSWG FY23		◇ SSWG FY24		◇ PSWG FY24	
CEC Cyber					◇ SBR 19.1			◇ SBR 19.2	◇ SBR 19.3			◇ SBR 20.2	◇ SBR 20.3	◇ SBR 21.1		◇ SBR 21.2	◇ SBR 21.3	◇ SBR 22.1	◇ SBR 22.2	◇ SBR 22.3	◇ SBR 23.1							
CEC Far Term Interoperability Improvement Project (FTIIP)								◇ SRR	CEC FTIIP FY20-FY23 efforts transition to new 3240 CEC Increment II																			

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy

Date: March 2019

Appropriation/Budget Activity

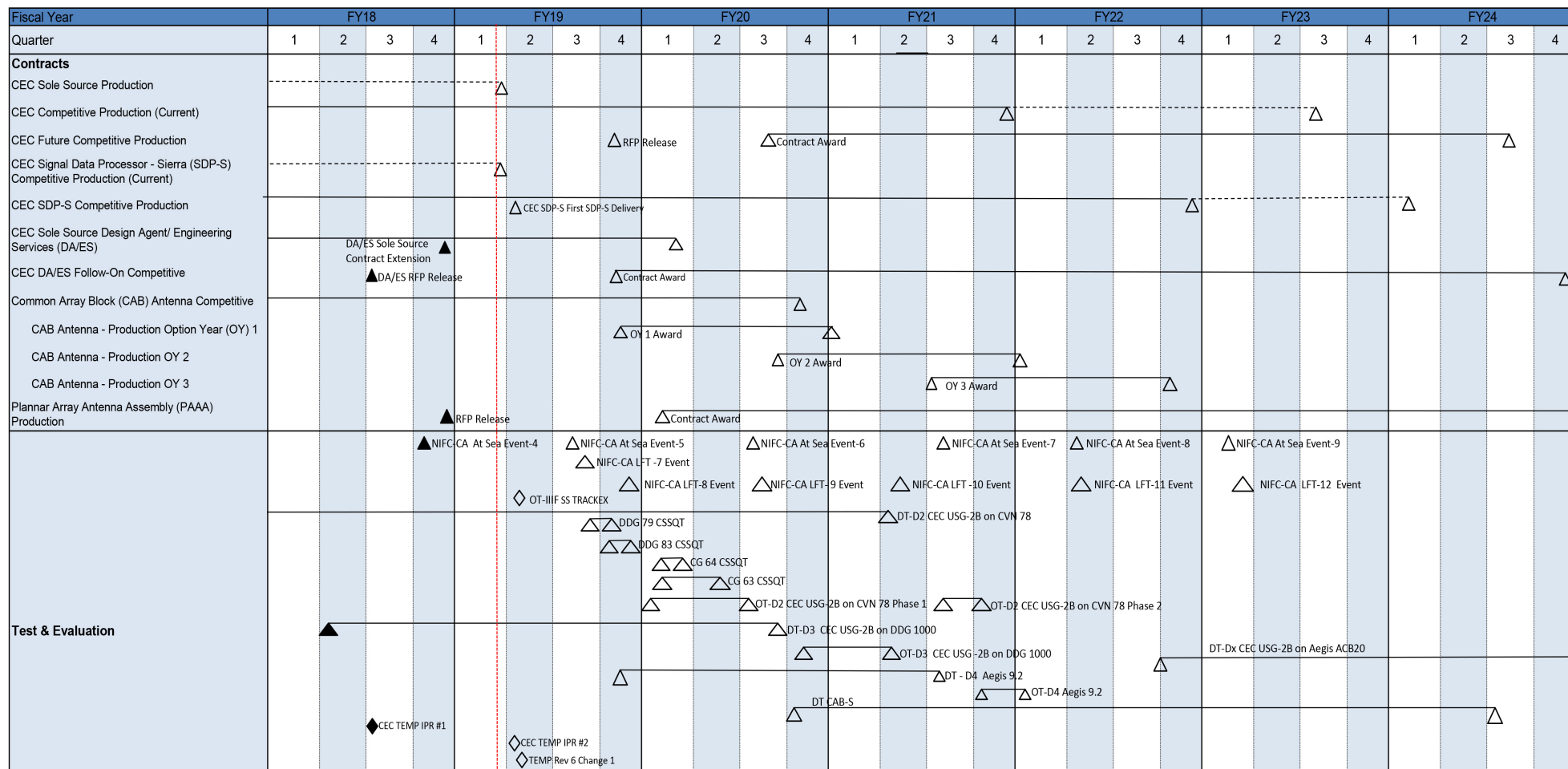
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R-1 Program Element (Number/Name)

