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For Open Publication**

Apr 28, 2022

Department of Defense  
OFFICE OF PREPUBLICATION AND SECURITY REVIEW

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# COOPERATIVE ENGAGEMENT CAPABILITY (CEC)

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## December 2021 Selected Acquisition Report (SAR)



*Signal Data Processor with Sierra Chip  
(SDP-S)*



*Planar Array Antenna Assembly  
(PAAA)*

DECEMBER 31, 2021  
DEPARTMENT OF THE NAVY

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**Common Acronyms and Abbreviations**

Acq O&M - Acquisition-Related Operations and Maintenance  
ACAT - Acquisition Category  
ADM - Acquisition Decision Memorandum  
APB - Acquisition Program Baseline  
APPN - Appropriation  
APUC - Average Procurement Unit Cost  
\$B - Billions of Dollars  
BA - Budget Authority/Budget Activity  
Blk - Block  
BY - Base Year  
CAPE - Cost Assessment and Program Evaluation  
CARD - Cost Analysis Requirements Description  
CDD - Capability Development Document  
CLIN - Contract Line Item Number  
CPD - Capability Production Document  
CY - Calendar Year  
DAB - Defense Acquisition Board  
DAE - Defense Acquisition Executive  
DAMIR - Defense Acquisition Management Information Retrieval  
DoD - Department of Defense  
DSN - Defense Switched Network  
EMD - Engineering and Manufacturing Development  
EVM - Earned Value Management  
FOC - Full Operational Capability  
FMS - Foreign Military Sales  
FRP - Full Rate Production  
FY - Fiscal Year  
FYDP - Future Years Defense Program  
ICE - Independent Cost Estimate  
IOC - Initial Operational Capability  
Inc - Increment  
JROC - Joint Requirements Oversight Council  
\$K - Thousands of Dollars  
KPP - Key Performance Parameter  
LRIP - Low Rate Initial Production  
\$M - Millions of Dollars  
MDA - Milestone Decision Authority  
MDAP - Major Defense Acquisition Program  
MILCON - Military Construction  
N/A - Not Applicable  
O&M - Operations and Maintenance  
ORD - Operational Requirements Document  
OSD - Office of the Secretary of Defense  
O&S - Operating and Support  
PAUC - Program Acquisition Unit Cost  
PB - President's Budget  
PE - Program Element  
PEO - Program Executive Officer  
PM - Program Manager  
POE - Program Office Estimate  
RDT&E - Research, Development, Test, and Evaluation  
SAR - Selected Acquisition Report  
SCP - Service Cost Position  
TBD - To Be Determined  
TY - Then Year  
UCR - Unit Cost Reporting  
U.S. - United States  
USD(A&S) - Under Secretary of Defense (Acquisition and Sustainment)  
USD(AT&L) - Under Secretary of Defense (Acquisition, Technology and Logistics)

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## Program Manager

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## Mission and Description

The Cooperative Engagement Capability (CEC) acquisition program is an ACAT IC program which is based on the Mission Needs Statement (MNS) M030-086-093 approved by the Chief of Naval Operations (CNO) on February 5, 1993.

The CEC system makes it possible for multiple surface ships and aircrafts to form an air defense network for the purpose of sharing radar target measurements in real-time, thus a "cooperative engagement." Sharing data from all capable sensors' assets in a battle force provides increased timeliness, accuracy, and continuity for greater engagement decision and prosecution responsiveness.

The CEC program provides a sensor network with Integrated Fire Control capability that significantly improves battle force air and missile defense capabilities by coordinating measurement data from air search sensors on CEC-equipped units into a single, integrated real-time, composite track air picture. The CEC sensor netting system extracts sensor-derived information and distributes a superset of the best Anti Air Warfare (AAW) sensor data to all CEC Cooperating Units (CUs) participating in Naval Carrier and Expeditionary Strike Groups. Each CU independently employs high capacity, parallel processing and advanced algorithms to combine all distributed sensor data into a fire control quality track picture improving own unit track precision, consistency and continuity; expanding detection range; and increasing reaction time.

CEC also provides situational awareness by enabling longer range, cooperative, multiple or layered engagement strategies to improve strike force effectiveness and is highly resistant to jamming and delivers accurate gridlocking between CUs.

