Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy

Appropriation/Budget Activity R-1 Program Element (Number/Name)

1319: Research, Development, Test & Evaluation, Navy I BA 7: Operational PE 0206335M I (U)Common Aviation Command and Control Sys (CAC2S)

Systems Development

COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	31.568	13.959	11.850	7.343	-	7.343	4.936	4.524	4.382	4.468	Continuing	Continuing
3373: Common Aviation Command and Control System (CAC2S)	31.568	13.959	11.850	7.343	-	7.343	4.936	4.524	4.382	4.468	Continuing	Continuing

Program MDAP/MAIS Code:

Project MDAP/MAIS Code(s): MN36

Note

Funding for FY 2014 and prior is listed in PE 0206313M Marine Corps Comms Systems, Project 2273 Air Ops Cmd & Control (C2) Sys.

A. Mission Description and Budget Item Justification

Common Aviation Command and Control System (CAC2S) - A coordinated modernization effort to replace the existing aviation command and control equipment of the Marine Air Command and Control System (MACCS) and to provide the Aviation Combat Element (ACE) with the necessary hardware, software, equipment, and facilities to effectively command, control, and coordinate aviation operations. The CAC2S system will accomplish the MACCS missions with a suite of operationally scalable modules to support the Marine Air Ground Task Force (MAGTF), Joint, and Coalition Forces. The CAC2S integrates the functions of aviation command and control into an interoperable system that will support the core competencies of all Marine Corps warfighting concepts. The CAC2S, in conjunction with the MACCS organic sensors (AN/TPS-63, AN/TPS-59 and AN/TPS-80 (Ground/Air Task Oriented Radar (G/ATOR)) and weapon system Composite Tracking Network (CTN) will provide enhanced air control, improved situational awareness, sensor integration (G/ATOR and AN/TPS-59), full Tactical Data Link integration, airspace and battle planning and command functionality as well as sensor netting integration (CTN). CAC2S with these organic MACCS programs support the tenets of Expeditionary Maneuver Warfare and fosters joint interoperability. CAC2S Increment I will replace legacy aviation command and control systems in the following Marine aviation agencies: Direct Air Support Center (DASC), Tactical Air Command Center (TACC), and Tactical Air Operations Center (TAOC).

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy

Date: May 2017

Appropriation/Budget Activity

R-1 Program Element (Number/Name)

1319: Research, Development, Test & Evaluation, Navy I BA 7: Operational Systems Development

PE 0206335M I (U)Common Aviation Command and Control Sys (CAC2S)

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	13.431	11.850	7.307	-	7.307
Current President's Budget	13.959	11.850	7.343	-	7.343
Total Adjustments	0.528	0.000	0.036	-	0.036
 Congressional General Reductions 	-	-			
 Congressional Directed Reductions 	-	-			
 Congressional Rescissions 	-	-			
 Congressional Adds 	-	-			
 Congressional Directed Transfers 	-	-			
Reprogrammings	0.823	0.000			
SBIR/STTR Transfer	-0.294	0.000			
Rate/Misc Adjustments	-0.001	0.000	0.036	-	0.036

Change Summary Explanation

Funding decreases, in the amount of \$4.507M, from FY 2017 to FY 2018 largely due to completion of hardware and software engineering in support of Phase 2 Engineering Change Proposals (ECPs) resulting from IOT&E.

Exhibit R-2A, RDT&E Project Ju	stification:	FY 2018 N	lavy						Date: May 2017				
Appropriation/Budget Activity 1319 / 7		PE 0206335M I (U)Common Aviation 3373 I Con						Number/Name) mmon Aviation Command and ystem (CAC2S)					
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost	
3373: Common Aviation Command and Control System (CAC2S)	31.568	13.959	11.850	7.343	-	7.343	4.936	4.524	4.382	4.468	Continuing	Continuing	
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-			
Project MDAP/MAIS Code: MN3	6												

Project Midap/Mais Code: Min36

Note

Prior year funding is listed in PE 0206313M Marine Corps Comms Systems, Project 2273 Air Operations Command & Control (C2) Systems.