PE 0607658N / (U) Cooperative
Engagement Capability

Project (Number/Name)

2039 / COOP Engagement



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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)	
1319 / 7	PE 0607658N / (U)Cooperative Engagement Capability	2039 / COOP Engagement	
<div><div><div>Legend</div><div><div><div>◆</div><div>Actual Milestone Completion</div></div><div><div>◇</div><div>Planned Milestone Completion</div></div><div><div>▲</div><div>Actual Event Start/Completion</div></div><div><div>△</div><div>Planned Event Start/Completion</div></div><div><div>---</div><div>Current Date</div></div><div><div>----</div><div>Delivery Period based on Last Order Date</div></div></div><div><div>ACB: Advance Capability Build</div><div>AWS: Aegis Weapon System</div><div>AP: Acquisition Plan</div><div>AS: Acquisition Strategy</div><div>APB: Acquisition Program Baseline</div><div>CAB: Common Array Block</div><div>Common Array Block - Shipboard</div><div>CDD: Capability Development Document</div><div>CEC: Cooperative Engagement Capability</div><div>CEN: CEC Enhanced Network</div><div>CSSQT: Combat System Shipboard Qualification Trials</div><div>CTT: CEC Technical Training</div><div>DA/ES: Design Agent/Engineering Services</div><div>DT: Developmental Test</div><div>DWO: Digital Warfare Office</div><div>ERS: Enterprise Radar Suite</div></div><div><div>Acronym List</div><div><div>FCILP: Fire Control Loop Improvement Project</div><div>FNC: Future Naval Capability</div><div>FOC: Full Operational Capability</div><div>FSBR: Final Software Build Review</div><div>FTIIP: Far Term Interoperability Improvement Project</div><div>FY: Fiscal Year</div><div>HS: Hypersonic</div><div>ILA: Independent Logistics Assessment</div><div>IPR: Internal Program Review</div><div>LFT: Live Fire Test</div><div>NIFC: Naval Integrated Fire Control</div><div>NIFC P: Naval Integrated Fire Control Passive</div><div>NIFC-CA: Naval Integrated Fire Control - Counter Air</div><div>NoGAPSS: Non-GPS Aided PNT (Position, Navigation and Timing) for Surface and Subsurface</div><div>OT: Operational Test</div><div>OY: Option Year</div><div>PAAA: Planar Array Antenna Assembly</div><div>PDR: Preliminary Design Review</div><div>PH: Phase</div><div>PSWG: Product Support Working Group</div><div>RFP: Request For Proposal</div><div>SBR: Software Build Review</div><div>SBT: Sea Based Terminal</div><div>SDP-S: Signal Data Processor - Sierra</div><div>SFR: System Functional Review</div><div>SRR: System Requirements Review</div><div>SSDS: Ship Self Defense System</div><div>SS TRACKEX: Supersonic Tracking Exercise</div><div>SSWG: Supply Support Working Group</div><div>SWBLR: Software Baseline Review</div><div>TEMP: Test and Evaluation Master Plan</div><div>TIM: Technical Interchange Meeting</div><div>TRR: Technical Readiness Review</div></div></div></div></div>			