CEC is comprised of the following:

- AN/USG-2/2B: Shipboard designation of CEC deployed aboard CG, DDG, FFG, LPD, LHD, LHA and CVN ship platforms. AN/USG-2A configuration retired.
- AN/USG-3/3B: Airborne designation of CEC deployed in Hawkeye, Navy Airborne Warning and Control System
- Aircraft (E-2C) and Advanced Hawkeye (AHE), Navy Airborne Warning and Control System Aircraft (E-2D)
- AN/USG-4B: USMC Ground Mobile designation of CEC Composite Tracking Network (CTN)
- AN/USG-7B: CEC designation for Shipboard Foreign Military Sales (FMS) to Australia
- AN/USG-10B: CEC designation for Shipboard FMS to Japan

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## Executive Summary

The CEC program has been in FRP for the AN/USG-2/2B (shipboard variant) since CY 2002 and for the AN/USG-3B (E-2D airborne variant) since CY 2014. Development efforts continue in order to keep pace with the security threats and ensure producibility. The program remains focused on ensuring compatibility and interoperability.

- DDG 1000 and CEC are implementing the Accelerated Mid-Term Interoperability Improvement Plan (AMIIP) for the DDG 1000 Zumwalt combat system. Fielding in 3Q FY 2022.
- Fielding of Identification Friend or Foe (IFF) Mode 5 updates is complete for majority of CEC equipped platforms. Efforts continue for DDG 1000 class ships and United States Marine Corps (USMC) Composite Tracking Network (CTN).

CEC follows an evolutionary acquisition process, delivering capability in increments of hardware and/or software upgrades. This evolutionary approach actively addresses the need for future capability improvements to overmatch evolving threats.

A follow-on Design Agent/Engineering Services (DA/ES) contract was competitively awarded to Raytheon on May 8, 2019. N00024-19-C-5200 includes design, development, integration, test, and facility management.

The quantity change from 358 to 366 due to the addition of two DDGs (DDG 145 and DDG 146) and two CVN SCN units (CVN 76 and 82) in PB22. Four additional DDG units (DDG 147 – DDG 150) were added in PB23.

There are no significant software-related issues with this program at this time.

### Significant Accomplishments:

- Completed Supersonic TRACKEX and testing of E-2D Track File Concurrence (TFC) fix with E-2D DSSC 3. Completed fielding of updated software to all E-2D squadrons.
- Completed Combat System Ship's Qualification Trials (CSSQTs) onboard HOBART Class Air Warfare Destroyers (AWDs) HMAS Hobart (DDG 39) and HMAS Brisbane (DDG 41)
- Successfully completed first ever Naval Integrated Fire Control (NIFC) From the Sea (FTS) engagement utilizing USMC radar in October 2021.
- CEC Increment II established as a separate ACAT II Program to evolve the current system to outpace new and more stressing security threats.
- CEC integration with AEGIS Baseline 10: Development Complete. Testing nearing completion.
- CEC integration with Ship Self-Defense System (SSDS) Baseline 12/EASR: Development and integration in progress. Successfully demonstrated tracks on SSDS Glass from Live Enterprise Air Surveillance Radar (EASR) at Risk Reduction Event 2 in August 2021.

### Significant Issues:

- Signal Data Processor – Sierra II Chip (SDP-S) contract delivery delays due to a variety of issues during production process

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### *History of Significant Developments Since Program Initiation*

History of Significant Developments Since Program Initiation	
Date	Significant Development Description
May 1995	CEC Acquisition Decision Milestone CEC Milestone (MS) I/II Navy Program Decision – Approved to proceed into EMD
July 1996	Preliminary Design Review CEC Shipboard
December 1996	Critical Design Review (CDR) CEC Shipboard
May 1997	CDR CEC Airborne Transceiver
December 1997	Initial Operation Testing and Evaluation (IOT&E) of AN/USG-2 equipment
February 1998	AN/USG-2 equipment LRIP award
April 1998	Initial production of AN/USG-2 equipment was awarded
April 2002	CEC MS III ADM - Approved for the AN/USG-2 Surface-based CEC system for MS III for FRP
April 2002	CEC MS III ADM - Approved the FY 2002 and FY 2003 AN/USG-3 Airborne-based CEC System LRIP quantity (5 units each year)
April 2002	CEC MS III ADM - Approved the updated APB
May 2005	CEC achieves FOC
January 2009	CEC Acquisition Decision Milestone Program Decision Memorandum - Approved an increase in the total LRIP quantity for CEC program of an additional 14 AN/USG-3A systems
February 2009	CEC Acquisition Decision Milestone Program Decision Memorandum - Approved the second LRIP of up to six (6) complete AN/USG-3B systems
February 2010	CEC Acquisition Decision Milestone Program Decision Memorandum - Approved the procurement of up to two (2) additional SDP-S components, to support the E-2D Advanced Hawkeye LRIP
August 2010	CEC Acquisition Decision Milestone Program Decision Memorandum - Authorized the Navy to procure one additional CEC AN/USG-3B system as part of the second LRIP Lot, increasing the total CEC LRIP Lot 2 quantity authorized to 7
December 2011	CEC Acquisition Decision Milestone Program Decision Memorandum - Authorized the Navy to procure one additional CEC AN/USG-3B unit as part of the FY 2011 LRIP Lot 2, approved via ADM on February 12, 2010. This decision now authorizes procurement of up to eight complete AN/UGS-3B units as CEC LRIP Lot 2. Also authorize an increase in the total CEC AN/USG-3A/B LRIP quantity to not more than 16 units

