Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy											Date: February 2020	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0206313M *I Marine Corps Comms Systems*							
COST ($ in Millions)	**Prior Years**	**FY 2019**	**FY 2020**	**FY 2021 Base**	**FY 2021 OCO**	**FY 2021 Total**	**FY 2022**	**FY 2023**	**FY 2024**	**FY 2025**	**Cost To Complete**	**Total Cost**
Total Program Element	1,577.222	180.758	171.307	207.662	-	207.662	125.858	147.856	145.604	144.779	Continuing	Continuing
2270: *Exp Indirect Fire Gen Supt Wpn Sys*	309.476	22.924	29.620	25.978	-	25.978	28.028	30.230	34.494	34.676	Continuing	Continuing
2273: *Air Ops Cmd & Control (C2) Sys*	446.669	8.091	5.397	6.684	-	6.684	7.656	5.903	5.987	6.109	Continuing	Continuing
2274: *Command & Control Warfare Sys*	53.249	11.512	10.454	8.592	-	8.592	14.404	28.429	22.529	22.981	Continuing	Continuing
2275: *Marine Corps Tactical Radio Systems*	81.083	18.701	13.348	14.469	-	14.469	12.848	11.904	9.822	9.994	Continuing	Continuing
2276: *Comms Switching and Control Sys*	46.562	1.568	1.778	4.749	-	4.749	1.585	1.616	1.649	1.682	Continuing	Continuing
2277: *System Engineering and Integration*	35.769	4.186	5.071	2.627	-	2.627	2.679	4.918	5.233	11.337	Continuing	Continuing
2278: *Air Defense Weapons System*	101.583	88.051	64.535	131.052	-	131.052	43.256	48.967	49.539	40.409	Continuing	Continuing
2510: *MAGTF CSSE & SE*	301.156	1.279	1.814	0.962	-	0.962	0.972	0.990	1.009	1.029	Continuing	Continuing
3099: *Radar System*	201.675	12.802	13.708	1.431	-	1.431	1.460	1.497	1.528	1.559	Continuing	Continuing
3772: *Information Related Capabilities (IRC)*	0.000	4.030	4.791	3.135	-	3.135	4.820	5.087	5.332	6.351	Continuing	Continuing
3773: *Fire Coordination and Sensors*	0.000	7.614	7.801	7.983	-	7.983	8.150	8.315	8.482	8.652	Continuing	Continuing
9999: *Congressional Adds*	0.000	0.000	12.990	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	12.990

A. Mission Description and Budget Item Justification

This program element provides funding to develop the command and control (C2) support and information infrastructures for the Fleet Marine Force and supporting establishment. Doctrinally, the C2 support system and the information infrastructure form two parts of a triad of capabilities which permits command and control systems to be transformed into a complete operating system. The third element of the triad is command and control organization and is not covered in this program element. USMC command and control is divided into seven functional areas and one supporting functional area as follows: intelligence C2, fire support C2, air operations C2, radio systems C2, combat service support C2, warfare C2, radar systems C2, and C2 support (information processing and communications).

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy	Date: February 2020
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0206313M *I Marine Corps Comms Systems*

Within this program element, subprojects have been grouped by C2 functional area for more efficient planning. Air defense weapons systems have been added to facilitate planning and a separate project is used for systems assigned to the supporting establishment. Subprojects which support the Commander's decision processes have been collected into the Command Post Systems project since these systems must work in close cooperation to ensure effective C2 of Marine Air Ground Task Forces.

B. Program Change Summary ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	188.813	143.317	101.043	-	101.043
Current President's Budget	180.758	171.307	207.662	-	207.662
Total Adjustments	-8.055	27.990	106.619	-	106.619
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	12.990			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-2.505	0.000			
• SBIR/STTR Transfer	-5.550	0.000			
• Program Adjustments	0.000	15.000	37.037	15.000	52.037
• Rate/Misc Adjustments	0.000	0.000	69.582	-15.000	54.582

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2019	FY 2020
Project: 9999: *Congressional Adds*		
Congressional Add: *Shipboard integration and AI networking/NOTM*	0.000	4.390
Congressional Add: *Multi function electronic warfare*	0.000	8.600
Congressional Add Subtotals for Project: 9999	0.000	12.990
Congressional Add Totals for all Projects	0.000	12.990

Change Summary Explanation

The FY 2021 funding request was reduced by $20.400 million to account for the availability of prior year execution balances.

The net increase of $36.355M between FY 2020 and FY 2021 is primarily due to the following major program adjustment within the PE:

1) Air Defense Weapons System increase of $66.517M from FY 2020 to FY 2021 is due to the additional integration, engineering, developmental, and operational testing required for major components on the MADIS Increment 1.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020	
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0206313M / *Marine Corps Comms Systems*				Project (Number/Name) 2270 / *Exp Indirect Fire Gen Supt Wpn Sys*			
COST ($ in Millions)	**Prior Years**	**FY 2019**	**FY 2020**	**FY 2021 Base**	**FY 2021 OCO**	**FY 2021 Total**	**FY 2022**	**FY 2023**	**FY 2024**	**FY 2025**	**Cost To Complete**	**Total Cost**
2270: *Exp Indirect Fire Gen Supt Wpn Sys*	309.476	22.924	29.620	25.978	-	25.978	28.028	30.230	34.494	34.676	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Marine Air-Ground Task Force (MAGTF) Command and Control (C2) Systems (MAGTF C2) - MAGTF C2 Tactical Service Oriented Architecture (TSOA) is an ACAT IV(M) program of record (POR) that is the Marine Corps' response to the Department of Defense (DoD) Net-Centric Services Strategy (NCSS). TSOA is a software only "IT-Box" program that was created in order to achieve agility and greater cost reduction across the USMC Command and Control (C2) Enterprise. This POR has been identified by the USMC Combat Development and Integration (CD&I) as the USMC's Service Oriented Infrastructure (SOI), which is equivalent to a Common Operating Environment (COE). The USMC seeks to rectify its current C2 architecture, which is composed of disparate and duplicative legacy systems through TSOA. TSOA will enable a collapse of this disparate C2 construct and create a Net-Centric environment where Marines employ user-centered applications that access required information across Authoritative Data Sources (ADS). This will be achieved through the CD&I-directed TSOA compliance effort in order to reduce duplicative product development and enable a divestiture of legacy disparate systems. This requires additional effort to ensure other ADSs are compliant with the TSOA product line.

TSOA's purpose is to ensure that Marines receive the right information, from trusted and accurate sources, when and where it is needed. This enables decisions "in context" for USMC operations across the Range of Military Operations and in support of the Unified Command Plan. TSOA's four capabilities include: Infrastructure and Services (I&S) which is the capability of authorized users to subscribe and publish required information from ADS with the use of software connectors; Agile Application Development (A2D) which is the capability to develop, accredit, and provide easy-to-learn, user-defined software applications that meet emergent Marine needs; Modular Software Architecture (MSA) which is virtualized, hardware agnostic, and scalable; Marine Corps Software Resource Center (MCSRC) is the Marine Corps' enterprise "App Store" for developed applications that allows Marines the ability to download, review, rate, and provide feedback. Funding in FY21 will be used to federate data across the Marine Air-Ground Task Force and Joint Task Force to support the USMC Common Operational Picture (COP)/Common Tactical Picture (CTP).

Joint Battle Command - Platform (JBC-P) Family of Systems (FoS) - JBC-P FoS is an Army led ACAT II program of Joint Requirements Oversight Council (JROC) interest, formerly known as the Blue Force Tracker (BFT) FoS. It is comprised of L-Band SATCOM and is a digital, battle command information FoS that provides integrated, on the move, timely, relevant Command and Control Situational Awareness (C2SA) information to tactical combat, combat support and combat service support commanders, leaders, and key C2 nodes. JBC-P FoS will provide JROC mandated C2SA convergence across Combat Operations Centers (COC), ground vehicles and dismounted personnel.

Identity Dominance System-MC (IDS-MC) is a multi-modal (fingerprint, iris, and face) biometric collection system that provides the USMC a reliable and effective capability to collect, share, match, access, verify and store identity information. IDS-MC will enable the Marine to collect appropriate biometric, biographical and reference information on an individual and match this locally developed information with pre-existing information available to the expeditionary force. The system will display match results with linkage to the respective individual's biographical and reference information as well as help analyze the response, update records as

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2270 / *Exp Indirect Fire Gen Supt Wpn Sys*

appropriate, create reports and disseminate updated information. The primary mission of IDS-MC is to provide the Marine Corps with the means to identify persons encountered in the battle space. While IDS-MC is not an intelligence analysis system, it does provide identification information in support of military intelligence and law enforcement operations by providing positive identification of persons of interest. IDS-MC is an enabler in the areas of detainee management and questioning, base access, counterintelligence screening, border control, law enforcement, displaced persons' management and aiding in humanitarian assistance missions. IDS-MC supports the tactical application of identity dominance and fully supports a forward presence, crisis response and contingency response capability.

The Expeditionary Forensic Exploitation Capability (EFEC) is a multi-modal (fingerprint, DNA, document, cellular, media, chemical, and fire arm) forensic collection system that provides the United States Marine Corps (USMC) a reliable and effective capability to recognize, protect, collect, analyze, store and share forensic information. This organic Marine Corps forensic capability supports deployed Marine Forces with agile, ruggedized, and scalable expeditionary forensics that are compatible and fully integrated with joint, other Service, and interagency laboratories, yet also tailored to the unique operating requirements of the maritime domain. Maritime applications include the ability to support Marine Expeditionary Units with an at sea forensic exploitation capability to conduct vessel boarding and ship search operations. EFEC supports the Information Environment through sensitive forensic testing and analysis that positively identifies personnel and trace chemicals/ elements; forensically exploits document and media; and scientifically links identities and networks to places, events, and activities. EFEC increment 2 will provide a transformative capability that integrates Artificial Intelligence and Machine Learning to enable intelligence operations, force protection, intelligence, targeting, and law enforcement activities.

Handheld Command and Control (H2C2) - The H2C2 portfolio consists of two specific capabilities - secure wireless access to multiple networks and handheld communication platforms. The handheld capability provides low cost (commercially available) platforms (smartphones and tablets) for use on tactical networks, up to SECRET, regardless of the operational environment. The secure wireless capability enables Marines burdened by wired implementations an option to leverage wireless mediums. This capability provides wireless communication between a variety of devices.

Global Command and Control System Tactical Combat Operations (GCCS TCO) - The GCCS TCO program is the principal tool within the MAGTF for situational awareness through distribution of the Common Tactical Picture (CTP). It supports tactical operations providing information via high speed computer systems in a timely manner and includes the Tactical COP Workstation/Servers. RDT&E funding allows for developmental software development as the program of record changes from a client/server relationship to a cloud based enterprise solution.

Military Global Positioning System (GPS) User Equipment (MGUE) - MGUE program efforts are focused on increasing the resiliency and assurance of Positioning, Navigation, and Timing (PNT) capabilities across the enterprise, which enable Marine Air-Ground Task Force (MAGTF) Commanders to know and trust position, effectively navigate, and receive precise and accurate timing for users, platforms, and systems across warfighting functions. Current MGUE efforts will enable the Marine Corps to transition to the modernized military GPS signal (M-Code) through participation in both Air Force-led MGUE Increment I and Increment II programs. Increment I will deliver a receiver card capable of being embedded and integrated within a variety of USMC platforms and end items, while Increment II will deliver the next generation handheld device and will replace the Defense Advanced GPS Receiver (DAGR).

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2270 / *Exp Indirect Fire Gen Supt Wpn Sys*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: MAGTF C2: Product Development	7.393	12.869	12.189	0.000	12.189
Articles:	-	-	-	-	-
FY 2020 Plans: - Initiate and complete the release of new logistics applications and intelligence connectors. - Initiate harvested cloud data which enables higher fidelity Machine Learning models. This will enable future Cognitive Assistants. - Initiate MCSRC support for USMC Common Handheld devices for lightweight applications. ***FY 2021 Base Plans:*** - Continue harvesting cloud data which enables higher fidelity Machine Learning models. This will enable future Cognitive Assistants. - Continue MCSRC support for USCMC Common Handheld devices for lightweight applications. - Initiate and complete the federation and data correlation services to support Common Operational Picture (COP)/Common Tactical Picture (CTP) across the Marine Air-Ground Task Force (MAGTF)/Joint Task Force (JTF). ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Decrease of $0.680M from FY20 to FY21 is due to the completion and subsequent release of the logistics applications to the Fleet.					
Title: MAGTF C2: Support Costs	0.955	1.387	1.387	0.000	1.387
Articles:	-	-	-	-	-
FY 2020 Plans: - Continue system engineering support for system integration, configuration management, and technical assessments of software products. ***FY 2021 Base Plans:*** - Continue system engineering support for system integration, configuration management, and technical assessments of TSOA software products. ***FY 2021 OCO Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2270 / *Exp Indirect Fire Gen Supt Wpn Sys*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
N/A					
Title: MAGTF C2: Test and Evaluation	1.578	2.081	2.081	0.000	2.081
Articles:	-	-	-	-	-
FY 2020 Plans: - Initiate TSOA compliance testing with USMC Tactical Data Systems (TDS). - Continue to participate in technical working groups in support of test and engineering. - Continue to provide technical assistance to other programs supported by Marine Corps Tactical Systems Support Activity (MCTSSA) that involve the use of these systems as well as through the Operating Forces Tactical Systems Support Center (OFTSSC) trouble calls.					
FY 2021 Base Plans: - Continue TSOA compliance testing with USMC tactical Data Systems (TDS). - Continue to participate in technical working groups in support of test and engineering. - Continue to provide technical assistance to other programs supported by Marine Corps Tactical Systems Support Activity (MCTSSA) that involve the use of these systems as well as through the Operating Forces Tactical Systems Support Center (OFTSSC) trouble calls.					
FY 2021 OCO Plans: N/A					
Title: MAGTF C2: Management Services	1.296	1.296	1.296	0.000	1.296
Articles:	-	-	-	-	-
FY 2020 Plans: - Continue to receive software engineering support to provide appropriate government direction in design and development of software, conduct of source code reviews, and prime vendor oversight from Federally Funded Research and Development Center (FFRDC).					
FY 2021 Base Plans: - Continue to receive software engineering support to provide appropriate government direction in design and development of software, conduct of source code reviews, and prime vendor oversight from Federally Funded Research and Development Center (FFRDC).					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2270 / *Exp Indirect Fire Gen Supt Wpn Sys*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
- Initiate the examination and prototyping of Artificial Intelligence (AI) applications for USMC tactical commanders. ***FY 2021 OCO Plans:*** N/A					
Title: JBC-P: Product Development ***Articles:*** ***FY 2020 Plans:*** - Complete laboratory integration to facilitate network integration and test events in support of mounted and dismounted interoperability. ***FY 2021 Base Plans:*** N/A ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** The decrease of $0.588M from FY20 to FY21 is due to the Marine Corps concerted effort to modernize in accordance with the National Defense Strategy (NDS)/Defense Planning Guidance (DPG).	0.000 -	0.588 -	0.000 -	0.000 -	0.000 -
Title: JBC-P: Test and Evaluation ***Articles:*** ***FY 2020 Plans:*** - Complete laboratory integration to facilitate network integration and test events in support of mounted and dismounted interoperability. ***FY 2021 Base Plans:*** N/A ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:***	0.000 -	0.291 -	0.000 -	0.000 -	0.000 -

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2270 / *Exp Indirect Fire Gen Supt Wpn Sys*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
The decrease of $0.291M from FY20 to FY21 is due to the Marine Corps concerted effort to modernize in accordance with the National Defense Strategy (NDS)/Defense Planning Guidance (DPG).					
Title: IDS-MC: Product Development	0.000	0.000	0.450	0.000	0.450
Articles:	-	-	-	-	-
FY 2020 Plans: N/A					
FY 2021 Base Plans: - Conduct software enhancements to improve interoperability with data sharing.					
FY 2021 OCO Plans: N/A					
FY 2020 to FY 2021 Increase/Decrease Statement: Increase of $0.450M from FY20 to FY21 reflects development of software enhancements to improve interoperability with data sharing.					
Title: IDS-MC: Support	0.937	0.987	0.568	0.000	0.568
Articles:	-	-	-	-	-
FY 2020 Plans: - Initiated software engineering support. - Initiated laboratory integration to facilitate test and network integration cybersecurity updates, to include Technical Readiness Reviews and software patching. - Conducted Market Research for IDS-MC Increment 3 technical refresh.					
FY 2021 Base Plans: - Continue software engineering support. - Continue laboratory integration to facilitate test and network integration cybersecurity updates, to include Technical Readiness Reviews and software patching. - Continue and complete Market Research for IDS-MC Increment 3 technical refresh.					
FY 2021 OCO Plans: N/A					
FY 2020 to FY 2021 Increase/Decrease Statement:					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2270 / *Exp Indirect Fire Gen Supt Wpn Sys*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Decrease of $0.419M from FY20 to FY21 is due to the reduction of market research for IDS-MC Increment 3 technical refresh in FY21.					
Title: EFEC: Support	0.000	0.000	0.200	0.000	0.200
Articles:	-	-	-	-	-
FY 2020 Plans: N/A ***FY 2021 Base Plans:*** - Initiate laboratory integration to facilitate test and network integration cybersecurity updates, to include Technical Readiness Reviews and software patching. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Increase of $0.200M from FY20 to FY21 reflects initiation of lab integration in support of cybersecurity updates Technical Readiness Reviews and software patching.					
Title: EFEC: Test and Evaluation	0.384	0.550	0.180	0.000	0.180
Articles:	-	-	-	-	-
FY 2020 Plans: - Completed coordination with the government labs and industry for product testing and integration of Commercial Off-the-Shelf (COTS) capabilities for the EFEC system design. - Completed User Assessments in support of EFEC MS C/FRP. ***FY 2021 Base Plans:*** -Initiate User Evaluations of EFEC Increment 2 Market Research. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:***					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2270 / *Exp Indirect Fire Gen Supt Wpn Sys*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Decrease of $0.370M from FY20 to FY21 reflects completion of coordination with the government labs and industry for product testing and integration of Commercial Off-the-Shelf (COTS) capabilities for the EFEC system design and completion of User Assessments in support of EFEC MS C/FRP in FY20.					
Title: EFEC: Management Services ***Articles:*** ***FY 2020 Plans:*** N/A ***FY 2021 Base Plans:*** - Initiate Market Research for EFEC Increment 2 technical refresh. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Increase of $0.180M from FY20 to FY21 reflects initiation of market research for EFEC Increment 2 technical refresh.	0.000 -	0.000 -	0.180 -	0.000 -	0.180 -
Title: H2C2: Product Development ***Articles:*** ***FY 2020 Plans:*** N/A ***FY 2021 Base Plans:*** Increment I: - Initiate and develop cybersecurity and vulnerability patches for MCH 1.0 software. Increment II: - Initiate software development to incorporate cybersecurity patches and software updates to improve interoperability with existing C2 Systems and peripheral devices as part of future Engineering Change Proposals (ECPs). (i.e. MCH 2.X) ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:***	1.525 -	0.000 -	1.433 -	0.000 -	1.433 -

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2270 / *Exp Indirect Fire Gen Supt Wpn Sys*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Increase of $1.433M from FY20 to FY21 reflects initiation of Cybersecurity and interoperability software updates for fielded systems.					
Title: H2C2: Support	3.968	4.286	1.100	0.000	1.100
Articles:	-	-	-	-	-
FY 2020 Plans: - Initiate develop, design, and integrate emerging capabilities across the H2C2 portfolio to include: MAGTF Common Handheld end user device, software application, peripheral equipment and integration with existing C2 programs of record. - Initiate and complete support development of Operational Architecture for the H2C2 program, required to support completion of Operational Test (OT) and Joint Interoperability Test Command (JTIC) events. - Initiate support for sustained engagement with various industry providers, quick look technology excursions and experimentation demonstrations for high risk emerging technology, to include emergent Commercial Solutions for Classified (CSfC) components and Type 1 encryption technologies. - Complete software and hardware engineering integration efforts for NSA CSfC approved capability packages in support of integration tests. ***FY 2021 Base Plans:*** - Initiate integration of additional software applications into the H2C2 end user device hardware platform. - Continue integration of emerging capabilities across the H2C2 portfolio to include: MAGTF Common Handheld end user device, software application, peripheral equipment and integration with existing C2 programs of record. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Decrease of $3.186M from FY20 to FY21 reflects completion of software and hardware engineering integration efforts for NSA CSfC approved capability packages.					
Title: H2C2: Test and Evaluation	4.888	3.285	1.016	0.000	1.016
Articles:	-	-	-	-	-
FY 2020 Plans: - Initiate Operational Test of Handheld end user devices, software application, peripheral equipment and integration into C2 programs of record, specifically JBC-P, Joint Tactical Common Operational (COP) Workstation (JTCW) and Advanced Field Artillery Tactical Data System (AFATDS).					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2270 / *Exp Indirect Fire Gen Supt Wpn Sys*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
- Complete RMF process and cybersecurity testing in support of accreditation. - Continue interoperability testing between MCH system and JBC-P and other C2 systems. - Complete JTIC testing - Complete integration testing between MCH hardware and software. ***FY 2021 Base Plans:*** Increment I: - Continue Testing of cybersecurity and vulnerability patches for MCH 1.0 software. Increment II: - Complete interoperability testing between Increment II (MCH 2.0 Software) and other existing C2 systems. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Decrease of $2.269M from FY20 to FY21 reflects completion of software and hardware developmental tests and integration test efforts associated with Increment II Handheld end user devices, software application (MCH 2.0), peripheral equipment and interoperability with C2 programs of record specifically JTCW and AFATDS.					
Title: GCCS TCO: Product Development ***Articles:*** ***FY 2020 Plans:*** - Initiate software development support services for a modernization transition from a client/server relationship to a cloud based enterprise solution. ***FY 2021 Base Plans:*** N/A ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Decrease of $2.000M from FY20 to FY21 is due to the completion of work associated with the Tactical COP Servers (TCS) 6.0 fielding events.	0.000 -	2.000 -	0.000 -	0.000 -	0.000 -
Title: MGUE: Support	0.000	0.000	1.856	0.000	1.856

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2270 / *Exp Indirect Fire Gen Supt Wpn Sys*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Articles:	-	-	-	-	-
FY 2020 Plans: N/A ***FY 2021 Base Plans:*** - Initiate operation of the Positioning, Navigation, and Timing (PNT) systems integration lab (SIL) which is responsible for evaluating technologies to increase resiliency and assurance of PNT across the USMC enterprise. Funding supports efforts such as integration of MGUE receivers into a variety of Marine Corps platforms. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Increase of $1.856M from FY20 to FY21 reflects transition from Air Force funding to Marine Corps funding for the development of Positioning, Navigation, and Timing (PNT) capabilities.					
Title: MGUE: Test and Evaluation	0.000	0.000	1.292	0.000	1.292
Articles:	-	-	-	-	-
FY 2020 Plans: N/A ***FY 2021 Base Plans:*** - Initiate efforts to increase resiliency and assurance of PNT capabilities across the USMC enterprise via a multitude of material solutions to include ground platforms, aerial platforms, and handheld devices. Initial efforts will focus on transition to M Code capability. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Increase of $1.292M from FY20 to FY21 reflects transition from Air Force funding to Marine Corps funding for the development of Positioning, Navigation, and Timing (PNT) capabilities.					
Title: MGUE: Management Services	0.000	0.000	0.750	0.000	0.750
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2270 / *Exp Indirect Fire Gen Supt Wpn Sys*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
FY 2020 Plans: N/A ***FY 2021 Base Plans:*** - Initiate MITRE engineering support to develop and update Positioning, Navigation, and Timing (PNT) technology road map and associated technical studies focused on increasing resiliency and assurance of PNT capabilities across the USMC enterprise. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Increase of $0.750M from FY20 to FY21 reflects transition from Air Force funding to Marine Corps funding for the development of Positioning, Navigation, and Timing (PNT) capabilities.					
Accomplishments/Planned Programs Subtotals	22.924	29.620	25.978	0.000	25.978

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• PMC/4631/PE0206313M: *JBC-P*	14.481	8.159	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	129.397
• PMC/4652/PE0206315M: *IDS-MC*	0.971	4.945	1.006	-	1.006	0.178	0.274	0.548	0.848	Continuing	Continuing
• PMC/4631AA/: *GCCS TCO*	2.955	1.409	0.753	-	0.753	0.096	0.098	0.100	0.102	0.000	21.202
• PMC/4631BB/: *H2C2*	0.000	11.516	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	11.516
• PMC/4633/PE0206313M: *MGUE*	0.531	7.965	0.150	-	0.150	2.650	3.613	3.386	3.511	Continuing	Continuing
• PMC/4652/PE0208018M: *EFEC*	0.000	0.000	0.000	4.200	4.200	0.000	0.000	0.000	0.000	Continuing	Continuing

Remarks

D. Acquisition Strategy

MAGTF C2 (TSOA): TSOA program office has developed its Acquisition Strategy/Acquisition Plan (ASAP) to define the TSOA operational mission, business strategy and the detailed acquisition approach relative to cost, schedule and performance drivers. The TSOA program is being developed and managed using an "IT-Box" construct that supports agile development and requirements oversight for information systems." Requirements for TSOA are described in three key documents: the Information System Initial Capabilities Document (IS-ICD), the Requirements Definition Package (RDP), and the Capability Drop (CD).

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2270 / *Exp Indirect Fire Gen Supt Wpn Sys*

JBC-P: JBC-P FoS is leveraging the Army's development of the JBC-P. The Marine Corps program is contingent upon the Army's development and acquisition strategy. The Army will fund research and development for JBC-P unless there are Service unique requirements, which the Marine Corps program office will fund. The decrease of funding is due to the Marine Corps concerted effort to modernize in accordance with the National Defense Strategy (NDS)/Defense Planning Guidance (DPG).

IDS-MC: For IDS-MC Increment 1, the Program Office continues to coordinate with the Navy's IDS Program Office for required technical support. The Marine Corps conducted agile technology assessments and test events in FY18 and FY19. The Program Office is planning a MS C/FRP in FY19, and Fielding Decision (with system procurement) in FY20. The long-term goal is to equip the Marine with a user-friendly biometric authentication technology that will be employed throughout DoD to deny the enemy freedom of movement within the populace and positively identify known insurgents within an Area of Responsibility (AOR).

EFEC: EFEC will use the evolutionary approach for technology insertion and enhancements. For EFEC Increment 2 and Increment 3, the Marine Corps will conduct market research and technology demonstrations with industry to replace EFEC Increment 1 hardware and software. The acquisition of components (software/hardware) will maximize the use of existing COTS, Non-Developmental Items, and Government Furnished Equipment for the Information Technology components.

H2C2: H2C2 will use an evolutionary approach for technology insertion. The approach will leverage and mature COTS and NDI technologies to rapidly transition a handheld data capability to other acquisition programs. H2C2 inserts mature technology into existing programs in order to fill capability gaps and requirement shortfalls. These technologies will be inserted at different times along gaining program acquisition cycles. This strategy will apply to available technology at different proposed technology insertion points for each gaining program. Additionally, H2C2 has been tasked to develop a solution that meets the JBC-P Dismount requirements and C2SA interoperability with existing C2 POR. The H2C2 program is now comprised of two increments which are procured and fielded separately. Increment I provides a dismounted C2SA capability at the squad level via a tethered connection to tactical radios.

GCCS TCO: The Program is managed by Marine Corps System Command (MCSC) internal program management, engineering, logistics and financial support. Hardware acquisition is accomplished by using MCSC Marine Corps Common Hardware Suite (MCHS) and a combination of MCHS and MCSC Command and Control Systems (C2S) contracting. Software acquisition, integration and support is provided using Space and Naval Information Warfare Atlantic (NIWC-A) program reutilizes Joint Staff, Defense Information Systems Agency (DISA) provided software for its functional and capability requirements and Marine Corps specific hardware for its hardware solution.

MGUE: As the commodities management office, the Marine Corps program office will continue to leverage efforts conducted within the joint environment to assist in informing and implementing the enterprise positioning, navigation, and timing strategy for the Marine Corps. The program office will seek out opportunities to maximize the use of COTS/NDI products in its approach, while identifying opportunities for integration of emerging technologies across a variety of ground platforms.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2270 / *Exp Indirect Fire Gen Supt Wpn Sys*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MAGTF C2	C/CPFF	NIWC-A : Charleston, SC	55.957	2.693	Apr 2019	2.815	Apr 2020	2.915	Apr 2021	-		2.915	Continuing	Continuing	Continuing
MAGTF C2	C/CPFF	NIWC-P : San Diego, CA	7.555	1.000	Jun 2019	2.986	May 2020	3.174	May 2021	-		3.174	Continuing	Continuing	Continuing
MAGTF C2	WR	NIWC-LANT : Charleston, SC	10.032	1.500	Feb 2019	1.004	Feb 2020	1.200	Feb 2021	-		1.200	Continuing	Continuing	Continuing
MAGTF C2	WR	NRL : Washington, DC	2.483	0.000		0.864	Jun 2020	0.900	Mar 2021	-		0.900	Continuing	Continuing	Continuing
MAGTF C2	C/CPFF	ARL : Penn State, PA	0.000	0.600	Jun 2019	1.200	Apr 2020	0.000		-		0.000	0.000	1.800	-
MAGTF C2	C/CPFF	NG : San Diego, CA	0.000	1.600	Jun 2019	4.000	Dec 2019	4.000	Dec 2020	-		4.000	0.000	9.600	-
JBC-P	C/CPFF	NIWC LANT : Charleston, SC	0.827	0.000		0.003	Dec 2019	0.000		-		0.000	0.000	0.830	-
JBC-P	C/CPFF	NSWC2 : Crane, IN	0.399	0.000		0.291	Dec 2019	0.000		-		0.000	0.000	0.690	-
JBC-P	C/FFP	MCTSSA : Camp Pendleton, CA	0.252	0.000		0.294	Dec 2019	0.000		-		0.000	0.000	0.546	-
IDS-MC	C/CPFF	NIWC LANT : Charleston, SC	0.000	0.000		0.000		0.450	Feb 2021	-		0.450	0.000	0.450	-
H2C2	WR	DPSS : China Lake, CA	0.000	0.000		0.000		1.433	Nov 2020	-		1.433	0.000	1.433	-
H2C2	C/FFP	NIWC LANT : Charleston, SC	0.000	1.525	Nov 2019	0.000		0.000		-		0.000	0.000	1.525	-
GCCS TCO	C/CPFF	NIWC-A : Charleston, SC	0.000	0.000		2.000	May 2020	0.000		-		0.000	0.000	2.000	-
Prior Years Cumulative Funding	Various	Various : Various	167.367	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	244.872	8.918		15.457		14.072		-		14.072	Continuing	Continuing	N/A

Remarks

Decrease of $1.385M from FY20 to FY21 largely due to completion of GCCS TCO product development efforts.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206313M / *Marine Corps Comms Systems*	Project (Number/Name) 2270 / *Exp Indirect Fire Gen Supt Wpn Sys*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MAGTF C2	WR	NIWC-P : San Diego, CA	7.524	0.955	Feb 2019	1.387	Feb 2020	1.387	Feb 2021	-		1.387	0.000	11.253	-
IDS-MC	C/FFP	MITRE : Mc Lean, Va	0.703	0.156	Nov 2018	0.000		0.000		-		0.000	0.000	0.859	-
IDS-MC	WR	NIWC LANT : Charleston, SC	0.643	0.520	Mar 2019	0.987	Mar 2020	0.568	Dec 2020	-		0.568	Continuing	Continuing	Continuing
IDS-MC	C/CPFF	ARDEC : Picatinny Arsenal, NJ	0.000	0.261	Jun 2019	0.000		0.000		-		0.000	0.000	0.261	-
EFEC	WR	NIWC LANT : Charleston, SC	0.000	0.000		0.000		0.200	Dec 2020	-		0.200	0.000	0.200	-
H2C2 Integration Eng	WR	NIWC LANT : Charleston, SC	3.484	0.557	Mar 2019	1.053	Dec 2019	0.220	Dec 2020	-		0.220	0.000	5.314	-
H2C2 Integration Eng	C/FFP	NIWC LANT : Charleston, SC	0.664	0.874	Mar 2019	0.578	Dec 2019	0.440	Dec 2020	-		0.440	0.000	2.556	-
H2C2 Integration Eng	WR	NSWC Crane : Crane, IN	1.784	0.575	Mar 2019	0.732	Nov 2019	0.440	Dec 2020	-		0.440	0.000	3.531	-
H2C2 Integration Eng	WR	NSWC China Lake : China Lake, CA	0.615	1.962	Mar 2019	1.623	Dec 2019	0.000		-		0.000	0.000	4.200	-
H2C2 Integration Eng	C/FFP	NSWC Crane2 : Crane, IN	0.060	0.000		0.300	Oct 2019	0.000		-		0.000	Continuing	Continuing	Continuing
MGUE	WR	NIWC LANT : Charleston, SC	0.000	0.000		0.000		1.103	Feb 2021	-		1.103	0.000	1.103	-
MGUE	WR	NSWC Corona : Norco, CA	0.000	0.000		0.000		0.753	Dec 2020	-		0.753	0.000	0.753	-
Prior Years Cumulative Funding	Various	Various : Various	1.172	0.000		0.000		0.000		-		0.000	0.000	1.172	-
		Subtotal	16.649	5.860		6.660		5.111		-		5.111	Continuing	Continuing	N/A

Remarks

Decrease of $1.549M from FY20 to FY21 is largely due to reduction of H2C2 integration engineering efforts.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206313M / *Marine Corps Comms Systems*	Project (Number/Name) 2270 / *Exp Indirect Fire Gen Supt Wpn Sys*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MAGTF C2	WR	NRL : Washington, DC	4.017	0.500	Mar 2019	0.000		0.000		-		0.000	0.000	4.517	-
MAGTF C2	C/ FFPLOE	MCTSSA : Camp Pendleton, CA	4.291	1.078	Jun 2019	2.081	Apr 2020	2.081	Apr 2021	-		2.081	0.000	9.531	-
JBCP	C/FFP	NSWC Corona5 : Norco, CA	0.868	0.000		0.291	Jun 2020	0.000		-		0.000	0.000	1.159	-
EFEC	WR	NIWC LANT : Charleston, SC	0.000	0.384	Nov 2018	0.550	Nov 2019	0.180	Nov 2020	-		0.180	0.000	1.114	-
H2C2	WR	NIWC LANT : Charleston, SC	1.762	0.000		0.250	Dec 2019	0.151	Dec 2020	-		0.151	0.000	2.163	-
H2C2	WR	MCOTEA : Quantico, VA	0.000	0.000		1.785	Dec 2019	0.400	Dec 2020	-		0.400	0.000	2.185	-
H2C2	C/FFP	NIWC/LANT : Charleston, SC	0.858	0.000		0.500	Dec 2019	0.225	Dec 2020	-		0.225	0.000	1.583	-
H2C2	C/FFP	MCTSSA : Camp Pendleton, CA	0.690	0.000		0.750	Dec 2019	0.240	Mar 2021	-		0.240	0.000	1.680	-
H2C2	C/FFP	MCSC : Quantico, VA	0.000	4.725	Feb 2019	0.000		0.000		-		0.000	0.000	4.725	-
H2C2	C/FFP	NSWC DAHLGREN : Dahlgren, VA	0.000	0.008	Oct 2019	0.000		0.000		-		0.000	0.000	0.008	-
H2C2	WR	NSWC CRANE : Crane, IN	0.000	0.155	Oct 2019	0.000		0.000		-		0.000	0.000	0.155	-
MGUE	TBD	MCTSSA : Camp Pendleton, CA	0.000	0.000		0.000		0.343	Apr 2021	-		0.343	0.000	0.343	-
MGUE	WR	NIWC LANT : Charleston, SC	0.000	0.000		0.000		0.949	Feb 2021	-		0.949	0.000	0.949	-
Prior Years Cumulative Funding	Various	Various : Various	22.000	0.000		0.000		0.000		-		0.000	0.000	22.000	-
		Subtotal	34.486	6.850		6.207		4.569		-		4.569	0.000	52.112	N/A

Remarks

Decrease of $1.638M from FY20 to FY21 largely due to reduction of H2C2 test and evaluation efforts.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2270 / *Exp Indirect Fire Gen Supt Wpn Sys*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MAGTF C2	C/CPFF	CECOM/MITRE : Ft. Monmouth, NJ	8.828	1.296	Apr 2019	1.296	Jun 2020	1.296	Jun 2021	-		1.296	Continuing	Continuing	Continuing
EFEC	C/CPFF	CECOM/MITRE : Ft. Monmouth, NJ	0.000	0.000		0.000		0.180	Jan 2021	-		0.180	0.000	0.180	-
MGUE	C/CPFF	CECOM/MITRE : Ft. Monmouth, NJ	0.000	0.000		0.000		0.750	Feb 2021	-		0.750	0.000	0.750	-
Prior Years Cumulative Funding	Various	Various : Various	4.641	0.000		0.000		0.000		-		0.000	0.000	4.641	-
		Subtotal	13.469	1.296		1.296		2.226		-		2.226	Continuing	Continuing	N/A

Remarks

Increase of $0.930M from FY20 to FY21 is due to MGUE transition from Air Force funding for the development of Positioning, Navigation, and Timing (PNT) capabilities as well as initiation of market research for EFEC Increment 2 technical refresh.