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0607658N / (U)Cooperative Engagement Capability	Project (Number/Name) 2039 / COOP Engagement	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 2039				
CSB/Gate 6 FY19	1	2019	1	2019
CSB/Gate 6 FY20	1	2020	1	2020
CSB/Gate 6 FY21	1	2021	1	2021
CSB/Gate 6 FY22	1	2022	1	2022
CSB/Gate 6 FY23	1	2023	1	2023
CSB/Gate 6 FY24	1	2024	1	2024
Updated APB	1	2018	1	2018
AS Approved	1	2018	1	2018
AP Approved	3	2018	3	2018
CDD Approval	3	2019	3	2019
CEN SBR 18.1	2	2018	2	2018
CEN SBR 18.3	1	2019	1	2019
CEN SBR 19.1	2	2019	2	2019
CEN SBR 19.2	4	2019	4	2019
CEN SBR 19.3	1	2020	1	2020
CEN SBR 20.2	4	2020	4	2020
CEN SBR 20.3	1	2021	1	2021
CEN SBR 21.1	2	2021	2	2021
CEN SBR 21.2	4	2021	4	2021
CEN SBR 21.3	1	2022	1	2022
CEN SBR 22.1	2	2022	2	2022

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy			Date: March 2019		
Appropriation/Budget Activity 1319 / 7		R-1 Program Element (Number/Name) PE 0607658N / (U)Cooperative Engagement Capability		Project (Number/Name) 2039 / COOP Engagement	
		Start		End	
Events by Sub Project		Quarter	Year	Quarter	Year
CEN SBR 22.2		4	2022	4	2022
CEN SBR 22.3		1	2023	1	2023
CEN FSBR		2	2023	2	2023
CEC Technical Training TIM		1	2018	1	2018
CEC Technical Training SBR 18.1		2	2018	2	2018
CEC Technical Training SBR 18.2		4	2018	4	2018
CEC Technical Training SBR 18.3		1	2019	1	2019
CEC Aegis ACB 20 TIM 18.2		4	2018	4	2018
CEC Aegis ACB 20 Delta SRR		1	2019	1	2019
CEC Aegis ACB 20 TIM 18.3		1	2019	1	2019
CEC Aegis ACB 20 TIM 19.1		2	2019	2	2019
CEC Aegis ACB 20 SFR		3	2019	3	2019
CEC Aegis ACB 20 TIM 19.2		4	2019	4	2019
CEC Aegis ACB 20 TIM 19.3		1	2020	1	2020
CEC Aegis ACB 20 Delta SFR		2	2020	2	2020
CEC Aegis ACB 20 SBR 20.2		4	2020	4	2020
CEC Aegis ACB 20 SBR 20.3		1	2021	1	2021
CEC Aegis ACB 20 SBR 21.1		2	2021	2	2021
CEC Aegis ACB 20 SBR 21.2		4	2021	4	2021
CEC Aegis ACB 20 FSBR		1	2022	1	2022
CEC ELEKTRA SRR		3	2021	3	2021
CEC ELEKTRA SFR		2	2022	2	2022
CEC ELEKTRA SBR 22.2		4	2022	4	2022
CEC ELEKTRA SBR 22.3		1	2023	1	2023
CEC ELEKTRA SBR 23.1		2	2023	2	2023

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy				Date: March 2019	
Appropriation/Budget Activity 1319 / 7		R-1 Program Element (Number/Name) PE 0607658N / (U)Cooperative Engagement Capability		Project (Number/Name) 2039 / COOP Engagement	
		Start		End	
Events by Sub Project		Quarter	Year	Quarter	Year
CEC ELEKTRA SBR 23.2		4	2023	4	2023
CEC ELEKTRA SBR 23.3		1	2024	1	2024
CEC ELEKTRA SBR 24.1		2	2024	2	2024
CEC ELEKTRA SBR 24.2		4	2024	4	2024
FCLIP Ph 2 SBR 2		1	2018	1	2018
FCLIP Ph 2 SBR 18.2		4	2018	4	2018
CEC ERS/EASR SRR/SFR/SWBLR		2	2018	2	2018
CEC EASR SBT 18.2		4	2018	4	2018
CEC EASR SBT 19.1		2	2019	2	2019
CEC EASR SBT 19.3		1	2020	1	2020
CEC SSDS ACB 20 SRR		3	2019	3	2019
CEC SSDS ACB 20 Delta SFR		2	2020	2	2020
CEC SSDS ACB 20 SBR 20.2		4	2020	4	2020
CEC SSDS ACB 20 SBR 20.3		1	2021	1	2021
CEC SSDS ACB 20 SBR 21.1		2	2021	2	2021
CEC SSDS ACB 20 SBR 21.2		4	2021	4	2021
CEC SSDS ACB 20 SBR 21.3		1	2022	1	2022
CEC SSDS ACB 20 FSBP		2	2022	2	2022
DWO IPR 1		1	2019	1	2019
DWO IPR 2		4	2019	4	2019
DWO IPR 3		3	2020	3	2020
DWO IPR 4		2	2021	2	2021
DWO Demo		4	2021	4	2021
ILA Self Assessment		3	2018	3	2018
CEC Cyber SBR 19.1		2	2019	2	2019