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May 2012	CEC Acquisition Decision Milestone Program Decision Memorandum - Approved the LRIP Lot 3 for up to five complete AN/USG-3B systems. Designate the CEC program as an ACAT 1C program with the Navy as the lead Component
May 2012	The USD(AT&L) memorandum of May 25, 2012 - Re-designated CEC from an ACAT 1D to an ACAT 1C program with the Navy as lead component and authorized the Navy to procure the third increment of LRIPs for the CEC Airborne variant
April 2014	CEC Acquisition Decision Memorandum - Authorized entrance into FRP for the CEC AN/USG-3B (E-2D Airborne Variant) System in support of E-2D Advance Hawkeye FRP

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## Schedule

### Schedule Events

Events	SAR Baseline Production Estimate	Current APB Development Objective/Threshold		Current Estimate/Actual
Milestone II	May 1995	May 1995	May 1995	May 1995
Development Contract Modification	May 1995	May 1995	May 1995	May 1995
Preliminary Design Review Complete	Feb 1996	Jul 1996	Jul 1996	July 1996
Baseline System Initial Operational Capability	Sep 1996	Sep 1996	Sep 1996	Sep 1996
Critical Design Review Complete	Aug 1996	Dec 1996	Dec 1996	Dec 1996
<b>IOT&amp;E (DT-IIIB/OT-IIA1)</b>				
Start	May 1997	May 1997	May 1997	May 1997
Complete	Aug 1997	Aug 1997	Aug 1997	Aug 1997
LRIP Decision	Dec 1997	Feb 1998	Feb 1998	Feb 1998
Low Rate Production Contract Award	Apr 1998	Apr 1998	Apr 1998	Apr 1998
Service Depot Support Date	Oct 2000	Oct 2000	Oct 2000	Oct 2000
<b>Service Final DT&amp;E</b>				
Start	Jul 2000	Jan 2001	Jan 2001	Jan 2001
Complete	Nov 2000	May 2001	May 2001	May 2001
<b>IOT&amp;E – OPEVAL (OT-IIA2)</b>				
Start	Sep 2000	Mar 2001	Mar 2001	Mar 2001
Complete	Nov 2000	May 2001	May 2001	May 2001
Organic Support Date	Oct 2001	Oct 2001	Oct 2001	Oct 2001
<b>FOT&amp;E-1 (DT-IIIA/OT-IIIA) E-2C</b>				
Start	Jan 2002	Jan 2002	Jan 2002	Jan 2002
Complete	Aug 2002	Nov 2002	Nov 2002	Nov 2002
Milestone III	Apr 2002	Apr 2002	Apr 2002	Apr 2002
Full Rate Production Contract Award	May 2002	Apr 2002	Apr 2002	Apr 2002
<b>FOT&amp;E-2 (DT-IIIB/OT-IIIB) E-2C</b>				
Start	Mar 2003	Mar 2004	Mar 2004	Mar 2004
Complete	Jul 2003	Apr 2004	Apr 2004	Apr 2004
Fill Operational Capability	Dec 2003	May 2005	May 2005	May 2005
Airborne IOC	Dec 2003	May 2005	May 2005	May 2005

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AN/USG-3B Full Rate Production Decision for E-2D	N/A	Apr 2014	Apr 2014	Apr 2014
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**Schedule Notes:**

All events listed in the APB are completed.