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	309.476	22.924		29.620		25.978		-		25.978	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2270 / *Exp Indirect Fire Gen Supt Wpn Sys*

MAGTF C2 PROGRAM SCHEDULE

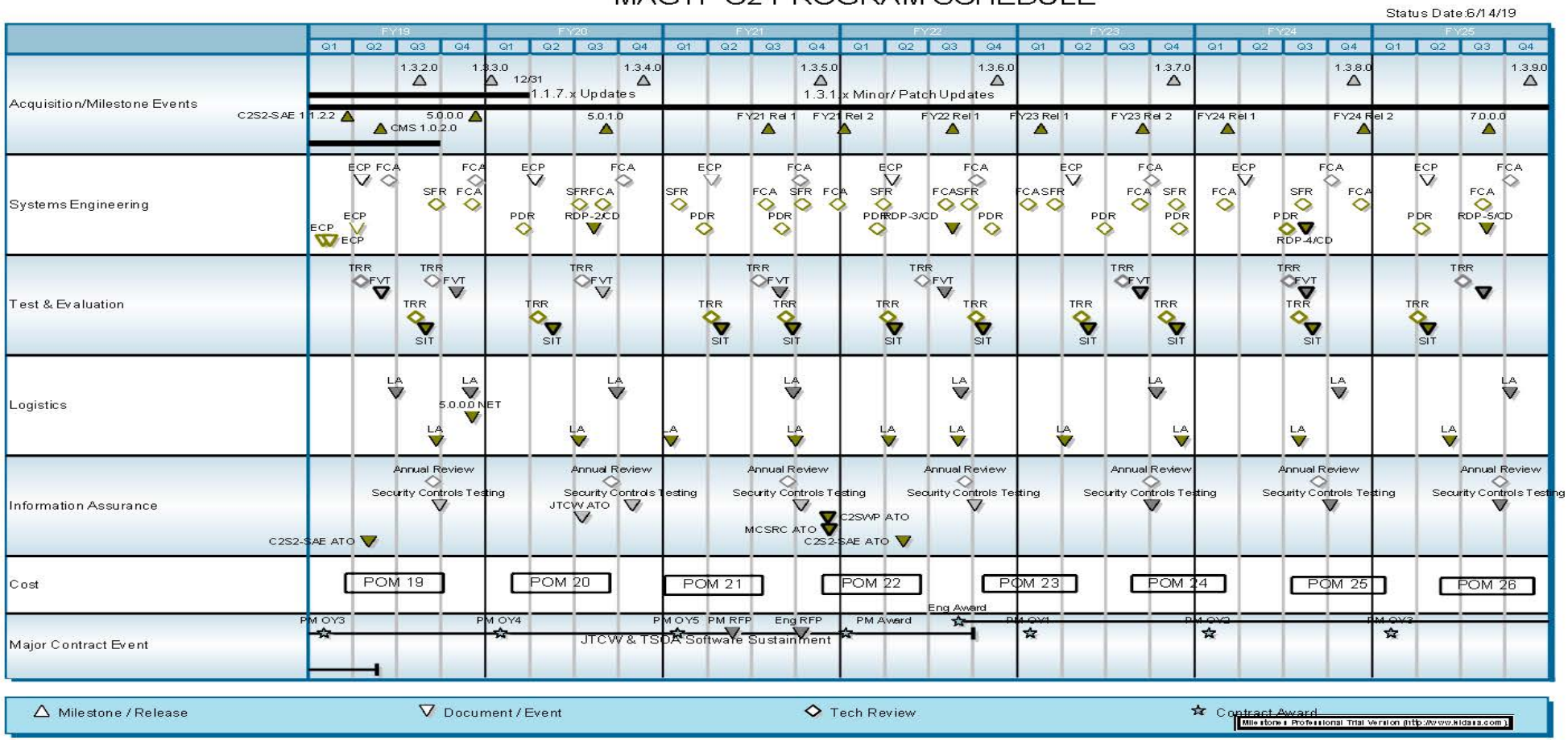


Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2270 / *Exp Indirect Fire Gen Supt Wpn Sys*

JBC-P FoS Program Schedule

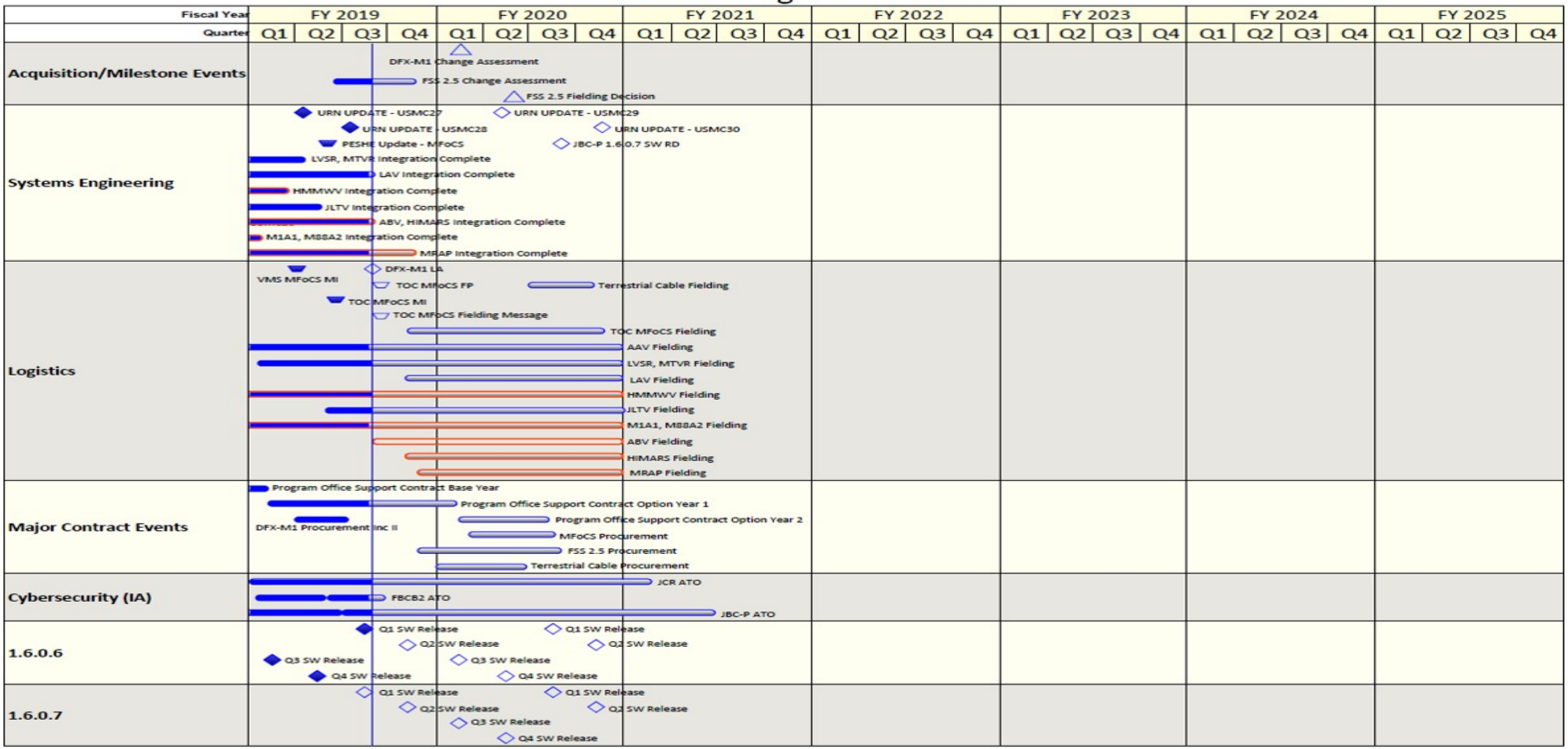


Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2270 / *Exp Indirect Fire Gen Supt Wpn Sys*

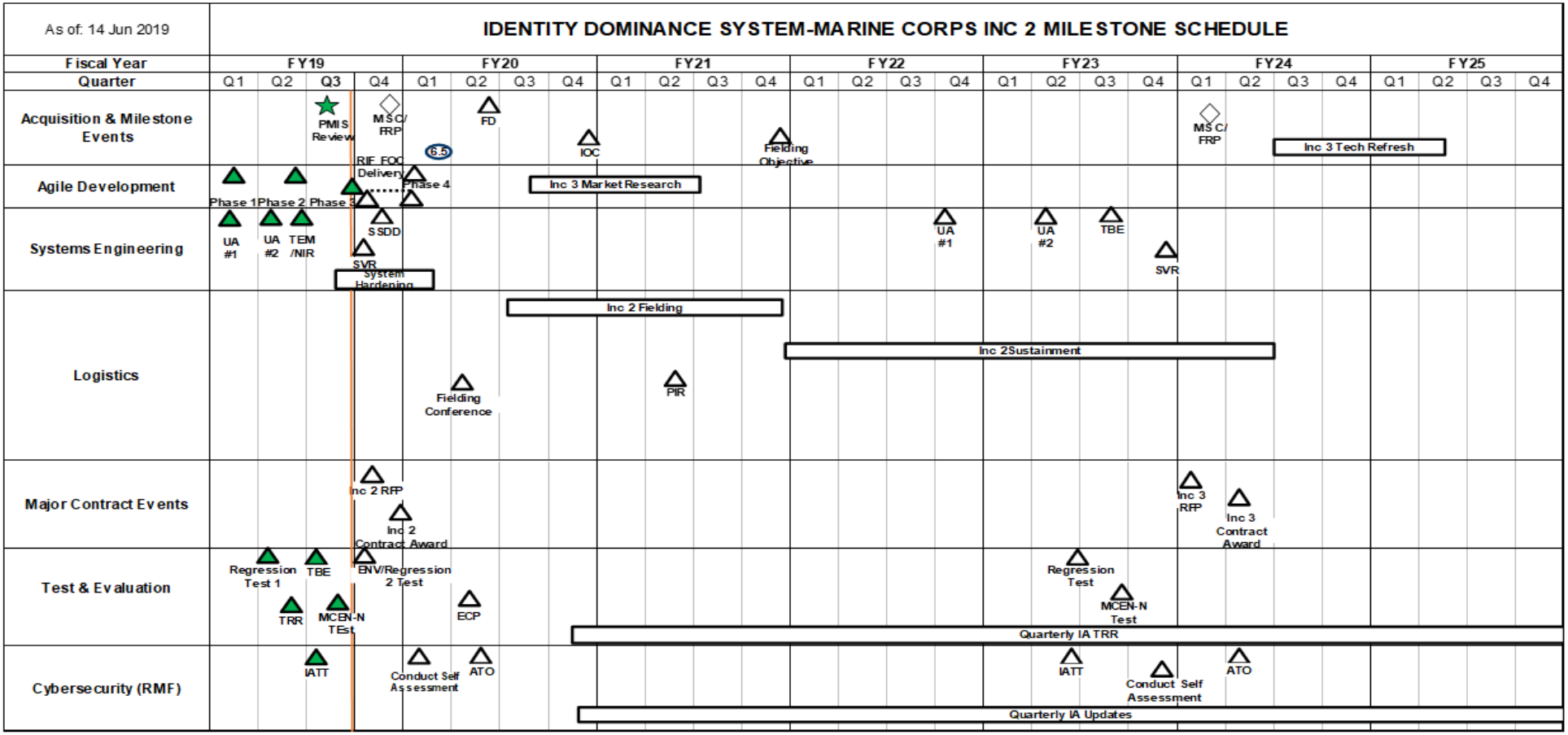


Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2270 / *Exp Indirect Fire Gen Supt Wpn Sys*

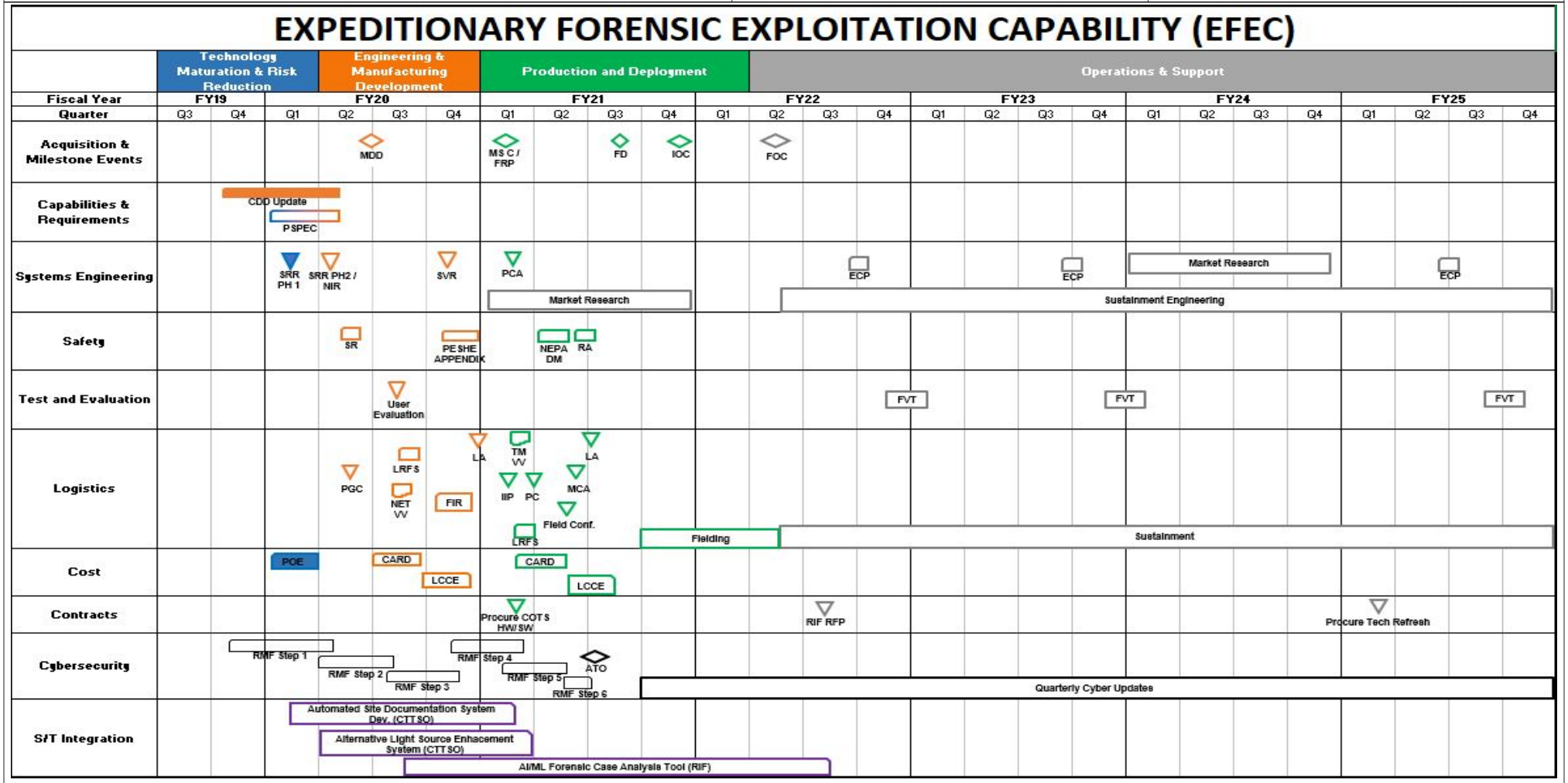
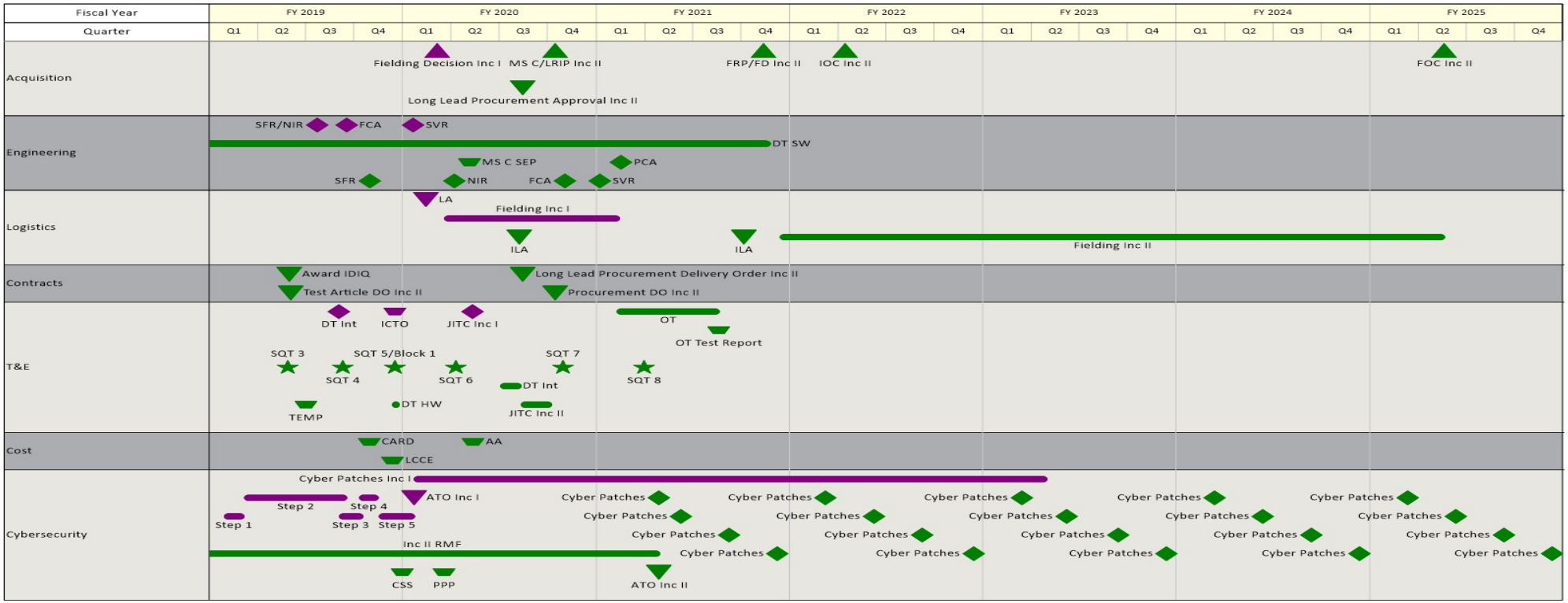


Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2270 / *Exp Indirect Fire Gen Supt Wpn Sys*

H2C2



Snapshot Date: 5/27/2019

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2270 / *Exp Indirect Fire Gen Supt Wpn Sys*

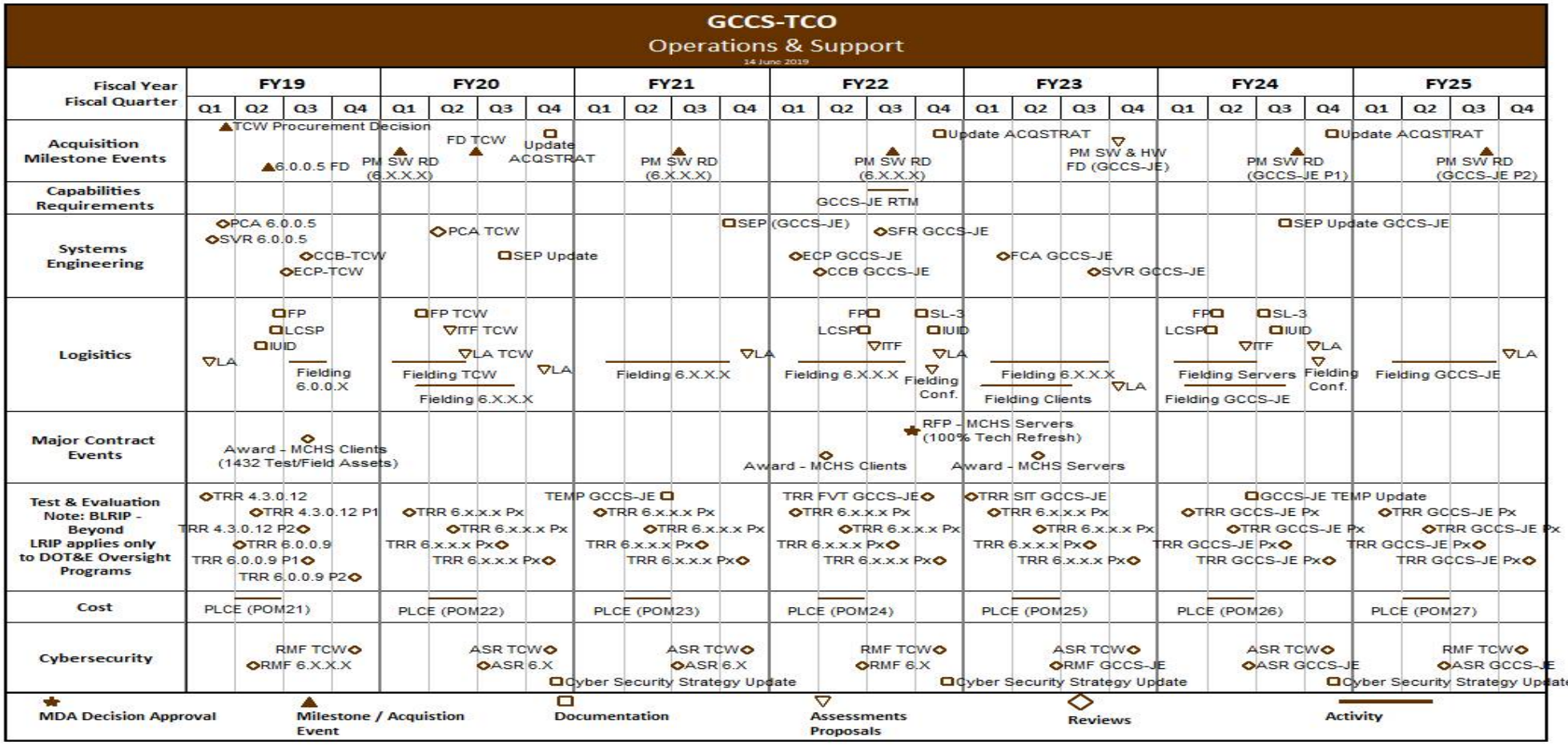


Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2270 / *Exp Indirect Fire Gen Supt Wpn Sys*

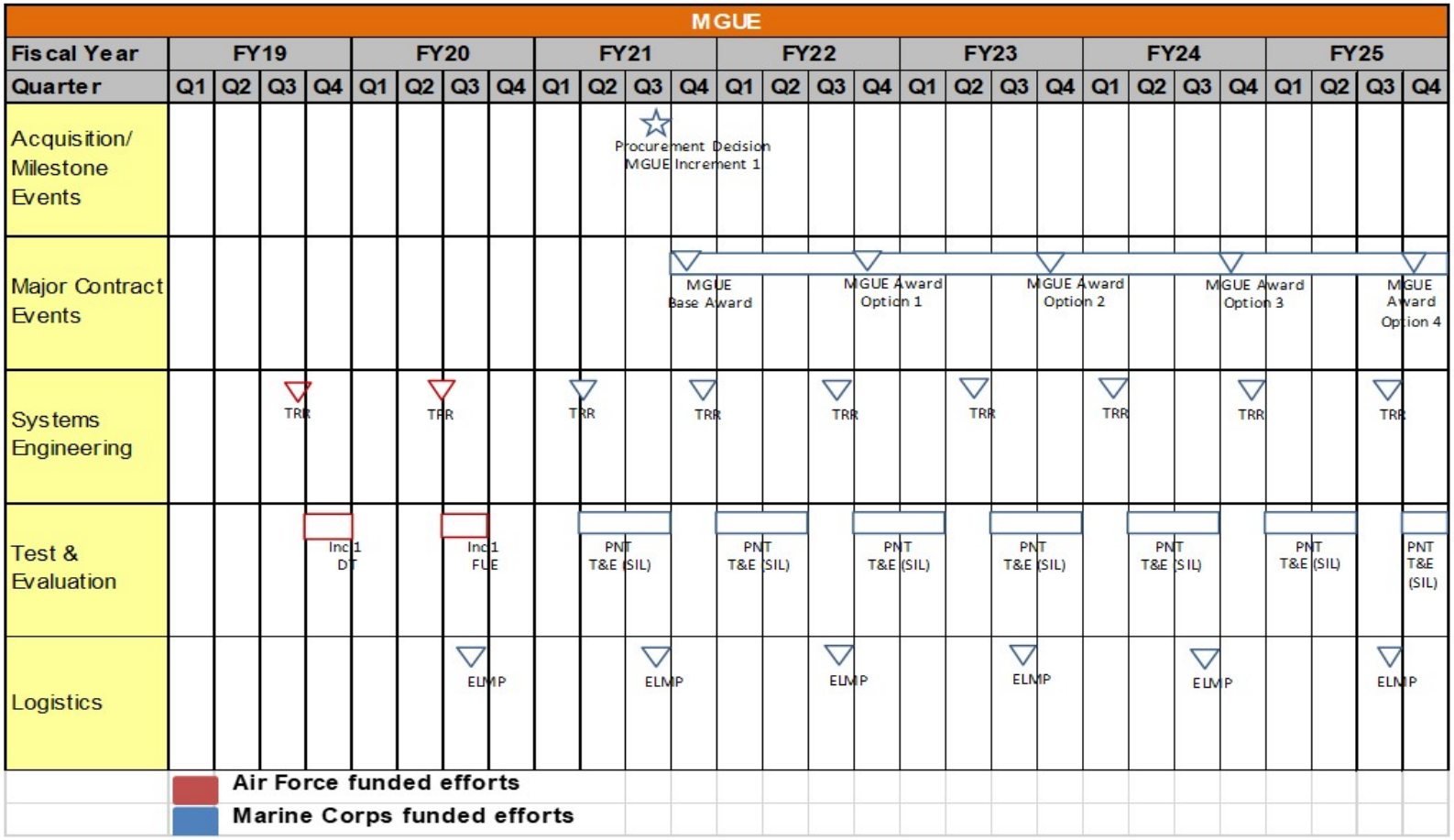


Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2270 / *Exp Indirect Fire Gen Supt Wpn Sys*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2270				
MAGTF C2 Security Controls Testing FY19	3	2019	3	2019
MAGTF C2 TRR	3	2019	3	2019
MAGTF C2 ECP FY20	2	2020	2	2020
MAGTF C2 SIT	2	2020	2	2020
MAGTF C2 Security Controls Testing FY20	4	2020	4	2020
MAGTF C2 Software Sustainment Award FY21	1	2021	1	2021
MAGTF C2 ECP FY21	2	2021	2	2021
MAGTF C2 TRR FY21	2	2021	2	2021
MAGTF C2 SIT FY21	3	2021	3	2021
MAGTF C2 Security Controls Testing FY21	4	2021	4	2021
MAGTF C2 Minor Patch Updates FY21	4	2021	4	2021
MAGTF C2 Eng RFP	4	2021	4	2021
JBC-P FoS Platform Fielding - MTVR, LVSR, AAV	2	2019	4	2020
JBC-P FoS Platform Fielding - LAV	4	2019	4	2020
JBC-P FoS Platform Fielding - JLTV	2	2019	4	2020
IDS-MC MS C/FRP	4	2019	4	2019
IDS-MC Fielding Decision	2	2020	2	2020
EFEC Inc 2 MDD	2	2020	2	2020
EFEC Inc 2 MS C	1	2021	1	2021
H2C2 MS C	4	2020	4	2020
GCCS TCO Award MCHS Clients	3	2019	3	2019

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2270 / *Exp Indirect Fire Gen Supt Wpn Sys*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
GCCS TCO TRR	4	2019	4	2019
GCCS TCO PM SW RD (6.X.X.X)	1	2020	1	2020
GCCS TCO Fielding TCW	1	2020	2	2020
GCCS TCO Fielding 6.X.X.X	1	2020	3	2020
GCCS TCO SEP Update	3	2020	3	2020
GCCS TCO ASR TCW	4	2020	4	2020
GCCS TCO TRR 6.x.x.x	1	2021	1	2021
GCCS TCO PM SW RD	3	2021	3	2021
MGUE Increment 1 Procurement Decision	3	2021	3	2021
MGUE Contract Award	4	2021	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206313M / *Marine Corps Comms Systems*	Project (Number/Name) 2273 / *Air Ops Cmd & Control (C2) Sys*	

COST ($ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
2273: *Air Ops Cmd & Control (C2) Sys*	446.669	8.091	5.397	6.684	-	6.684	7.656	5.903	5.987	6.109	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Composite Tracking Network (CTN) - The Composite Tracking Network (CTN) system distributes composite tracking data to Command and Control (C2) and weapon systems participating in a Cooperative Engagement Capability (CEC) network. The system will significantly contribute to real-time situational awareness. The program received ACAT III designation in Nov 2001 and is an instantiation of the USN CEC Program. The program is USMC led with US Navy and US Army cooperation. AAO: 10 systems plus four (4) spares. The 12 April 1995 Mission Need Statement (MNS) No. AAS 48 for the Common Aviation Command and Control System (CAC2S) established the Marine Corps' need to upgrade its existing air defense architecture with capabilities to support improved situational awareness (SA) and advanced engagement concepts. The Composite Tracking Network (CTN) program was initiated to address this capability gap. The CTN system (AN/MSQ-143A(V)1) is an integration effort consisting of an AN/USG-4B and other Marine-unique components. The CTN system interfaces with the AN/TPS-59 radar, the AN/TPS-80 Ground/Air Task Oriented Radar (G/ATOR), and the CAC2S to provide the Marine Air-Ground Task Force (MAGTF) and Joint Task Force Commanders a ground based sensor netting solution that correlates sensor measurement data (target velocity and position) from local and remote radars that interface in the CEC network. This data will effectively increase Situational Awareness by providing accurate, composite, and real-time surveillance tracks, reduce ground-to-air and air-to-air fratricide, enable air and surface Integrated fire control (IFC), and extend the air defensive capability of forces in the littorals.

Remote Video Viewing Terminal (RVVT) - Consists of Commercial Off-The-Shelf (COTS) Video Down-Link (VDL) products such as the VideoScout Mobile Configuration 2 (VS-MC/2), VideoScout Mobile Configuration 3 (VS-MC/3), Man Portable Video Down-Link (MPVDL) that allow for the viewing and exploitation of Full Motion Video (FMV) from Intelligence, Surveillance and Reconnaissance (ISR) assets. VDL systems are mission critical for coordination of direct and indirect fires and the prevention of fratricide. These systems provide the warfighter with video and metadata from all USMC manned and unmanned aircraft to include but not limited to Raven B, Puma, Micro-UAS, Shadow, Predator, Fire Scout, and Litening Pod on P-3, AV8-B, and F/A-18. Data is displayed to Forward Observers (FO), Joint Fires Observers (JFO), Joint Terminal Attack Coordinators (JTAC), and Forward Air Controller (FAC).

Theater Battle Management Core System (TBMCS) - A Joint mandated Air War planning tool for the generation, dissemination and execution of the Air Tasking Order (ATO). TBMCS is an Air Force led program, which provides the automated tools necessary to manage tactical air operations, execute area air defense and airspace management in the tactical area of operation, and coordinate operations with components of other military services. TBMCS is located at the Tactical Air Command Center (TACC), with remotes located throughout the area of operation. It is scalable, allowing for joint, coalition and service specific operations. It was an Air Force-led evolutionary acquisition joint ACAT III program. The USAF now seeks a replacement for TBMCS by applying a Mid-tier acquisition approach (Section 804 of the FY 2016 NDAA). Its original solution, the Command and Control Air Operation System (C2AOS) has transitioned to the development of the TBMCS Replacement. In order to prevent TBMCS legacy system hardware obsolescence and enable the ability to host the new TBMCS Replacement capabilities being delivered by the Air Force, the Marine Corps will align with the Air Force in its system development and procurement. This will keep Marine Aviation relevant and operational in a joint theater and maintain its ability to plan and manage Marine Air-Ground Task Force (MAGTF) Air Operations.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2273 / *Air Ops Cmd & Control (C2) Sys*

The Project 2273 budget supports a $1.287M increase FY 2020 to FY 2021 to include Common Array Block-Expeditionary (CAB-E) Field User Evaluation (FUE) test events. Funding will also support TBMCS Replacement Service Level Testing and USMC development and testing of Air Force variant TBMCS modules.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Composite Tracking Network (CTN): Support and Management Services	0.262	0.214	0.352	0.000	0.352
Articles:	-	-	-	-	-
FY 2020 Plans: - Continue systems engineering efforts and updates to the software baseline to support annual CEC FQTs and IV&Vs, maintain cybersecurity updates and its Authority to Operate. - Continue travel, engineering support, and test support for G/ATOR Mode V development and integration					
FY 2021 Base Plans: - Continue systems engineering efforts and updates to the software baseline to support annual CEC FQTs and IV&Vs, maintain cybersecurity updates and its Authority to Operate. - Continue travel, engineering support, and test support for G/ATOR Mode V Integration					
FY 2021 OCO Plans: N/A					
FY 2020 to FY 2021 Increase/Decrease Statement: $0.138M increase from FY 2020 to FY 2021 is due to an increase in software baseline support resulting from the implementation of CAB-E.					
Title: Composite Tracking Network (CTN): Engineering Development	0.774	0.742	0.400	0.000	0.400
Articles:	-	-	-	-	-
FY 2020 Plans: - Continue software certification to maintain interoperability with Cooperative Engagement Capability (CEC) Network to include associated engineering support. - Continue engineering support for CTN Software Development and Integration and System Verification Testing, and certification efforts required to support the G/ATOR Mode V development - Complete CTN interface development.					
FY 2021 Base Plans: - Continue software certification to maintain interoperability with Cooperative Engagement Capability (CEC) Network to include associated engineering support. - Continue engineering support for CTN Software Development and Integration and System Verification Testing					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2273 / *Air Ops Cmd & Control (C2) Sys*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
- Complete developmental efforts to support the G/ATOR Mode V development. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** The $0.342M decrease is due to reduction of scope for engineering support for G/ATOR Mode V development upon the completion of CTN interface development.					
Title: RVVT: Software Development Support	1.103	0.876	0.205	0.000	0.205
Articles:	-	-	-	-	-
FY 2020 Plans: - Continue integration with type 1 encrypted sensor platforms to ensure interoperability with newly fielded airframes. - Initiate developmental and operational testing of software supporting newly fielded airframes. ***FY 2021 Base Plans:*** - Continue software development for the integration of encrypted video with new and fielded sensor platforms. - Complete software development for hand off system viewing features. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** - Decrease in $0.671M from FY20 to FY21 is due to the completion of software development required for the JTAC/JFO to view type 1 encrypted video and develop targeting information with the current hand off system.					
Title: Composite Tracking Network (CTN): Developmental Testing and Cyber Security	1.065	0.719	1.797	0.000	1.797
Articles:	-	-	-	-	-
FY 2020 Plans: - Continue to support CEC Independent Verification and Validation support and Formal Qualification Test (FQT) - Initiate support for the CAB Family of Antennas (FoA) Independent Verification and Validation support (IV&V) and Formal Qualification Test (FQT). - Continue support for G/ATOR Mode V Integration and Testing. - Complete CAB Developmental Test Event 2 & 3 ***FY 2021 Base Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2273 / *Air Ops Cmd & Control (C2) Sys*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
- Continue Information Assurance (IA) developmental activities. - Continue to support CEC Independent Verification and Validation support and Formal Qualification Test (FQT) - Continue support for the FQT and IV&V. - Conduct CAB-E Field User Evaluation (FUE) test events. - Complete G/ATOR Mode V Integration and Testing. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** The $1.078M cost increase from FY 2020 to FY 2021 is due to the initiation of CAB-E Field User Evaluation (FUE) test events.					
Title: TBMCS/TBMCS Replacement Managment Services	0.396	0.256	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2020 Plans: - Complete TBMCS legacy system Software and Hardware design and test analysis in support of the system sustainment. - Complete TBMCS Replacement system Software and Hardware design and test analysis, and provide engineering, procurement, and logistic support for system development. ***FY 2021 Base Plans:*** N/A ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** The $0.256M decrease is due to completion of Software and Hardware design and test analysis for TBMCS Replacement and due to the reduction of scope for the RDTEN sustainment of the TBMCS legacy system					
Title: TBMCS Replacement Engineering Support	0.314	0.323	0.792	0.000	0.792
Articles:	-	-	-	-	-
FY 2020 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2273 / *Air Ops Cmd & Control (C2) Sys*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
- Continue critical analysis efforts with TBMCS Replacement applications in support of operational test and evaluation, USMC led developmental test (DT). ***FY 2021 Base Plans:*** - Complete critical analysis efforts with TBMCS Replacement applications in support of operational test and evaluation, USMC led developmental test (DT). - Initiate engineering support for the development of TBMCS Replacement system integration. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** The $0.469M increase from FY 2020 to FY 2021 is due to the ramping up of TBMCS Replacement system integration development and engineering support aligned to completion of USMC developmental test support.					
Title: TBMCS Replacement Test and Evaluation	1.322	1.548	2.449	0.000	2.449
Articles:	-	-	-	-	-
FY 2020 Plans: - Continue setting up and prepare lab to receive and test TBMCS Air Force modules against Marine Corps TBMCS Replacement requirements. This includes pivotal cloud foundry (PCF) use and testing of developmental software - Continue Marine Corps participation in Air Force-led TBMCS replacement developmental events. - Initiate information assurance (IA) testing and cybersecurity reviews on incoming replacement software ***FY 2021 Base Plans:*** - Initiate development and T&E of Air Force TBMCS modules to meet Marine Corps TBMCS Replacement capability requirements. - Initiate TBMCS Replacement system Service Level Testing. - Initiate the development TBMCS-MC replacement Integrated Logistics Activities (ILA) in concert with the Air Force. - Continue information assurance testing on developmental software to meet cyber security posture and conduct risk reduction testing to identify potential software vulnerabilities. - Continue Marine Corps participation in Air Force-led TBMCS replacement developmental events. - Continue information assurance (IA) testing and cybersecurity reviews on incoming replacement software. ***FY 2021 OCO Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2273 / *Air Ops Cmd & Control (C2) Sys*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** The $0.901M increase from FY2020 to FY 2021 is due to the start of TBMCS Replacement system Service Level Testing and USMC development and testing of Air Force variant TBMCS modules.					
Title: TBMCS Replacement: Product Development	0.000	0.000	0.689	0.000	0.689
Articles:	-	-	-	-	-
FY 2020 Plans: N/A ***FY 2021 Base Plans:*** - Initiate USMC TBMCS Replacement Developmental Testing (DT) upon procurement of TBMCS replacement Engineering Development Model (EDM). ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** The $0.689M increase is due to the start of TBMCS Replacement EDM developmental Tests.					
Title: Legacy TBMCS-Engineering Support & Software Development Support	2.855	0.719	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2020 Plans: - Continue test and evaluation support for TBMCS upgrades for Joint Interoperability. - Continue development test and Evaluation support of software releases in support of the software baseline for Cyber Security upgrades as well as conduct annual Cyber Security Accreditation. ***FY 2021 Base Plans:*** N/A ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:***					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2273 / *Air Ops Cmd & Control (C2) Sys*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
The $0.719M decrease FY 2020 to FY 2021 is due to transition of cost associated with legacy TBMCS annual Cyber Security Accreditation to Operations and Sustainment until transition to TBMCS Replacement.					
Accomplishments/Planned Programs Subtotals	8.091	5.397	6.684	0.000	6.684

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• PMC/4640CT: *CTN*	3.510	10.070	14.301	-	14.301	0.000	0.000	0.000	0.000	0.000	82.291
• PMC/4640CU: *MACCS*	0.050	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	96.599
• PMC/4640DX: *TBMCS*	2.422	1.464	1.290	-	1.290	1.298	1.336	1.359	1.388	Continuing	Continuing
• PMC/464023: *RVVT*	9.665	5.874	0.020	-	0.020	6.197	0.001	0.130	0.132	Continuing	Continuing

Remarks

D. Acquisition Strategy

TBMCS - is an ACAT III Air Force led program with joint interest/oversight. The Marine Corps will continue to follow the Air Force's lead when fielding only the joint modules of the current TBMCS. The Marine Corps continues to sustain unique requirements and deviates as necessary to sustain its legacy TBMCS. For instance, TBMCS separately manages the development and fielding of software and hardware engineering change proposals for Information Assurance (IA) and functionality updates to ensure daily direct support of the Air Battle Plan in joint theaters of operation. The Air Force is in the process of transitioning from its legacy TBMCS to a new TBMCS Command & Control (C2) Replacement system. The Air Force TBMCS C2 Replacement program (originally an ACAT III) is now is to be procured utilizing the tenets of mid-tier acquisition. The new Air Force led joint interest program intends to use agile development to build a modular cloud based system replacing the legacy TBMCS. The Marine Corps TBMCS replacement strategy supports and participates in the Air Force-led efforts and conducts testing at its laboratories (NSWC Crane and Langley AFB) to remain aligned with the overall TBMCS Joint development. The Air Force seeks a deployment in Q4 FY 2020 and the Marine Corps plans to stay aligned to this schedule by testing released software in concert with the Air Force. The Marine Corps will determine replacement of the current legacy TBMCS when testing and evaluation confirms the new system is ready to provide sufficient capability to enable the MAGTF to plan and execute aviation operations in a joint environment.