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy				Date: March 2019	
Appropriation/Budget Activity 1319 / 7		R-1 Program Element (Number/Name) PE 0607658N / (U)Cooperative Engagement Capability		Project (Number/Name) 2039 / COOP Engagement	
		Start		End	
Events by Sub Project		Quarter	Year	Quarter	Year
CEC Cyber SBR 19.2		4	2019	4	2019
CEC Cyber SBR 19.3		1	2020	1	2020
CEC Cyber SBR 20.2		4	2020	4	2020
CEC Cyber SBR 20.3		1	2021	1	2021
CEC Cyber SBR 21.1		2	2021	2	2021
CEC Cyber SBR 21.2		4	2021	4	2021
CEC Cyber SBR 22.1		2	2022	2	2022
CEC Cyber SBR 22.2		4	2022	4	2022
CEC Cyber SBR 22.3		1	2023	1	2023
CEC Cyber SBR 23.1		2	2023	2	2023
CEC FTIIP SRR		4	2019	4	2019
CEC Sole Source Production		1	2018	1	2019
CEC Competitive Production (Current)		2	2018	3	2023
RFP Release-CEC Future Competitive Production		4	2019	4	2019
CEC Future Competitive Production		3	2020	3	2024
CEC SDP-S Competitive Production (Current)		1	2018	1	2019
CEC SDP-S Competitive Production		1	2018	1	2024
CEC SDP-S First SDP-S Delivery		2	2019	2	2019
CEC Sole Source DA/ES		1	2018	1	2020
DA/ES RFP Release		3	2018	3	2018
CEC DA/ES Follow-On Competitive		4	2019	4	2024
CAB Antenna Competitive		1	2018	4	2020
NIFC-CA At Sea Event-4		4	2018	4	2018
NIFC-CA At Sea Event-5		3	2019	3	2019
NIFC-CA At Sea Event-6		3	2020	3	2020

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy				Date: March 2019	
Appropriation/Budget Activity 1319 / 7		R-1 Program Element (Number/Name) PE 0607658N / (U)Cooperative Engagement Capability		Project (Number/Name) 2039 / COOP Engagement	
		Start		End	
Events by Sub Project		Quarter	Year	Quarter	Year
NIFC-CA At Sea Event-7		3	2021	3	2021
NIFC-CA At Sea Event-8		2	2022	2	2022
NIFC-CA At Sea Event-9		1	2023	1	2023
NIFC-CA LFT-7 Event		3	2019	3	2019
NIFC-CA LFT-8 Event		4	2019	4	2019
NIFC-CA LFT-9 Event		3	2020	3	2020
NIFC-CA LFT-10 Event		2	2021	2	2021
NIFC-CA LFT-11 Event		2	2022	2	2022
NIFC-CA LFT-12 Event		1	2023	1	2023
OT-IIF Supersonic Trackex (SS TRX)		2	2019	2	2019
DT-D2 CEC USG-2B on CVN 78		1	2018	2	2021
OT-D2 CEC USG-2B on CVN 78 Phase 1		1	2020	3	2020
OT-D2 CEC USG-2B on CVN 78 Phase 2		3	2021	4	2021
TEMP Rev 6 Chg 1		2	2019	2	2019
DT-D3-CEC USG-2B on DDG 1000		2	2018	3	2020
OT-D3 USG-2B on DDG 1000		4	2020	2	2021
DT-Dx CEC USG-2B on Aegis ACB 20		4	2022	4	2024
DT-D4 Aegis 9.2		4	2019	3	2021
OT-D4 Aegis 9.2		4	2021	1	2022
DT CAB-S		4	2020	3	2024
CAB Antenna - Production Option Year (OY) 1		4	2019	1	2021
CAB Antenna - Production OY 2		3	2020	1	2022
CAB Antenna - Production OY 3		3	2021	4	2022
CEC TEMP IPR #1		3	2018	3	2018
CEC TEMP IPR #2		2	2019	2	2019