A. Mission Description and Budget Item Justification

Common Aviation Command and Control System (CAC2S) - A coordinated modernization effort to replace the existing aviation command and control equipment of the Marine Air Command and Control System (MACCS) and to provide the Aviation Combat Element (ACE) with the necessary hardware, software, equipment, and facilities to effectively command, control, and coordinate aviation operations. The CAC2S system will accomplish the MACCS missions with a suite of operationally scalable modules to support the Marine Air Ground Task Force (MAGTF), Joint, and Coalition Forces. The CAC2S integrates the functions of aviation command and control into an interoperable system that will support the core competencies of all Marine Corps warfighting concepts. The CAC2S, in conjunction with the MACCS organic sensors (AN/TPS-63,

AN/TPS-59 and AN/TPS-80 (Ground/Air Task Oriented Radar (G/ATOR)) and weapon system Composite Tracking Network (CTN) will provide enhanced air control, improved situational awareness, sensor integration (G/ATOR and AN/TPS-59), full Tactical Data Link integration, airspace and battle planning and command functionality as well as sensor netting integration (CTN). CAC2S with these organic MACCS programs support the tenets of Expeditionary Maneuver Warfare and fosters joint interoperability. CAC2S Increment I will replace legacy aviation command and control systems in the following Marine aviation agencies: Direct Air Support Center (DASC), Tactical Air Command Center (TACC), and Tactical Air Operations Center (TAOC). Funding decreases, in the amount of \$4.507M, from FY 2017 to FY 2018 largely due to completion of hardware and software engineering in support of Phase 2 Engineering Change Proposals (ECPs) resulting from IOT&E.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)			FY 2018	FY 2018	FY 2018
	FY 2016	FY 2017	Base	oco	Total
Title: Product Development	1.175	5.747	1.063	0.000	1.063
Articles:	-	-	-	-	-
Description: The total program decrease of \$4.507M from FY 2017 to FY 2018 is largely due to the completion of hardware and software engineering in support of Phase 2 Engineering Change Proposals (ECP) development resulting from IOT&E.					
FY 2016 Accomplishments:					

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy			Date: May	2017			
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/ PE 0206335M / (U)Common Avia Command and Control Sys (CAC	Project (Number/Name) 3373 I Common Aviation Command and Control System (CAC2S)					
B. Accomplishments/Planned Programs (\$ in Millions, Article C	Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	
- Conducted validation and verification of the four CAC2S Phase 2 I	Limited Deployment Units (LDUs).						
FY 2017 Plans: - Initiate development of ECPs resulting from the developmental tes - Initiate CAC2S Phase 1 Communication Subsystem hardware mo - Complete hardware and software engineering support to provide 0 from IOT&E.	dification development effort.						
FY 2018 Base Plans: - Complete the initial integration of CAC2S with G/ATOR and associated - Perform root cause analysis of G/ATOR and related CTN findings - Implement the required corrections resulting from G/ATOR DT-C1 - Continue CAC2S Phase 1 Communication Subsystem hardware in	resulting from G/ATOR DT-C1 and OA. and OA test events.						
FY 2018 OCO Plans: N/A							
Title: Support and Management Services	Articles:	3.831	2.828	2.094 -	0.000	2.094	
FY 2016 Accomplishments: - Continued support of Phase 2 cyber security certification test scar - Completed test data analysis for CAC2S Phase 2 DT. - Conducted Operational Test Readiness Review (OTRR). - Provided MITRE support during CAC2S Phase 2 IOT&E.	ns.						
FY 2017 Plans: - Conduct yearly Cyber Compliance Tests required with each of the conduct the Annual Security Review testing to support the maintena (ATO). - Provide design and development support of the CAC2S Phase 1 C system obsolescence and to ensure accreditation is maintained. - Continue MITRE support during G/ATOR DT-C1, and Operational	Communication Subsystem (CS) to mitigate						
		1	1				

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy				Date: May	2017		
Appropriation/Budget Activity 1319 / 7	PE 0206335M / (U)Common Avia	R-1 Program Element (Number/Name) PE 0206335M I (U)Common Aviation Command and Control Sys (CAC2S)					
B. Accomplishments/Planned Programs (\$ in Millions, Article	e Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	
 Conduct yearly Cyber Compliance Tests required with each of to conduct the Annual Security Review testing to support the mainte (ATO). Perform root cause analysis of G/ATOR and related CTN findin support the G/ATOR DT-1E and IOT&E events. 	enance of the CAC2S Authority to Operate						
FY 2018 OCO Plans: N/A							
Title: Test and Evaluation	Articles:	8.953	3.275	4.186 -	0.000	4.186	
FY 2016 Accomplishments: - Conducted CAC2S Phase 2 interoperability Independent Verific CTN. - Conducted CAC2S Phase 2 Developmental Test C2 (DT-C2) w Test and Evaluation (IOT&E). - Completed CAC2S Phase 2 System Level Test. - Conducted CAC2S Phase 2 Joint Interoperability Test. - Conducted CAC2S Phase 2 IOT&E.	,						
FY 2017 Plans: - Conduct Interoperability testing with G/ATOR. - Initiate interface test support during G/ATOR DT-C1 and Opera - Prepare for G/ATOR DT-1E, IOT&E and CAC2S Phase 2 FOT&							
FY 2018 Base Plans: Increase from FY 2017 to FY 2018 is due to providing interface swell as CAC2S Phase 2 FOT&E test events Complete interface test support during G/ATOR DT-C1 and OA - Initiate interface test support during G/ATOR DT-1E and IOT&E - Initiate and approve the Air Command and Control Interface De changes resulting from the updated and approved IDD and support Software adaptive layer.	test events. E. esign Document (IDD). Implement the software						