CTN - The USMC's CTN acquisition strategy is to participate in the USN's Cooperative Engagement Capability (CEC) program procurement and testing, making necessary modifications to support the Marine Corps' requirement. The next major efforts are the development and procurement of the Common Array Block-Expeditionary (CAB-E) Antenna to replace the aging Composite Solid State Antenna (CSSA). CTN is to leverage the Naval Sea Systems Command (NAVSEA) led effort to procure CAB antennas. CTN is to procure fourteen (14) CAB-E. CTN will develop Mode V interfaces with the Ground/Air Task Oriented Radar (G/ATOR) and the Common Aviation Command and Control System (CAC2S). The Mode V is CTN's Identification Friend or Foe (IFF) capability.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2273 / *Air Ops Cmd & Control (C2) Sys*

RVVT - The RVVT acquisition strategy is to continue integration of Video Down-Link (VDL) systems into new and existing sensor platforms by enhancing the encryption, range, and reducing the power and weight requirements in order to support existing and planned capabilities supporting targeting and fires activities. Efforts to integrate Full Motion Video (FMV) to support Joint Fires Observers (JFOs) and Joint Terminal Attack Controllers (JTACs) began in FY 2017 and is an ongoing requirement to maintain interoperability with new and existing sensor systems.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2273 / *Air Ops Cmd & Control (C2) Sys*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Years Cumulative Funding	Various	VARIOUS : VARIOUS	267.138	0.000		0.000		0.000		-		0.000	0.000	267.138	-
CTN Engineering Devlopment	C/CPFF	NAVSEA PEO IWS : Washington, DC	23.068	0.774	Mar 2019	0.742	Feb 2020	0.400	Feb 2021	-		0.400	Continuing	Continuing	Continuing
TBMCS Replacement Tactical Map Software Development	SS/FFP	Raytheon Solypsis : Fulton, MD	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
TBMCS Replacement Pivotal Cloud Licensing	C/FFP	NSWC Crane : Crane, IN	0.000	0.000		0.000		0.689	Nov 2020	-		0.689	0.000	0.689	-
RVVT	MIPR	AMRDEC : Huntsville, AL	2.277	1.103	Mar 2019	0.876	Nov 2019	0.205	Nov 2020	-		0.205	0.000	4.461	-
		Subtotal	292.483	1.877		1.618		1.294		-		1.294	Continuing	Continuing	N/A

Remarks

CTN: The $0.342M decrease is due to reduction of scope for engineering support for G/ATOR Mode V development upon the completion of CTN interface development.
TBMCS Replacement: The $0.689M increase FY20 to FY FY21 is due to the start of TBMCS Replacement EDM developmental Tests.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Years Cumulative Funding	Various	VARIOUS : VARIOUS	47.558	0.000		0.000		0.000		-		0.000	0.000	47.558	-
CTN Engineering Support	WR	NSWC : Dahlgren, VA	7.120	0.242	Jan 2019	0.200	Jan 2020	0.326	Jan 2021	-		0.326	Continuing	Continuing	Continuing
CTN Engineering Support	Various	Travel-TAD : Not Specified	1.138	0.020	Sep 2019	0.014	Sep 2020	0.026	Sep 2021	-		0.026	Continuing	Continuing	Continuing
TBMCS Replacement Engineering Support	Various	Travel - TAD : Not Specified	0.000	0.075	Sep 2019	0.000	Sep 2020	0.075	Sep 2021	-		0.075	0.000	0.150	-
TBMCS Replacement Engineering Support	WR	NSWC Dahlgren : Dahlgren, VA	0.240	0.080	Dec 2019	0.323	Dec 2020	0.000		-		0.000	0.000	0.643	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2273 / *Air Ops Cmd & Control (C2) Sys*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
TBMCS Replacement C2 SME support	C/FFP	NSWC Crane : Crane, IN	0.000	0.300	Jul 2019	0.000		0.000		-		0.000	0.000	0.300	-
TBMCS Replacement C2 SME support	C/CPFF	DTIC : Fort Belvoir, VA	0.000	0.000		0.000	Nov 2019	0.717	Nov 2020	-		0.717	0.000	0.717	-
		Subtotal	56.056	0.717		0.537		1.144		-		1.144	Continuing	Continuing	N/A

Remarks

CTN: $0.138M increase from FY 2020 to FY 2021 is due to an increase in software baseline support resulting from the implementation of CAB-E.
TBMCS Replacement: The $0.469M increase from FY 2020 to FY 2021 is due to the ramping up of TBMCS Replacement system integration development and engineering support aligned to completion of USMC developmental test support.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Years Cumulative Funding	Various	VARIOUS : VARIOUS	40.227	0.000		0.000		0.000		-		0.000	0.000	40.227	-
TBMCS Software Development	C/FFP	Lockheed Martin : Colorado Springs, CO	14.842	2.855	Mar 2020	0.223	Mar 2020	0.000		-		0.000	0.000	17.920	-
CTN Developmental Testing	WR	NSWC Corona : Corona, CA	2.610	0.056	Feb 2019	0.250	Feb 2020	0.065	Nov 2020	-		0.065	0.000	2.981	-
CTN Engineering/Cyber Security Development	C/CPFF	NAVSEA PEO IWS : Washington DC	3.125	0.552	Jan 2019	0.469	Jan 2020	1.168	Dec 2020	-		1.168	0.000	5.314	-
CTN Functional Test Support	C/FFP	NSWC Crane : Crane, IN	0.000	0.166	Feb 2019	0.000		0.000		-		0.000	0.000	0.166	-
TBMCS/TBMCS Replacement Engineering Support	WR	NSWC : Crane, IN	0.000	0.000		0.496	Oct 2019	1.082	Oct 2020	-		1.082	0.000	1.578	-
CTN Test Support	WR	NSWC Dahlgren : Dahlgren, VA	0.000	0.291	Jan 2019	0.000		0.564	Nov 2020	-		0.564	0.000	0.855	-
TBMCS Replacement Cyber Security Support	C/FFP	NSWC Indian Head : Indian Head, MD	0.000	0.049	Mar 2019	0.000		0.145	Mar 2021	-		0.145	0.000	0.194	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2273 / *Air Ops Cmd & Control (C2) Sys*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
TBMCS Replacement Cyber Security Training	WR	NSWC Dahlgren : Dahlgren	0.000	0.112	Dec 2018	0.423	Dec 2019	0.000		-		0.000	0.000	0.535	-
TBMCS Replacement Operational Test Support	WR	MCOTEA : Quantico, VA	0.620	0.000		0.700	Dec 2019	0.000		-		0.000	0.000	1.320	-
TBMCS/TBMCS Replacement Engineering Support	C/FFP	NSWC Crane : Crane, IN	0.000	0.000		0.000		1.222	Jun 2021	-		1.222	0.000	1.222	-
TBMCS Replacement Developmental Test Support	C/FFP	MCTSSA : Camp Pendleton, CA	0.315	0.000		0.425	Jan 2020	0.000		-		0.000	0.000	0.740	-
TBMCS Replacement Capability host EDM T&E	WR	DLA : Philadelphia, PA	0.000	1.020	Jul 2019	0.000		0.000		-		0.000	0.000	1.020	-
		Subtotal	61.739	5.101		2.986		4.246		-		4.246	0.000	74.072	N/A

Remarks

CTN: The $1.078M cost increase from FY 2020 to FY 2021 is due to the initiation of CAB-E Field User Evaluation (FUE) test events. Event delayed due to one year slip in DoN's delivery of CAB Pre-Production Units (PPUs). The FY 2020 RDT&E is to be utilized for test related Data Collection, Analysis, and Test Reports.
TBMCS Replacement: The $0.901M increase from FY2020 to FY 2021 is due to the start of TBMCS Replacement system Service Level Testing and USMC development and testing of Air Force variant TBMCS modules.
TBMCS: The $0.719M decrease FY 2020 to FY 2021 is due to transition of cost associated with legacy TBMCS annual Cyber Security Accreditation to Operations and Sustainment until transition to TBMCS Replacement.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Years Cumulative Funding	Various	VARIOUS : VARIOUS	36.391	0.000		0.000		0.000		-		0.000	0.000	36.391	-
TBMCS Replacement Program Support	C/FFP	NSWC Dahlgren : Dahlgren, VA	0.000	0.396	Apr 2019	0.256	Apr 2020	0.000		-		0.000	0.000	0.652	-
		Subtotal	36.391	0.396		0.256		0.000		-		0.000	0.000	37.043	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2273 / *Air Ops Cmd & Control (C2) Sys*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract

Remarks

TBMCS: The $0.256M decrease is due to completion of Software and Hardware design and test analysis for TBMCS Replacement and due to the reduction of scope for the RDTEN sustainment of the TBMCS legacy system

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	446.669	8.091		5.397		6.684		-		6.684	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2273 / *Air Ops Cmd & Control (C2) Sys*

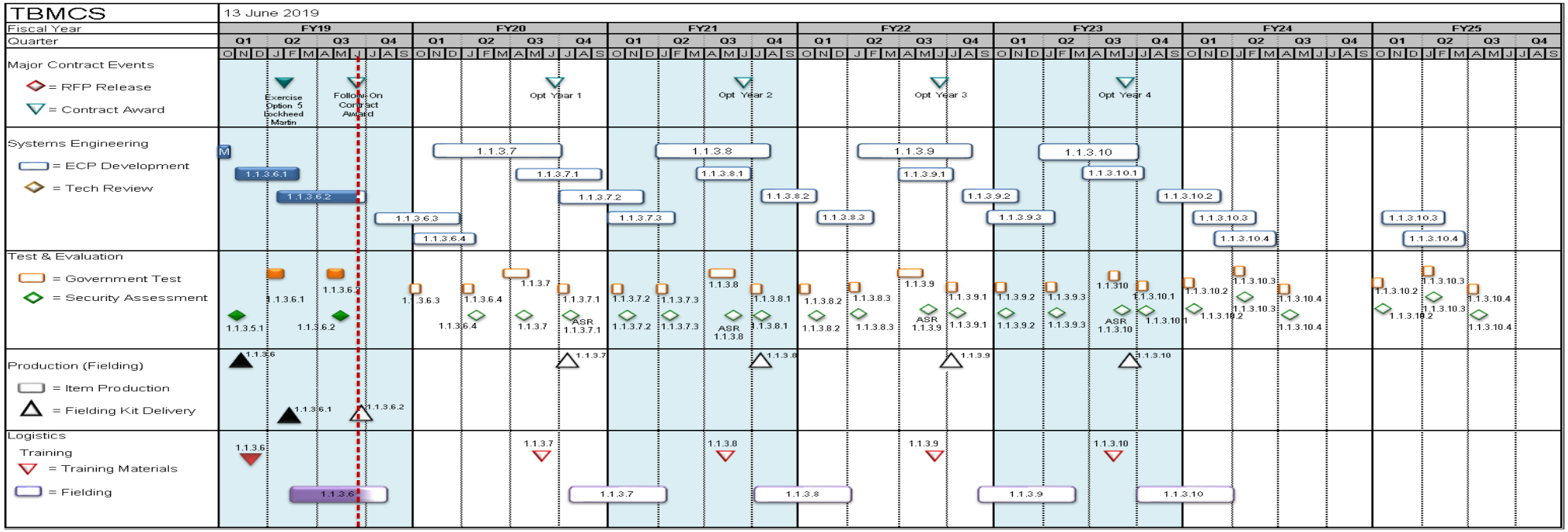


Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2273 / *Air Ops Cmd & Control (C2) Sys*

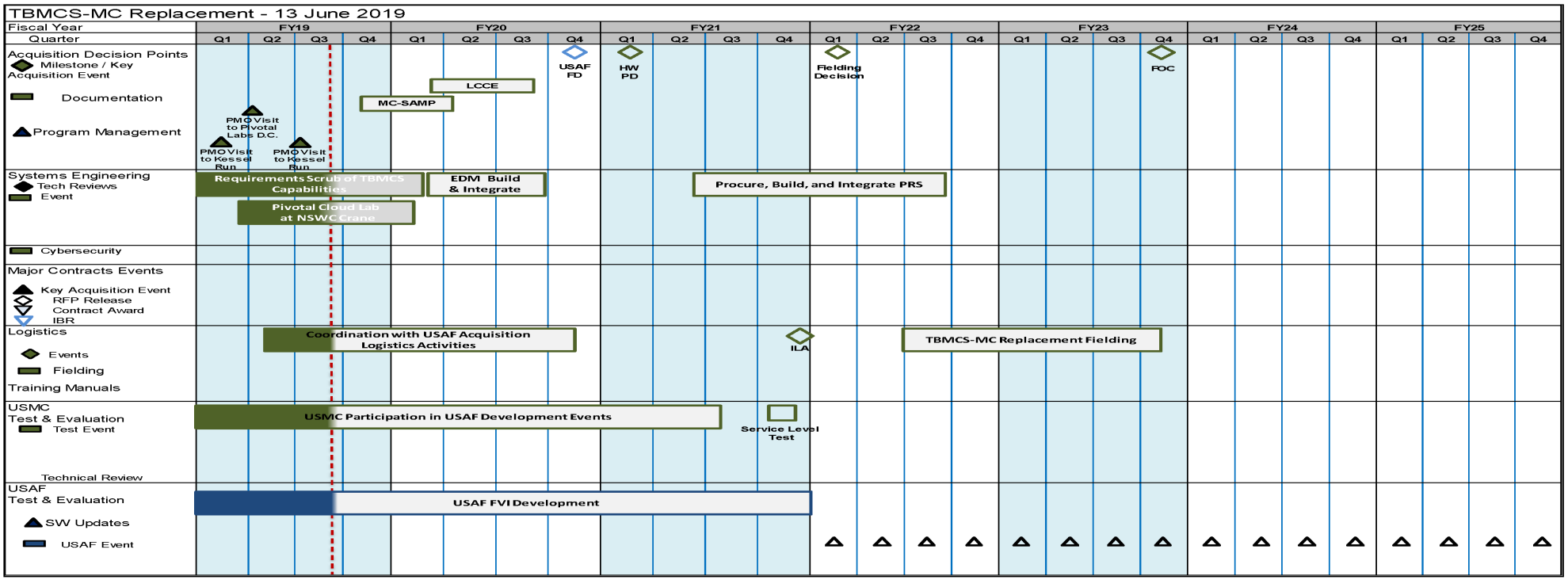


Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2273 / *Air Ops Cmd & Control (C2) Sys*

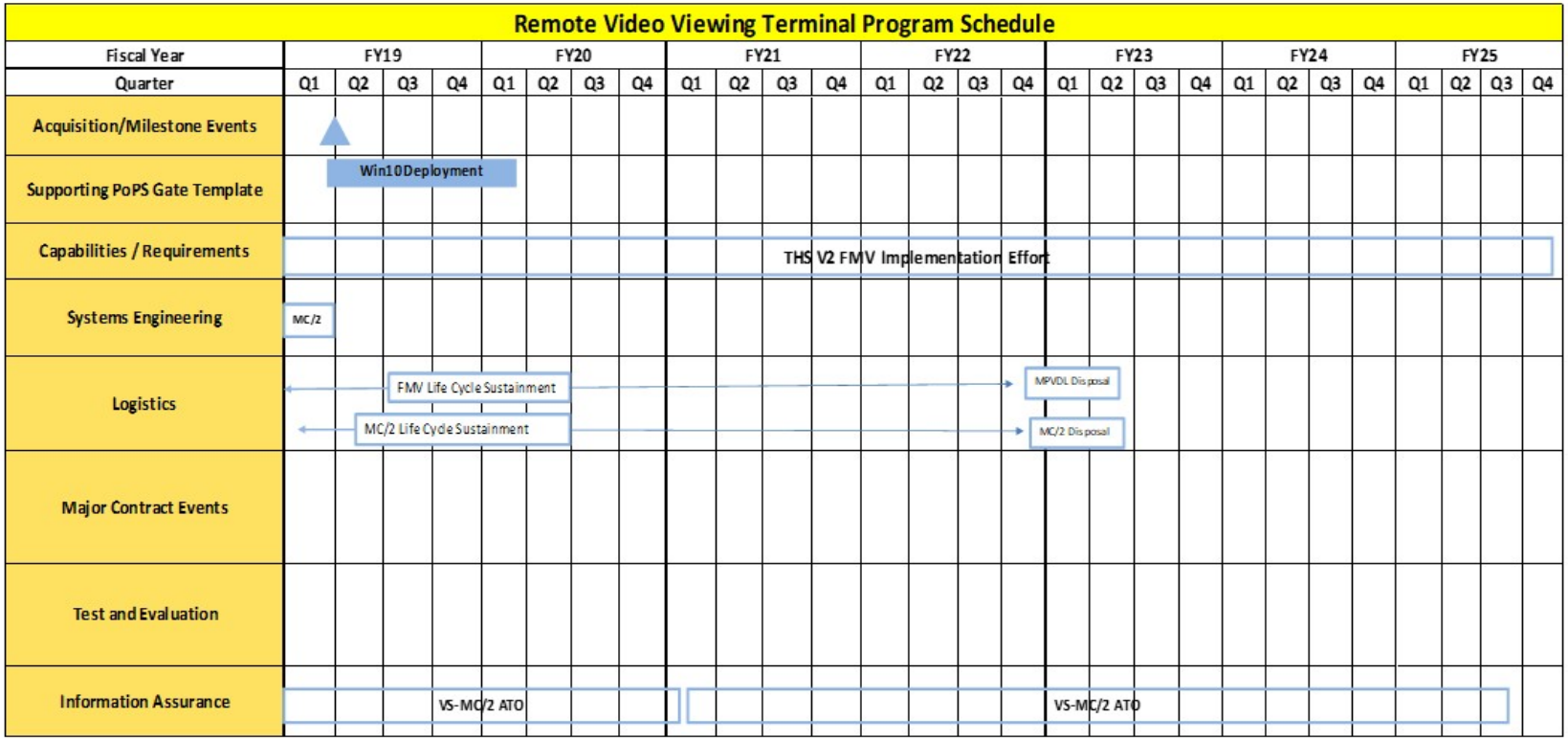


Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2273 / *Air Ops Cmd & Control (C2) Sys*

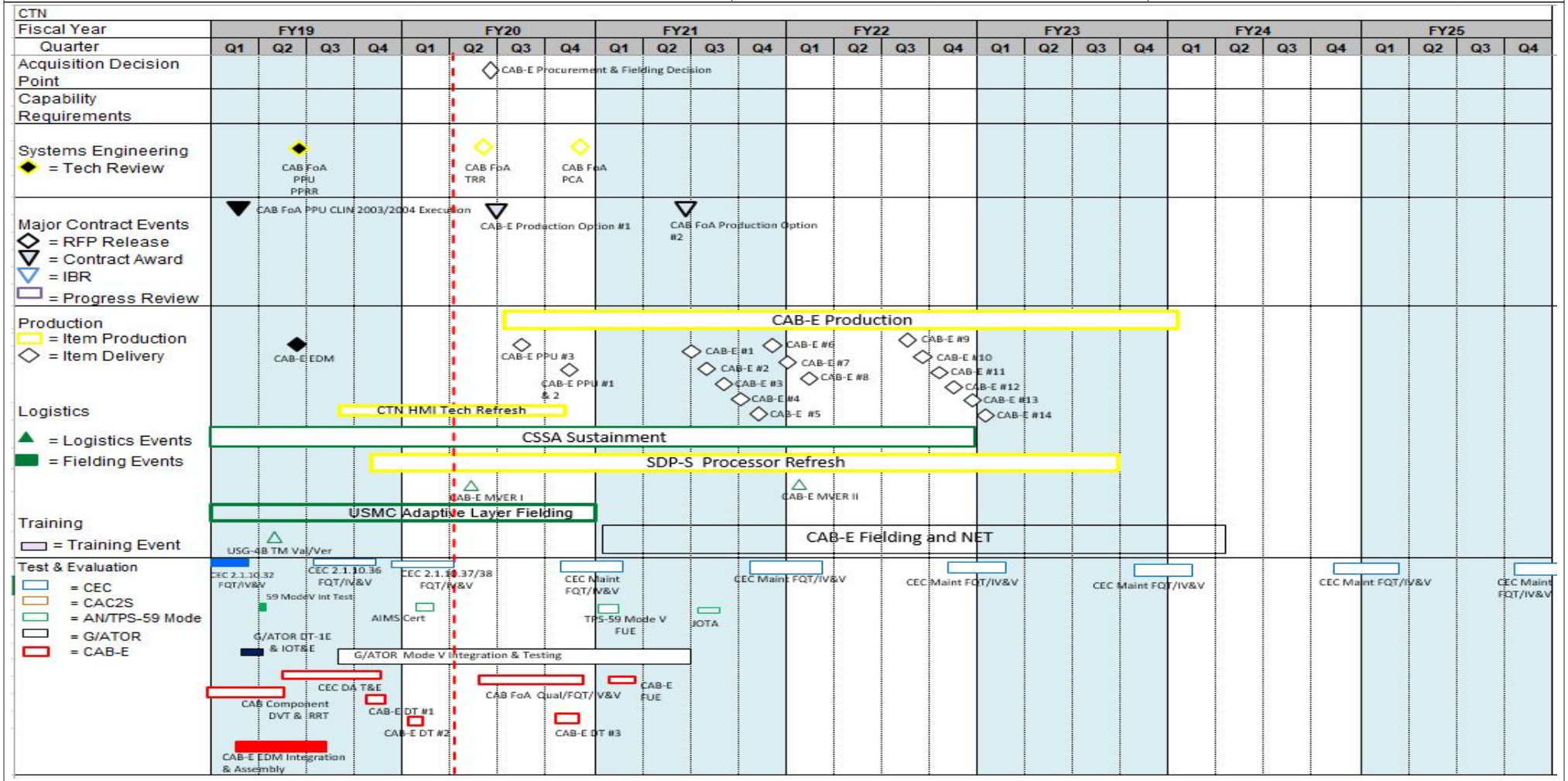


Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2273 / *Air Ops Cmd & Control (C2) Sys*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2273				
TBMCS RDT&E IMS: TBMCS quarterly cyber security assessment T&E	1	2019	1	2025
TBMCS RDT&E IMS: TBMCS annual software release Government Developmental Test	3	2019	3	2025
CTN RDT&E IMS: CTN - CEC FQT / V&V	1	2019	4	2025
CTN RDT&E IMS: CTN - G/ATOR Mode V Integration and Testing	3	2019	2	2021
CTN RDT&E IMS: CTN - CAB-E Developmental Test #2	1	2020	1	2020
CTN RDT&E IMS: CTN - CAB-E FoA Qualification/FQT/IV&V	2	2020	4	2020
CTN RDT&E IMS: CTN - CAB-E Developmental Test #3	4	2020	4	2020
CTN RDT&E IMS: CTN - TPS-59 Mode V Field User Evaluation (FUE)	1	2021	1	2021
CTN RDT&E IMS: CTN - TPS-59 Mode V Joint Operational Test Approach (JOTA)	3	2021	3	2021
RVVT RDT&E IMS: RVVT - Software Development 2019	1	2019	4	2024
RVVT RDT&E IMS: RVVT - Cyber Security Accreditation 2020	1	2020	1	2023
RVVT RDT&E IMS: RVVT - EUD Refresh 2020	3	2020	4	2024
TBMCS REPLACEMENT RDT&E IMS: TBMCS Replacement - USAF-led Developmental Testing	1	2019	3	2021
TBMCS REPLACEMENT RDT&E IMS: TBMCS Replacement - EDM Development	1	2020	3	2020
TBMCS REPLACEMENT RDT&E IMS: TBMCS Replacement - USMC Integration Development	2	2021	3	2022
TBMCS REPLACEMENT RDT&E IMS: TBMCS Replacement - Service Level Test / Operational Assessment	4	2021	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206313M / *Marine Corps Comms Systems*	Project (Number/Name) 2274 / *Command & Control Warfare Sys*	

COST ($ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
2274: *Command & Control Warfare Sys*	53.249	11.512	10.454	8.592	-	8.592	14.404	28.429	22.529	22.981	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

The FY 2021 funding request was reduced by $3.1Mt o account for the availability of prior year execution balances.

A. Mission Description and Budget Item Justification

COUNTER RADIO-CONTROLLED IMPROVISED EXPLOSIVE DEVICE (RCIED) ELECTRONIC WARFARE (USMC CREW) SYSTEMS are vehicle mounted and dismounted modular programmable multi-band radio frequency jammers designed to deny enemy use of selected portions of the radio frequency spectrum in the vicinity of the jammer to counter the RCIED threat. The mounted and dismounted systems provide Marines in vehicle convoys and on foot with the necessary protection from the continued and evolving threat of deadly RCIEDs. Legacy CREW systems are currently deployed to meet threats in the multiple theaters of operation and fielded to selected Marine Expeditionary Units (MEU)/Marine Expeditionary Forces (MEF) in support of worldwide deployment. To continue to support the various worldwide missions, each CREW unit receives customized programming (loadsets) to counter that area's RCIED threats. The testing, programming development, and product improvement research are funded with the CREW's RDTE,N funding and prioritized to meet the growing demand for all deployed Marine units. CREW received an Urgent Statement of Need (USON) 30 January 2018 directing the development of Multi-Function Electronic Warfare (MFEW) systems. MFEW will combine the capabilities to conduct the existing Counter Radio-Controlled Improvised Explosive Device Electronic Warfare (CREW) mission, with electronic warfare (EW), electronic attack (EA) to Counter-Unmanned Aircraft System (CUAS), Networking, Direction Finding, and future forward looking capabilities as they are developed. Legacy Crew Capabilities and the MFEW development will be components of the Marine Electronic Warfare Ground Family of Systems (MEGFoS). Beginning FY21, USMC CREW funding has been realigned into the MEGFoS funding profile.

MEGFoS will provide interconnected electronic warfare systems for use at fixed sites, on tactical vehicles, and dismounted that will operate across a range of frequencies in order to provide the Marine Corps the ability to maneuver efficiently inside the electromagnetic spectrum. MEGFoS provides the ability to protect friendly use of spectrum, sense all spectrum usage in an area of responsibility, and to target adversaries inside spectrum with the intent to deny, delay or degrade an adversary's decision making cycle.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: *USMC CREW - Product Development	8.357	3.151	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2020 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2274 / *Command & Control Warfare Sys*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
- Develop increased capability packages for the Modi II and MFEW systems. Specifically, Networking, and Advanced Graphical User Interface (GUI) and Integration in the MAGTF Common Handheld solution. ***FY 2021 Base Plans:*** N/A ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Decrease of $3.151M from FY20 to FY21 reflects transition of USMC CREW funding into the MEGFoS funding profile.					
Title: *USMC CREW - Support ***Articles:***	0.617 -	0.164 -	0.000 -	0.000 -	0.000 -
FY 2020 Plans: - Provide systems engineering support for MFEW (Modi II, MVPA II) and Universal Test Sets by analyzing performance impacts resulting from compatibility, technology and software updates and environmental risks. ***FY 2021 Base Plans:*** N/A ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Decrease of $0.164M from FY20 to FY21 reflects transition of USMC CREW funding into the MEGFoS funding profile.					
Title: *USMC CREW - Test and Evaluation ***Articles:***	0.910 -	1.019 -	0.000 -	0.000 -	0.000 -
FY 2020 Plans: - Test of the mounted and dismounted MFEW Engineering Changes that will be fielded. - Continue compatibility testing against USMC and other services devices to ensure Marine Corps MFEW systems maintain required performance capabilities.					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2274 / *Command & Control Warfare Sys*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
- Test new and developing load-sets ability to exploit or defeat advanced and emerging threat systems. ***FY 2021 Base Plans:*** N/A ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Decrease of $1.019M from FY20 to FY21 reflects transition of USMC CREW funding into the MEGFoS funding profile.					
Title: *USMC CREW - Management Services	1.628	2.041	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2020 Plans: - Provide management services support for the MFEW (Modi II, MVPA II) bridging capability, and Universal Test Sets by analyzing performance impacts resulting from compatibility, technology and software updates and environmental risks. - Support The Office of Naval Research (ONR) Future Naval Capabilities (FNC) Ensuring Defense in Operating System Resilience/Electronic Warfare Operating System Kernel (ENDOR/EWOK) software development. ***FY 2021 Base Plans:*** N/A ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Decrease of $2.041M from FY20 to FY21 reflects transition of USMC CREW funding into the MEGFoS funding profile.					
Title: MEGFoS - Product Development	0.000	4.079	4.580	0.000	4.580
Articles:	-	-	-	-	-
FY 2020 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2274 / *Command & Control Warfare Sys*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
- Initiate market research of MEGFoS capabilities such as electronic attack (EA)/electronic support (ES) capabilities, precision geolocation, fully networked, radar EA, advanced electronic warfare (EW) techniques, and enhanced frequency range. ***FY 2021 Base Plans:*** - Continue development of MEGFoS capabilities such as electronic attack (EA)/electronic support (ES) capabilities, precision geolocation, fully networked, radar EA, advanced electronic warfare (EW) techniques, and enhanced frequency range. - Initiate development of a common, open hardware backplane based off the C4ISR Modular Open Suites of Standards (CMOSS), and an open software architecture. - Develop hardware components that will be interoperable across the mounted, dismounted and fixed site systems. - Integrate advanced transceivers to fully realize advanced EA/ES capabilities. - Incorporate algorithms to conduct precision geolocation autonomously. - Develop networking capability for mounted, dismounted and fixed site systems to provide a high level of situational awareness to commanders and Marines at the company level and fully realize advanced EA/ES capabilities. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Increase of $0.501M from FY20 to FY21 is largely due to the initiation of development efforts associated with a common, open hardware backplane based off the C4ISR Modular Open Suites of Standards (CMOSS), and an open software architecture as well as hardware interoperability.					
Title: MEGFoS - Support	0.000	0.000	0.932	0.000	0.932
Articles:	-	-	-	-	-
FY 2020 Plans: N/A ***FY 2021 Base Plans:*** - Provide systems engineering support for the MFEW (Modi II, MVPA II) bridging capability, MEGFoS Hardware backplane and Universal Test Sets by analyzing performance impacts resulting from compatibility, technology and software updates and environmental risks.					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2274 / *Command & Control Warfare Sys*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
- Support The Office of Naval Research (ONR) Future Naval Capabilities (FNC) Ensuring Defense in Operating System Resilience/Electronic Warfare Operating System Kernel (ENDOR/EWOK) software development and integration into MEGFoS hardware backplane. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Increase of $0.932M from FY20 to FY21 reflects initiation of MEGFoS systems engineering support for the MFEW (Modi II, MVPA II) bridging capability, MEGFoS Hardware backplane and Universal Test Sets by analyzing performance impacts resulting from compatibility, technology and software updates and environmental risks. Additionally, funds support ONR FNC ENDOR/EWOK software development and integration into MEGFoS hardware backplane.					
Title: MEGFoS - Test and Evaluation ***Articles:*** ***FY 2020 Plans:*** N/A ***FY 2021 Base Plans:*** - Developmental test of MEGFoS Architectures in relevant environments. - Test new and developing load-sets ability to exploit or defeat advanced and emerging threat systems. - Test of the mounted and dismounted MFEW engineering changes that will be procured and fielded. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Increase of $1.029M from FY20 to FY21 reflects transition of USMC CREW funding into the MEGFoS funding profile and supports initiation of developmental testing of MEGFoS Architectures in relevant environments. Additionally, funds support testing of new and developing load-sets ability to exploit or defeat advanced and emerging threat systems and testing of the mounted and dismounted MFEW Engineering Changes that will be procured and fielded.	0.000 -	0.000 -	1.029 -	0.000 -	1.029 -
Title: MEGFoS - Management Services ***Articles:***	0.000 -	0.000 -	2.051 -	0.000 -	2.051 -

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2274 / *Command & Control Warfare Sys*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
FY 2020 Plans: N/A ***FY 2021 Base Plans:*** - Transition of successful science and technology efforts as components of MEGFoS systems. - Manage all Systems Engineering and Test and Evaluation events for the EWS team. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Increase of $2.051M from FY20 to FY21 reflects transition of USMC CREW funding into the MEGFoS funding profile and supports transition of successful science and technology efforts as components of MEGFoS systems as well as support during all Systems Engineering and Test and Evaluation events.					
Accomplishments/Planned Programs Subtotals	11.512	10.454	8.592	0.000	8.592

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• PMC/652000: *MEGFoS*	0.000	0.000	0.000	-	0.000	0.000	34.998	80.498	82.108	0.000	197.604

Remarks

D. Acquisition Strategy

COUNTER RADIO-CONTROLLED IMPROVISED EXPLOSIVE DEVICE (RCIED) ELECTRONIC WARFARE (USMC CREW): CREW mounted and dismounted systems provide Marines in vehicle convoys and on foot with the necessary protection from the continued and evolving threat of deadly RCIEDs in all current and future operations. The program will continue to develop new counter techniques, improve capabilities, enhance software and develop upgrades to counter evolving threats and prevent technology obsolescence. Activities include waveform development, non-recurring engineering for system enhancements, capability upgrades, and the testing/government studies required to support these changes. The CVRJ Program consists of 3100 CREW Vehicle Receiver Jammer CVRJ(V)2. The Modi II program consists of 565 dismounted systems currently being issued to deploying Units for CREW and Counter UAS capability. Modi II and the MVPA II are considered Multi-Functional Electronic Warfare (MFEW) systems. FY19 plan reflects test and evaluation for MFEW development efforts to include software load-set development and capability testing of the Modi II and MVPA II Systems. FY20 plan reflects further test and evaluation for MFEW development efforts to include software load-set development and increased capability testing of the MFEW System, which would provide both CREW and Counter Unmanned Aerial Systems (C-UAS), electronic support, geolocation, direction finding, and networking. MFEW systems are considered a bridge capability based on a USON requirement and will be replaced by the

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2274 / *Command & Control Warfare Sys*

MAGTF Electronic Warfare Ground Family of Systems (MEGFoS) systems in FY25. MEGFoS will provide a significant improvement in capability when compared to MFEW and what is commercially available today.