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy			Date: March 2019	
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0607658N / (U)Cooperative Engagement Capability		Project (Number/Name) 2039 / COOP Engagement	
	Start		End	
Events by Sub Project	Quarter	Year	Quarter	Year
DDG 79 CSSQT	3	2019	4	2019
DDG 83 CSSQT	4	2019	4	2019
CG 64 CSSQT	1	2020	1	2020
CG 63 CSSQT	1	2020	2	2020
PAAA Production	1	2020	4	2024
CEC Cyber SBR 21.3	1	2022	1	2022
SSWG FY19	1	2019	1	2019
PSWG FY19	3	2019	3	2019
SSWG FY20	1	2020	1	2020
PSWG FY20	3	2020	3	2020
SSWG FY21	1	2021	1	2021
PSWG FY21	3	2021	3	2021
SSWG FY22	1	2022	1	2022
PSWG FY22	3	2022	3	2022
SSWG FY23	1	2023	1	2023
PSWG FY23	3	2023	3	2023
SSWG FY24	1	2024	1	2024
PSWG FY24	3	2024	3	2024
PAAA RFP Release	4	2018	4	2018
CEC TEMP Rev 6 Change 1	2	2019	2	2019
DA/ES Sole Source Contract Extension	4	2018	4	2018

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy										Date: March 2019		
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0607658N / (U)Cooperative Engagement Capability				Project (Number/Name) 3240 / CEC Increment II			
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
3240: CEC Increment II	0.000	0.000	0.000	18.428	-	18.428	36.297	44.049	32.917	35.248	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
Note FY 2020 funding of \$18.428 million for CEC Increment II efforts was realigned from Project 2039 to to a new project code 3240. This is not a new start.												
A. Mission Description and Budget Item Justification CEC Capability Development Document (CDD) Increment II evolves Increment I capabilities by enhancing the current naval air defense and sensor network system capabilities through the expansion of network capacity as well as extension into other warfare mission domains. CEC CDD Increment 2 shall integrate new sensor types and track data sources into the network, such as surface search radars and passive detection sensors, as well as relevant data from other networks. CEC CDD Increment II shall accommodate more CUs and provide a more complete, robust, and resilient situational awareness picture, composite identification, and Integrated Fire Control (IFC), with assured communications for Integrated Air and Missile Defense (IAMD), surface warfare, and electronic mission warfare domains.												
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)								FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: CEC FAR-TERM INTEROPERABILITY IMPROVEMENT PROJECT (FTIIP) Articles: FY 2019 Plans: FY2019 Plans are identified under PE 0607658N / (U)Cooperative Engagement Capability Project 2039 / COOP Engagement. FY 2020 Base Plans: Continue development of CEC integration with Identification Friend or Foe (IFF) Mode S and Automatic Dependent Surveillance - Broadcast (ADS-B) systems. Continue system of system coordination with Aegis, SSDS, E-2D, and USMC CAC2S to ensure proper functional allocation across the system of systems. Conduct System Functional Review (SFR). FY 2020 OCO Plans: N/A FY 2019 to FY 2020 Increase/Decrease Statement: CEC FTIIP efforts transition from PE 0607658N / Cooperative Engagement Capability Project 2039 to PE 0607658N/ Cooperative Engagement Capability Project 3240 / CEC CDD Increment II in FY20.								0.000	0.000	6.600	0.000	6.600
								-	-	-	-	-
Title: NIFC HYPERSONIC								0.000	0.000	1.620	0.000	1.620