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date : May 2017
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)
1319 / 7	PE 0206335M I (U)Common Aviation	3373 I Common Aviation Command and
	Command and Control Sys (CAC2S)	Control System (CAC2S)

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
- Implement the Mode 5, Mode S and CTN Web Identification software changes required to support the CAC2S FOT&E and close out the caveats identified in the CAC2S Joint Interoperability Certification memorandum.					
FY 2018 OCO Plans: N/A					
Accomplishments/Planned Programs Subtotals	13.959	11.850	7.343	0.000	7.343

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

			FY 2018	FY 2018	FY 2018					Cost To	
Line Item	FY 2016	FY 2017	Base	OCO	<u>Total</u>	FY 2019	FY 2020	FY 2021	FY 2022	Complete	Total Cost
 PMC/4644: Common 	16.623	53.012	44.928	-	44.928	32.875	41.504	34.228	17.553	5.176	259.729
Aviation Command And											

Remarks

RDT&E prior to FY15 is listed in PE 0206313M Marine Corps Comms Systems, Project 2273 Air Operations Command & Control (C2) Systems.

PMC funding for FY15 and beyond is listed in BLI 4644 Common Aviation Command and Control System (CAC2S). Prior to FY15 PMC funding is listed in BLI 4640 Air Operations C2 Systems, Common Aviation Command and Control Systems (CAC2S).

D. Acquisition Strategy

Control System (CAC2S)

CAC2S will employ an evolutionary acquisition strategy utilizing an incremental and phased approach for development and fielding of the CAC2S. The Capability Production Document (CPD) identifies two increments to achieve the full requirements of CAC2S. The current acquisition strategy addresses Increment I of the CAC2S development process and focuses on the requirements that will modernize the assault and air support, air defense and control, and Aviation Combat Element (ACE) battle management capabilities of the Marine Air Command and Control System (MACCS). Increment I of the CAC2S will be accomplished through a two phased approach. Phase 1 addresses the requirements to establish the baseline CAC2S capabilities for the MACCS and improve Air Command and Control (AC2) performance and effectiveness. Phase 2 will address the requirements for remaining ACE Battle Management Command & Control (BMC2) requirements.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy

R-1 Program Element (Number/Name)

Appropriation/Budget Activity 1319 / 7

PE 0206335M I (U)Common Aviation Command and Control Sys (CAC2S)

Project (Number/Name)

3373 I Common Aviation Command and

Date: May 2017

Control System (CAC2S)

Product Developmen	nt (\$ in Mi	illions)		FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO					
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	Total Cost	Target Value of Contract
Hardware Development	WR	NSWC CD : Crane, IN	1.031	0.753	Nov 2015	0.258	Nov 2016	0.264	Nov 2017	-		0.264	0.896	3.202	-
Engineering Manufacturing and Development	C/FPIF	General Dynamics : Pheonix, AZ	3.800	0.000		0.000		0.000		-		0.000	16.544	20.344	59.922
Software Development	WR	NSWC DD : Dahlgren, VA	1.951	0.422	Nov 2015	0.813	Nov 2016	0.799	Nov 2017	-		0.799	0.000	3.985	-
Hardware and Software Engineering	C/CPIF	NSWC CD : Crane, IN	0.000	0.000		4.676	Mar 2017	0.000		-		0.000	0.000	4.676	-
		Subtotal	6.782	1.175		5.747		1.063		-		1.063	17.440	32.207	-

Remarks

Decrease in FY 2018 is due to completion of hardware and software engineering in support of Phase 2 Engineering Change Proposals (ECPs) resulting from IOT&E.