***Significant Schedule Risks***

Significant Schedule Risks	
Current Estimate (December 2021)	
1.	N/A

## Performance

Performance Characteristics					
Development APB Objective	Current APB Development Objective/Threshold		Demonstrated Performance (Include Date of Demonstration)	Current Estimate/Actual	Deviation
<b>Operational Availability</b>					
>=.95	N/A	N/A	N/A	N/A	N/A
<b>Interoperability Information Exchange Requirements (IER)</b>					
100% of top-level IER's	100% of top-level IER's	100% of top-level IER's designated critical	100% of top-level IER's designated critical	100% of top-level IER's designated critical	N/A
<b>Track File Consistency</b>					
Integration will improve track file consistency in each host system	Integration will improve track file consistency in as measured in each host system	Integration will improve track file consistency (0% degradation) as measured in each host system	Integration will improve track file consistency as measured in each host system	Integration will improve track file consistency as measured in each host system	N/A

### Performance Notes:

CEC Security Classification has changed and current guide is in routing with PEO IWS Front Office. Current classification notes Operational Availability (A<sub>o</sub>) as UNCLASSIFIED but still considered CUI with the program office.

### Requirements Source:

CEC Increment 1 CPD as validated by JROC memorandum dated August 12, 2016 which replaces the 2011 Change 1 CEC ORD, which was rescinded.

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## Acquisition Budget Estimate

### Total Acquisition Cost

Category	Base Year	Development APB	APB Name (Current) (01/19/2019)		Budget Estimate PB 2023		Deviation
		Objective (BY\$)	Objective (BY\$)	Threshold (BY\$)	BY\$	TY\$	
RDT&E	2002	2028.1	3326.9	3662.3	3415.1	3861.2	
Procurement	2002	2095.2	2104.2	2314.6	2070.7	2757.8	
MILCON	2002	0.0	0.0	0.0	0.0	0.0	
Acq. O&M	2002	0.0	1757.6	1933.4	1794.9	3391.1	
<b>Total</b>		<b>4123.3</b>	<b>5431.1</b>	<b>N/A</b>			
PAUC	2002		15.2	16.7	15.0	N/A	
APUC	2002		6.4	7.1	6.2	N/A	

### Total End Item Quantity

Quantity Category	Current APB Quantity	Current Estimate Quantity
Development	30	30
Procurement	328	336
<b>Total</b>	<b>358</b>	<b>366</b>

#### Quantity Notes:

The quantity change from 358 to 366 due to the addition of two DDGs (DDG 145 and DDG 146) and two CVN SCN units (CVN 76 and 82) in PB 2022. Four additional DDGs (DDG 147 – DDG150) were added in PB 2023.

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***Risk and Sensitivity Analysis***

Risks and Sensitivity Analysis	
<b>Current Procurement Cost (December 2021)</b>	
1.	Base Year-Total Acquisition Cost \$5,527.9M, Average Procurement Unit Cost (APUC) \$6.21M, Program Acquisition Unit Cost \$15.10M
2.	Then Year-Total Acquisition Cost \$6,625.1M
3.	Interoperability remains a technical risk with cost implications to the CEC program. To mitigate these risks the CEC program is continuing their evolutionary acquisition approach of delivering capability in increments, reducing technical and cost risk, while maintaining effectiveness and producibility.
4.	Track File Concurrence (TFC) Performance Shortfall: required software updates to resolve shortfalls. Completed development and testing of TFC improvements. Fielding completed to all E-2D squadrons. Risk retired.
5.	Cybersecurity Vulnerabilities in Deployed CEC Assets
<b>Original Baseline Estimate (September 2018)</b>	
1.	
<b>Revised Original Estimate (N/A)</b>	
None	
<b>Current Baseline Estimate (Month YYYY)</b>	
1.	None

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## Unit Cost

### *Current Baseline Compared with Current Estimate*

Category (\$M)	Current APB (1/19/2019)	Current Estimate	% Change	NMC Breach
<b>PAUC</b>				
Cost	5431.1	5485.82	-	-
Quantity	358	366	-	-
Unit Cost	15.171	14.99	-1.2%	
<b>APUC</b>				
Cost	2104.2	2070.72	-	-
Quantity	328	336	-	-
Unit Cost	6.415	6.16	-4.0%	