MEGFoS: Will employ an evolutionary acquisition strategy utilizing an incremental and phased approach for development and fielding. The first increment will focus on developing a common hardware and software standard and the integration of legacy capabilities (MFEW) into that standard. Additionally, it will develop and integrate all EW sensors into a common operating picture allowing all elements of the MAGTF to gain and maintain awareness in the Electro-Magnetic (EM) Spectrum. It will also integrate existing legacy capabilities to include, communications EW, CREW and C-UAS. The subsequent phases will be structured to develop and integrate additional capability into the suite of standards and software. This will include but is not limited to, Cyber, Communications, Signature Management, and advanced signals detection and attack techniques. Increment 1 will procure LRIP quantities of 50 in FY23, for Operational Test at the beginning of FY 24, in support of a full rate production decision in FY24. IOC is projected in 4Q FY25.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2274 / *Command & Control Warfare Sys*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
USMC CREW	WR	NSWC CD : CRANE, IN	7.630	1.631	Feb 2019	3.151	Nov 2019	0.000		-		0.000	0.000	12.412	-
USMC CREW	C/CPFF	MCSC : QUANTICO, VA	0.216	6.726	Aug 2019	0.000		0.000		-		0.000	0.000	6.942	-
MEGFoS	TBD	MCSC : QUANTICO, VA	0.000	0.000		4.079	Dec 2019	4.580	Dec 2020	-		4.580	Continuing	Continuing	Continuing
Prior Years Cumulative Funding	Various	VARIOUS : VARIOUS	9.723	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	17.569	8.357		7.230		4.580		-		4.580	Continuing	Continuing	N/A

Remarks

Decrease of $2.650M from FY20 to FY21 reflects completion of CREW product development efforts and transition to MEGFoS beginning FY21.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
USMC CREW	WR	SSC-A : CHARLESTON, SC	1.411	0.617	Feb 2019	0.164	Feb 2020	0.000		-		0.000	0.000	2.192	-
MEGFoS	WR	SSC-A : CHARLESTON, SC	0.000	0.000		0.000		0.932	Mar 2021	-		0.932	0.000	0.932	-
Prior Years Cumulative Funding	Various	VARIOUS : VARIOUS	5.161	0.000		0.000		0.000		-		0.000	0.000	5.161	-
		Subtotal	6.572	0.617		0.164		0.932		-		0.932	0.000	8.285	N/A

Remarks

Increase of $0.768M from FY20 to FY21 reflects initiation of MEGFoS systems engineering support for the MFEW (Modi II, MVPA II) bridging capability, MEGFoS Hardware backplane and Universal Test Sets by analyzing performance impacts resulting from compatibility, technology and software updates and environmental risks. Additionally, funds support ONR FNC ENDOR/EWOK software development and integration into MEGFoS hardware backplane.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2274 / *Command & Control Warfare Sys*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
USMC CREW	MIPR	YPG : YUMA, AZ	10.694	0.910	Apr 2019	0.370	Apr 2020	0.000		-		0.000	0.000	11.974	-
USMC CREW	MIPR	SOCOM : TAMPA, FL	0.000	0.000		0.649	Jun 2020	0.000		-		0.000	0.000	0.649	-
MEGFoS	MIPR	YPG : YUMA, AZ	0.000	0.000		0.000		1.029	May 2021	-		1.029	0.000	1.029	-
Prior Years Cumulative Funding	Various	VARIOUS : VARIOUS	6.982	0.000		0.000		0.000		-		0.000	0.000	6.982	-
		Subtotal	17.676	0.910		1.019		1.029		-		1.029	0.000	20.634	N/A

Remarks

No significant change from FY20 to FY21.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
USMC CREW	WR	NSWC CD : CRANE, IN	9.520	1.578	Mar 2019	1.627	Jan 2020	0.000		-		0.000	0.000	12.725	-
USMC CREW	C/CPFF	NSWC DD : DAHLGREN VA	0.310	0.050	Feb 2019	0.414	Jan 2020	0.000		-		0.000	0.000	0.774	-
MEGFoS	WR	NSWC CD : CRANE, IN	0.000	0.000		0.000		2.051	Jan 2021	-		2.051	0.000	2.051	-
Prior Years Cumulative Funding	Various	VARIOUS : VARIOUS	1.602	0.000		0.000		0.000		-		0.000	0.000	1.602	-
		Subtotal	11.432	1.628		2.041		2.051		-		2.051	0.000	17.152	N/A

Remarks

No significant change from FY20 to FY21.

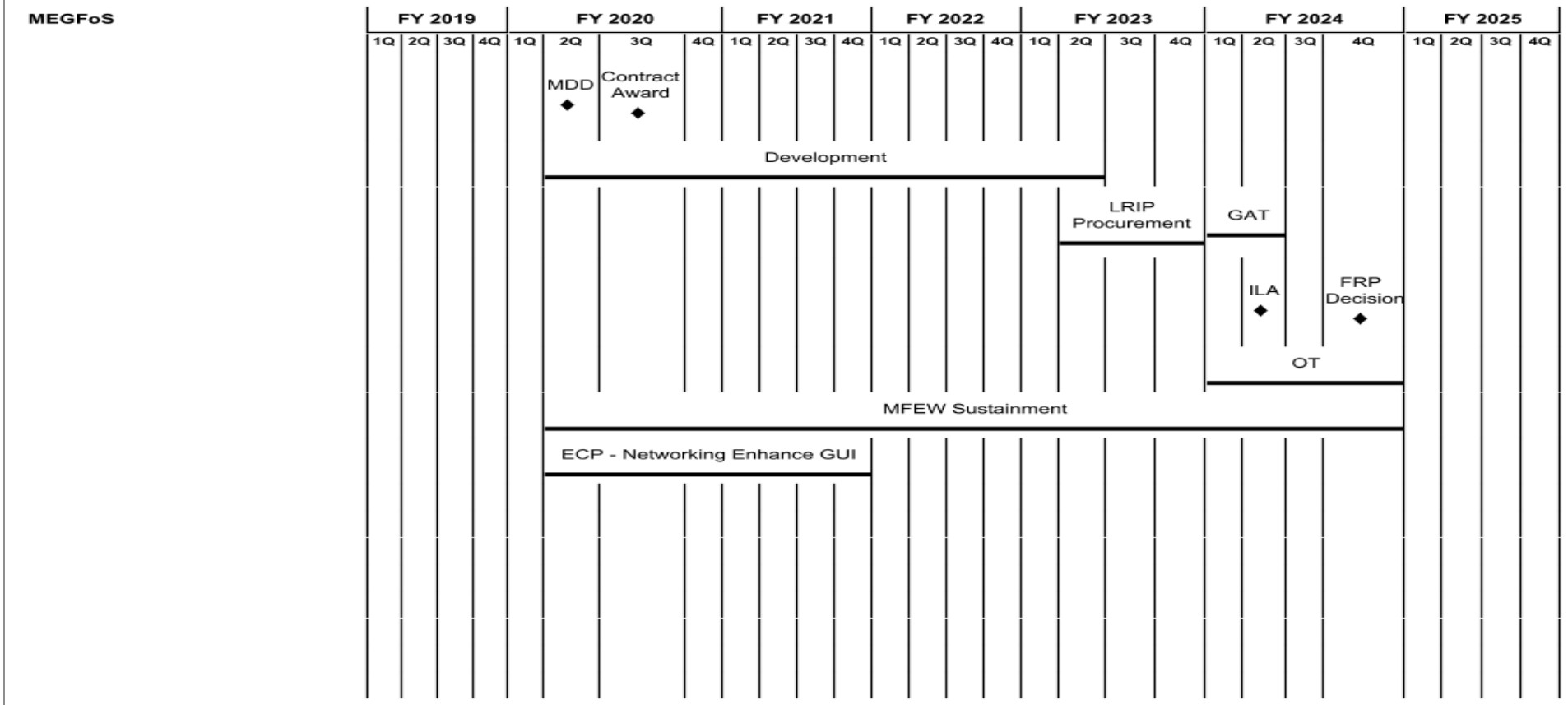
	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	53.249	11.512		10.454		8.592		-		8.592	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206313M / *Marine Corps Comms Systems*	Project (Number/Name) 2274 / *Command & Control Warfare Sys*	

	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2274 / *Command & Control Warfare Sys*



2021PB - 0206313M - 2274

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2274 / *Command & Control Warfare Sys*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
MEGFoS				
MEGFoS MDD	2	2020	2	2020
MEGFoS Contract Award	3	2020	3	2020
MEGFoS Development	2	2020	2	2023
MEGFoS LRIP Procurement	2	2023	4	2023
MEGFoS GAT	1	2024	2	2024
MEGFoS ILA	2	2024	2	2024
MEGFoS FRP Decision	4	2024	4	2024
MEGFoS OT	1	2024	4	2024
MFEW Sustainment	2	2020	4	2024
MFEW ECP	2	2020	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206313M / *Marine Corps Comms Systems*	Project (Number/Name) 2275 / *Marine Corps Tactical Radio Systems*	

COST ($ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
2275: *Marine Corps Tactical Radio Systems*	81.083	18.701	13.348	14.469	-	14.469	12.848	11.904	9.822	9.994	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

Beginning in FY19, COC funding has been realigned from project 2273 and Air Operations C2 Systems funding to this project. Realignment of efforts to new projects in FY19 and beyond reflects USMC Program Management Office (PMO) reorganization to improve support of USMC OPFOR.

The FY 2021 funding request was reduced by $3.0M to account for the availability of prior year execution balances.

A. Mission Description and Budget Item Justification

Tactical Communications Modernization (TCM): TCM supports the research, testing, and evaluation of non-developmental tactical voice and data radio systems for mounted and dismounted operations within all echelons of the Marine Air-Ground Task Force. The testing will ensure the communication systems are joint networking capable and support National Security Agency (NSA) Communications Security (COMSEC) Modernization requirements. The funding provides contracted engineering support, facility test support, and test reporting for multiple systems. These include the Mobile User Objective System (MUOS), High Frequency Radio II (HFR II), and Multi-Channel Radio Family of System (MCR FoS) [Multi-Channel Man Pack (MCMP) and Multi-Channel Handheld (MCHH)] radios, High Altitude Radio Delay, terminals, antennas, current systems requiring updates or obsolescence issues, and Joint Enterprise Network Manager (JENM).

Networking On The Move (NOTM): NOTM provides a command and control (C2) capability by integrating tactical data systems with on the move satellite communications (SATCOM) for beyond line-of-sight communication that allows commanders to have uninterrupted two-way access to digital data, anywhere on the battlefield. NOTM provides Marine Air-Ground Task Force (MAGTF) commanders and staffs with full Common Operational Picture (COP) access, virtually unlimited situational awareness and a powerful ability to issue digital orders (fires, maneuver, planning) to Ground Combat Element (GCE), Air Combat Element (ACE) and Logistics Combat Element (LCE) units at all echelons while on-the-move or at-the-halt. NOTM also provides Marine units the capability to link with and extend Defense Information System Network (DISN) services; SIPRNet, NIPRNet, and Defense Switched Networks (DSN). Integrated full motion video (receipt and retransmission), tactical voice communications, plus three options for secure wireless local area network (LAN) connectivity between staff members makes this capability a crucial asset to all elements of the MAGTF. Currently the USMC has three variants depending on the type of transportation being used; the NOTM Ground Combat Vehicle (GCV), NOTM Utility Task Vehicle (UTV), and NOTM Airborne (NOTM-A).

Very Small Aperture Terminal (VSAT): The VSAT Family of Systems (FoS) provides wideband Beyond Line of Sight (BLOS), low-cost satellite communications to Marine Air-Ground Task Force (MAGTF) commanders at the Major Subordinate Commands to the Battalion levels. The VSAT FoS provides the RF communications link in support of the transfer of voice, video, and data services.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2275 / *Marine Corps Tactical Radio Systems*

Secure Mobile Anti-Jam Reliable Tactical-Terminal (SMART-T): SMART-T provides tactical users with protected data and voice via Advanced Extremely High Frequency (AEHF) satellite communications. The SMART-T system is transported on High Mobility Multipurpose Wheeled Vehicles (HMMWVs), providing MAGTF Commanders a secure, survivable, long-haul, low/medium data rate communications link not subject to terrain masking and horizon limitations. The SMART-T is the only USMC asset that possesses a SATCOM AEHF capability.

Terrestrial Wideband Transmission Systems (TWTS): TWTS is a capabilities portfolio that provides the Marine Air-Ground Task Force (MAGTF) with a continued capability of secure terrestrial digital data transmission. The portfolio includes, the Army/Navy Transportable Radio Communications-170A (AN/TRC-170A) Beyond Line of Sight (BLOS) systems and their replacement Next Generation Troposcatter (NGT). The AN/MRC-142 and the Wireless Point to Point Link (WPPL) Line of Sight (LOS) systems and their replacement called the LOS Replacement (LOS-R), Tactical Elevated Antenna Mast (TEAMS), and Free-Space Optics (FSO) system. The NGT capability will provide a high bandwidth communications data link to support remote locations where satellite communication is not available. The LOS-R capability will provide a digital wideband full duplex link between operating units ashore and units aboard amphibious ships via the Navy's Automated Data Network System (ADNS) to meet ship-to-shore and shore-to-shore communication requirements. FSO is designed to provide additional LOS transmission diversity with an optical line-of-sight transmission path with a Low Probability of Detection/Low Probability of Intercept (LPD/LPI).

Combat Operations Center (COC): COC provides commanders with a rapidly deployable, common, modular, and scalable operational agency that facilitates command and control across the full spectrum of MAGTF operations. The AN/TSQ-239A Family of Systems (FoS), is designed to provide centralized C2 Operational Facilities (OPFAC) to collect, process, and disseminate tactical data for the commander and staff of a Marine Expeditionary Force (MEF), Division, Wing, Marine Logistics Group, Regiment, Marine Air Group, Battalion, and Squadron. The COC provides the commander with a Common Operational Picture (COP) and tactical data and communications assets needed to plan and conduct operations in an expeditionary combat environment. The system enables analytical and intuitive decision-making with a modular and scalable equipment set consisting of a common module OPFAC, C2 system, visual displays, and SW. Existing Tactical Data System software, previously resident on numerous platforms throughout the Marine Air-Ground Task Force (MAGTF), have been re-hosted on the COC system to provide commanders with integrated data access and communications. COC transitioned from Project C2273 to Project C2275 beginning FY19. COC program office will begin developing a design for a update to the current COC configuration called Next Generation Operational Facility (OPFAC). The Next Generation OPFAC will provide the MAGTF with a more agile and modular COC capability to better support future Expeditionary Advanced Based Operations (EABO) that require a smaller physical presence. In FY21 the Combat Operations Center (COC) requirements transitions into the Combat Data Network (CDN) program PE 0206313 Project 2276 under the title Common Hosting Environment (CHE).

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: TCM: Product Development	1.118	1.256	1.274	0.000	1.274
Articles:	-	-	-	-	-
FY 2020 Plans: - Continue funding the Marine Corps fair share cost for development of the Joint Enterprise Network Manager (JENM) application required for MUOS.					
FY 2021 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2275 / *Marine Corps Tactical Radio Systems*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
- Continue funding the Marine Corps fair share cost for development of the Joint Enterprise Network Manager (JENM) application required for MUOS. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** No significant changes between FY20 and FY21.					
Title: TCM: Engineering and Program Support ***Articles:*** ***FY 2020 Plans:*** - Engineering and support efforts for radios, such as MCHH, as well as crypto modernization efforts. ***FY 2021 Base Plans:*** - Engineering and support efforts for radios, such as MCHH, as well as crypto modernization efforts. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** No significant changes between FY20 and FY21.	0.336 -	0.342 -	0.349 -	0.000 -	0.349 -
Title: TCM: Test and Evaluation Support ***Articles:*** ***FY 2020 Plans:*** - Procure test assets to support testing to mitigate obsolescence issues. - Test events including software development test, road shock, shake and vibration testing and MIL-STD testing for TCM FoS, such as HFR II, MCR FoS, and system updates or obsolescence. ***FY 2021 Base Plans:*** - Procure test assets (to include High Altitude Radio Delay assets) to support testing to mitigate obsolescence issues. - Test events including software development test, road shock, shake and vibration testing and MIL-STD testing for TCM FoS, such as HFR II, MCR FoS, and system updates or obsolescence.	2.911 -	2.966 -	5.458 -	0.000 -	5.458 -

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2275 / *Marine Corps Tactical Radio Systems*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
- Support procurement of a High Altitude Radio Delay antenna test asset, and test events. (This initiative supports the following National Defense Strategy objective: sustain joint force military advantage) ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Increase of $2.492M from FY20 to FY21 is due to the increase of personnel for support to the new effort High Altitude Radio Delay (this initiative supports the following National Defense Strategy objective: sustain joint force military advantage); along with test asset procurement and testing requirements.					
Title: TCM: Management Services	0.386	0.386	0.394	0.000	0.394
Articles:	-	-	-	-	-
FY 2020 Plans: - Support FFRDC engineering and program support for the TCM Family of Systems (FoS), MCR FoS, MBR II equipment and legacy equipment reaching obsolescence. ***FY 2021 Base Plans:*** - Support FFRDC engineering and program support for the TCM Family of Systems (FoS), MCR FoS, MBR II equipment and legacy equipment reaching obsolescence. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** No significant changes between FY20 and FY21.					
Title: NOTM: Product Development	3.745	0.902	3.820	0.000	3.820
Articles:	-	-	-	-	-
Description: Networking on the Move Research and Development funding supports the design, development, prototyping and Engineering for technology refresh and upgrades, system refreshes and new capabilities. ***FY 2020 Plans:*** - Complete development of NOTM UTV variant.					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2275 / *Marine Corps Tactical Radio Systems*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
- Continue Engineering Change Proposals (ECPs) associated with NOTM tech refreshes, equipment upgrades and usability enhancements of fielded systems. ***FY 2021 Base Plans:*** - Initiate the prototyping of NOTM systems onto Light Armored Vehicle and Amphibious Combat Vehicle platforms. - Initiate the development of network management/configuration tools that support future artificial intelligence (AI) integration. - Initiate testing of network resiliency tools NOTM systems to support operations in the future cyber environment. - Initiate the testing of satellite network tools and increase resiliency with protected waveforms. - Initiate the research and prototype of NOTM-Air improved satellite antenna systems to reduce impact on aircraft integration. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** NOTM increase of $2.918M from FY20 to FY21 in Product Development is associated with the transition from procurement to technology refreshes focused toward network/system resiliency and future integration of artificial intelligence (AI) capabilities.					
Title: NOTM: Test and Evaluation Support	2.639	0.159	0.424	0.000	0.424
Articles:	-	-	-	-	-
Description: Networking on the Move Test and Evaluation funding supports acquisition testing for design, development, production, engineering and fielding of system variants and equipment upgrades. ***FY 2020 Plans:*** - Initiate and conduct test and evaluation efforts in support of NOTM technology refreshes and equipment upgrades. - Complete test and evaluation efforts in support of NOTM UTV. ***FY 2021 Base Plans:*** - Initiate tests and certification in support of satellite communication systems hardening and resiliency. - Initiate testing in support of network configuration and network management tool suit.					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2275 / *Marine Corps Tactical Radio Systems*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
- Initiate testing in support of NOTM-A SATCOM system improvements. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** NOTM increase of $0.265M from FY20 to FY21 for test and evaluation reflects transition from procurement to technology refreshes focused toward network/system resiliency and future integration of artificial intelligence (AI) capabilities.					
Title: NOTM: Management Services ***Articles:*** ***Description:*** NOTM Management Services: Funds support management of NOTM variant requirements. ***FY 2020 Plans:*** N/A ***FY 2021 Base Plans:*** N/A ***FY 2021 OCO Plans:*** N/A	0.372 -	0.000 -	0.000 -	0.000 -	0.000 -
Title: VSAT: Product Development ***Articles:*** ***FY 2020 Plans:*** - Continue to support quarterly VSAT Graphical User Interface (GUI) design and development efforts to mitigate cyber-security vulnerabilities. ***FY 2021 Base Plans:*** - Continue VSAT GUI design and development efforts to mitigate cyber-security vulnerabilities. - Initiate procurement of Marine Corps Wideband Satellite-Light (MCWS-L) test assets. The MCWS-L will provide increased bandwidth at the battalion level. ***FY 2021 OCO Plans:***	0.912 -	0.468 -	1.016 -	0.000 -	1.016 -

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2275 / *Marine Corps Tactical Radio Systems*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Increase of $0.548M from FY20 to FY21 supports procurement of MCWS-L test assets.					
Title: VSAT: Test and Evaluation	0.768	1.350	0.240	0.000	0.240
Articles:	-	-	-	-	-
FY 2020 Plans: - Complete certification testing, such as cyber security and radiation hazard (RAD HAZ), in support of Marine Corps Wideband Satellite - Expeditionary (MCWS-X) fielding requirements. - Initiate test and evaluation efforts, such as test plans, for Marine Corps Wideband Satellite - Light (MCWS-L). ***FY 2021 Base Plans:*** - Continue test and evaluation efforts for Marine Corps Wideband Satellite - Light (MCWS-L). ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Decrease of $1.110M from FY20 to FY21 reflects completion of the MCWS-X testing requirements.					
Title: VSAT: Engineering and Program Support	0.617	0.201	0.277	0.000	0.277
Articles:	-	-	-	-	-
FY 2020 Plans: - Initiate performance specification (P-SPEC) development for the MCWS family of systems (FOS), to include MCWS-X and MCWS-L. ***FY 2021 Base Plans:*** - Initiate engineering documentation, such as risk management and requirements traceability matrix, in support of Marine Corps Wideband Satellite-Light (MCWS-L). ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Increase of $0.076M from FY20 to FY21 supports engineering for the MCWS-L development.					
Title: VSAT: Management Services	0.982	0.055	0.105	0.000	0.105

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2275 / *Marine Corps Tactical Radio Systems*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Articles:	-	-	-	-	-
FY 2020 Plans: - Continue engineering efforts through a FFRDC in support of analysis of requirements and research to mitigate end-of-life/end-of-sale, and component obsolescence. ***FY 2021 Base Plans:*** - Continue engineering efforts through a FFRDC in support of analysis of requirements and research to mitigate end-of-life/end-of-sale, and component obsolescence. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Increase of $0.050M from FY20 to FY21 supports FFRDC engineering efforts for the Marine Corps Wideband Satellite (MCWS).					
Title: SMART-T: Management Services	0.161	0.000	0.067	0.000	0.067
Articles:	-	-	-	-	-
FY 2020 Plans: N/A ***FY 2021 Base Plans:*** - Continue to provide engineering analysis through a FFRDC on future technical upgrades and research to mitigate end-of-life/end-of-sale, and component obsolescence. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Increase of $0.067M from FY20 to FY21 supports engineering analysis.					
Title: SMART-T: Engineering and Program Support	0.021	0.000	0.030	0.000	0.030
Articles:	-	-	-	-	-
FY 2020 Plans: N/A ***FY 2021 Base Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2275 / *Marine Corps Tactical Radio Systems*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
- Continue ECPs and Information Assurance support efforts. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Increase of $0.030M from FY20 to FY21 is due to ECPs and Information Assurance support efforts.					
Title: TWTS: Engineering and Program Support ***Articles:*** ***FY 2020 Plans:*** - Continue to provide TWTS program office management support. ***FY 2021 Base Plans:*** N/A ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Decrease of $0.200M from FY20 to FY21 reflects transition of support requirements to test and evaluation requirements.	1.771 -	0.200 -	0.000 -	0.000 -	0.000 -
Title: TWTS: Test and Evalution ***Articles:*** ***FY 2020 Plans:*** - Ramp up of test and evaluation efforts related to Next Generation Tropo (NGT) and Line of Sight Replacement (LOS-R) developmental test. ***FY 2021 Base Plans:*** - Complete NGT test events. - Continue LRS FoS (formerly LOS-R) testing; to include initiation of MRC Radio Frequency capability. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:***	0.819 -	0.686 -	1.015 -	0.000 -	1.015 -

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2275 / *Marine Corps Tactical Radio Systems*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Increase of $0.329M from FY20 to FY21 supports initiation of the LRS FoS MRC Radio Frequency capability.					
Title: TWTS: Management Services	0.335	0.105	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2020 Plans: - Completes FFRDC engineering and program support for TWTS FoS.					
FY 2021 Base Plans: N/A					
FY 2021 OCO Plans: N/A					
FY 2020 to FY 2021 Increase/Decrease Statement: Decrease of $0.105M from FY20 to FY21 reflects completion of requirements for FFRDC support.					
Title: COC: Product Development	0.500	3.272	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2020 Plans: - Complete testing and integration efforts for tactical wireless capability and cyber intrusion to meet readiness and warfighting requirements. - Initiate and complete testing, integration, and network interoperability for network and table top switch replacement. - Initiate and complete an internal communications systems re-design and evaluate a new solution for the internal communication system to address intercom noise hazardous issues.					
FY 2021 Base Plans: N/A					
FY 2021 OCO Plans: N/A					
FY 2020 to FY 2021 Increase/Decrease Statement:					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2275 / *Marine Corps Tactical Radio Systems*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
The decrease of $3.272M from FY20 to FY21 is due to the Marine Corps concerted effort to modernize in accordance with the National Defense Strategy (NDS)/Defense Planning Guidance (DPG) in completion of COC efforts.					
Title: COC: Management Services ***Articles:*** ***FY 2020 Plans:*** - Continue and complete engineering support for system optimization and system enhancements to provide the ability for COC to operate with present and future MAGTF operations. ***FY 2021 Base Plans:*** N/A ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** The decrease of $1.000M from FY20 to FY21 is due to the Marine Corps concerted effort to modernize in accordance with the National Defense Strategy (NDS)/Defense Planning Guidance (DPG) in completion of COC efforts.	0.164 -	1.000 -	0.000 -	0.000 -	0.000 -
Title: COC: Technical Program Support ***Articles:*** ***FY 2020 Plans:*** N/A ***FY 2021 Base Plans:*** N/A ***FY 2021 OCO Plans:*** N/A	0.144 -	0.000 -	0.000 -	0.000 -	0.000 -
Accomplishments/Planned Programs Subtotals	18.701	13.348	14.469	0.000	14.469

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2275 / *Marine Corps Tactical Radio Systems*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• PMC/4633-1: *TCM*	184.285	156.965	264.421	-	264.421	296.459	330.344	344.698	353.936	Continuing	Continuing
• PMC/4631-1: *NOTM*	86.042	51.373	32.956	-	32.956	14.245	14.827	15.122	15.429	Continuing	Continuing
• PMC/4633-2: *VSAT*	7.567	15.957	14.602	-	14.602	15.011	18.991	19.369	19.668	Continuing	Continuing
• PMC/4633-3: *SMART-T*	0.778	0.000	1.552	-	1.552	1.571	1.504	1.739	1.865	Continuing	Continuing
• PMC/4633-4: *TWTS*	36.643	28.567	56.231	-	56.231	212.963	208.803	212.991	4.243	Continuing	Continuing
• PMC/7000-1: *SMART-T Spares*	0.000	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• PMC/4631-2: *COC*	13.803	8.440	0.004	-	0.004	0.000	0.000	0.000	0.000	Continuing	Continuing

Remarks

D. Acquisition Strategy

Tactical Communications Modernization (TCM): TCM will maximize the use of non-developmental radio solutions to meet the next generation of Marine Corps tactical radio requirements. The Mobile User Objective System (MUOS) testing at contracted government test labs to include environmental, shock, electromagnetic compatibility, and interoperability testing until full capability is completed. Due to NSA Type 1 COMSEC capability requirement, High Frequency Radios II (HFR II) is limited on vendor opportunities. The contracting strategy is sole-source to a qualified NSA vendor. The validation of Military and Marine Corps Standards will be tested and will be completed before procurement. The MCR FoS is an evolutionary program that will field non-developmental software defined radios (SDR) to meet the National Security Agency's (NSA) Communications Security Modernization end of Calendar Year 2024 deadline. To maximize better buying power, reduce lifecycle cost, and enhance interoperability, the MCR FoS will engage in a cooperative acquisition with the United States Army (USA) Program Executive Office - Command, Control, and Communications-Tactical (PEO C3T), Program Manager Tactical Radios Handheld, Manpack and Small Form Fit Program. MCR FoS will leverage programmatic documentation and contracts under PEO-C3T in order to meet the material solution for the MCMP and MCHH, reduce duplication of effort and meet future sustainment requirements.

Networking on the Move (NOTM): NOTM will use an evolutionary acquisition strategy that leverages Commercial-Off-The-Shelf (COTS) and Government-Off-The-Shelf (GOTS) technology to procure, sustain, and meet emerging requirements. The design of the system provides for internal growth capability through an open system architecture enabling technology refresh to extend the system's life, maintain interoperability, Information Assurance (IA) compliance, and reduce costs due to Diminishing Manufacturing Sources and Material Shortages (DMSMS). It is envisioned that technology refresh will occur on the NOTM hardware and software periodically due to component obsolescence, user-driven requests for improvements, IA compliance, and mission-related requirements. Refresh will include investments to incorporate evolving capabilities to ensure compatibility with other systems, create lighter and more efficient equipment, and keep pace with evolving software requirements. End-of-life equipment refresh is expected throughout the program's life cycle and may be managed through kit purchases, replacement through Engineering Change Proposals (ECPs), or as replacement parts as equipment is repaired.

Very Small Aperture Terminal (VSAT): The VSAT Family of Systems (FoS) was fielded over 10 years and as a result, many subcomponents have reached End-of-Life/ End-of-Sale (EoL/EoS). The VSAT program will conduct a VSAT-Medium refresh to bridge the gap between current obsolescence and Marine Corps Wideband Satellite

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2275 / *Marine Corps Tactical Radio Systems*

(formerly named Next Generation SATCOM) development. The VSAT acquisition strategy leverages Commercial-Off-The-Shelf (COTS) technology to keep the systems relevant and capable. The design of Marine Corps Wideband Satellite (MCWS) is intended to be scalable and utilize like subcomponents to minimize sustainment costs and equipment readiness issues. The MCWS-Expeditionary (MCWS-E) variant in FY21 will provide a man-packable, lighter, smaller, and more capable terminal. Refreshes will be required periodically through the life of the program due to equipment obsolescence, user requirements, and IA compliance, which will be conducted through the Engineering Change Proposal (ECP) process.

Secure Mobile Anti-Jam Reliable Tactical-Terminal (SMART-T): SMART-T is an Army led, ACAT II program. The Marine Corps SMART-T has fielded the full Authorized Acquisition Objective (AAO) of 42 terminals and 35 AN/PSQ-17 Network Planning tools and completed the Advanced Extremely High Frequency (AEHF) upgrades. The SMART-T Project Office will procure non developmental items utilizing an Army contract to mitigate obsolescence, Diminishing Manufacturing Sources and Material Shortages (DMSMS), and components whose warranty has expired. This strategy will continue until a NEXGEN AEHF solution is identified.

Terrestrial Wideband Transmission Systems (TWTS): TWTS is a capabilities portfolio that includes Beyond Line of Sight (BLOS) system and Line of Sight (LOS) systems. The AN/TRC-170A BLOS is a vehicle mounted self-enclosed troposcatter terminal fielded in 1992 and will be replaced by the Next Generation Troposcatter (NGT) transit case solution capable of providing 900% capacity increase, decrease size, and frequency diversity over the current system. The AN/MRC-142 Family of Systems (FoS) is the current LOS system that provides two-way, secure voice and data communications up to 35 miles. The AN/MRC-142 FOS will be replaced by the LOS replacement (LOS-R) system providing radio compatibility with the Army and Navy for these high capacity LOS communication systems.

Combat Operations Center (COC): The COC AN/TSQ-239 (V)1-4 is the foundation of USMC Command and Control (C2), meeting near term communications and network requirements across the OpFor. There is a continuing developmental effort to evolve the COC into a fully integrated MAGTF C2 capability to maintain industry standard and interoperability with disparate C2 systems across the joint forces. COC program office will begin developing a design for a update to the current COC configuration called Next Generation Operational Facility (OPFAC) to begin fielding in FY23. The Next Generation OPFAC will provide the MAGTF with a more agile and modular COC capability to better support future Expeditionary Advanced Based Operations (EABO) that require a smaller physical presence.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206313M / *Marine Corps Comms Systems*	Project (Number/Name) 2275 / *Marine Corps Tactical Radio Systems*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
TCM JENM Development	SS/CPFF	ARL : Aberdeen, MD	3.445	1.118	Feb 2019	1.121	Feb 2020	1.139	Feb 2021	-		1.139	0.000	6.823	-
TCM FoS LCCEs	C/IDIQ	MCSC : Quantico, VA	0.110	0.000		0.135	Jul 2020	0.135	Jul 2021	-		0.135	0.000	0.380	-
NOTM Development/ Enhancement	C/FFP	MCTSSA: : Camp Pendleton, CA	0.000	0.000		0.200	Jan 2020	0.000		-		0.000	0.000	0.200	-
NOTM Development	C/CPFF	NIWC-LANT : Charleston, SC	3.747	2.027	Feb 2019	0.200	Feb 2020	1.910	Dec 2020	-		1.910	0.000	7.884	-
NOTM Development	WR	NIWC-Pacific : San Diego, CA	2.631	0.511	May 2019	0.502	Dec 2019	1.910	Dec 2020	-		1.910	Continuing	Continuing	Continuing
NOTM Production Enchancement	MIPR	DTIC : Fort Belvoir, VA	0.791	1.207	May 2019	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
VSAT GUI Development	C/FFP	CECOM : Aberdeen, MD	1.020	0.613	Jun 2019	0.468	Jun 2020	0.476	Jun 2021	-		0.476	0.000	2.577	-
VSAT MRT Refresh Test Asset	C/IDIQ	MCSC : Quantico, VA	0.000	0.299	Feb 2019	0.000		0.000		-		0.000	0.000	0.299	-
VSAT MCWS-L Test Asset	TBD	TBD : TBD	0.000	0.000		0.000		0.540	Feb 2021	-		0.540	0.000	0.540	-
COC	WR	NIWC-LANT : Charleston, SC	0.000	0.000	May 2019	1.338	May 2020	0.000		-		0.000	0.000	1.338	-
COC	C/FFP	NIWC-Pacific : San Diego, CA	0.000	0.500	May 2019	0.000		0.000		-		0.000	0.000	0.500	-
COC	C/CPIF	NIWC-LANT : Charleson, SC	0.000	0.000	Sep 2019	1.934	May 2020	0.000		-		0.000	0.000	1.934	-
Prior Years Cumulative Funding	Various	Various : Various	20.912	0.000		0.000		0.000		-		0.000	0.000	20.912	-
		Subtotal	32.656	6.275		5.898		6.110		-		6.110	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2275 / *Marine Corps Tactical Radio Systems*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
TCM Engineering Support	Various	MCSC : Quantico, VA	0.325	0.336	Sep 2019	0.342	May 2020	0.349	May 2021	-		0.349	Continuing	Continuing	Continuing
VSAT Engineering Support	WR	NIWC-PAC : San Diego, CA	0.757	0.228	Dec 2018	0.201	Feb 2020	0.277	Feb 2021	-		0.277	Continuing	Continuing	Continuing
VSAT SATCOM Technical Writer	MIPR	DHHS : Bethesda, MD	0.000	0.207	Jun 2019	0.000		0.000		-		0.000	0.000	0.207	-
VSAT-E iDirect Hub Support	WR	NIWC-LANT : Charleston, SC	0.000	0.182	Jun 2019	0.000		0.000		-		0.000	0.000	0.182	-
SMART-T Engineering Support 2	WR	NIWC-PAC : San Diego, CA	0.000	0.021	Dec 2018	0.000		0.030	Dec 2020	-		0.030	0.000	0.051	-
TWTS Program Management Support	Various	MCSC : Quantico, VA	1.583	0.816	Jun 2019	0.200	May 2020	0.000		-		0.000	Continuing	Continuing	Continuing
TWTS Engineering Support	WR	NIWC-LANT : Charleston, SC	1.057	0.955	Jan 2019	0.000		0.000		-		0.000	0.000	2.012	-
COC	WR	NRL : Washington, DC	0.000	0.094	Apr 2019	0.000		0.000		-		0.000	0.000	0.094	-
COC	WR	NIWC-LANT : Charleston, SC	0.000	0.050	Jun 2019	0.000		0.000		-		0.000	0.000	0.050	-
Prior Years Cumulative Funding	Various	Various : Various	2.095	0.000		0.000		0.000		-		0.000	0.000	2.095	-
		Subtotal	5.817	2.889		0.743		0.656		-		0.656	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
TCM FoS Test Activities and Support	TBD	TBD : TBD	1.722	1.876	Aug 2019	1.805	Aug 2020	3.271	Aug 2021	-		3.271	Continuing	Continuing	Continuing
TCM T&E Support	MIPR	DHHS : Bethesda, MD	0.121	0.583	Mar 2019	0.293	Mar 2020	0.302	Mar 2021	-		0.302	0.000	1.299	-
TCM FoS Test Assets	C/IDIQ	PRP : San Diego, CA	0.981	0.452	Jul 2019	0.868	Feb 2020	1.885	Mar 2021	-		1.885	0.000	4.186	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2275 / *Marine Corps Tactical Radio Systems*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
NOTM Vehicle Integration Testing	WR	NIWC-LANT : Charleston, SC	2.555	1.641	Apr 2019	0.000		0.124	Dec 2020	-		0.124	Continuing	Continuing	Continuing
NOTM-A Testing	WR	NIWC PAC : San Diego, CA	1.361	0.750	Apr 2019	0.159	May 2020	0.000		-		0.000	0.000	2.270	-
NOTM Test & Eval	WR	NIWC-PAC : San Diego, CA	0.000	0.000		0.000		0.150	Dec 2020	-		0.150	0.000	0.150	-
NOTM T&E	C/CPFF	NIWC-LANT : Charleston, SC	0.000	0.000		0.000		0.150	Feb 2021	-		0.150	0.000	0.150	-
NOTM Testing	MIPR	NIWC-PAC : Hawaai	0.409	0.248	May 2019	0.000		0.000		-		0.000	0.000	0.657	-
VSAT Testing	MIPR	NAWCAD : Patuxent River, MD	0.246	0.136	Jun 2019	1.350	Apr 2020	0.000		-		0.000	Continuing	Continuing	Continuing
VSAT Testing	MIPR	NSWC : Dahlgren, VA	0.000	0.080	Jul 2019	0.000		0.000		-		0.000	0.000	0.080	-
VSAT Testing	MIPR	TBD : TBD	0.000	0.302	Sep 2019	0.000		0.240	Jul 2021	-		0.240	0.000	0.542	-
VSAT Testing	MIPR	CECOM : Aberdeen, MD	0.000	0.250	Aug 2019	0.000		0.000		-		0.000	0.000	0.250	-
TWTS T&E Support	C/FFP	Dept. of Human Health and Services : Rockville, MD	1.113	0.622	Mar 2019	0.686	Mar 2020	0.898	Mar 2021	-		0.898	Continuing	Continuing	Continuing
TWTS ECP Testing	WR	NSWC : Crane, IN	0.000	0.059	Jun 2019	0.000		0.000		-		0.000	0.000	0.059	-
TWTS ECP Testing	WR	NIWC-LANT : Charleston, SC	0.000	0.118	Jul 2019	0.000		0.117	Nov 2020	-		0.117	0.000	0.235	-
TWTS Test Asset	WR	MCTSSA : Camp Pendleton, CA	0.000	0.020	Aug 2019	0.000		0.000		-		0.000	0.000	0.020	-
Prior Years Cumulative Funding	Various	Various : Various	19.907	0.000		0.000		0.000		-		0.000	0.000	19.907	-
		Subtotal	28.415	7.137		5.161		7.137		-		7.137	Continuing	Continuing	N/A