Support (\$ in Million	. ,			FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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	Total Cost	Target Value of Contract
Reliability Assessment	MIPR	AMSSA : Aberdeen, MD	0.501	0.300	Nov 2015	0.185	Nov 2016	0.000		-		0.000	0.238	1.224	-
Architecture Support	WR	SpaWar : Charleston, SC	0.250	0.200	Nov 2015	0.000		0.000		-		0.000	0.350	0.800	-
Interoperability Certification	MIPR	JITC : Fort Huachuca, AZ	0.500	0.300	Nov 2015	0.077	Nov 2016	0.000		-		0.000	0.265	1.142	-
Interoperability Certification	Sub Allot	MCTSSA : Camp Pendleton, CA	0.170	0.000		0.000		0.000		-		0.000	0.000	0.170	-
Data Analysis	WR	NSWC Corona : Corona, CA	0.376	0.000		0.000		0.000		-		0.000	0.000	0.376	-
Logistics Support	Sub Allot	LogCom : Albany, GA	0.502	0.219	Nov 2015	0.000		0.000		-		0.000	0.302	1.023	-
Safety Engineering	C/FP	MCSC Safety : TBD	0.250	0.175	Nov 2015	0.411	Nov 2016	0.000		-		0.000	0.095	0.931	-
Travel	Various	Travel : TBD	0.000	0.143	Oct 2015	0.072	Oct 2016	0.050	Oct 2017	-		0.050	Continuing	Continuing	Continuin

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy

Appropriation/Budget Activity

1319 *I* 7

R-1 Program Element (Number/Name)

PE 0206335M I (U)Common Aviation Command and Control Sys (CAC2S)

Date: May 2017

Project (Number/Name)

3373 I Common Aviation Command and

Control System (CAC2S)

Support (\$ in Millions	s)			FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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
Software Engineering	WR	NSWC DD : Dahlgren, VA	0.000	0.528	Feb 2016	1.117	Nov 2016	1.151	Nov 2017	-		1.151	0.000	2.796	-
Hardware Engineering	WR	NSWC CD : Crane, IN	0.000	0.000		0.399	Nov 2016	0.372	Nov 2017	-		0.372	0.000	0.771	-
		Subtotal	2.549	1.865		2.261		1.573		-		1.573	-	-	-

Test and Evaluation	(\$ in Milli	ons)		FY 2	2016	FY 2	2017		2018 ase		2018 CO	FY 2018 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
Testing and Evaluation	WR	NSWC - Port Huenueme : Port Huenueme, CA	1.001	0.750	Nov 2015	0.597	Nov 2016	0.623	Nov 2017	-		0.623	0.955	3.926	-
Testing and Evaluation	Sub Allot	MCOTEA : Quantico, VA	1.338	1.200	Jan 2016	0.500	Jan 2017	0.000		-		0.000	3.465	6.503	-
Testing and Evaluation	WR	MACCS - 2 : Cherry Point, NC	0.500	0.261	Jan 2016	0.000		0.000		-		0.000	0.125	0.886	-
Testing and Evaluation	Sub Allot	MCTSSA : Camp Pendleton, CA	6.200	0.876	Nov 2015	0.288	Nov 2016	0.250	Nov 2017	-		0.250	0.952	8.566	-
Testing and Evaluation	MIPR	NAWC AB : Patuxent River, MD	6.000	1.863	Jan 2016	0.000		0.000		-		0.000	1.258	9.121	-
Testing and Evaluation	WR	NSWC CD : Crane, IN	4.426	2.652	Nov 2015	0.555	Nov 2016	0.907	Nov 2017	-		0.907	7.445	15.985	-
Testing and Evaluation	WR	NSWC DD : Dahlgren, VA	0.000	1.351	Nov 2015	1.335	Nov 2016	2.406	Nov 2017	-		2.406	0.000	5.092	-
		Subtotal	19.465	8.953		3.275		4.186		-		4.186	14.200	50.079	-

Remarks

Increase in FY 2018 is due to initiation of CAC2S Phase 2 FOT&E and providing integrated test support during G/ATOR DT-1E and IOT&E.

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy		Date: May 2017

Appropriation/Budget Activity

R-1 Program Element (Number/Name)
PE 0206335M / (U)Common Aviation

R-1 Program Element (Number/Name)
3373 / Common Aviation Command and

1319 / 7

PE 0206335M / (U)Common Aviation
Command and Control Sys (CAC2S)

Control Sys (CAC2S) Control System (CAC2S)

Management Services (\$ in Millions)			FY 2	2016	FY 2	2017	FY 2 Ba	2018 ise	FY 2		FY 2018 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	Total Cost	Target Value of Contract
Engineering and Program Management Support	C/FFP	Get It Done (GID) Solutions LLC : Fredericksburg, VA	1.752	0.980	Mar 2016	0.000		0.000		-		0.000	0.000	2.732	19,096.227
Sensor Management	C/FFP	MITRE : Bedford, MA	1.020	0.986	Oct 2015	0.567	Oct 2016	0.521	Oct 2017	-		0.521	2.958	6.052	-
		Subtotal	2.772	1.966		0.567		0.521		-		0.521	2.958	8.784	-