### *Original Baseline Compared with Current Estimate*

Category (\$M)	Original APB (7/10/1995)	Current Estimate	% Change	NMC Breach
<b>PAUC</b>				
Cost	2221.9	5485.82	-	-
Quantity	183	366	-	-
Unit Cost	12.142	14.99	+23.5%	
<b>APUC</b>				
Cost	1150.3	2070.72	-	-
Quantity	174	336	-	-
Unit Cost	6.611	6.16	-6.80%	

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## Contracts

Contract Data (\$TYM)		
Contract Number	N00024-15-C-5228	
Effort Number	0	
Modification Number	P00067	
Award Date	12/31/2021	
Definitization Date	2/25/2015	
Order Number		
CAGE Code/CAGE Legal Name	0ERB9	
Contract Title	DRS Laurel Technologies	
Contract Address	246 Airport Road, Johnstown, PA 15904	
Contracts/Effort Price, Quantity, and Performance (\$M)		
Initial Target Price	Current Target Price	
\$1.99	\$114.74	
Initial Ceiling Price	Current Ceiling Price	
\$1.99	\$227	
Contract's EAC	PM's EAC	
Initial Quantity	Current Quantity	Delivered Quantity
2	78	60
BAC	BCWP	ACWP
BCWS	Cost Variance	Schedule Variance

### Contract Notes:

The Firm Fixed Price (FFP) portion of the Contract N00024-15-C-5228 includes production and testing for AN/USG-2B (Shipboard), AN/USG-3B (Airborne), AN/USG-4B (USMC) Cooperative Engagement Capability (CEC) systems and backfit kits to convert AN/USG-2/2A to AN/USG-2B. The Cost Plus Fixed Fee (CPFF) portion of the contract includes Engineering Services in support of the manufacture, assembly and testing of the CEC production systems under this contract.

The 60 Delivery to Date reflects the number of principal items actually delivered to date. The two Original Quantity reflects the number of principal items procured under the initial contract. The 78 Current Quantity reflects the number of Principal items procured with the latest authorized modification. P00067 no cost modification change to change part numbers

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Contract Data (\$TYM)		
Contract Number	N00024-17-C-5201	
Effort Number	0	
Modification Number	P00021	
Award Date	08/24/2017	
Definitization Date	08/24/2017	
Order Number		
CAGE Code/CAGE Legal Name	0ERB9	
Contract Title	DRS Laurel Technologies	
Contract Address	246 Airport Road, Johnstown, PA 15904	
Contracts/Effort Price, Quantity, and Performance (\$M)		
Initial Target Price	Current Target Price	
\$0.50M	\$6.05M	
Initial Ceiling Price	Current Ceiling Price 227	
\$82.00M	\$82.00M	
Contract's EAC	PM's EAC	
Initial Quantity	Current Quantity	Delivered Quantity
3	86	53
BAC	BCWP	ACWP
N/A	N/A	N/A
BCWS	Cost Variance	Schedule Variance
N/A	N/A	N/A

**Contract Notes:**

This CEC SDP Production (FY 2017 - FY 2022) contract is a follow-on to the CEC Signal Data Processor – Sierra II Chip (SDP-S) Production (FY 2011 - FY 2016) contract and includes the manufacture, assembly, test, and repair of a SDP assembly for the Cooperative Engagement Transmission Processing Set. The Scheduled Quantity remained at 68 to reflect the number of principal items planned to have been delivered to date. The Delivery to Date changed remained at 53 to reflect the number of principal items actually delivered to date. SDP-S Production delay has been partially resolved and deliveries resumed in March 2021 and yet to meet contractual required output of 10 units per month. Continue monitoring and working the seams issues for SDP-S deliveries and contractor's performance. Utilizing repaired and converted assets we are meeting our install schedules. NAVSUP orders are delayed and have increased the Mean Logistics Delay Time (MLDT) for fleet units needing assets. The Government team is also conducting a deep-dive into contractor's production and quality management processes to determine root cause of the current delivery delays. The three Original Quantity reflects the number of principal items procured under the initial contract. The 86 Current Quantity reflects the number of principal items procured with the latest modification.