Remarks

Overall increase of $1.976M from FY20 to FY21 supports test asset procurement and test activities for the TCM FoS.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2275 / *Marine Corps Tactical Radio Systems*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
TCM Engineering Support	FFRDC	US Army, MITRE : Stafford, VA	1.239	0.386	Aug 2019	0.386	Dec 2019	0.394	Aug 2021	-		0.394	0.000	2.405	-
NOTM Engineering Support	FFRDC	US Army, MITRE : Stafford, VA	0.000	0.372	Dec 2018	0.000		0.000		-		0.000	0.000	0.372	-
VSAT Engineering Support 1	FFRDC	US Army, MITRE : Stafford, VA	6.015	0.098	Feb 2019	0.055	Feb 2020	0.105	Feb 2021	-		0.105	0.000	6.273	-
VSAT Engineering Support 2	FFRDC	US Army, MITRE : Stafford, VA	0.000	0.884	Sep 2019	0.000		0.000		-		0.000	0.000	0.884	-
SMART-T Engineering Support	FFRDC	US Army, MITRE : Stafford, VA	0.347	0.161	Dec 2018	0.000		0.067	Dec 2020	-		0.067	Continuing	Continuing	Continuing
TWTS Engineering Support	FFRDC	US Army, MITRE : Stafford, Va	0.896	0.335	Jan 2019	0.105	Jan 2020	0.000		-		0.000	0.000	1.336	-
COC Engineering Support	FFRDC	US Army, MITRE : Stafford, VA	0.000	0.164	Jul 2019	1.000	Feb 2020	0.000		-		0.000	Continuing	Continuing	Continuing
Prior Years Cumulative Funding	FFRDC	US Army, MITRE : Stafford, VA	5.698	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	14.195	2.400		1.546		0.566		-		0.566	Continuing	Continuing	N/A

Remarks

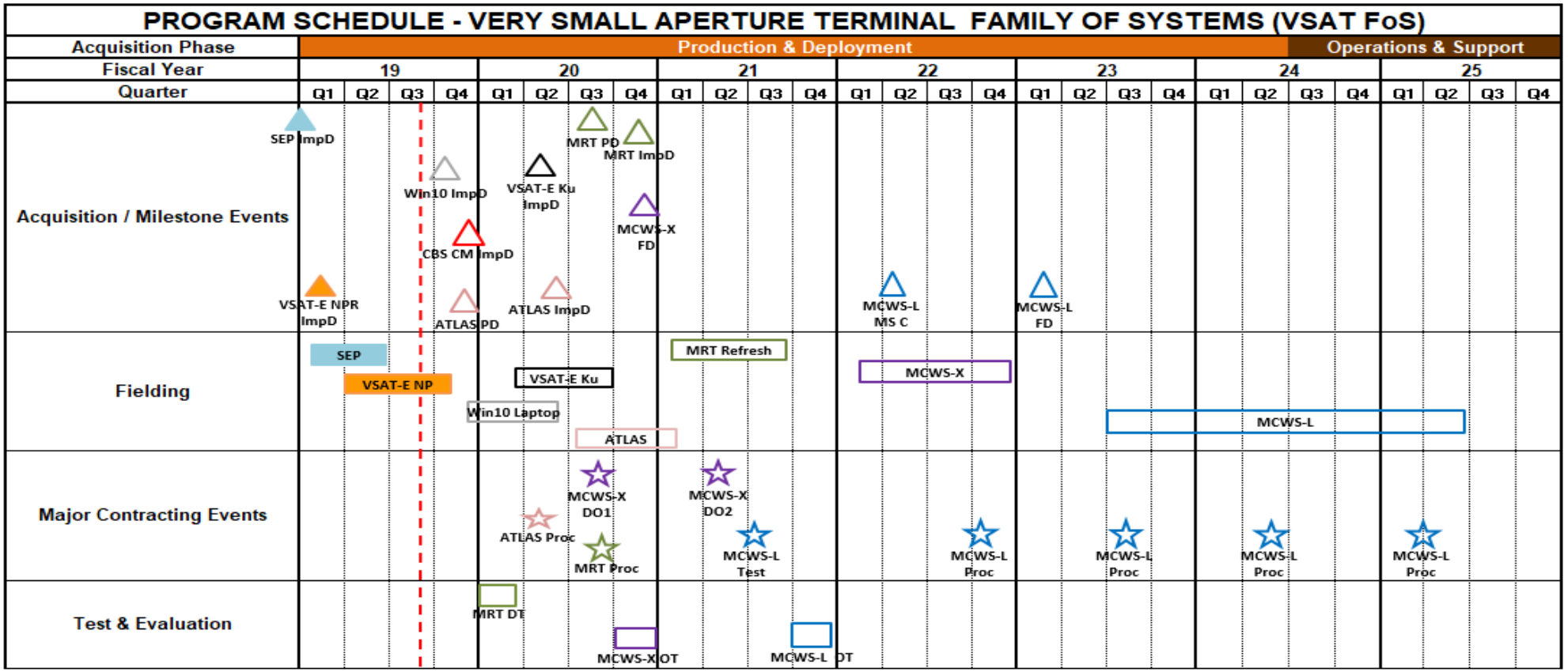
Overall decrease of $0.980M from FY20 to FY21 reflects reduction in FFRDC engineering requirements.

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	81.083	18.701		13.348		14.469		-		14.469	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2275 / *Marine Corps Tactical Radio Systems*

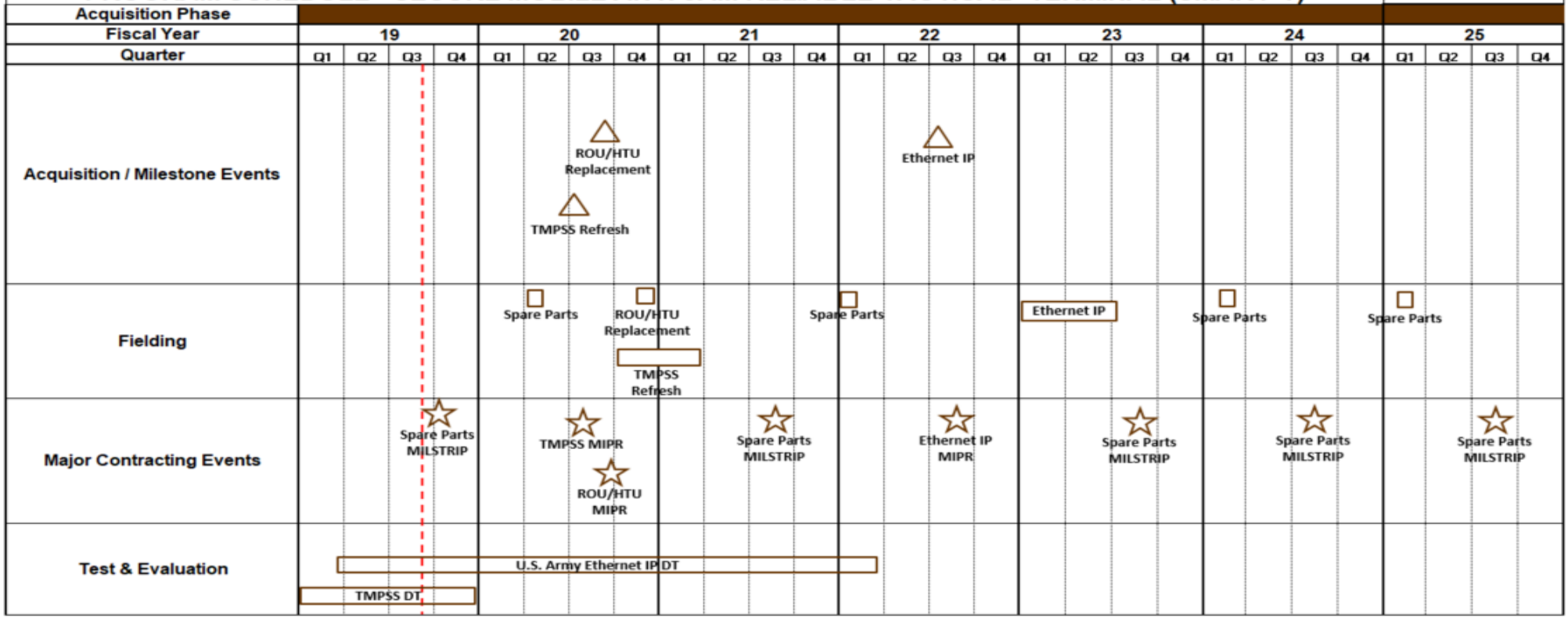
PROGRAM SCHEDULE - VERY SMALL APERTURE TERMINAL FAMILY OF SYSTEMS (VSAT FoS)



ATLAS: Adaptable Tactical Lightweight Antenna System (formerly VSAT ISA)
MRT: Master Reference Terminal
VSAT-E NP: Very Small Aperture Terminal - Expeditionary Network Package
SEP: Signal Entry Panel (VSAT Large)
MCWS-X: Marine Corps Wideband Satellite - Expeditionary
MCWS-L: Marine Corps Wideband Satellite - Light

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2275 / *Marine Corps Tactical Radio Systems*

PROGRAM SCHEDULE - SECURE MOBILE ANTI-JAM RELIABLE TACTICAL- TERMINAL (SMART-T)



ImpD: Implementation Decision
Remote Operator Unit / Handheld Terminal Unit (ROU/HTU)
Military Standard Requistion Issure Procedure (MILSTRIP)
Military Interdepartmental Purchase Request (MIPR)
Tactical Mission Planning Subsystem (TMPSS)
Note: ROU/HTU replacement will be sent to the RIPs through attrition

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2275 / *Marine Corps Tactical Radio Systems*

NOTM FY19-25

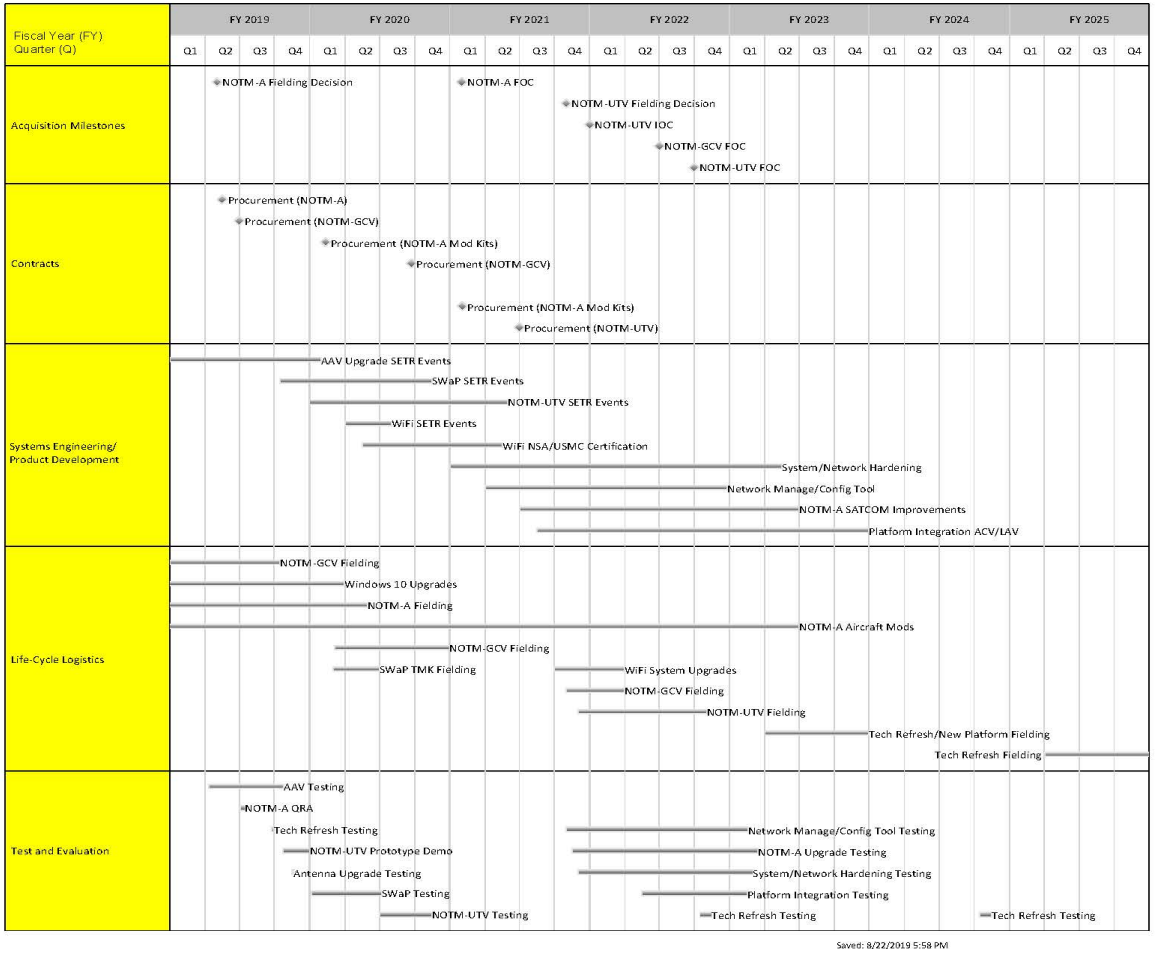


Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2275 / *Marine Corps Tactical Radio Systems*

TCM – MBR II

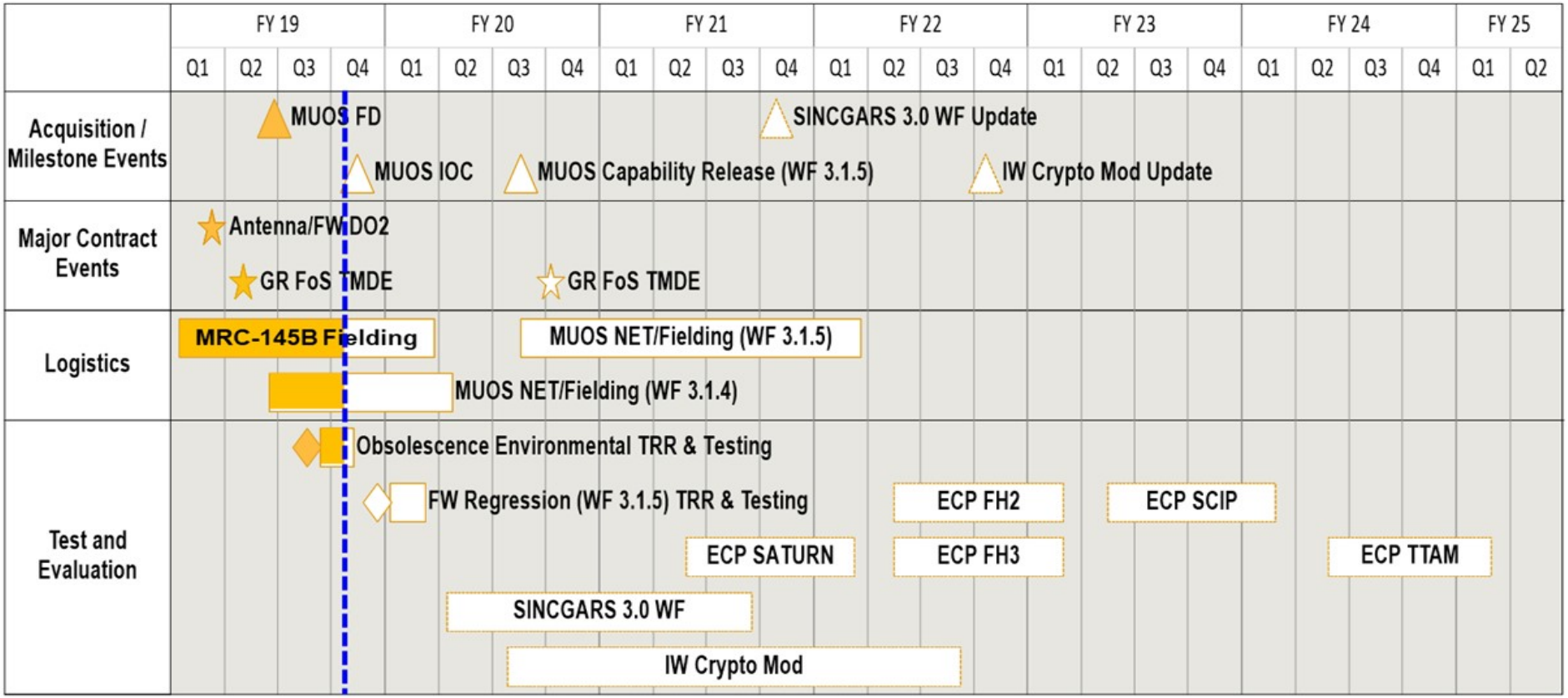


Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2275 / *Marine Corps Tactical Radio Systems*

TCM – HFR II

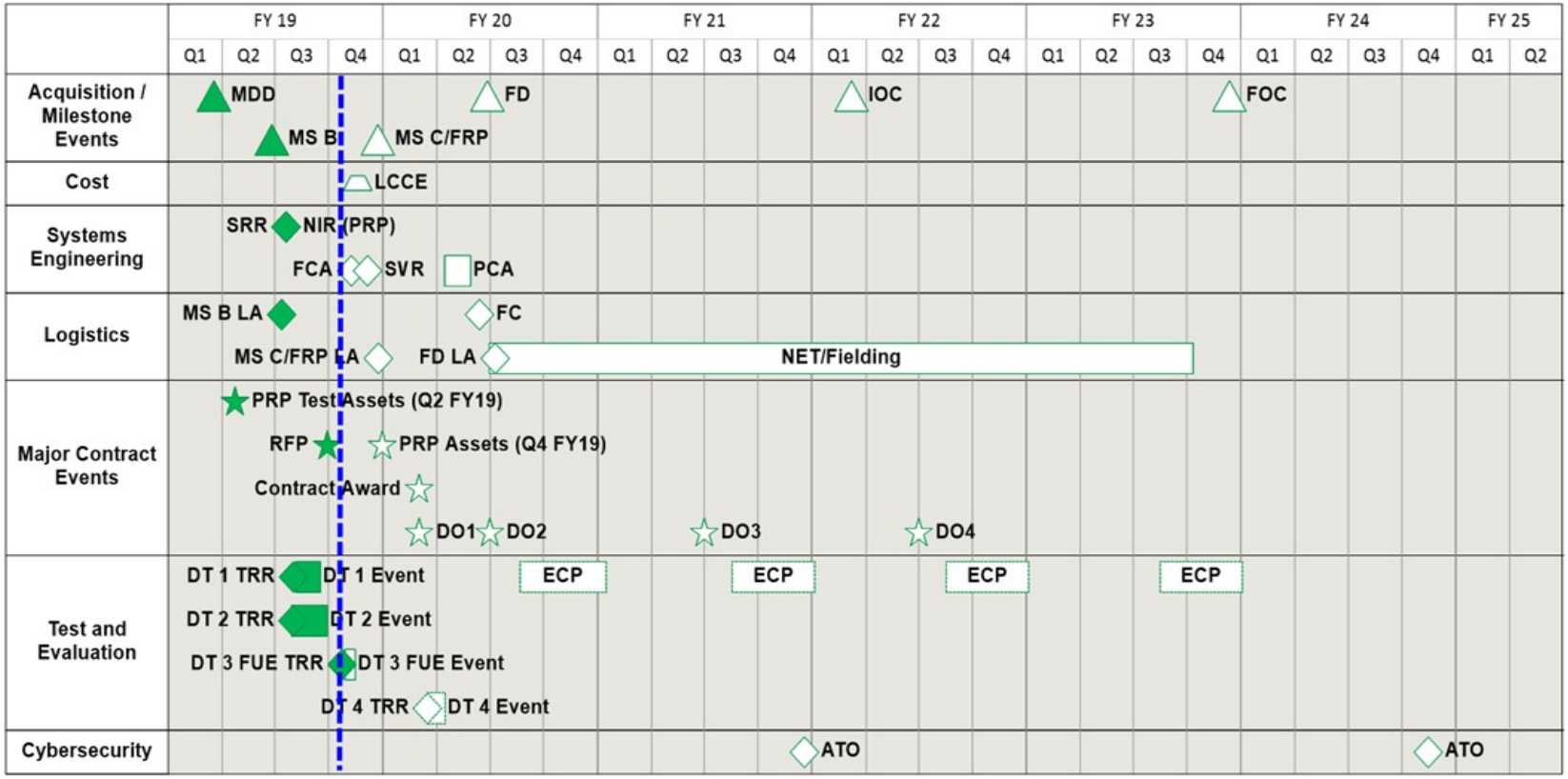


Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2275 / *Marine Corps Tactical Radio Systems*

TCM – MCMP

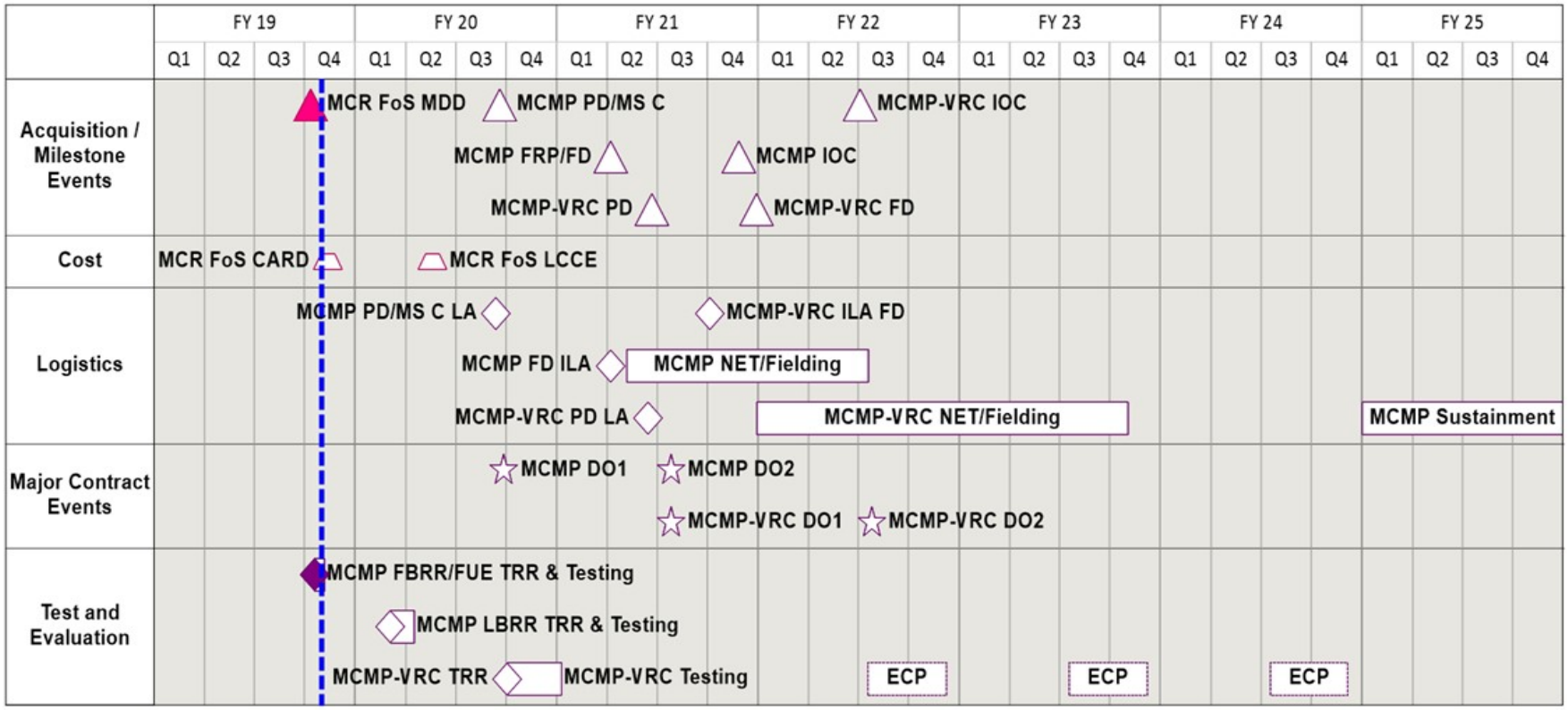


Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2275 / *Marine Corps Tactical Radio Systems*

TCM – MCHH

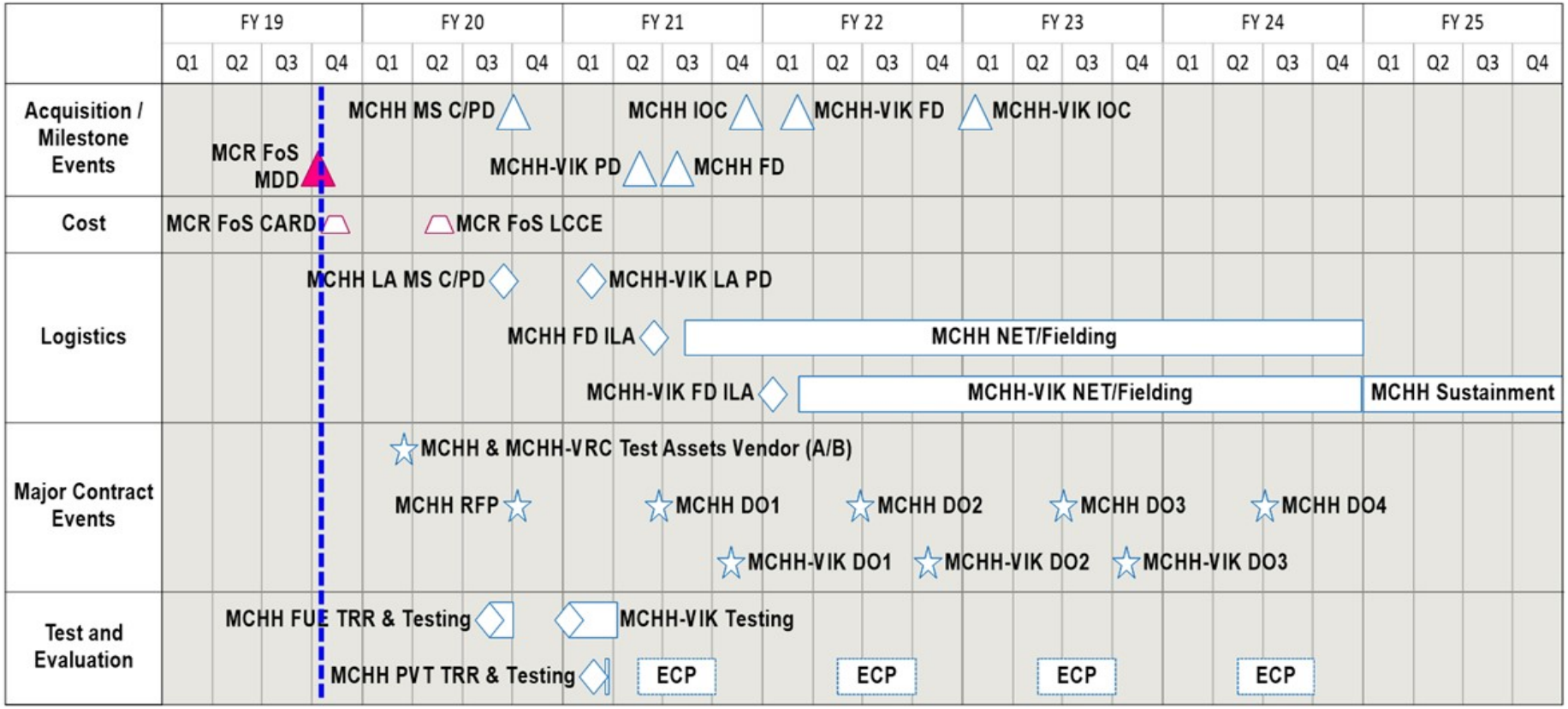


Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2275 / *Marine Corps Tactical Radio Systems*

THC2 Portfolio

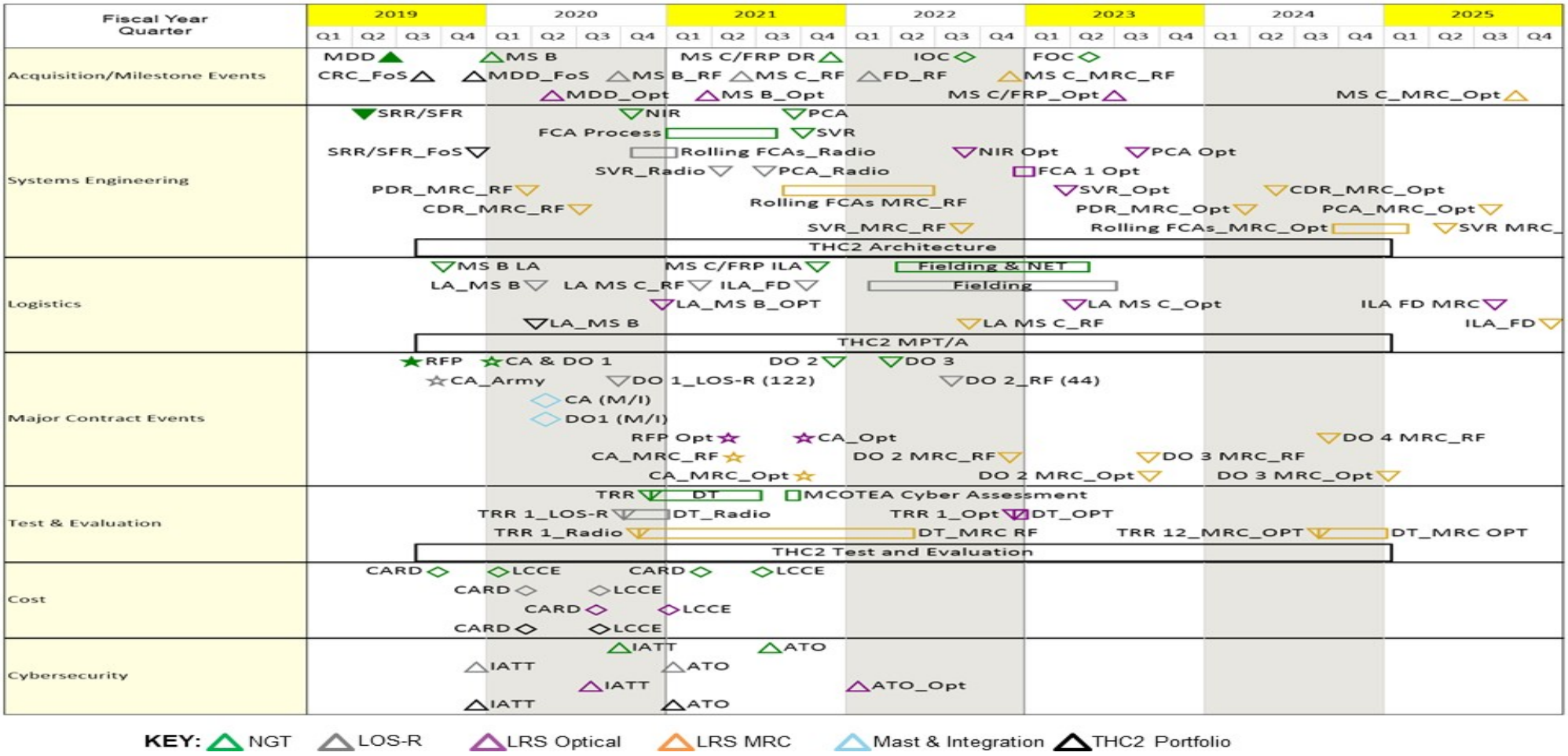
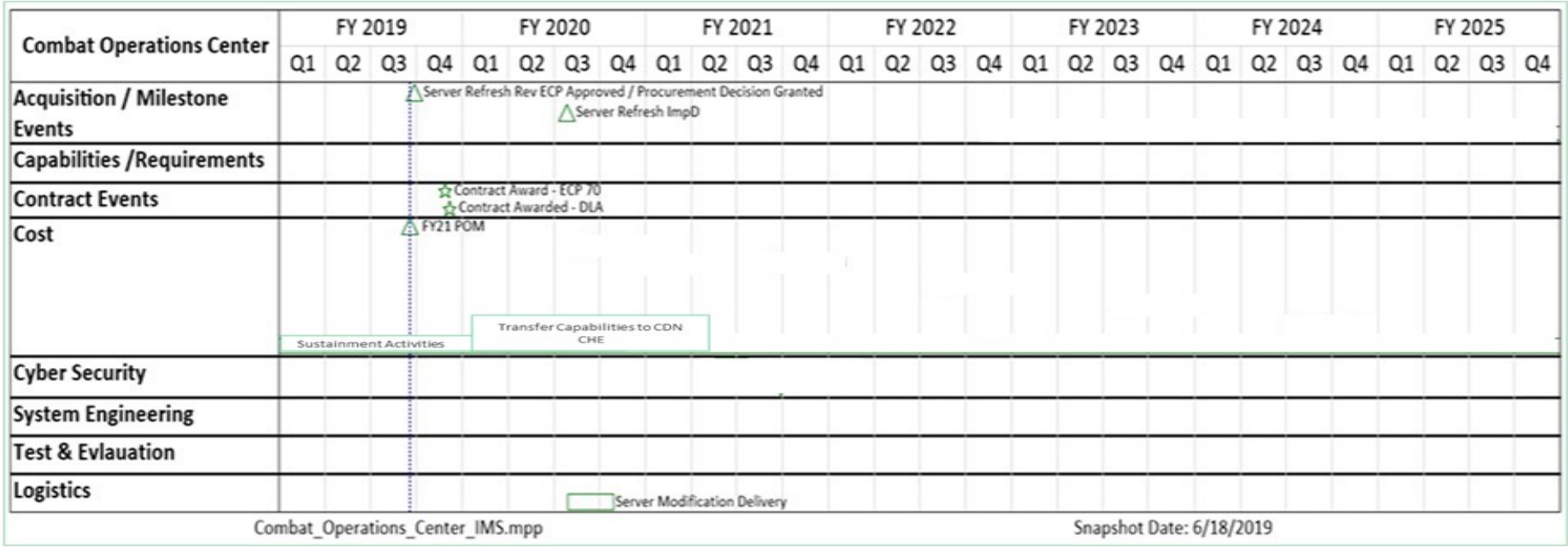


Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2275 / *Marine Corps Tactical Radio Systems*



In FY21 the Combat Operations Center (COC) requirements transitions into the Combat Data Network (CDN) program under the title Common Hosting Environment (CHE).

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2275 / *Marine Corps Tactical Radio Systems*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2275				
TCM MCHH Test Assets	1	2020	2	2020
TCM HFR II MP Fielding Decision	2	2020	2	2020
TCM HFR II Contract Award DO #2	2	2020	2	2020
TCM MCMP PD / Contract Award DO#1	3	2020	3	2020
TCM MCHH Procurement Decision	4	2020	3	2021
TCM MCMP Fielding Decision	2	2021	2	2021
TCM HFR II DO #3	2	2021	2	2021
TCM MCHH Contract Award DO #1	2	2021	3	2021
TCM MCHH VRC PD	2	2021	3	2021
TCM MCMP PD VRC	2	2021	2	2021
TCM MCMP VRC DO #1	3	2021	3	2021
VSAT MRT Fielding	1	2021	3	2021
VSAT MRT Implementation Decision	4	2020	4	2020
VSAT MCWS-X Procurement DO1	3	2020	3	2020
VSAT MCWS-X Procurement DO2	2	2021	2	2021
VSAT MCWS-Light (L) Test Asset Procurement	3	2021	3	2021
VSAT-E MCWS-X Fielding Decision	4	2020	4	2020
VSAT MCWS-L Operational Testing	4	2021	4	2021
SMART-T Tech Refresh 3	2	2020	2	2020
SMART-T Spare Parts Procurement	3	2021	3	2021
NOTM-A fielding decision	2	2019	2	2019

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2275 / *Marine Corps Tactical Radio Systems*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
NOTM-A FOC	1	2021	1	2021
NOTM-UTV Fielding Decision	4	2021	4	2021
NOTM UTV IOC	4	2021	4	2021
NOTM-UTV FOC	3	2022	3	2022
TWTS LOS-R Radios Delivery Order 1 (DO 1)	2	2020	2	2020
TWTS LOS-R Mast & Integration Contract Award & DO 1	2	2020	2	2020
TWTS MS B LRS FoS Optical	1	2021	1	2021
TWTS Contract Award (CA) Optical	3	2021	3	2021
TWTS NGT Delivery Order (DO) 2	4	2021	4	2021
TWTS CA MRC RF	2	2021	2	2021
TWTS CA MRC Optical	3	2021	3	2021
COC IV&V	3	2019	3	2019
COC Video Display Refresh	3	2019	3	2019
COC Opt Wave/NetApp	4	2019	4	2019
COC Software Releases 6.0.11.0	1	2020	1	2020
COC Software Releases 6.0.12.0	2	2020	2	2020
COC Laptop Display Refresh	2	2020	2	2020

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206313M / *Marine Corps Comms Systems*	Project (Number/Name) 2276 / *Comms Switching and Control Sys*	

COST ($ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
2276: *Comms Switching and Control Sys*	46.562	1.568	1.778	4.749	-	4.749	1.585	1.616	1.649	1.682	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

(U) Tactical Voice Switching System (TVSS): The TVSS is a modular Integrated Services Digital Network (ISDN) circuit switch capable system that provides Voice Over Internet Protocol telecommunications, multiplexing, transmission encryption, and group modem capabilities in one system for tactical telephony voice communications. TVSS is reaching end of life and is planned to be removed from the fleet inventory by the end of FY21.