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy				Date: March 2019		
Appropriation/Budget Activity 1319 / 7		R-1 Program Element (Number/Name) PE 0607658N / (U)Cooperative Engagement Capability		Project (Number/Name) 3240 / CEC Increment II		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Articles:		-	-	-	-	-
FY 2019 Plans: N/A						
FY 2020 Base Plans: Begin initial Requirements Development by conducting analysis against threats of interest to inform CEC and systems of systems design factors. In close coordination with Missile Defense Agency (MDA) and USN Programs of Record, conduct Modeling and Simulation and Systems Integration Lab (SIL) Demo to refine understanding and shape Concepts of Employment (CONEMPS).						
FY 2020 OCO Plans: N/A						
FY 2019 to FY 2020 Increase/Decrease Statement: Increase is due to start of development in FY 2020.						
Title: CRYPTO MODERNIZATION		0.000	0.000	5.748	0.000	5.748
Articles:		-	-	-	-	-
FY 2019 Plans: FY2019 Plans are identified under PE 0607658N / (U)Cooperative Engagement Capability Project 2039 / COOP Engagement.						
FY 2020 Base Plans: Continue cryptographic modernization effort for Signal Data Processor. Complete System Functional Review (SFR) and conduct Preliminary Design.						
FY 2020 OCO Plans: N/A						
FY 2019 to FY 2020 Increase/Decrease Statement: CEC Crypto Modernization efforts transition from PE 0607658N / (U)Cooperative Engagement Capability Project 2039 to PE 0607658N / (U)Cooperative Engagement Capability Project 3240 / CEC Increment II in FY20.						
Title: NIFC Passive		0.000	0.000	4.460	0.000	4.460
Articles:		-	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy				Date: March 2019		
Appropriation/Budget Activity 1319 / 7		R-1 Program Element (Number/Name) PE 0607658N / (U)Cooperative Engagement Capability		Project (Number/Name) 3240 / CEC Increment II		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
FY 2019 Plans: N/A FY 2020 Base Plans: In Close Coordination with IWS 2 and PMA 231, begin integration effort for new Electronic Surveillance (ES) sensors to enable advanced passive features, completing initial Modeling and Simulation (M&S) to refine concepts and inform requirements. Complete element level System Requirement Review (SRR). FY 2020 OCO Plans: N/A FY 2019 to FY 2020 Increase/Decrease Statement: Increase is due to start of development in FY 2020.						
Accomplishments/Planned Programs Subtotals		0.000	0.000	18.428	0.000	18.428
C. Other Program Funding Summary (\$ in Millions) N/A						
Remarks						
D. Acquisition Strategy The CEC Increment II Acquisition Strategy (AS) is covered under the Cooperative Engagement Capability / COOP Engagement Project 2039 Acquisition Strategy (AS). Approval of the CEC Increment II Capability Development Document (CDD) is expected in FY19.						
E. Performance Metrics The CEC Increment II Performance Metrics are covered under the Cooperative Engagement Capability / COOP Engagement Project 2039 Performance Metrics.						

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy												Date: March 2019			
Appropriation/Budget Activity 1319 / 7						R-1 Program Element (Number/Name) PE 0607658N / (U)Cooperative Engagement Capability				Project (Number/Name) 3240 / CEC Increment II					
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Crypto Modernization	Various	Various : Not Specified	0.000	0.000		0.000		5.748	Oct 2019	-		5.748	Continuing	Continuing	Continuing
FTIIP	Various	Various : Not Specified	0.000	0.000		0.000		6.600	Oct 2019	-		6.600	Continuing	Continuing	Continuing
NIFC Hypersonic	Various	Various : Not Specified	0.000	0.000		0.000		1.620	Oct 2019	-		1.620	Continuing	Continuing	Continuing
NIFC Passive	Various	Various : Not Specified	0.000	0.000		0.000		4.460	Oct 2019	-		4.460	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		0.000		18.428		-		18.428	Continuing	Continuing	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		0.000		18.428		-		18.428	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy

Date: March 2019

Appropriation/Budget Activity

1319 / 7

R-1 Program Element (Number/Name)

PE 0607658N / (U)Cooperative
Engagement Capability

Project (Number/Name)

3240 / CEC Increment II

Fiscal Year	FY18				FY19				FY20				FY21				FY22				FY23				FY24			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Acquisition Milestones																												
Program Milestones																												
CEC Far Term Interoperability Improvement Project (FTIIP)																												
Naval Integrated Fire Control Passive (NIFC P)																												
CEC Naval Integrated Fire Control (NIFC) Hypersonic (HS)																												

12/20/2018

Legend

Acronym List

- ◆ Actual Milestone Completion
- ◇ Planned Milestone Completion
- ▲ Actual Event Start/Completion
- △ Planned Event Start/Completion