**Cost Variance:**

No EVM Data for this contract

**Schedule Variance:**

No EVM Data for this contract

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Contract Data (\$TYM)		
Contract Number	N00024-20-C-5203	
Effort Number	0	
Modification Number	P00009	
Award Date	12/17/2021	
Definitization Date	05/07/2020	
Order Number		
CAGE Code/CAGE Legal Name	00724	
Contract Title	Raytheon	
Contract Address		
Contracts/Effort Price, Quantity, and Performance (\$M)		
Initial Target Price	Current Target Price	
\$32.74M	\$68.70M	
Initial Ceiling Price	Current Ceiling Price	
\$32.74M	\$68.70M	
Contract's EAC	PM's EAC	
Initial Quantity	Current Quantity	Delivered Quantity
12	52	
BAC	BCWP	ACWP
N/A	N/A	N/A
BCWS	Cost Variance	Schedule Variance
N/A	N/A	N/A

**Contract Notes:**

The Firm Fixed Price (FFP) portion of the Contract N00024-20-C-5203 includes the manufacture, assembly, and test of the Planar Array Antenna Assembly (PAAA) for the Cooperative Engagement Transmission Processing Set. The Cost Plus Fixed Fee (CPFF) portion of the contract includes Engineering Services in support of the design, manufacture, assembly and testing of the PAAA production systems under this contract.

**Cost Variance:**

No EVM Data for this contract

**Schedule Variance:**

No EVM Data for this contract

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Contract Data (\$TYM)		
Contract Number	N00024-19-C-5200	
Effort Number	0	
Modification Number	P00030	
Award Date	05/08/2019	
Definitization Date	05/08/2019	
Order Number		
CAGE Code/CAGE Legal Name	00724	
Contract Title	Raytheon	
Contract Address		
Contracts/Effort Price, Quantity, and Performance (\$M)		
Initial Target Price	Current Target Price	
\$8.01M	\$133.00M	
Initial Ceiling Price	Current Ceiling Price	
\$279.34M	\$279.34M	
Contract's EAC	PM's EAC	
\$9.40M	\$9.40M	
Initial Quantity	Current Quantity	Delivered Quantity
0	0	0
BAC	BCWP	ACWP
\$9.45M	\$7.85	\$7.05
BCWS	Cost Variance	Schedule Variance
\$8.21M	1.12	0.97

**Contract Notes:**

The FY 2019 - FY 2024 Design Agent/Engineering Services (DA/ES) contract N00024-19-C-5200 is a competitively awarded follow on to the N00024-13-C-5212 and includes design, development, integration, test, and maintenance to system capabilities for all baselines applicable to the CEC System, supporting the evolution and maintenance of the CEC System and Single Source Library required for CEC Design Agent.

The N00024-19-C-5200 contract includes development environment infrastructure that supports the complete CEC System development, verification, and support. The Contractor shall maintain the CEC hardware and Software Development Environment (SDE) and testing infrastructure and provide requisite facility and security infrastructure to support existing CEC baselines. Support provided by the Contractor under this contract shall include Program Management, Systems Engineering, Software Development, System Tech Refresh and Obsolescence Update Support, Test and Analysis, Quality Assurance (QA), Configuration Management (CM), ILS, Reliability and Maintainability (R&M), System Safety, System Security, and Cost Estimation.

The Design Agent/Engineering Services (FY 2019 - FY 2024), N00024-19-C-5200 has the following efforts:

1) CEC Capabilities for Integration with AEGIS Advanced Capability Build (ACB) 20 with a period of performance of 8 May 2019 through 30 September 2022; 2) CEC Facilities Management (FY 2019 Design Agent); 3) Advanced Studies and Integration (FY 2019); 4) Software Sustainment (FY 2019); 5) CEC Facilities Management (FY 2020 Design Agent); 6) Advanced Studies and Integration (FY 2021); 7) Software Sustainment (FY 2021); 8) CEC Facilities Management (FY 2021 Design Agent); 9) Provisioned Item Order; 10) Advanced Studies and Integration (FY2 2022); 11) Software Sustainment (FY 2022).

The Design Agent/Engineering Services (FY 2019 - FY 2024), N00024-19-C-5200, Effort 0, is a cumulative total of CLINs 0001, 0002, 0100, 0300, 1002, 1100, 1300, 2002, 0700, 2100, 2300, and 2500.

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The following methodology ensures values for Design Agent/Engineering Services Competitive FY 2019 - FY 2024 DA/ES Efforts are not double counted. The PM's Estimated Price (\$133.00M) reported for the FY 2019 - FY 2024 DA/ES Effort 0 is not reflected in the Contract Cost Report section. Open Efforts are reported separately, and when completed, moved into the Completed Contracts line.