	Drien			FY 2018	FY 2018	EV 2049	Coat To	Total	Target
	Prior			FY 2018		FY 2018	Cost To	Total	Value of
	Years	FY 2016	FY 2017	Base	oco	Total	Complete	Cost	Contract
Project Cost Totals	31.568	13.959	11.850	7.343	-	7.343	-	-	-

Remarks

Funding decreases, in the amount of \$4.507M, from FY 2017 to FY 2018 due to the completion of hardware and software engineering in support of Phase 2 Engineering Change Proposals (ECPs) resulting from IOT&E.

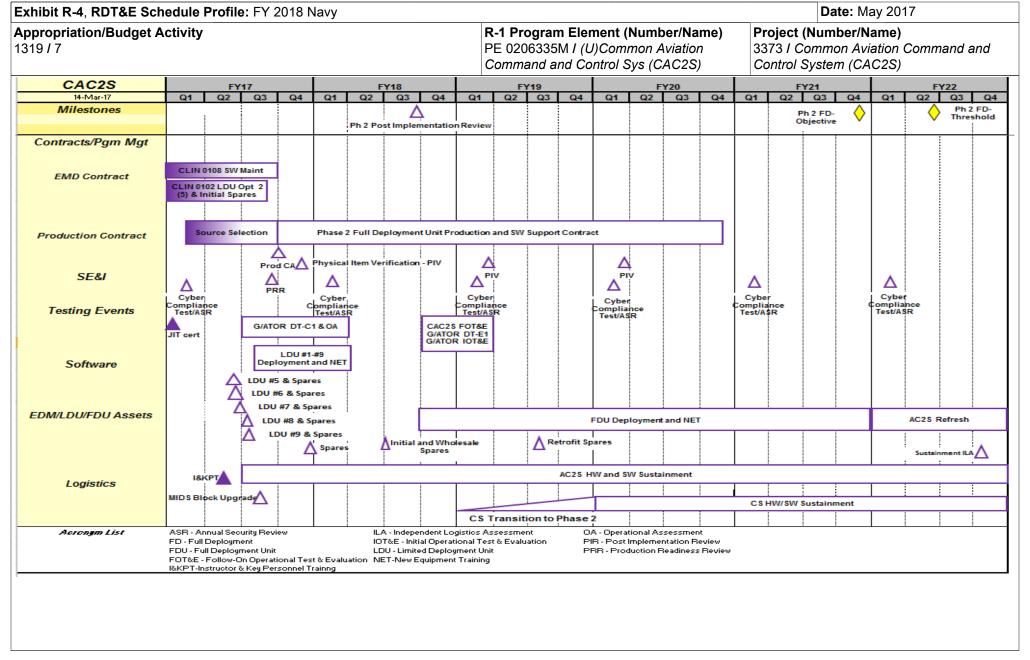


Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy			Date: May 2017
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (N	umber/Name)
1319 / 7	PE 0206335M I (U)Common Aviation	3373 I Con	nmon Aviation Command and
	Command and Control Sys (CAC2S)	Control Sy	stem (CAC2S)

Schedule Details

	Sta	art	End		
Events by Sub Project	Quarter	Year	Quarter	Year	
Proj 3373					
Full Deployment Unit (FDU) Production Contract (PMC BLI 464400)	3	2017	4	2020	
Communication Subsystem (CS) Hardware Modification Development (Phase 1)	2	2017	3	2018	
Limited Deployment Units (LDU) 1-9 deliveries, deployment and NET (PMC BL 464400)	3	2017	2	2018	
Interoperability Testing for G/ATOR Developmental Test - C1 & Operational Assessment	3	2017	2	2018	
Cyber Compliance Test / Annual Service Review FY18	1	2018	1	2018	
Full Deployment Unit (FDU) deployment and NET (PMC BLI 464400)	3	2018	4	2021	
CAC2S Follow-On Operational Test & Evaluation	4	2018	2	2019	
G/ATOR Initial Operational Test & Evaluation	4	2018	2	2019	
G/ATOR Developmental Test - 1E	3	2018	2	2019	
Cyber Compliance Test / Annual Service Review FY19	1	2019	1	2019	
Cyber Compliance Test / Annual Service Review FY20	1	2020	1	2020	
Cyber Compliance Test / Annual Service Review FY21	1	2021	1	2021	
Cyber Compliance Test / Annual Service Review FY22	1	2022	1	2022	
CAC2S Full Deployment Threshold	2	2022	2	2022	