- Current Date
- Delivery Period based on Last Order Date

CDD: Capability Development Document
CEC: Cooperative Engagement Capability
DA/ES: Design Agent/Engineering Services
FTIIP: Far Term Interoperability Improvement Project
FY: Fiscal Year

HS: Hypersonic
NIFC: Naval Integrated Fire Control
NIFC P: Naval Integrated Fire Control Passive
NIFC-HS: Naval Integrated Fire Control - Hypersonic

R3B: Resources and Requirements Review Board
RFP: Request For Proposal
SBR: Software Build Review
SFR: System Functional Review
SRR: System Requirements Review

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy

Date: March 2019

Appropriation/Budget Activity

1319 / 7

R-1 Program Element (Number/Name)

PE 0607658N / (U)Cooperative
Engagement Capability

Project (Number/Name)

3240 / CEC Increment II

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 3240				
Navy Gate 3/R3B	3	2019	3	2019
CEC Increment II Approval	3	2019	3	2019
MS B	2	2020	2	2020
MS C	4	2023	4	2023
CEC FTIIP SFR	3	2020	3	2020
CEC FTIIP SBR 20.3	1	2021	1	2021
CEC FTIIP SBR 21.1	2	2021	2	2021
CEC FTIIP SBR 21.2	4	2021	4	2021
CEC FTIIP SBR 21.3	1	2022	1	2022
CEC FTIIP SBR 22.1	2	2022	2	2022
CEC FTIIP SBR 22.2	4	2022	4	2022
CEC FTIIP SBR 22.3	1	2023	1	2023
CEC FTIIP FSBF	2	2023	2	2023
NIFC Passive SRR	2	2021	2	2021
NIFC Passive SFR	4	2021	4	2021
NIFC Passive SBR 21.3	1	2022	1	2022
NIFC Passive SBR 22.1	2	2022	2	2022
NIFC Passive SBR 22.2	4	2022	4	2022
NIFC Passive SBR 22.3	1	2023	1	2023
NIFC Passive SBR 23.1	2	2023	2	2023
NIFC Passive SBR 23.2	4	2023	4	2023

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy			Date: March 2019		
Appropriation/Budget Activity 1319 / 7		R-1 Program Element (Number/Name) PE 0607658N / (U)Cooperative Engagement Capability		Project (Number/Name) 3240 / CEC Increment II	
		Start		End	
Events by Sub Project		Quarter	Year	Quarter	Year
NIFC Passive SBR 23.3		1	2024	1	2024
NIFC Passive SBR 24.1		2	2024	2	2024
NIFC Passive FSBR		4	2024	4	2024
CEC NIFC Hypersonic SRR		1	2021	1	2021
CEC NIFC Hypersonic SFR		1	2022	1	2022
CEC NIFC Hypersonic SBR 22.1		2	2022	2	2022
CEC NIFC Hypersonic SBR 22.2		4	2022	4	2022
CEC NIFC Hypersonic SBR 22.3		1	2023	1	2023
CEC NIFC Hypersonic SBR 23.1		2	2023	2	2023
CEC NIFC Hypersonic SBR 23.2		4	2023	4	2023
CEC NIFC Hypersonic SBR 23.3		1	2024	4	2024
CEC NIFC Hypersonic SBR 24.1		2	2024	2	2024
CEC NIFC Hypersonic SBR 24.2		4	2024	4	2024