(U) Combat Data Network (CDN), formerly Data Distribution System - Modular (DDS-M): The CDN provides the commander a modular, integrated, and interoperable Internet Protocol (IP) - based Local Area Network (LAN) and Wide Area Network (WAN) capability that forms the data communications backbone to tactical organizations within a Marine Air-Ground Task Force (MAGTF). The CDN provides an extension of the Defense Information System Network (DISN), Secret Internet Protocol Router Network (SIPRNet), Sensitive But Unclassified (SBU), Non-secure Internet Protocol Router Network (NIPRNet) as well as a coalition networking. The CDN provides Marine Corps maneuver elements with a modular and scalable IP data transport capability by providing computers, servers, routers, data switches, cabling, multiple connections to various tactical transmission devices, contains integral In-line Network Encryption (INE) device supporting IP Security (IPSec), and Virtual Private Networking (VPN). CDN is currently designated as the Common Hosting Environment (CHE) for tactical networking. CHE will consolidate like capabilities from various programs of record, primarily server capacity and network access switching, under a single program of record. CHE will simplify the equipment string and will help reduce the overall Size, Weight, and Power (SWaP) requirements for the MAGTF. In FY21 the Combat Operations Center (COC) requirements PE 0206313 Project 2275 transitions into the Combat Data Network (CDN) program under the title Common Hosting Environment (CHE).

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: TVSS: Management Services	0.003	0.065	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: TVSS is transitioning to a virtual software solution with no hardware requirements.					
FY 2020 Plans: - Complete development efforts and annual cyber security testing in support of transition from hardware to software solution.					
FY 2021 Base Plans: N/A					
FY 2021 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2276 / *Comms Switching and Control Sys*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** TVSS: Management Services decrease of $0.065M in FY21 reflects TVSS reaching end of life and is planned to be removed from the fleet inventory by the end of FY21.					
Title: CDN: Product Development	0.550	0.580	3.001	0.000	3.001
Articles:	-	-	-	-	-
Description: CDN Product Development: Funds support Engineering Change Proposals (ECP) for systems tech refresh on a three to five year cycle while in sustainment. ***FY 2020 Plans:*** - Continue development of required hardware upgrades to include routers and servers. ***FY 2021 Base Plans:*** - Initiate development activities associated with Common Hosting Environment (CHE) virtualization efforts and incorporation of cloud based technologies. - Continue development of required hardware upgrades to include routers and servers. Development effort will focus on integration and testing of improved versions of existing components. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** CDN: Product Development increase of $2.421M from FY20 to FY21 reflects initiation of development activities associated with Common Hosting Environment (CHE) virtualization efforts and incorporation of cloud based technologies.					
Title: CDN: Test and Evaluation	0.389	0.450	1.111	0.000	1.111
Articles:	-	-	-	-	-
Description: CDN Test and Evaluation: Funds support acquisition testing for system technology refresh on a three to five year cycle while in sustainment. ***FY 2020 Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2276 / *Comms Switching and Control Sys*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
- Continue support for joint interoperability test certification efforts demonstrated through DoD Interoperability Communication Exercises for routers and servers equipment upgrades. ***FY 2021 Base Plans:*** - Initiate support for joint interoperability test certification efforts demonstrated through DoD Interoperability Communication Exercises for Common Hosting Environment (CHE) virtualization efforts and incorporation of cloud based technologies. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** CDN: Test and Evaluation increase of $0.661M from FY20 to FY21 reflects initiation of Common Hosting Environment (CHE) virtualization efforts and incorporation of cloud based technologies.					
Title: CDN: Management Services	0.626	0.683	0.637	0.000	0.637
Articles:	-	-	-	-	-
Description: CDN Management Services: Funds support Federally Funded Research and Development Contracts for systems tech refresh on a three to five year cycle while in sustainment. ***FY 2020 Plans:*** - Complete FFRDC efforts in support of Network Optimization and reconfiguration efforts to upgrade system routers and servers. ***FY 2021 Base Plans:*** - Initiate Network Optimization and reconfiguration efforts to upgrade Voice over Internet Protocol (VoIP) and Information Assurance Modules (IPS/Firewalls). ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** CDN: Management Services decrease of $0.046M from FY20 to FY21 reflects completion of upgrades to system routers and servers.					
Accomplishments/Planned Programs Subtotals	1.568	1.778	4.749	0.000	4.749

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2276 / *Comms Switching and Control Sys*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• PMC/4634/A: *CDN*	30.370	22.040	38.792	-	38.792	56.016	38.236	37.968	38.219	Continuing	Continuing

Remarks

D. Acquisition Strategy

(U) Tactical Voice Switching System (TVSS) (formerly Transition Switch Module (TSM)): TVSS is reaching end of life and is planned to be removed from the fleet inventory by the end of FY21.

(U) Combat Data Network (CDN), formerly Data Distribution System - Modular (DDS-M): CDN will maximize use of existing COTS, GOTS, and GFE. CDN hardware and software will continue to be upgraded and improved as technology advances. Major focus will be on interoperability and compatibility with existing systems and components in the Marine Corps, as well as Joint and Coalition forces. R&D effort will focus on integration and testing of improved versions of existing components. CDN may reuse other Services' development and utilize external contracts that satisfy requirements and analysis of alternatives. R&D effort will focus on implementation of the Common Hosting Environment (CHE) which will lead to the ability to transition to cloud technologies.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206313M / *Marine Corps Comms Systems*	Project (Number/Name) 2276 / *Comms Switching and Control Sys*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CDN Development Efforts	WR	NIWC-LANT : Charleston, SC	0.530	0.550	May 2019	0.580	May 2020	3.001	Feb 2021	-		3.001	0.000	4.661	-
Prior Year Cumulative Funding	Various	Various : Various	30.590	0.000		0.000		0.000		-		0.000	0.000	30.590	-
		Subtotal	31.120	0.550		0.580		3.001		-		3.001	0.000	35.251	N/A

Remarks

Product Development increase of $2.421M from FY20 to FY21 reflects initiation of CDN development activities associated with Common Hosting Environment (CHE) virtualization efforts and incorporation of cloud based technologies.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Cumulative Funding	Various	Various : Various	5.696	0.000		0.000		0.000		-		0.000	0.000	5.696	-
		Subtotal	5.696	0.000		0.000		0.000		-		0.000	0.000	5.696	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CDN Testing	WR	NIWC Pacific : San Diego, CA	0.981	0.000		0.000		1.111	Mar 2021	-		1.111	Continuing	Continuing	Continuing
CDN Integration testing	WR	JITC : Ft. Huachuca, AZ	0.078	0.093	Jan 2019	0.090	Jan 2020	0.000		-		0.000	Continuing	Continuing	Continuing
CDN Testing	C/FFP	NAWC-AD : Patuxent River, MD	0.000	0.296	Mar 2019	0.360	Mar 2020	0.000		-		0.000	0.000	0.656	-
Prior Year Cumulative Funding	Various	Various : Various	1.969	0.000		0.000		0.000		-		0.000	0.000	1.969	-
		Subtotal	3.028	0.389		0.450		1.111		-		1.111	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206313M / *Marine Corps Comms Systems*	Project (Number/Name) 2276 / *Comms Switching and Control Sys*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Test and Evaluation increase of $0.661M from FY20 to FY21 reflects initiation of CDN testing in support of Common Hosting Environment (CHE) virtualization efforts and incorporation of cloud based technologies.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CDN	FFRDC	MITRE : Stafford, VA	1.189	0.626	Dec 2018	0.683	Dec 2019	0.637	Dec 2020	-		0.637	0.000	3.135	-
TVSS	FFRDC	MITRE : Stafford, VA	1.082	0.003	Dec 2018	0.065	Dec 2019	0.000		-		0.000	0.000	1.150	-
Prior Year Cummulative Funding	FFRDC	MITRE : Stafford, VA	4.447	0.000		0.000		0.000		-		0.000	0.000	4.447	-
		Subtotal	6.718	0.629		0.748		0.637		-		0.637	0.000	8.732	N/A

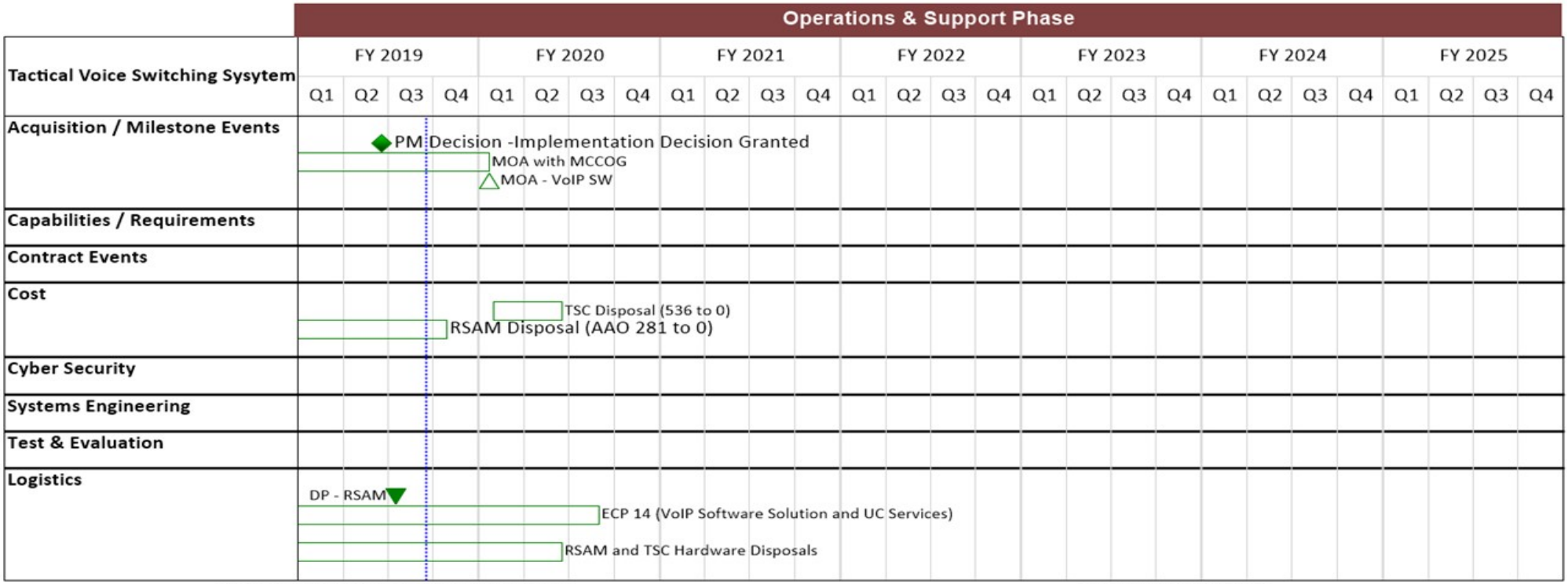
Remarks

Management Services decrease of $0.111M from FY20 to FY21 reflects reduction of CDN upgrades to system routers and servers and completion of TVSS MITRE support.

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	46.562	1.568		1.778		4.749		-		4.749	Continuing	Continuing	N/A

Remarks

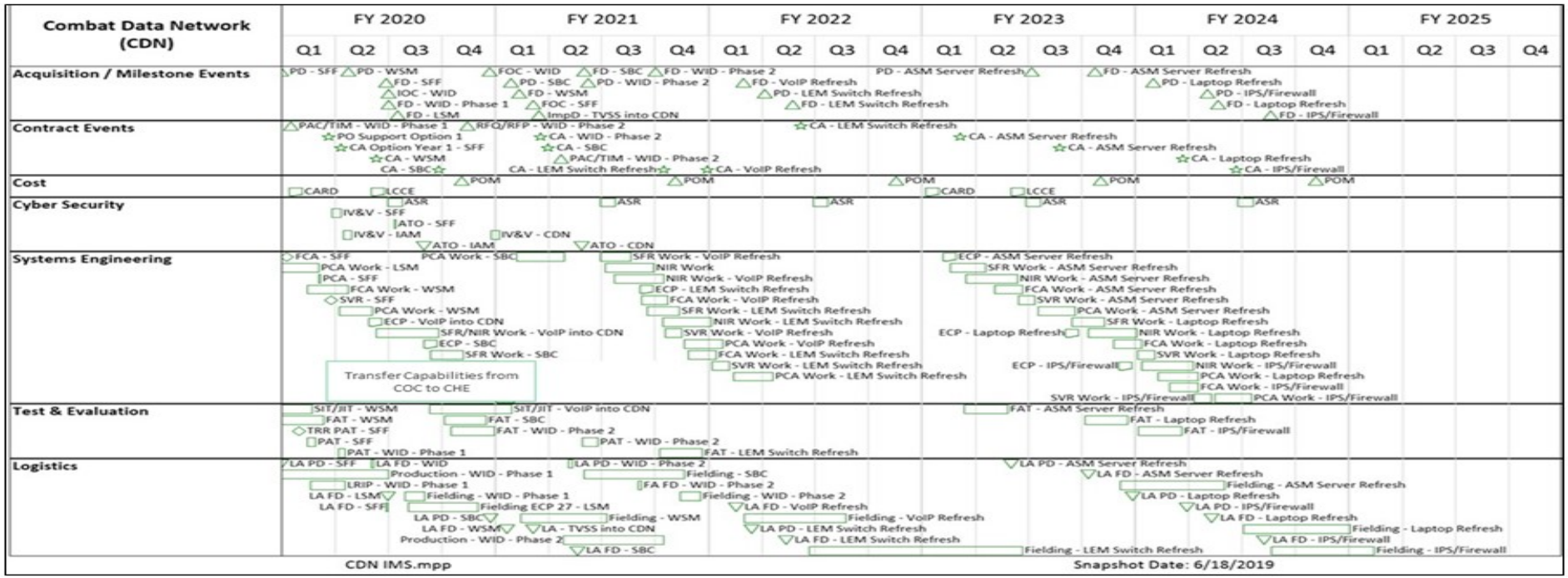
Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2276 / *Comms Switching and Control Sys*



ECP 16.mpp; ECP14.mpp; TACNET_ATO_IMS.mpp

Snapshot Date: 6/18/2019

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2276 / *Comms Switching and Control Sys*



In FY21 the Combat Operations Center (COC) requirements transitions into the Combat Data Network (CDN) program under the title Common Hosting Environment (CHE).

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2276 / *Comms Switching and Control Sys*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2276				
CDN Fielding VMware	2	2019	2	2019
CDN MS-C SFF	2	2019	2	2019
CDN APB MS-C	2	2019	2	2019
CDN Test & Evaluation SFF	2	2019	3	2019
CDN Limited Fielding SFF	4	2019	4	2019
CDN Fielding Decision SFF	4	2019	4	2019
CDN Production Decision LSM & WSM Routers	4	2019	4	2019
TVSS MOA for VoIP Software	1	2019	1	2019
TVSS IOC VoIP Software	1	2019	1	2019
TVSS Contract Award VoIP Software	3	2019	3	2019
CDN WSM Test & Evaluation	1	2020	2	2020
CDN WSM Production Decision	2	2020	2	2020
CDN WSM Fielding Decision	1	2021	1	2021
CDN LEM Test & Evaluation	3	2021	4	2021
CDN LEM Contract Award #1	4	2021	4	2021
CDN LEM Contract Award #2	2	2022	2	2022
CDN LEM Fielding Decision	1	2021	1	2021

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy											Date: February 2020	
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0206313M / *Marine Corps Comms Systems*				Project (Number/Name) 2277 / *System Engineering and Integration*			
COST ($ in Millions)	**Prior Years**	**FY 2019**	**FY 2020**	**FY 2021 Base**	**FY 2021 OCO**	**FY 2021 Total**	**FY 2022**	**FY 2023**	**FY 2024**	**FY 2025**	**Cost To Complete**	**Total Cost**
2277: *System Engineering and Integration*	35.769	4.186	5.071	2.627	-	2.627	2.679	4.918	5.233	11.337	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project provides funds for engineering, test, and evaluation activity, which ensures that the systems being developed within the Program Element (PE) employ consistent standards for interoperability and to the maximum extent feasible use of hardware and software which is uniform and standard across programs.

Expeditionary Energy Office (E2O): Energy is a top priority for the USMC and one of the six pillars of Modernization for the Corps identified by the Commandant. In 2009, the Commandant established the USMC Expeditionary Energy Office (E2O), with the mission to analyze, develop, and direct the Marine Corps' energy strategy in order to optimize expeditionary capabilities across all warfighting functions. E2O's role is to advise the Marine Requirements Oversight Council (MROC) on all energy and resource related requirements, acquisitions, and programmatic decisions. This office and funding directly support execution of the USMC Expeditionary Energy Strategy and Implementation Plan (Mar 2011), and priorities identified in the USMC Expeditionary Energy Water and Waste Initial Capabilities Document/Capabilities Based Assessment (Sep 2011), as well as Science and Technology (S&T) Objectives identified in the 2012 USMC S&T Strategic Plan. The Marine Corps program aligns with the Commandant's Planning Guidance 2010, the National Defense Authorization Act 2009, DoD directives and SECNAV goals. This funding will support the achievement of the Strategy, and the activities of the USMC Expeditionary Energy Concepts process, managed by the E2O.

Joint Interoperability of Tactical Command and Control Systems (JINTACCS) is a Joint Chiefs-of-Staff (JCS)/DoD-mandated program for joint development, implementation, and testing of tactical data links and US Message Text Format (MTF) under the direction of the Defense Information Systems Agency (DISA) and Office of the Secretary of Defense/ Networks and Information Integration (OASD/NII) per the Commander Joint Chiefs of Staff (CJCSI) Instructions 6610.01E and CJCS16241.04 respectively. This effort also covers interoperability analyses, standardization, and testing of tactical message standards such as Link 16, Joint Range Extension Application Protocol (JREAP), and Variable Message Format (VMF) used between the Marine Corps and joint forces. Responsible for the development of Net Centric standards (XML, Web Services) to meet requirements of USMC/DoD/Coalition Net Centric Data Strategies. Efforts in this area include Marine Corps representation in tactical data link and tactical data message joint working groups and configuration control boards and application of the Interoperability Enhancement Process (IEP) across Marine Air Ground Task Force systems and platforms.

Systems Engineering, Integration and Coordination (SEIC) is MCSC Chief Engineer's systems engineering and integration program. SEIC provides the decision support tools and engineering analysis resources needed to assess, identify and resolve Marine Air Ground Task Force (MAGTF) inter-systems' SoS issues and challenges. SEIC supports DC CD&I, DC PP&O, DC A, DC I&L, DC M&RA, HQMC C4, and HQMC INT in the analysis, evaluation, and assessment of MAGTF Systems and SoS requirements. SEIC centralized management of Command, Control, Communications, Computers and Intelligence Surveillance and Reconnaissance (C4ISR) programs allows the implementation of systems engineering certification process in support of milestone decision approval; a requirements and functional analysis process enabling system of systems engineering and an overarching C4ISR systems architecture, and a product realization process to support budget decisions. SEIC

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2277 / *System Engineering and Integration*

engineering conducts functional analyses for emergent system of systems challenges and ensures seamless integration and maximum interoperability of materiel across USMC, Naval, Joint, and DoD programs consistent with the Commandant's Vision and Strategy 2025.

The overall decrease of $0.291M is primarily due to a $0.104M decrease in bulk fuel experimentation for E2O, decrease of $0.104 due to reduced technical and engineering support for the development of the 2019 Afloat MAGTF C4, and $0.011M increase to address inflation/fact of life cost increases for JINTACCS.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Expeditionary Energy Office (E2O)	2.114	2.501	2.036	0.000	2.036
Articles:	-	-	-	-	-
FY 2020 Plans: - Initiate and complete the field exercise experimentation with Marine Corps Warfighting Lab and its MAGTF Integration Exercise. Also, continue efforts to support the USMC Expeditionary Energy Strategy and Implementation Plan, and priorities identified in the USMC Expeditionary Energy Water and Waste Initial Capabilities Document/Capabilities Based Assessment, as well as Science and Technology Objectives identified in the 2012 USMC S&T Strategic Plan. Using these priority roadmaps, E2O will invest in R&D programs to advance Strategy goals. Priority areas for investment include, but are not limited to: Fuel distribution, Energy harvesting, hybrid power, energy command and control data, energy storage, energy metering and monitoring decision tools.					
FY 2021 Base Plans: - Continue to support the USMC Expeditionary Energy Strategy and Implementation Plan, and priorities identified in the USMC Expeditionary Energy Water and Waste Initial Capabilities Document/Capabilities Based Assessment, as well as Science and Technology Objectives identified in strategic plans. E2O will invest in R&D programs to advance Strategy goals. Priority areas for investment include, but are not limited to: Fuel distribution, Energy harvesting, hybrid power, energy command and control data, energy storage, energy metering and monitoring decision tools.					
FY 2021 OCO Plans: N/A					
FY 2020 to FY 2021 Increase/Decrease Statement: Decrease of $0.465M from FY20 to FY21 is due to reduced bulk fuel experimentation. E2O efforts in this area will transition to other agencies.					
Title: JINTACCS: JCS and DoD CIO Data Links Testing	0.547	0.579	0.590	0.000	0.590
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2277 / *System Engineering and Integration*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Description: Joint Interoperability of Tactical Command and Control Systems (JINTACCS) is a United States military program for the development and maintenance of tactical information exchange configuration items (CIs) and operational procedures. It was originated to ensure that the command and control (C2 and C3) and weapons systems of all US military services and NATO forces would be interoperable. MARCORSYSCOM Systems Engineering, Interoperability Architectures, and Technology direct the JINTACCS Program. Created as a non-acquisition R&D engineering program it provides for critical engineering services in several areas. JINTACCS is essential to USMC development and maintenance of tactical data exchange standards (Link 16, VMF, MTF, etc.), maintenance of C2 systems interoperability issues, development of Net Centric standards (XML, Web Services) to meet requirements of DoD/USMC Net Centric Data Strategy, and participation in Marine Corps, Joint, and Coalition Interoperability Certification testing to DoD/JCS/USMC/NATO requirements in an ever-changing cyber environment. ***FY 2020 Plans:*** - Continue to provide Marine Corps representation at Tactical Data Link (TDL) and tactical data message working groups, Configuration Control Boards (CCBs), and other interoperability forums. Continue to assess and represent Marine Corps positions on TDL and tactical data message interface change proposals (ICPs), requests for exceptions (RFEs), and other initiatives. - Continue data collection and information dissemination associated with the Marine Corps Interoperability Enhancement Program (IEP). Enter system bit-level information into the eSMART tool; conduct interoperability assessments of MAGTF systems using the eSMART tool to highlight gaps and identify investment opportunities to meet emerging interoperability needs; provide feedback to JCS representatives concerning shortfalls or recommended improvements to the eSMART tool. - Continue to provide TDL subject matter expert support to Marine Corps Systems Command and Program Executive Office Land Systems programs to support test, certification, and modernization of Marine Corps capabilities. ***FY 2021 Base Plans:*** - Continue to provide Marine Corps representation at TDL and tactical data message working groups, CCBs, and other interoperability forums. Continue to assess and represent Marine Corps positions on TDL and tactical data message ICPs, RFEs, and other initiatives. - Continue data collection and information dissemination associated with the Marine Corps IEP. Enter system bit-level information into the eSMART tool; conduct interoperability assessments of MAGTF systems using the eSMART tool to highlight gaps and identify investment opportunities to meet emerging interoperability needs;					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2277 / *System Engineering and Integration*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
provide feedback to JCS representatives concerning shortfalls or recommended improvements to the eSMART tool. - Continue to provide TDL subject matter expert support to Marine Corps Systems Command and Program Executive Office Land Systems programs to support test, certification, and modernization of Marine Corps capabilities. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Increase of $0.011M from FY20 to FY21 is due to inflation/fact of life cost increases.					
Title: SEIC: Engineering and Technical Support	1.525	1.991	0.001	0.000	0.001
Articles:	-	-	-	-	-
FY 2020 Plans: - Continue technical and engineering support to the development of the 2019 Afloat MAGTF C4 Required Capabilities (AMC4RC) Letter. - Continue to contribute to the OPNAV N9 & N2/N6 Blue-In-Support-Of-Green (BISOG) program development. - Continue engineering support to the development of USMC input to OUSD AT&L's Joint C2 Capability Area FY19/20 Integration Workshop. - Continue focused integration testing with PEO C4I & Naval Information Warfare Systems Command (NAVWARSYSCOM) to integrate Marine Corps Enterprise Network (MCEN) Services and MAGTF C4I Systems into the Navy's follow-on version of Consolidated Afloat Network Enterprise Services (CANES) environment aboard the LHD, LHA-6, LPD and LSD class amphibious assault ships. - Continue to manage and expand the Engineering Knowledge Management system to provide consumer focused support to the engineering competency in a configuration controlled electronic library system. - Continue integration of MAGTF C2 systems and C4 services with shipboard C2 architectures and C4ISR infrastructures in direct support of Marine Expeditionary Unit (MEU) deployments via Deploying Group Systems Integration Test (DGSIT). ***FY 2021 Base Plans:*** - Complete the integration of MAGTF C2 systems and C4 services with shipboard C2 architectures and C4ISR infrastructures in direct support of MEU deployments via Deploying Group Systems Integration Test (DGSIT). ***FY 2021 OCO Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2277 / *System Engineering and Integration*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Decrease of $1.990M from FY20 to FY21 is due to reduced technical and engineering support for the development of the 2019 Afloat MAGTF C4, OPNAV N9 & N2/N6 Blue-In-Support-Of-Green (BISOG), Engineering Knowledge Management system, and USMC input to OUSD AT&L's Joint C2 Capability Area FY19/20 Integration Workshop.					
Accomplishments/Planned Programs Subtotals	4.186	5.071	2.627	0.000	2.627

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The System Engineering and Integration programs utilizes a non-traditional acquisition strategy. The program utilize the Naval Surface Warfare Centers for system engineering support services.

EEO - Expeditionary Energy Strategy and Implementation Plan, and priorities identified in the USMC Expeditionary Energy Water and Waste Initial Capabilities Document/Capabilities Based Assessment, as well as Science and Technology Objectives identified in the 2012 USMC S&T Strategic Plan. The program utilize the Naval Surface Warfare Centers for system engineering support services.

JINTACCS - Created as a non-acquisition R&D engineering program it provides for critical engineering services in several areas. (JINTACCS) is a United States military program for the development and maintenance of tactical information exchange configuration items (CIs) and operational procedures. It was originated to ensure that the command and control (C2 and C3) and weapons systems of all US military services and NATO forces would be interoperable. MARCORSYSCOM Systems Engineering Directorate, Integration Division directs the JINTACCS Program.

SEIC - Provides the decision support tools and engineering analysis resources needed to assess, identify and resolve Marine Air Ground Task Force (MAGTF)inter-systems' SoS issues and challenges. SEIC supports the Marine Corps in the analysis, evaluation, and assessment of MAGTF Systems and SoS requirements. The program utilize the Naval Surface Warfare Centers for system engineering support services.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** *2277 / System Engineering and Integration*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Years Cumulative Funding	Various	Various : Various	10.899	0.000		0.000		0.000		-		0.000	0.000	10.899	-
		Subtotal	10.899	0.000		0.000		0.000		-		0.000	0.000	10.899	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MAGTF SEI&C	WR	NSWC : Dahlgren, VA	5.483	0.230	Nov 2018	0.250	Nov 2019	0.001	Mar 2021	-		0.001	Continuing	Continuing	Continuing
MAGTF SEI&C	WR	NSWC : DAM NECK, VA	0.270	0.000		0.150	Dec 2019	0.000		-		0.000	0.000	0.420	-
MAGTF SEI&C	C/FP	MANTECH : Stafford, VA	0.000	1.295	Nov 2018	1.591	Mar 2020	0.000		-		0.000	0.000	2.886	-
JINTACCS	C/FFP	MCTSSA : Camp Pendleton, CA	2.031	0.272	Jan 2019	0.300	Mar 2020	0.306	Mar 2021	-		0.306	0.000	2.909	-
JINTACCS	C/FFP	IEP Analysis : Quantico, VA	0.000	0.225	Jan 2019	0.225	Jan 2020	0.225	Jan 2021	-		0.225	0.000	0.675	-
Experimental Forward Operating Base (E2O)	WR	SSC PAC : San Diego, CA	2.562	0.350	Nov 2018	0.612	Jan 2020	0.000		-		0.000	0.000	3.524	-
Experimental Forward Operating Base (E2O)	WR	Various : Various	1.392	0.756	Nov 2018	0.558	Nov 2019	0.300	Nov 2020	-		0.300	0.000	3.006	-
Experimental Forward Operating Base (E2O)	WR	NSWC : Carderock	0.628	0.150	Nov 2018	0.403	Nov 2019	0.330	Nov 2020	-		0.330	0.000	1.511	-
Experimental Forward Operating Base (E2O)	WR	NAVFAC EXWC : Port Hueneme, CA	0.540	0.608	Nov 2018	0.119	Feb 2020	0.250	Feb 2021	-		0.250	0.000	1.517	-
Experimental Forward Operating Base (E2O)	WR	NSWC : Panama City, FL	0.200	0.075	Nov 2018	0.334	Nov 2019	0.000		-		0.000	0.000	0.609	-
Experimental Forward Operating Base (E2O)	WR	NSWC : Crane, IN	0.751	0.150	Nov 2018	0.000		0.412	Nov 2020	-		0.412	0.000	1.313	-
Experimental Forward Operating Base (E2O)	C/FFP	DTIC : FT. Belvoir	0.050	0.025	Nov 2018	0.075	Apr 2020	0.200	Apr 2021	-		0.200	0.000	0.350	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** *2277 / System Engineering and Integration*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Experimental Forward Operating Base (E2O)	WR	NSWC Dahlgreen : Dahlgren, VA	0.000	0.000		0.400	Mar 2020	0.344	Mar 2021	-		0.344	0.000	0.744	-
Experimental Forward Operating Base (E2O)	WR	Naval Research Lab : Washington, DC	0.000	0.000		0.000		0.200	Apr 2021	-		0.200	0.000	0.200	-
Prior Years Cumulative Funding	C/FFP	Various : Various	3.022	0.000		0.000		0.000		-		0.000	0.000	3.022	-
		Subtotal	16.929	4.136		5.017		2.568		-		2.568	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Years Cumulative Funding	Various	Various : Various	7.611	0.000		0.000		0.000		-		0.000	0.000	7.611	-
		Subtotal	7.611	0.000		0.000		0.000		-		0.000	0.000	7.611	N/A

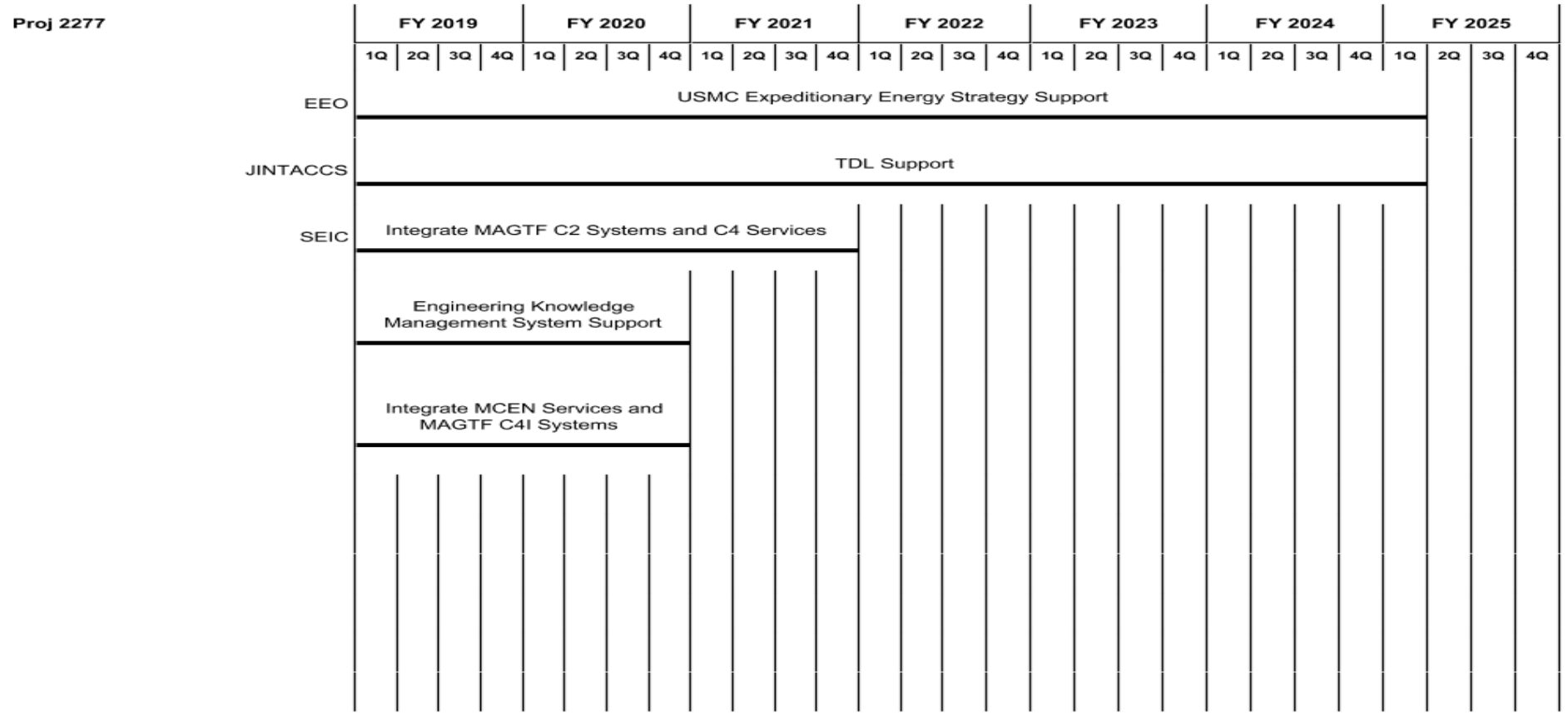
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
JINTACCS-Travel	Various	PROGRAM : TRAVEL	0.330	0.050	Feb 2019	0.054	Feb 2020	0.059	Feb 2021	-		0.059	Continuing	Continuing	Continuing
		Subtotal	0.330	0.050		0.054		0.059		-		0.059	Continuing	Continuing	N/A

	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	35.769	4.186		5.071		2.627		-		2.627	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** *2277 / System Engineering and Integration*



2021PB - 0206313M - 2277

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2277 / *System Engineering and Integration*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2277				
EEO: USMC Expeditionary Energy Strategy Support	1	2019	1	2025
JINTACCS: TDL Support	1	2019	1	2025
SEIC: Integrate MAGTF C2 Systems and C4 Services	1	2019	4	2021
SEIC: Engineering Knowledge Management System Support	1	2019	4	2020
SEIC: Integrate MCEN Services and MAGTF C4I Systems	1	2019	4	2020

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206313M / *Marine Corps Comms Systems*	Project (Number/Name) 2278 / *Air Defense Weapons System*	

COST ($ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
2278: *Air Defense Weapons System*	101.583	88.051	64.535	131.052	-	131.052	43.256	48.967	49.539	40.409	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

The FY 2021 funding request was reduced by $14.3M to account for the availability of prior year execution balances.

A. Mission Description and Budget Item Justification

Ground Based Air Defense (GBAD) supports the Low Altitude Air Defense (LAAD) Battalion's missions of Short Range Air Defense (SHORAD) and provides the Marine Air Ground Task Force (MAGTF) to include; bases, posts and stations, the necessary force protection to defeat the full spectrum of threats associated with the Marine Corps Low-Altitude Air Defense mission, to include hostile aerial threats from Unmanned Aerial Systems (UAS). With the proliferation of both military and commercial UAS platforms, the program is pursuing and acquiring more lethal and survivable GBAD Future Weapons System platforms; such as JLTV's with armored protection and better maneuverability than a HMMWV, providing increased Counter-UAS capabilities now and continually spiraling out increasing capability for the foreseeable future.

Based on an Urgent Universal Need Statement (UUNS), a Joint Urgent Operational Need (JUON) and a Joint Emergent Operational Need (JEON) the Marine corps has aggressively pursued Counter Unmanned Aerial Systems (CUAS) solutions in support of deployed Marines and critical facilities. The development of these solutions has been leveraged heavily by the Marine Air Defense Integrated System (MADIS) Increment 1 on a Joint Light Tactical Vehicle (JLTV), the ACAT II Program of Record that will initiate at MS C in 4QFY21.

Marine Air Defense Integrated System Family of Systems (MADIS FoS): The MADIS FoS provides the Marine Corps with an organic, upgradable, and state of the art capability to protect MAGTF maneuver forces, installations and other designated defended assets from Fixed/Rotary Wing (FW/RW) aircraft and Unmanned Aircraft Systems. The MAGTF is at increased risk of lethal air attack and fires coordination from next generation aircraft as well as significant advances from small UAS (sUAS) threats due to their rapid development and proliferation by the commercial sector. To address these threats, the MADIS FoS consists of mission tailored variants designed for sustained operations ashore, afloat, and aboard installations.