PM and Contractor Estimated Ceiling Price is Target Cost (\$263.36M) plus Maximum Fee (\$15.98M).

The Current Negotiated Contract Cost (\$125.66M) is the current dollar value (excluding fee of profit) on which contractual agreement was reached as of the reflected report period.

**Cost Variance:**

Cost Variance above 1 is favorable.

**Schedule Variance:**

Schedule variance below 1 is unfavorable, but the variance in days to the baseline schedule is 0 work days with the program forecasted to complete in fiscal July 2022 prior to the contract end period of performance.

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## Technologies and Systems Engineering

### *Significant Technical Risks*

Significant Technical Risks
Current Estimate (December 2021)
1. Cybersecurity Vulnerabilities in Deployed CEC Assets

## Deliveries and Expenditures

Deliveries				
Delivered to Date	Planned to Date	Actual to Date	Total Quantity	Percent Delivered
Development	30	30	30	100.00%
Production	328	223	336	66.37%
Total Program Quantity Delivered	358	253	366	69.13%

### Expended and Appropriated (TY \$M)

Total Acquisition Cost:	6625.1
Expended to Date:	5046.0
Percent Expended:	76.2%
Total Funding Years:	39
Years Appropriated:	29
Percent Years Appropriated:	74.35%
Appropriated to Date:	5363.6
Percent Appropriated:	80.9%

The above data is current as of April 18, 2022.

### Deliveries and Expenditures Notes:

Assumed that all funding through FY 2022 is appropriated (O&M values not included)

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## Low Rate Initial Production

Item	Initial LRIP Decision	Current Total LRIP
Approval Date	3/2/1998	10/31/2013
Approved Quantity	7	84
Reference	LRIP 1 ADM	LRIP 14 ADM
Start Year	1998	1998
End Year	1998	2013

**Rationale if Current Total LRIP Quantity exceeds 10% of the total Procurement quantities:**

The Current Total LRIP Quantity is more than 10% of the total production quantity due to the requirements to meet ship installation schedules, outfit Land Based Test Sites in preparation for completion of Operational Testing (OT), and to maintain the Minimum Sustaining Rate for production of CEC systems pending completion of OT and entry into FRP.

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## Operating and Support Costs

### Total Program O&S Cost Compared with Baseline

	Current APB Objective (BY\$)	Current APB Threshold (BY\$)	Current Estimate (BY\$)	Current Estimate (TY\$)	Deviation
Total O&S (\$Millions)	1757.6	1933.4	1794.9	3391.1	2.12%

#### Deviation Explanation:

As a result of Component S-ICE completed for Gate 7 review, programmatic updates include: increase of 8 additional units (PB23); increase in sustainment duration until FY54 (increase of 2 years); and transition from CAB to PAAA antenna. Additionally, updated cost estimating methodology for government depot (NAVSUP).

### O&S Cost Breakdown

Category (BY02\$ Million)	CEC Avg Annual Cost Per System
Unit-Level Manpower	0.000
Unit Operations	0.010
Maintenance	0.150
Sustaining Support	0.082
Continued System Improvements	0.090
Other	0.000
Total O&S	0.331

**Cost Estimate Source:** NAVSEA 05C Component S-ICE dated March 2022 completed in coordination with required Gate 7 review; Update to NAVSEA letter 7000 Ser 05C/037 dated December 13, 2018

#### O&S Cost Notes:

- a. Disposal/Demilitarization Cost Estimate and Source of Estimate: \$12.3M; NAVSEA 05C S-ICE dated March 2022 completed in coordination with required Gate 7 review
- b. Sustainment Strategy: Sustainment strategy efforts include: Maintenance and repair of CEC fielded systems (AN/USG-2, Land Based Test Sites, AN/USG-3), Integrated Logistics Support, Software Trouble Reports, Original Equipment Manufacturer Design Agent support, In-Service Engineering, Diminishing Manufacturing Supply Material Shortages, Obsolescence Management.
- c. For Each Acquired System or System Variant:
  - i. Quantity to Sustain: 366
  - ii. First Operational Fiscal Year: FY 1994
  - iii. Final Operational Fiscal Year: FY 2054
  - iv. Unit Expected Service Life: 20 years
- d. Antecedent System(s) O&S Costs: No Antecedent

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