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy										Date: March 2019		
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0607658N / (U)Cooperative Engagement Capability				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	10.616	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	10.616
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
CEC integrates Identification Friend Foe (IFF) Mode 4 and 5 information and distributes that information within the CEC network for improved tracking, Composite Identification, and Combat Identification. Fleet operational requirements necessitate acceleration of IFF Mode 5 improvements within CEC that include software corrections to existing functionality as well as IFF integration design improvements for all CEC configurations that support IFF Mode 5 including E-2D Delta System Software Configuration version (DSSC) 3, Aegis Weapon System Baseline 7.2 and above, and Ship Self Defense System SSDS) Mk 2 Build 10 and above.												
In addition, acceleration of IFF Mode 5 integration with multiple combat system configurations is required including Ship Self Defense System (SSDS) Mk 2 Builds 6 and 9. For these configurations, IFF Mode 5 functionality will be added to CEC and SSDS prior to originally planned SSDS and CEC modernization schedules.												
B. Accomplishments/Planned Programs (\$ in Millions)								FY 2018	FY 2019			
Congressional Add: CEC Identification Friend or Foe (IFF) Mode 5 Acceleration								10.616	0.000			
FY 2018 Accomplishments: Completed development, integration, test and certification of critical IFF Mode 5 related software trouble report corrections for AWS BL 7.2, 9.2.0 and SSDS Build 9 configurations. Completed development and integration of IFF processing design changes to improve the overall performance of IFF processing including IFF M5. Initiated development of CEC software builds for SSDS Builds 9 and 6 to enable IFF Mode 5 functionality within CEC (including the IFF Mode 5 software trouble report corrections and IFF processing design improvements) ahead of combat system modernization.												
Completed element certification of IFF Mode 5 software trouble report corrections with IFF processing design changes for SSDS Build 11 on CVN 78.												
FY 2019 Plans: Will complete development, integration, test, and certification of CEC software builds for SSDS Builds 9 and 6 to enable IFF Mode 5 functionality within CEC (including the IFF Mode 5 software trouble report corrections and IFF processing design improvements) ahead of combat system modernization. Will complete development, integration, test, and certification of CEC software builds for AEGIS BL 7.2.3 and 9A2A (including the IFF Mode 5 software trouble report corrections and IFF processing design improvements). Conduct Software Build Review (SBR) 18.3 and Final SBR (FSBR).												
Congressional Adds Subtotals								10.616	0.000			

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C. Other Program Funding Summary (\$ in Millions) N/A		
Remarks		
D. Acquisition Strategy N/A		
E. Performance Metrics N/A		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy													Date: March 2019		
Appropriation/Budget Activity 1319 / 7						R-1 Program Element (Number/Name) PE 0607658N / (U) Cooperative Engagement Capability					Project (Number/Name) 9999 / Congressional Adds				
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
IFF Mode 5 Acceleration	C/CPFF	Raytheon : St Petersburg, FL	0.000	9.327	Jun 2018	0.000		0.000		-		0.000	0.000	9.327	-
IFF Mode 5 Acceleration	WR	NSWC : Dahlgren, VA	0.000	0.792	Jun 2018	0.000		0.000		-		0.000	0.000	0.792	-
IFF Mode 5 Acceleration	WR	NSWC : Port Hueneme, CA	0.000	0.220	Jun 2018	0.000		0.000		-		0.000	0.000	0.220	-
IFF Mode 5 Acceleration	WR	NSWC : Crane, IN	0.000	0.055	Jun 2018	0.000		0.000		-		0.000	0.000	0.055	-
IFF Mode 5 Acceleration	C/CPFF	JHU/APL : Laurel, MD	0.000	0.222	Jun 2018	0.000		0.000		-		0.000	0.000	0.222	-
Subtotal			0.000	10.616		0.000		0.000		-		0.000	0.000	10.616	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	10.616		0.000		0.000		-		0.000	0.000	10.616	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy	Date: March 2019
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Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0607658N / (U)Cooperative Engagement Capability	Project (Number/Name) 9999 / Congressional Adds
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Fiscal Year	FY18				FY19			
Quarter	1	2	3	4	1	2	3	4
Program Milestones (CEC Mode 5 IFF)		◆ SBR 18.1		◆ SBR 18.2	◆ SBR 18.3	◇ FSBR		

Legend

◆ Actual Milestone Completion

◇ Planned Milestone Completion

--- Current Date

Acronym List

CEC: Cooperative Engagement Capability

FSBR: Final Software Build Review

IFF: Identification Friend or Foe

SBR: Software Build Review

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0607658N / (U)Cooperative Engagement Capability	Project (Number/Name) 9999 / Congressional Adds	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 9999				
CEC IFF Mode 5 SBR 18.1	2	2018	2	2018
CEC IFF Mode 5 SBR 18.2	4	2018	4	2018
CEC IFF Mode 5 SBR 18.3	1	2019	1	2019
CEC IFF Mode 5 FSBR	2	2019	2	2019