The MADIS FoS includes the fielded Advanced Man Portable Air Defense System (A-MANPADS) which provides close-in, low altitude, surface-to-air fires and command and control in defense of the MAGTF. The MADIS Increment 1 (Inc 1) will be accomplished with the development, test, and installation of Government Furnished C-UAS equipment on a Joint Light Tactical Vehicle (JLTV). The MADIS Inc 1 system is comprised of two vehicles; a MK 1 (stinger variant), and a MK 2 (CUAS variant). MADIS Increment 2 (Inc 2) will focus on the development of an extended range for the Inc 1 system as well as the development of a kinetic and non-kinetic capability supporting increased lethality. This includes the development of a drone on drone system, a high powered microwave capability to counter swarms, continued development of a laser capability to defeat small UAS with an unlimited magazine, enhancements for a direct fire CUAS capability, and other yet to be identified technologies that can be integrated with the MADIS FoS. The MADIS Inc 1 will replace the AMANPADs fielded systems.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2278 / *Air Defense Weapons System*

Medium Range Intercept Capability: The MRIC (Inc 3) will provide the MAGTF Commander the ability to defend fixed/semi-fixed and other designated defended assets against Cruise Missiles, Rockets, Artillery and Mortar (RAM) from a ground based air defense platform. MRIC is designed as a system-of systems and will be integrated with Marine Corps organic Command and Control (C2) and Joint Integrated Air Missile Defense (IAMD) architecture. The program will enhance the MAGTF's ground based air defense capability to rapidly prosecute aerial threats and expand layered defense to the MAGTF and supported Naval Forces. The MRIC is a separate Accomplishment/Planned Program in the FY 2021 President's Budget request to align with the current GBAD FoS structure.

Overall, the Ground Based Air Defense $66.517M increase in FY21 funding from FY20 to FY21; in combined baseline and OCO funding, is due to the additional integration, engineering, developmental and operational testing required for major components on the MADIS Increment 1. The increase supports the OSD directive to develop a common command and control system and also procures missiles, canisters, and a launcher to support Early Operational Assessment of the Medium Range Intercept Capability.

Funding in this line item has been reprioritized while ensuring the Marine Corps continues to evolve toward a force that is aligned with the National Defense Strategy.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: GBAD STINGER SUSTAINMENT: Product Development	0.051	0.026	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2020 Plans: -Completed system design and engineering efforts associated with the Night Sight replacement. ***FY 2021 Base Plans:*** N/A ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Decrease from FY20 to FY21 of $0.026M is due to completion of design efforts associated with Night Sights and the start of procurement in late FY20.					
Title: CUAS/MADIS INC 1 Product Development	54.266	17.802	18.557	0.000	18.557
Articles:	-	-	-	-	-
FY 2020 Plans: MADIS Inc 1: -Continued development of MADIS desktop training systems, which includes the development of the software that emulates the scenarios encountered by the Marines while operating the MADIS Inc 1.					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2278 / *Air Defense Weapons System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
-Initiated MADIS Inc 1 Engineering Development Model (EDM) integration by mounting a mix of legacy and technologically mature capabilities onto Joint Light Tactical Vehicles (JLTV), mitigating the risk of attacks from UAS and FW/RW aircraft, while maintaining pace with maneuver forces. -Initiated MADIS Inc 1 Software and C2 Development ***FY 2021 Base Plans:*** MADIS Inc 1: -Complete development of MADIS desktop training systems, which includes the development of the software that emulates the scenarios encountered by the Marines while operating the MADIS Inc 1. -Complete MADIS Inc 1 Engineering Development Model (EDM) integration by mounting a mix of legacy and technologically mature capabilities onto Joint Light Tactical Vehicles (JLTV), mitigating the risk of attacks from UAS and FW/RW aircraft, while maintaining pace with maneuver forces -Complete MADIS Inc 1 Software and C2 Development and integration efforts ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Funding increase of $0.755M from FY20 to FY21 based on the move from the reconfigurable integrated weapons platform (RIwP) to a lighter turret due to weight and egress considerations on the MADIS Increment 1.					
Title: CUAS/MADIS INC 1: Support Costs	15.391	10.776	8.653	0.000	8.653
Articles:	-	-	-	-	-
Description: The Government Technical Support Team provides functions such as technical planning, execution and analysis across multi-disciplinary competencies to include; Systems Architecture, Radar/Jamming Software Engineering, Radar/Jamming Systems Engineering, Cyber Security/Information Assurance, Human Systems Integration, Safety, Configuration Management and the coordination necessary to enable a System of Systems interface with other programs in the "Cue to Slew" kill chain to ensure platform/software compatibility. ***FY 2020 Plans:*** CUAS: -Completed GBAD CUAS JUON and JEON acquisition, engineering, and assessment efforts to determine the technology solutions required to defeat UAS threats associated with the Marine Corps Low-Altitude Air Defense mission. Efforts focus on C-UAS prototype software load set analysis with updates to address the ever evolving enemy threat and engineering efforts with lessons learned from the procurement of initial CUAS prototypes.					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2278 / *Air Defense Weapons System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
MADIS Inc 1: -Continued New Equipment Training (NET) development support efforts for MADIS Inc 1. -Continued technical manual development support for MADIS Inc 1. -Continued onsite engineering support at military operations, military exercises, military schools, and technology demonstrations. -Initiated full logistics supportability to include Independent Logistics Assessment (ILA), provisioning conferences, updates of manpower and training plan and manpower task lists for MADIS Inc 1. -Continues engineering and logistics support to ensure systems meet reliability thresholds. ***FY 2021 Base Plans:*** MADIS Inc 1 -Complete New Equipment Training (NET) development support efforts for MADIS Inc 1. -Continue full logistics supportability to include Independent Logistics Assessment (ILA), provisioning conferences, updates of manpower and training plan and manpower task lists for MADIS Inc 1. -Complete engineering and logistics support to ensure systems meet reliability thresholds ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Decrease of $2.123M from FY20 to FY21 supports the completion of the JUON and JEON acquisition, engineering and assessment efforts.					
Title: CUAS/MADIS INC 1: Test and Evaluation	7.701	10.054	25.220	0.000	25.220
Articles:	-	-	-	-	-
FY 2020 Plans: -Completed GBAD Future Weapons System Test and Evaluation of C-UAS Systems Soft-Kill and Hard-Kill prototypes integrated on both M-ATV's in support of JUON and JEON efforts. -Initiated component and lab testing in support of the MADIS Inc 1 system to ensure component capability and integration meet system requirements. ***FY 2021 Base Plans:*** -Initiate and complete Developmental Test (DT) and Operational Assessment (OA) of MADIS Inc 1 ***FY 2021 OCO Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2278 / *Air Defense Weapons System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Increase of $15.166M from FY20 to FY21 supports the movement of the MADIS Inc 1 into developmental and engineering test as well as Operational Assessment.					
Title: CUAS/MADIS INC 1: Management Services	1.164	0.877	0.302	0.000	0.302
Articles:	-	-	-	-	-
FY 2020 Plans: -Completed development of MADIS FoS acquisition documentation for MADIS Inc 1. ***FY 2021 Base Plans:*** -Initiate travel in support of engineering test events, acquisition and safety meetings, Developmental and Operational Assessment as well as other technical interface meetings. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Decrease of $0.575M from FY20 to FY21 due to completion of acquisition documentation for MADIS Inc 1.					
Title: INCREMENT 2 INCREASED LETHALITY: Product Development	3.180	11.782	13.224	0.000	13.224
Articles:	-	-	-	-	-
FY 2020 Plans: -Initiated development and integration efforts associated with increased lethality to support constantly evolving threats. OCO: -$11.782M provided for the rapid prototyping of equipment by pursuing advanced technology solutions in order to support critical emergent CENTCOM warfighting requirements identified in JUONS #CC-0558. Funding supported development associated with Fire Control for drone on drone and other kinetic kill capabilities, integration of C-UAS capabilities into a C2 system for airspace deconfliction & data sharing across air and ground C2 nodes. ***FY 2021 Base Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2278 / *Air Defense Weapons System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
-Continue development and integration efforts associated with increased lethality to support constantly evolving threats to include drone on done and high powered microwave (HPM). -Initiate development efforts for a Common Command and Control (C2) ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Increase of $1.442M from FY20 to FY21 is in line with OSD directed efforts to develop a High Powered Microwave (HPM) capability as well as a Common C2 beginning in FY21.					
Title: INCREMENT 2 INCREASED LETHALITY: Test and Evaluation	0.000	3.218	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2020 Plans: OCO: $3.218M provided for the test and evaluation of C-UAS "hard kill" capabilities to support urgent OCONUS needs identified in CENTCOM JUONS #CC-0558. Funding supported the Live Fire Test and Evaluation of the Fire Control for the drone on drone and other kinetic kill capabilities as well as the test and evaluations of the integration of C-UAS capabilities into a C2 system for airspace deconfliction & data sharing across air and ground C2 nodes and the mobile desktop trainer. ***FY 2021 Base Plans:*** N/A ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Decrease of $3.218M from FY20 to FY21 is a ramp down of test in support of increased lethality and kinetic and non-kinetic capabilities in order to adapt to the continually evolving threat and technologies and movement into integration					
Title: INCREMENT 3: MED RANGE INTERCEPT CAP (MRIC): Product Development	3.981	9.600	39.452	0.000	39.452
Articles:	-	-	-	-	-
FY 2020 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2278 / *Air Defense Weapons System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
-Initiated software architecture development to integrate a medium range intercept capability with the existing "Kill Chain" C2 architecture. This capability will be designed to be effective against rockets, Group 3+ Unmanned Aerial Systems, mortars, cruise missiles, precision guided missiles and rotary wing/fixed wing aircraft. -Initiated design development of the Medium Range Intercept Capability post successful 4QF19 demonstration. ***FY 2021 Base Plans:*** -Complete software architecture development to integrate a medium range intercept capability with the existing "Kill Chain" C2 architecture. This capability will be designed to be effective against rockets, Group 3+ Unmanned Aerial Systems, mortars, cruise missiles, precision guided missiles and rotary wing/fixed wing aircraft. -Complete design development of the Medium Range Intercept Capability post successful 4QF19 demonstration -Initiate the development of a fire control radar. -Initiate development of Medium Range Intercept Capability training, to include software development and hardware. -Initiate purchase and integration of hardware and software at the Systems Integration Lab (SIL) which supports the development and integration of the radar, uplink, and C2. -Initiate the integration of the missile launcher onto the combat vehicle platform, which includes transportability analysis ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Increase of $29.852M from FY20 to FY21 supports initiation of the Fire Control Radar development to meet 4QFY22 integration, initiation of the training development, stand up of the SIL, as well as the ramp up of hardware and software systems development.					
Title: INCREMENT 3: MED RANGE INTERCEPT CAP (MRIC): Support	0.000	0.400	3.773	0.000	3.773
Articles:	-	-	-	-	-
FY 2020 Plans: -Initiated the Threat Analysis engineering, Modeling and Simulation (M&S) in order to support development of the target statistics (trajectories, flight pattern, etc). ***FY 2021 Base Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2278 / *Air Defense Weapons System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
-Continue the Threat Analysis engineering, Modeling and Simulation (M&S) in order to support development of the target statistics (trajectories, flight pattern, etc). -Initiate launcher integration engineering efforts to support integration of the Prototype Surveillance Radar (PSR), Fire Control Radar, datalink, and missile safety feature upgrades/HW -Initiate Systems Integration Lab (SIL) engineering efforts to support the development of the radar, uplink, and C2. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Increase of $3.373M from FY20 to FY21 funds the initiation of the systems integration lab and launcher integration.					
Title: INCREMENT 3: MED RANGE INTERCEPT CAP (MRIC): Test and Evaluation	2.317	0.000	21.871	0.000	21.871
Articles:	-	-	-	-	-
FY 2020 Plans: N/A ***FY 2021 Base Plans:*** -Initiate testing to support the validation and integration of the Medium Range Intercept Capability (MRIC) utilizing hardware and software systems integration labs. -Continue the use of White Sands Missile Range (WSMR) in order to support engineering testing events. -Purchase (80) missiles, (1) launcher, and (16) canisters in support of the Early Operational Assessment in 4QFY22. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Increase of $21.871M supports the purchase of missiles, a launcher, and canisters in support of the Early Operational Assessment in 4QFY22.					
Accomplishments/Planned Programs Subtotals	88.051	64.535	131.052	0.000	131.052

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2278 / *Air Defense Weapons System*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• PMC/3006: *GBAD*	18.334	147.606	18.920	-	18.920	236.768	238.585	274.882	301.852	21.675	1,380.865

Remarks

D. Acquisition Strategy

GBAD Ground Based Air Defense: GBAD capability will be developed in three increments per the Capabilities Development Document (CDD). Increment 1 modernizes the existing GBAD legacy systems (A-MANPADS) by mounting a mix of legacy and technologically mature capabilities (from UUNS achievements) onto new tactical vehicles, Joint Light Tactical Vehicles (JLTV), mitigating the risk of attacks from UAS and FW/RW aircraft, while maintaining pace with maneuver forces. The MADIS Increment 1 will be built in a 3 block approach. The first block will include a turret, 30MM gun, electronic warfare (EW) CUAS defeat, and a dual launch stinger. The second block focuses on the development of a kinetic and non-kinetic capability which supports the CDD Increment 2 requirement of increased lethality. The third block will add a vehicle mounted quad stinger, allowing for additional ordnance to counter the threat and increase the probability of kill. Each MADIS Inc 1 system, to include Low Rate Initial Production (LRIP), will be retrofitted to include block 2 and 3 capabilities. Increment 3 will be a new Medium Range Intercept Capability (MRIC) designed to defend fixed/semi-fixed assets against Cruise Missiles (CM) and Rockets, Artillery, and Mortars (RAM) threats. The Marine Air Defense Integrated System (MADIS Inc 1) has been designated an ACAT II program. The MADIS Inc 1 development leverages JUON and JEON development efforts and will initiate at Milestone C 4QFY21, a change from the FY 2020 President's Budget request schedule of 1QFY20. IOC of 4QFY22 and FOC of 4QFY26 have been established, which is an update to the FY 2020 President's Budget request schedule. The schedule has been adjusted to allow time for integration of components on the JLTV. This includes a lighter turret, a move from the reconfigurable integrated weapons platform (RIwP) due to weight and egress considerations, as well as integration and testing of a different C2 system. Initial MADIS Inc 1 integration and development will be accomplished by a prime integrator via the Defense Microelectronics Activity (DMEA). To support an Inc 3 Medium Range Intercept Capability Material Support Decision, a concept demonstration of a proposed counter CM defense system occurred in 4QFY19. Initial design and integration reviews for this counter CM system are underway at this time. A 2QFY20 Accelerated Acquisition decision is planned to place Inc 3 Medium Range Intercept under the Middle Tier Acquisition guidelines.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2278 / *Air Defense Weapons System*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AMANPADs Night Sight Design	WR	NSWC : Crane.IN	5.422	0.051	Apr 2019	0.026	Dec 2019	0.000		-		0.000	Continuing	Continuing	Continuing
CUAS Component/HW	MIPR	DLA : Philadelphia, PA	7.454	37.321	Sep 2019	0.000		0.000		-		0.000	0.000	44.775	-
CUAS Prototype Development	Various	NSWC : Crane.IN	0.000	16.550	Jul 2019	0.000		0.000		-		0.000	0.000	16.550	-
MADIS Inc 1 SW Development	Various	NSWC : Dahlgren, VA	1.098	0.395	Nov 2018	1.636	Nov 2019	7.680	Nov 2020	-		7.680	0.000	10.809	-
MADIS Inc 1 SW Development	C/IDIQ	MCSC : Quantico, VA	0.000	0.000		0.000		0.740	Feb 2021	-		0.740	0.000	0.740	-
MADIS Inc 1 Integration	Various	NSWC : Crane.IN	6.115	0.000	Jul 2019	3.964	Dec 2019	0.000		-		0.000	0.000	10.079	-
MADIS Inc 1 Integration	C/CPFF	DMEA : McClellan, CA	0.000	0.000		11.202	Jun 2020	6.637	Jun 2021	-		6.637	0.000	17.839	-
MADIS Inc 1 C2 Development	C/CPFF	MCSC : Quantico, VA	0.000	0.000		1.000	Jun 2020	2.000	Jun 2021	-		2.000	0.000	3.000	-
MADIS Inc 1 Weapons Station Integration	MIPR	Army : Picitinny, NJ	0.000	0.000		0.000		1.500	May 2021	-		1.500	0.000	1.500	-
Inc 2 Kinetic Kill Development (High Powered Microwave)	MIPR	ARL : Adelphi,MD	1.293	3.180	Aug 2019	0.000		2.000	Mar 2021	-		2.000	0.000	6.473	-
Inc 2 OCO Kinetic Kill Develop/HW SDD	Various	NSWC : Crane	0.000	0.000		11.782	Nov 2019	0.000		-		0.000	0.000	11.782	-
Inc 2 Kinetic Kill Development/HW	C/CPFF	DMEA : McClellan, CA	0.000	0.000		0.000		2.474	Feb 2021	-		2.474	0.000	2.474	-
Inc 2 Common C2 Development	TBD	TBD : TBD	0.000	0.000		0.000		8.750	Mar 2021	-		8.750	0.000	8.750	-
MRIC (Inc 3) Demonstration	MIPR	DMEA : McClellan, CA	0.000	0.645	May 2019	0.000		0.000		-		0.000	0.000	0.645	-
MRIC (Inc 3) Demonstration	Various	VAR : VAR	0.000	3.336	Jul 2019	0.000		0.000		-		0.000	0.000	3.336	-
MRIC (Inc 3) Design Development	C/FFP	Raytheon Solypsis : Fulton, MD	0.000	0.000		3.440	Feb 2020	0.000		-		0.000	0.000	3.440	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2278 / *Air Defense Weapons System*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MRIC (Inc 3) SW Architecture Development	C/FFP	Raytheon Solypsis : Fulton, MD	0.000	0.000		2.000	Feb 2020	5.779	Feb 2021	-		5.779	0.000	7.779	-
MRIC (Inc 3) Integrated HW/SW Development	C/IDIQ	DMEA : McClellan, CA	0.000	0.000		4.160	Apr 2020	18.510	Apr 2021	-		18.510	0.000	22.670	-
MRIC (Inc 3) Fire Control Radar Develop	TBD	MCSC : Quantico, VA	0.000	0.000		0.000		6.800	Jun 2021	-		6.800	0.000	6.800	-
MRIC (Inc 3) Training Develop	TBD	TBD : TBD	0.000	0.000		0.000		1.042	Dec 2020	-		1.042	0.000	1.042	-
MRIC (Inc 3) Intercept SW Intg Lab (SIL)	TBD	TBD : TBD	0.000	0.000		0.000		3.315	Mar 2021	-		3.315	0.000	3.315	-
MRIC (Inc 3) Launcher Vehicle Integration	TBD	TBD : TBD	0.000	0.000		0.000		4.006	Aug 2021	-		4.006	0.000	4.006	-
Prior Years Cumulative Funding	Various	N/A : N/A	50.051	0.000		0.000		0.000		-		0.000	0.000	50.051	-
		Subtotal	71.433	61.478		39.210		71.233		-		71.233	Continuing	Continuing	N/A

Remarks

Overall increase of $32.023M from FY20 to FY21 is comprised of:
AMANPADs decrease of $0.026M due to the Night Sight moving into production in FY20.
MADIS Inc 1 SW Development increase of $6.784M due to the SW changes needed to integrate different major components and C2 system on the MADIS Inc 1.
MADIS Inc 1 Integration decrease of $8.529M due to MADIS Inc 1 achieving MS C in 4QFY21.
MADIS Inc 1 C2 Development increase of $1.000M due to additional engineering efforts to support a different C2 system on the MADIS Inc 1.
MADIS Inc 1 Weapons Station Integration increase of $1.500M due to requirement to change to a different turret due to weight restrictions.
Inc 2 Kinetic Kill Development/HW decrease of $7.308M due to ramp down of development of capability and start of integration associated to Increased Lethality.
Inc 2 Common C2 Development increase of $8.750M in line with OSD directed requirement to standardize Command and Control systems.
MRIC (Inc 3) Design Development decrease of $3.440M due to completion of design development and the beginning of development and integration.
MRIC (Inc 3) SW Architecture Development increase of $3.779M due to requirement to support the SW integration lab stand up in 2QFY21.
MRIC (Inc 3) Integrated HW/SW Development increase of $14.350M due to the ramp up of HW/SW integration in 3QFY21.
MRIC (Inc 3) Fire Control Radar (FCR) development increase of $6.800M due to requirement to have the 360 degree radar complete to meet the limited deployment decision in 4QFY22.
MRIC (Inc 3) Training development (SW/HW) increase of $1.042M supports the need to develop a training system for the MRIC before production in FY22.
MRIC (Inc 3) Intercept SW Intg Lab (SIL) increase of $3.315M supports the stand up of the Systems Integration Lab which will support the development of the radar, uplink, C2, etc.
MRIC (Inc 3) Launcher Vehicle Integration increase of $4.006M required for the full integration of the launcher onto the combat vehicle.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206313M / *Marine Corps Comms Systems*	Project (Number/Name) 2278 / *Air Defense Weapons System*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CUAS/MADIS Inc 1 Eng Spt	C/FFP	MITRE : Herndon, VA	0.000	0.493	Sep 2019	0.805	Sep 2020	0.500	Sep 2021	-		0.500	0.000	1.798	-
CUAS/MADIS Inc 1 HSI	Various	NSWC : Dahlgren	4.763	5.858	Mar 2019	0.745	Apr 2020	0.500	Nov 2020	-		0.500	0.000	11.866	-
MADIS Inc 1 NET Develop Spt	C/FFP	Lumbee Tribe : Pembroke, NC	0.000	4.953	May 2019	6.094	May 2020	6.094	May 2021	-		6.094	0.000	17.141	-
MADIS Inc 1 Tech Spt	C/FFP	MCSC : Quantico, VA	0.000	0.307	Jan 2019	0.516	Jan 2020	0.446	Jan 2021	-		0.446	0.000	1.269	-
MADIS Inc 1 Integrated Logistics/Eng	Various	VARIOUS : VARIOUS	0.344	0.722	Jul 2019	1.638	Dec 2019	1.113	Nov 2020	-		1.113	0.000	3.817	-
MADIS Inc 1 Curriculum Development, Eng, FSR	Various	NSWC : Crane, IN	0.758	3.058	Jul 2019	0.978	Apr 2020	0.000		-		0.000	0.000	4.794	-
MRIC (Inc 3) Threat Analysis Spt, M&S	Various	VAR : VAR	0.000	0.000		0.400	Apr 2020	0.400	Apr 2021	-		0.400	0.000	0.800	-
MRIC (INC 3) C2 Eng Integration Spt	C/CPFF	DMEA : McClellan, CA	0.000	0.000		0.000		2.274	Feb 2021	-		2.274	0.000	2.274	-
MRIC (INC 3) SIL Eng Spt	Various	NSWC : Dahlgren	0.000	0.000		0.000		1.099	Mar 2021	-		1.099	0.000	1.099	-
Prior Years Cumulative Funding	Various	N/A : N/A	7.858	0.000		0.000		0.000		-		0.000	0.000	7.858	-
		Subtotal	13.723	15.391		11.176		12.426		-		12.426	0.000	52.716	N/A

Remarks

Total increase of $1.250M from FY20 to FY21 supports the following:
CUAS/MADIS Inc 1 Eng Spt decrease of $0.305M supports the movement of the MADIS Inc 1 into production and fielding.
CUAS/MADIS Inc 1 HSI decrease of $0.245M supports the movement of the MADIS Inc 1 into production and fielding.
MADIS Inc 1 Tech Spt/ILS/Curriculum development decrease of $1.573M supports the movement of the MADIS Inc 1 into production.
MRIC (Inc 3) Launcher Integration support increase of $2.274M required to fund the support associated with the full integration of the Fire Control Radar, datalink, and missile safety feature upgrades/HW.
MRIC (Inc 3) SIL Engineering Spt increase of $1.099M due to engineering efforts associated with the stand up of the Systems Integration Lab, which will support the development of the radar, uplink, C2, etc.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2278 / *Air Defense Weapons System*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CUAS/MADIS Inc 1 DT	C/FFP	Lumbee Tribe : Pembroke, NC	0.000	4.149	Aug 2019	5.344	Dec 2019	0.000	Dec 2020	-		0.000	0.000	9.493	-
CUAS/MADIS Inc 1 DT	WR	NSWC Corona : Corona, CA	0.000	1.125	Nov 2018	0.350	Nov 2019	1.000	Nov 2020	-		1.000	0.000	2.475	-
CUAS/MADIS Inc 1 DT/OT	Various	NSWC Crane : Crane, IN	0.000	1.887	Mar 2019	0.000		10.000	Jan 2021	-		10.000	0.000	11.887	-
MADIS Inc 1 OT	C/FFP	Cherokee Nation : Tulsa, OK	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
MADIS Inc 1 OT	C/FFP	Lumbee Tribe : Pembroke, NC	0.000	0.000		0.000		5.300	Nov 2020	-		5.300	0.000	5.300	-
MADIS Inc 1 OT	WR	NSWC Corona : Corona, CA	0.000	0.000		0.000		1.000	Nov 2020	-		1.000	0.000	1.000	-
MADIS Inc 1 Test Pilots	C/FFP	Cherokee Nation : Tulsa, OK	0.000	0.346	Jul 2019	0.000	Jul 2020	0.000		-		0.000	0.000	0.346	-
MADIS Inc 1 Test PIlots	WR	NAWCWD : China Lake, CA	0.000	0.194	Jul 2019	0.000		0.500	Mar 2021	-		0.500	0.000	0.694	-
MADIS Inc 1 MCOTEA	TBD	MCOTEA : Quantico, VA	0.000	0.000		0.000		1.000	Nov 2020	-		1.000	0.000	1.000	-
MADIS Inc 1 Component/ Lab Testing	Various	NSWC : Dahlgren, VA	0.000	0.000		4.360	Apr 2020	5.420	Nov 2020	-		5.420	0.000	9.780	-
MADIS Inc 1 Live Fire Test	Various	TBD : TBD	0.000	0.000		0.000		1.000	Mar 2021	-		1.000	0.000	1.000	-
Inc 2 OCO Live Fire Test	MIPR	PD CRAM : Redstone Arsenal, AL	0.000	0.000		3.218	May 2020	0.000		-		0.000	0.000	3.218	-
MRIC (Inc 3) Test Range	MIPR	White Sands Missile Range : White Sands, NM	0.000	1.005	Feb 2019	0.000		2.000	Aug 2021	-		2.000	0.000	3.005	-
MRIC (Inc 3) - Test Range	WR	NAWCWD Pt Mugu : Pt Mugu, CA	0.000	1.312	Jun 2019	0.000		2.179	Jul 2021	-		2.179	0.000	3.491	-
MRIC (Inc 3) Missiles (QTY 80)	TBD	DMEA : McClellan, CA	0.000	0.000		0.000		14.960	Nov 2020	-		14.960	0.000	14.960	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2278 / *Air Defense Weapons System*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MRIC (Inc 3) - Launcher (QTY 1)	TBD	TBD : TBD	0.000	0.000		0.000		1.400	Nov 2020	-		1.400	0.000	1.400	-
MRIC (Inc 3) - Canisters (QTY 16)	TBD	TBD : TBD	0.000	0.000		0.000		0.832	Nov 2020	-		0.832	0.000	0.832	-
MRIC (Inc 3) - PSR Mode Test	Various	VAR : VAR	0.000	0.000		0.000		0.500	Jul 2021	-		0.500	0.000	0.500	-
Prior Years Cumulative Funding	Various	N/A : N/A	7.010	0.000		0.000		0.000		-		0.000	0.000	7.010	-
		Subtotal	7.010	10.018		13.272		47.091		-		47.091	0.000	77.391	N/A

Remarks

Total increase of $33.819M from FY20 to FY21 supports the additional engineering tests associated to a different turret and C2 system as well as the MADIS Inc 1 operational assessment. Increase also supports the required purchase of missiles, a launcher and canisters to support the MRIC early operational assessment in 3QFY22.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MADIS FoS Travel	Various	PMO Travel : Quantico, VA	0.000	0.635	Dec 2019	0.290	Sep 2020	0.302	Sep 2021	-		0.302	0.000	1.227	-
MADIS FoS PMO Spt	WR	NSWC : Crane, IN	0.000	0.265	Nov 2018	0.000	Nov 2019	0.000		-		0.000	0.000	0.265	-
MADIS FoS PMO Spt	WR	NSWC : Dahlgren, VA	0.000	0.264	Nov 2018	0.587	Nov 2019	0.000		-		0.000	0.000	0.851	-
Prior Years Cumulative Funding	Various	N/A : N/A	9.417	0.000		0.000		0.000		-		0.000	0.000	9.417	-
		Subtotal	9.417	1.164		0.877		0.302		-		0.302	0.000	11.760	N/A

Remarks

Funds decrease of $0.575M from FY20 to FY21 due to support efforts migrating into procurement as the MADIS Increment 1 reaches MS C in 4QFY21

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206313M / *Marine Corps Comms Systems*	Project (Number/Name) 2278 / *Air Defense Weapons System*	

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	101.583	88.051		64.535		131.052		-		131.052	Continuing	Continuing	N/A

Remarks

Overall, the Ground Based Air Defense $66.517M increase from FY20 to FY21, in combined baseline and OCO funding, is due to the additional integration, engineering, development, and operational testing required for major components on the MADIS Inc 1. Funding increase also supports the OSD directive to standardize to a common command and control system. This increase also supports the need for missiles, canisters, and a launcher to support Early Operational Assessment of the Medium Range Intercept Capability.

The increase of $94.529M in baseline funding between FY 2020 President's Budget request to FY 2021 President's Budget request is required in order to support the development of a suitable 360 degree cruise missile defense system in support of the Urgent Statement Of Need (USON). Preliminary analysis has determined that additional software/system development and component development and integration is required. The increase also supports additional integration, engineering, developmental and operational testing required for major components on the MADIS Inc 1 as well as the OSD directive to standardize to a common command and control system.

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2278 / *Air Defense Weapons System*

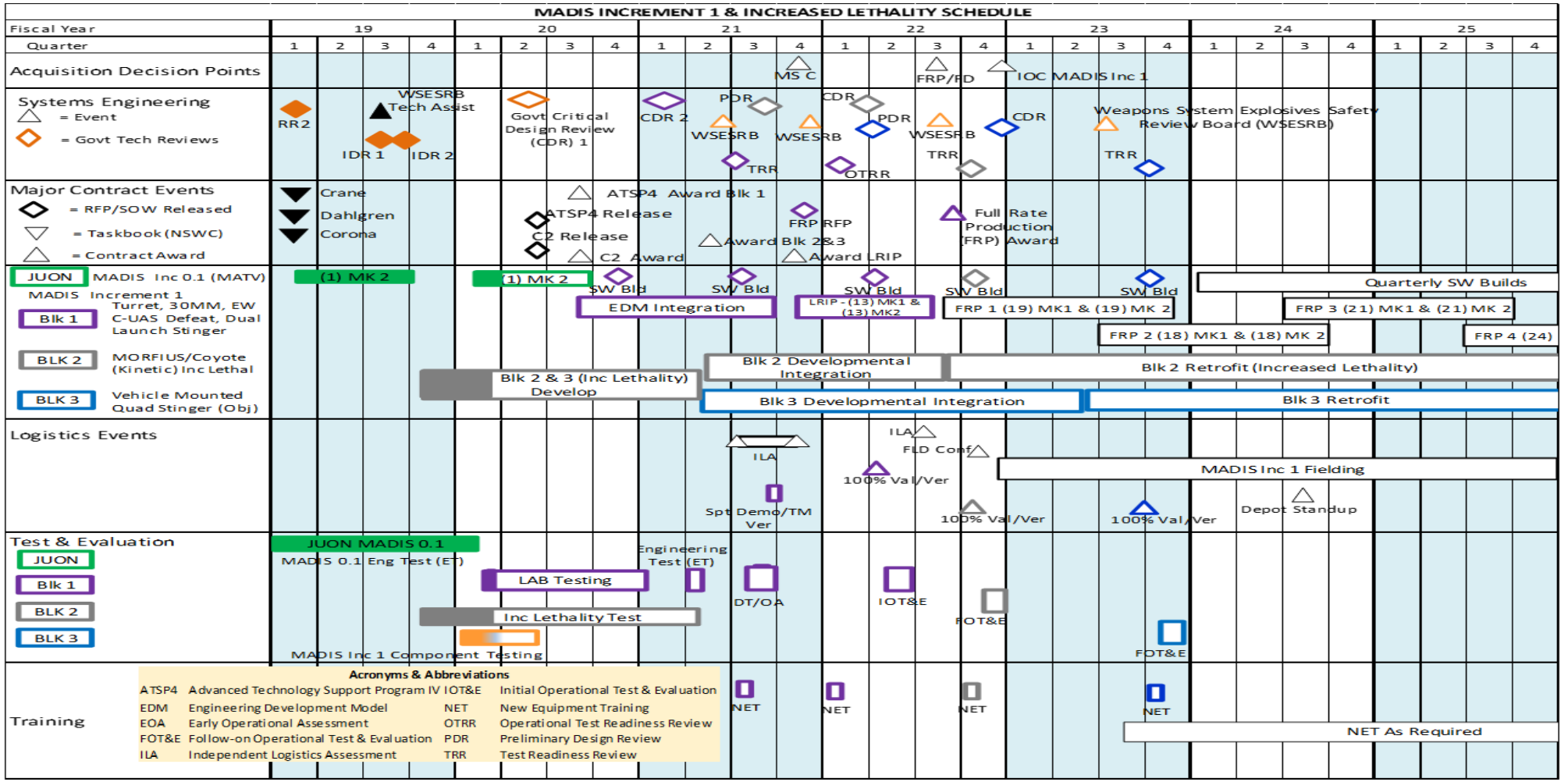


Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2278 / *Air Defense Weapons System*

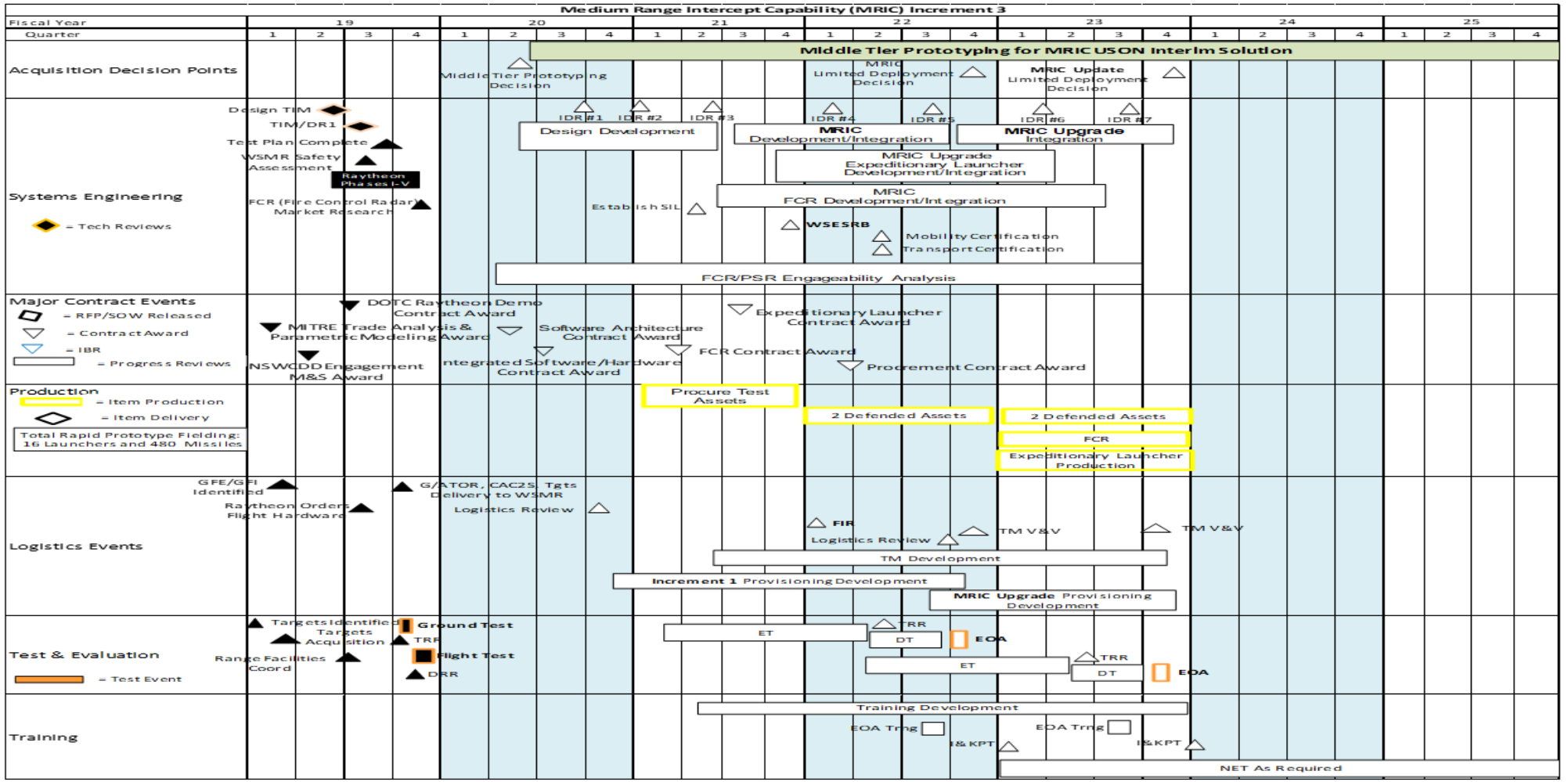


Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2278 / *Air Defense Weapons System*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
MADIS INCREMENT-1				
MS "C"/LRIP DECISION	4	2021	4	2021
LRIP CONTRACT AWARD	4	2021	4	2021
LRIP COMPONENT PRODUCTION/ INSTALLATION	4	2021	3	2022
DEVELOPMENTAL TESTING	3	2021	3	2021
OPERATIONAL ASSESSMENT	3	2021	3	2021
INITIAL OPERATIONAL TEST & EVALUATION	2	2022	2	2022
FULL RATE PRODUCTION DECISION	3	2022	3	2022
FULL RATE PRODUCTION CONTRACT AWARD	3	2022	3	2022
FOLLOW-ON OPERATIONAL TEST & EVALUATION	4	2022	4	2022
INITIAL OPERATIONAL CAPABILITY	4	2022	4	2022
INC 3 MEDIUM RANGE INTERCEPT CAPABILITY (MRIC)				
DOTC CONTRACT AWARD (DEMO)	3	2019	3	2019
MRIC 'CUE TO SLEW" INTEGRATION DEMO	4	2019	4	2019
MIDDLE TIER PROTOTYPE DECISION	2	2020	2	2020
C2/SENSOR SW DEVELOPMENT	3	2020	4	2021
FIRE CONTROL RADAR DEVELOPMENT	2	2021	3	2023
MRIC LIMITED DEPLOYMENT DECISION	4	2022	4	2022
LAUNCHER VEHICLE INTEGRATION	4	2021	2	2023
NEW EQUIPMENT TRAINING	1	2023	4	2025
EARLY OPERATIONAL ASSESSMENT (EOA)	4	2022	4	2022
MRIC UPDATE LIMITED DEPLOYMENT DECISION	4	2023	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206313M / *Marine Corps Comms Systems*	Project (Number/Name) 2510 / *MAGTF CSSE & SE*	

COST ($ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
2510: *MAGTF CSSE & SE*	301.156	1.279	1.814	0.962	-	0.962	0.972	0.990	1.009	1.029	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

(U) The Marine Air Ground Task Force (MAGTF) Combat Service Support Element & Supporting Establishment (CSSE & SE) consists of mutually supporting Logistics Information Technology (IT) programs that support force deployment, planning, and execution; sustainment and distribution; and contributes to the Combatant Commander's Common Operating Picture to support rapid accurate decision making.

JOINT FORCE REQUIREMENTS GENERATOR II (JFRG II) is an Automated Information System (AIS) that provides the Marine Corps the capability to plan and execute strategic force deployments in support of Joint contingency and crisis action operations and plans. It serves as the single link between Service operational force requirements and validated/sourced unit personnel and cargo data. JFRG II permits multi-level planning with entry of equipment and personnel data, transportation/ movement data, and the phasing of the total force throughout the entire movement timeline. JFRG II interfaces with the Joint Operation Planning and Execution System (JOPES) to register update and validate Time Phased Force and Deployment Data (TPFDD) within the Department of Defense chain of command. Validated deployment information is then used by U.S. Transportation Command for the scheduling of strategic transportation assets. JFRG II interfaces with the Sea Service Deployment Module (SSDM) for unit cargo information, and the War Reserve System (WRS) in order to register sustainment requirements. JFRG II can generate standard, executive, and ad hoc reports and perform database queries to support information requirements. JFRG II operates and functions in a classified environment.

BASE TELECOMMUNICATIONS INFRASTRUCTURE (BTI) provides all Marine Corps installations with the base area network communications infrastructure that connects the end-user to the DISA network. BTI modernizes, sustains, upgrades and enhances the telecommunications systems infrastructure for all Marine Corps Installations in order to meet the demands required to support the 5th Element of the Marine Air Ground Task Force (MAGTF). BTI is designed to maintain current industry standards as they relate to technological capabilities for all voice, video and data services and are transported via each installation's infrastructure. These data services include, support for but are not limited to: Enhanced 911 (E911), Video-Teleconferencing, Integrated Services Digital Network, Marine Corps Enterprise Network, Energy Monitoring Control Systems, Intrusion Detection Systems, Access Control Systems, Fire Alarm Control Networks and Fleet Training Systems. This includes supporting systems such as optical networks, telecommunications management systems, primary power, voice mail, teleconferencing, and outside plant infrastructure. The ongoing focus is technology refresh and standardization on DISA Unified Capabilities (UC) (voice, video, collaboration, and data) through modernization of installation infrastructure in order to maintain connection to the DISA network.

MAGTF LOGISTICS SUPPORT SYSTEMS (MLS2): Composed of several main components including the Electronic Maintenance Support System (EMSS). EMSS is a rugged organizational-level (O-level), light-weight, one-man portable maintenance device capable of supporting multiple platforms and systems across maintenance communities. It provides a Commercial Off-The-Shelf (COTS) hardware device equipped with Built-In-Test/Built-In-Test Equipment (BIT/BITE) interfaces, and Software Defined Test Instrument (SDTI) General Purpose Electronic Test Equipment (GPETE) capabilities. These hardware capabilities will enable commercial or custom DoD and USMC software capabilities including Interactive Electronic Technical Manuals (IETMs), Computer Based Training (CBT), and other maintenance applications to be hosted on EMSS. EMSS also has the capability to connect to the Marine Corps Enterprise Network (MCEN) and access sites like Global Combat Support System -

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2510 / *MAGTF CSSE & SE*

Marine Corps (GCSS-MC) in order to facilitate maintenance and supply transactions, thereby improving readiness. With these capabilities, maintainers will make more informed decisions and sustain force readiness over time.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: JOINT FORCES REQUIREMENT GENERATION II (JFRG II)	0.215	1.161	0.206	0.000	0.206
Articles:	-	-	-	-	-
FY 2020 Plans: - Continue Engineering Change Proposals (ECPs), initiate platform update from Ozone Widget Framework (OWF) to Ozone Widget Framework Version 8 and initiate Cross Domain Solution Development. ***FY 2021 Base Plans:*** - Initiate Engineering Change Proposals (ECPs) to increase user functionality. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Decrease of $0.955M from FY20 to FY21 is due to the Ozone Widget Platform update for JFRG II being accomplished in FY20.					
Title: BASE TELECOM (BTI)	0.438	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2020 Plans: N/A ***FY 2021 Base Plans:*** N/A ***FY 2021 OCO Plans:*** N/A					
Title: MAGTF LOGISTICS SUPPORT SYSTEMS (MLS2)	0.626	0.653	0.756	0.000	0.756
Articles:	-	-	-	-	-
FY 2020 Plans: - Continue to develop additional government off the shelf (GOTS) diagnostic software capability for additional Heavy Equipment, Motor Transport, and Ordnance weapon systems in order to enhance maintenance					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2510 / *MAGTF CSSE & SE*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
capabilities, migrate away from more expensive commercial off the shelf (COTS) solutions, and decrease total ownership cost (TOC) for supported platforms. ***FY 2021 Base Plans:*** - Continue to develop additional GOTS diagnostic software capability for additional Heavy Equipment, Motor Transport, Ordnance and Engineer weapon systems in order to enhance maintenance capabilities, migrate away from more expensive commercial off the shelf (COTS) solutions, and decrease total ownership cost (TOC) for supported platforms. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** The $0.103M increase from FY20 to FY21 supports the development of additional GOTS diagnostic software capability for the Engineer weapon systems.					
Accomplishments/Planned Programs Subtotals	1.279	1.814	0.962	0.000	0.962

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• PMC/BLI 463500 BTI: *BTI*	44.725	73.497	27.651	-	27.651	72.607	83.741	82.420	84.071	Continuing	Continuing
• PMC/BLI 418100: *MAGTF Logistics Support Systems*	10.453	10.540	12.333	-	12.333	12.444	12.499	12.749	13.006	Continuing	Continuing

Remarks

D. Acquisition Strategy

JOINT FORCES REQUIREMENT GENERATOR II (JFRG II) is required to modernize in order to implement Joint Requirements Oversight Counsel (JROC) mandates in support of Adaptive Planning and Execution (APEX) including the inclusion of Global Force Management - Data Initiative (GFM-DI) data elements and Joint Command and Control (JC2) Capabilities Development Document (CDD) requirements. The JFRG II legacy software application will remain supported until end of life (EOL) in FY20 when it will be replaced by the modernized application, JFRG II 2.0 Modernization. Future capability improvements as identified in the JC2 CDD will be implemented through the configuration management process.

BASE TELECOMMUNICATIONS INFRASTRUCTURE (BTI) provides all Marine Corps installations with the base area network communications infrastructure that connects the end-user to the DISA network. BTI modernizes, sustains, upgrades and enhances the telecommunications systems infrastructure for all Marine Corps

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2510 / *MAGTF CSSE & SE*

Installations in order to meet the demands required to support the 5th Element of the Marine Air Ground Task Force (MAGTF). Participation in the DISA Unified Capabilities Master Plan (voice, video, collaboration, and data) is critical to BTI modernization strategy. The RDT&E funds will be utilized for analysis, research and evaluation of Unified Capabilities (UC) (voice, video, collaboration, and data) implementation efforts.

MAGTF LOGISTICS SUPPORT SYSTEMS (MLS2) is pursuing an evolutionary acquisition strategy in order to sustain operationally suitable and supportable capability across the Marine Corps as a maintenance aid. Electronic Maintenance Support Systems must evolve in concert with the supported platforms maintenance philosophy to provide extended functionality and access to network connectivity.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2510 / *MAGTF CSSE & SE*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
JFRG II	C/IDIQ	SAIC : Stafford, VA	2.491	0.215	Jun 2019	0.856	Aug 2020	0.206	Aug 2021	-		0.206	Continuing	Continuing	Continuing
JFRG II	WR	NIWC/PAC : San Diego, CA	0.000	0.000		0.305	Feb 2020	0.000		-		0.000	0.000	0.305	-
EMSS/MAGTF Logistics Support Systems	WR	NSWC, Crane : Crane, IN	1.465	0.626	Feb 2019	0.653	Feb 2020	0.398	Feb 2021	-		0.398	Continuing	Continuing	Continuing
EMSS/MAGTF Logistics Support Systems	WR	MCLC, Albany : Albany, GA	0.000	0.000		0.000		0.358	Feb 2021	-		0.358	Continuing	Continuing	Continuing
Prior Years Cumulative Funding	Various	Various : Various	283.253	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	287.209	0.841		1.814		0.962		-		0.962	Continuing	Continuing	N/A

Remarks

The FY20 to FY21 decrease is due to the Ozone Widget Framework platform update for JFRG II being accomplished in FY20.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Years Cumulative Funding	Various	Various : Various	8.214	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	8.214	0.000		0.000		0.000		-		0.000	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

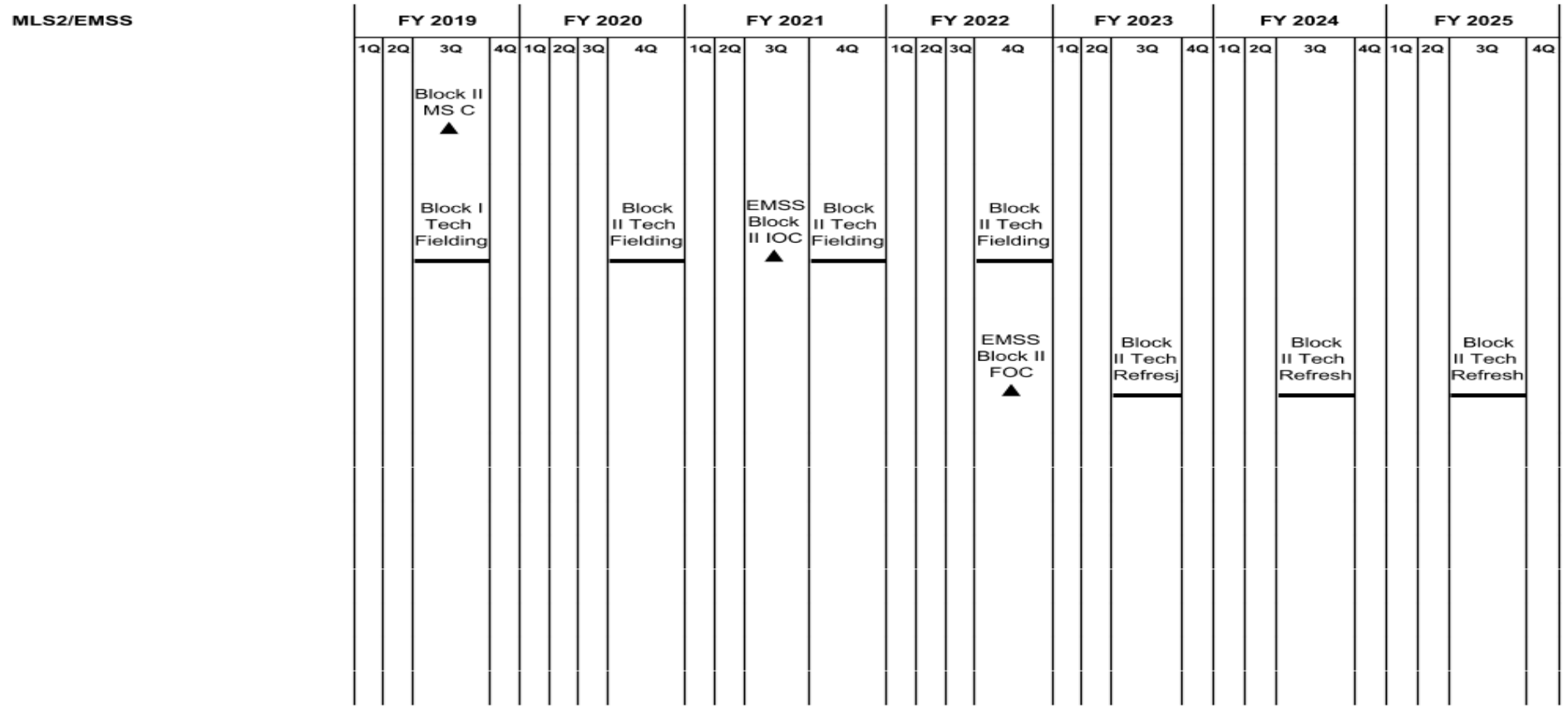
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
BTI	MIPR	MITRE : Aberdeen Proving Ground, MD	1.590	0.438	Jan 2019	0.000		0.000		-		0.000	0.000	2.028	Continuing
Prior Years Cumulative Funding	Various	Various : Various	4.143	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	5.733	0.438		0.000		0.000		-		0.000	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206313M / *Marine Corps Comms Systems*	Project (Number/Name) 2510 / *MAGTF CSSE & SE*	

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	301.156	1.279		1.814		0.962		-		0.962	Continuing	Continuing	N/A

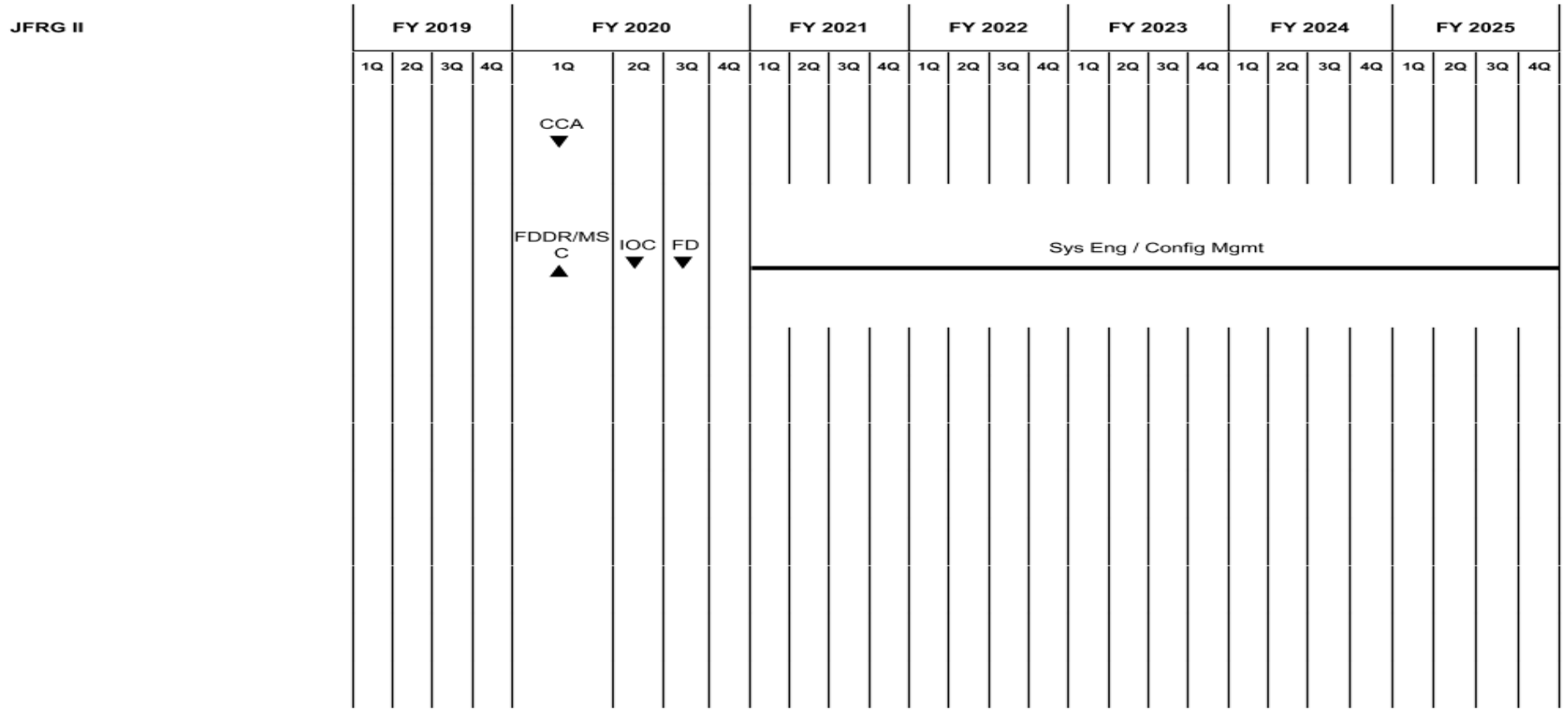
Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2510 / *MAGTF CSSE & SE*



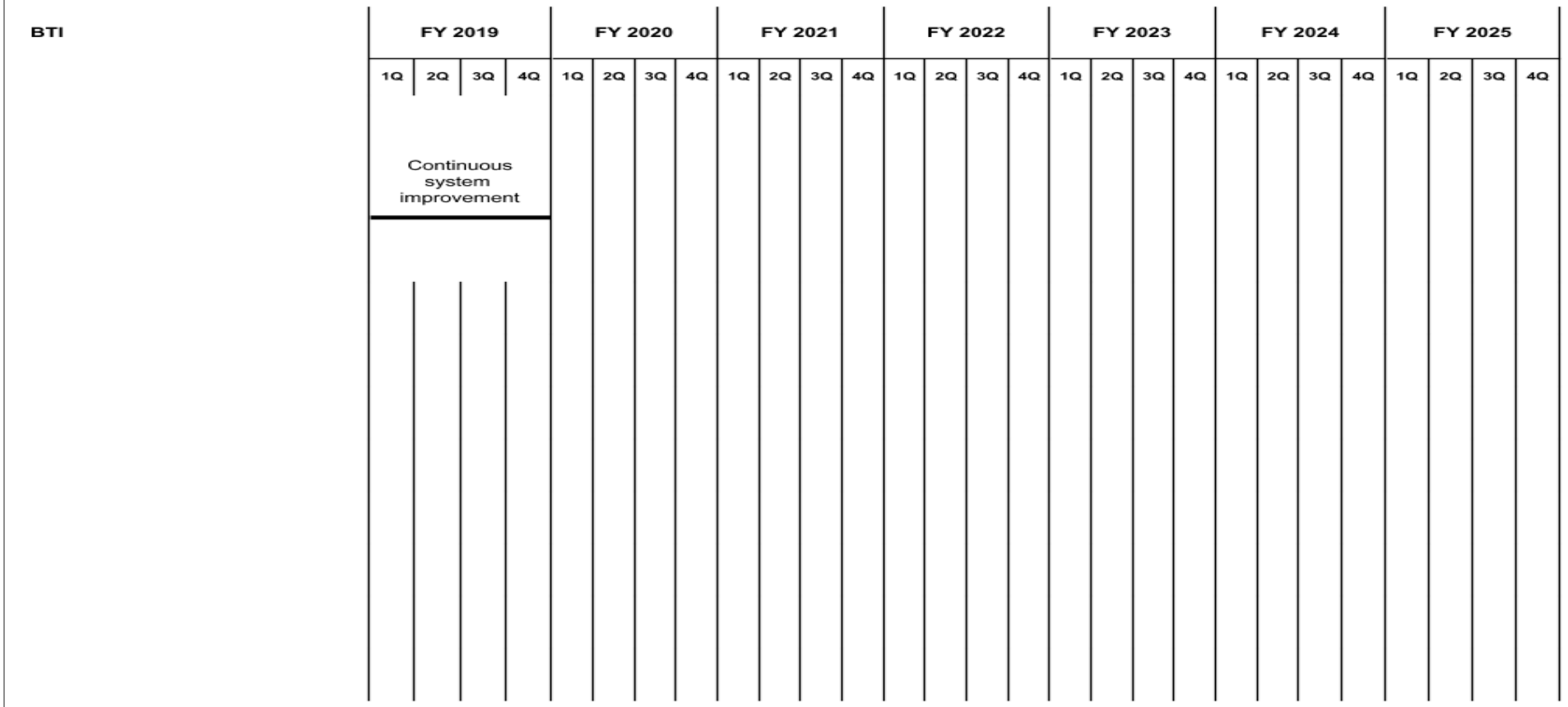
2021DON - 0206313M - 2510

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2510 / *MAGTF CSSE & SE*



2021DON - 0206313M - 2510

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2510 / *MAGTF CSSE & SE*



2021DON - 0206313M - 2510

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2510 / *MAGTF CSSE & SE*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
MLS2/EMSS				
EMSS Block II MS C	3	2019	3	2019
FY19 EMSS Block I Fielding	3	2019	3	2019
FY20 EMSS Block II Fielding	4	2020	4	2020
FY21 EMSS Block II Fielding	4	2021	4	2021
EMSS Block II IOC	3	2021	3	2021
FY22 EMSS Block II Fielding	4	2022	4	2022
FY22 EMSS Block II FOC	4	2022	4	2022
FY23 EMSS Block II Refresh	3	2023	3	2023
FY24 EMSS Block II Refresh	3	2024	3	2024
FY25 EMSS Block II Refresh	3	2025	3	2025
JFRG II				
CCA	1	2020	1	2020
MS C	1	2020	1	2020
IOC	4	2020	4	2020
FD	1	2021	1	2021
Sys Eng / Config Mgmt	1	2021	4	2025
BTI				
Continuous system improvement	1	2019	4	2019

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206313M / *Marine Corps Comms Systems*	Project (Number/Name) 3099 / *Radar System*	

COST ($ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
3099: *Radar System*	201.675	12.802	13.708	1.431	-	1.431	1.460	1.497	1.528	1.559	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Long Range Radar (AN/TPS-59) - The AN/TPS-59A(V)3 is a transportable, three dimensional, tactical radar system that provides the Marine Air Ground Task Force (MAGTF) with long-range surveillance. It is the MAGTF's only ground based long range sensor that provides the capability to detect and report Air Breathing Targets (ABT) and track Theater Ballistic Missiles (TBM). The AN/TPS-59A(V)3 Radar System is connected to the Common Aviation Command and Control Systems (CAC2S). It provides the air defense controllers data and may be used autonomously to conduct Ground Control Intercept, tactical en-route Air Traffic Control (ATC), or TBM alert operations via the Joint Integrated Air Missile Defense (IAMD) encrypted Link-16. The USMC extended the AN/TPS-59 service life through 2035; therefore, in order to maintain its operational relevance on the battlefield, a number of modernization efforts were initiated in FY17. The Digital Receiver and Exciter (DREX) upgrade will convert the analog receivers and exciters to digital to address Diminishing Manufacturing Sources and Material Shortages (DMSMS) issues, enable spectral agility, reduce noise, reduce false alarms, and enhance Electronic Counter-Countermeasures (ECCM) capability. This effort will include an essential simulation and test environment capability. Post Deployment Software Support (PDSS) funds the DREX software integration merge into the tactical system baseline.

Virtual Warfare Center (VWC) Support - The project team conducts fully interactive simulated war games at the Virtual Warfare Center (VWC) in St. Louis, MO, in order to quantify family of systems performance and how it impacts effectiveness in the Integrated Air and Missile Defense (IAMD) mission area. The VWC provides a venue for the exploration of advanced engagement concepts focused on persistent forward naval engagements in support of the MAGTF and the development of associated Joint and Service specific tactics, techniques, and procedures (TTPs). VWC support encompasses a set of integrated fire control (IFC) activities that also includes concept/CONOPS development, family of systems architecture development, and systems engineering/integration efforts.

The overall program decrease of $12.277M from FY20 to FY21 is due to the Marine Corps concerted effort to modernize in accordance with the National Defense Strategy (NDS)/Defense Planning Guidance (DPG).

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: AN/TPS-59: Product Development	5.800	5.567	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2020 Plans: - Initiate the Array Row Transmitter Technical Refresh which will increase radar detection ability, reduce power consumption and address obsolescence. - Initiate Mode 5 Level II updates which will increase capability for command and control of aircraft Identification of Friend or Foe (IFF) systems.					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 3099 / *Radar System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
- Continue enhanced software development for post deployment software support efforts TBM detection. ***FY 2021 Base Plans:*** - N/A ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Decrease of $5.567M from FY 2020 to FY 2021 is due to the Marine Corps concerted effort to modernize in accordance with the National Defense Strategy (NDS)/Defense Planning Guidance (DPG).					
Title: AN/TPS-59: Support	2.890	3.614	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2020 Plans: - Continue Engineering and Test Support for Digital Receiver Exciter (DREX), and Post Deployment Software Support enhancements. - Initiate Array Row Transmitter Technical Refresh and Mode 5 Level II engineering development efforts. ***FY 2021 Base Plans:*** - N/A ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Decrease of $3.614M from FY 2020 to FY 2021 is due to the Marine Corps concerted effort to modernize in accordance with the National Defense Strategy (NDS)/Defense Planning Guidance (DPG).					
Title: AN/TPS-59: Test and Evaluation	1.129	1.236	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2020 Plans: - Complete DREX developmental testing (DT) for successful transition into production. ***FY 2021 Base Plans:*** - N/A ***FY 2021 OCO Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 3099 / *Radar System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Decrease of $1.236M from FY 2020 to FY 2021 is due to the Marine Corps concerted effort to modernize in accordance with the National Defense Strategy (NDS)/Defense Planning Guidance (DPG).					
Title: AN/TPS-59: Management Services ***Articles:*** ***FY 2020 Plans:*** - Continue MITRE Technical Support which provides expertise necessary to support the radar systems, and provide analysis of test data to validate system performance. ***FY 2021 Base Plans:*** - N/A ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Decrease of $1.900M from FY 2020 to FY 2021 is due to the Marine Corps concerted effort to modernize in accordance with the National Defense Strategy (NDS)/Defense Planning Guidance (DPG).	1.900 -	1.900 -	0.000 -	0.000 -	0.000 -
Title: VWC: Test and Evaluation ***Articles:*** ***FY 2020 Plans:*** - Continue to simulate war games at the VWC in St. Louis, MO, in order to quantify family of systems performance and how it impacts effectiveness in the IAMD mission area. ***FY 2021 Base Plans:*** - Continue the simulation of war games at the VWC in St. Louis, MO, in order to quantify family of systems performance and how it impacts effectiveness in the IAMD mission area. ***FY 2021 OCO Plans:*** N/A	0.315 -	0.431 -	0.431 -	0.000 -	0.431 -
Title: VWC: Support ***Articles:***	0.768 -	0.960 -	1.000 -	0.000 -	1.000 -

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 3099 / *Radar System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
FY 2020 Plans: - Continue to simulate war games at the VWC in St. Louis, MO, in order to quantify family of systems performance and how it impacts effectiveness in the IAMD mission area. ***FY 2021 Base Plans:*** - Continue to simulate war games at the VWC in St. Louis, MO, for the quantification of the family of systems performance and determine how it impacts effectiveness in the IAMD mission area. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** No significant change from FY20 to FY21.					
Accomplishments/Planned Programs Subtotals	12.802	13.708	1.431	0.000	1.431

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• PMC/4650-1: *AN/TPS-59*	6.694	0.329	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

Remarks

D. Acquisition Strategy

Long Range Radar (AN/TPS-59) - Due to the proprietary nature of the software, the AN/TPS-59 Program will utilize a sole source contract with the Original Equipment Manufacturer (OEM) for software and Digital Receiver and Exciter development. The AN/TPS-59 Program will utilize full and open competition to the max extent possible on areas that do not have proprietary restrictions.

Virtual Warfare Center (VWC) Support - The project team conducts fully interactive simulated war games at the Virtual Warfare Center (VWC) in St. Louis, MO, in order to quantify family of systems performance and how it impacts effectiveness in the Integrated Air and Missile Defense (IAMD) mission area. VWC support encompasses a set of integrated fire control (IFC) activities that also includes concept/CONOPS development, family of systems architecture development, and systems engineering/ integration efforts. The Office of Naval Research (ONR) is the lead for all VWC contracting actions.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 3099 / *Radar System*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AN/TPS-59 - DREX EDM Development	SS/CPFF	LMC : Syracuse, NY	3.254	5.237	Dec 2018	3.297	Dec 2019	0.000		-		0.000	0.000	11.788	-
AN/TPS-59 - DREX EDM Development Program Management	SS/CPFF	LMC : Syracuse, NY	1.409	3.563	Sep 2019	2.270	Nov 2019	0.000		-		0.000	0.000	7.242	-
Prior Year Cumulative Funding	Various	Various : Various	90.234	0.000		0.000		0.000		-		0.000	0.000	90.234	-
		Subtotal	94.897	8.800		5.567		0.000		-		0.000	0.000	109.264	N/A

Remarks

- Decrease of $5.567M from FY20 to FY21 due to the Marine Corps concerted effort to modernize in accordance with the National Defense Strategy (NDS)/Defense Planning Guide (DPG).

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AN/TPS-59 - Engineering Support	C/FFP	MCSC : Quantico, VA	0.000	2.890	Nov 2018	3.614	Nov 2019	0.000		-		0.000	0.000	6.504	-
VWC	C/CPFF	ONR : St. Louis, MO	21.826	0.768	Feb 2019	0.960	Feb 2020	1.000	Feb 2021	-		1.000	Continuing	Continuing	Continuing
Prior Year Cumulative Funding	Various	Various : Various	52.687	0.000		0.000		0.000		-		0.000	0.000	52.687	-
		Subtotal	74.513	3.658		4.574		1.000		-		1.000	Continuing	Continuing	N/A

Remarks

- Decrease of $3.574M from FY20 to FY21 due to the Marine Corps concerted effort to modernize in accordance with the National Defense Strategy (NDS)/Defense Planning Guide (DPG).

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 3099 / *Radar System*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AN/TPS-59 - Test & Evaluation	C/CPFF	NSWC, Corona : Corona, CA	0.273	0.000		0.419	Aug 2020	0.000		-		0.000	0.000	0.692	-
AN/TPS-59 - GFE for Test Asset	C/CPFF	LMC : Syracuse, NY	0.000	0.000		0.817	Jun 2020	0.000		-		0.000	0.000	0.817	-
AN/TPS-59 - Platform Cert	MIPR	AIMS Prog Office : Warner Robbins AFB, GA	0.000	0.029	Jul 2019	0.000		0.000		-		0.000	0.000	0.029	-
VWC	C/CPFF	ONR : St. Louis, MO	1.328	0.315	May 2019	0.431	May 2020	0.431	May 2021	-		0.431	0.000	2.505	-
Prior Year Cumulative Funding	Various	Various : Various	4.683	0.000		0.000		0.000		-		0.000	0.000	4.683	-
		Subtotal	6.284	0.344		1.667		0.431		-		0.431	0.000	8.726	N/A

Remarks

- Decrease of $1.236M from FY20 to FY21 due to the Marine Corps concerted effort to modernize in accordance with the National Defense Strategy (NDS)/Defense Planning Guide (DPG).

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AN/TPS-59 Engineering Support	MIPR	MITRE : Bedford, MA	0.000	0.000		1.900	Oct 2019	0.000		-		0.000	0.000	1.900	-
Prior Year Cumulative Funding	Various	Various : Various	25.981	0.000		0.000		0.000		-		0.000	0.000	25.981	-
		Subtotal	25.981	0.000		1.900		0.000		-		0.000	0.000	27.881	N/A

Remarks

- Decrease of $1.900M from FY20 to FY21 due to the Marine Corps concerted effort to modernize in accordance with the National Defense Strategy (NDS)/Defense Planning Guide (DPG).

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206313M / *Marine Corps Comms Systems*	Project (Number/Name) 3099 / *Radar System*	

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	201.675	12.802		13.708		1.431		-		1.431	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 3099 / *Radar System*

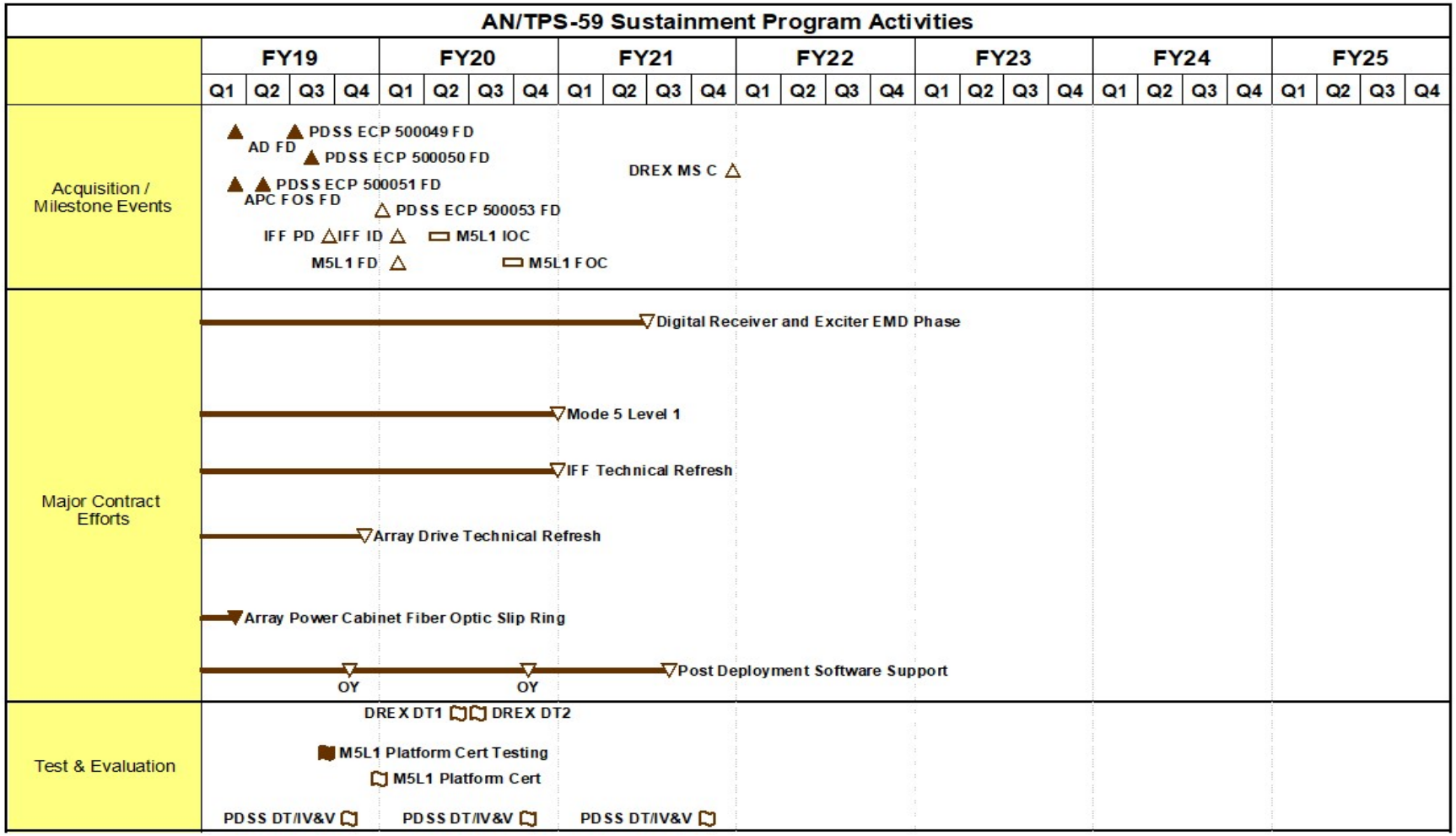


Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 3099 / *Radar System*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3099				
AN/TPS-59 PDSS Final Option Year Award	4	2020	4	2020
AN/TPS-59 M5L1 IOC	2	2020	2	2020
AN/TPS-59 M5L1 FOC	4	2020	4	2020

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206313M / *Marine Corps Comms Systems*	Project (Number/Name) 3772 / *Information Related Capabilities (IRC)*	

COST ($ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
3772: *Information Related Capabilities (IRC)*	0.000	4.030	4.791	3.135	-	3.135	4.820	5.087	5.332	6.351	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Marine Civil Information Management System (MARCIMS) is a system of systems comprised of people, process and technology that operates in the full Joint, Interagency, Intergovernmental, and Multinational (JIIM) environment. It is a force multiplier for the commander that allows him to leverage the process of Planning, Collection, Consolidation, Analysis, Production, and sharing of civil information in order to support the visualization and understanding of the civil environment to the military commander's decision making process.

Public Affairs System (PAS) provides the Marine Air-Ground Task Force (MAGTF) and the broader Marine Corps the capability to research, understand and affect the information environment. PA Marines and Systems enable commanders at all levels and across the range of military operations to engage domestic and foreign publics whose trust, confidence, and understanding are mission critical. The Public Affairs Systems (PAS) AAP identifies and fields materiel solutions required to research and plan communication initiatives, acquire still and video visual information, produce and disseminate communication products, and assess the effects of communication initiatives within the information environment. The program maintains an evolutionary approach to acquisitions, and leverages commercial industry-standard non-developmental items to provide the best value to the Marine Corps, while keeping PA Marines appropriately equipped to understand and affect the information environment. This effort supports research, testing, and evaluation of the Public Affairs Live Media Engagement System (PALMES) satellite transmission capability and testing of the Cloud environment. The combat Camera and Public Affairs MOSes modernized into the Communication Strategy and Operations (COMMSTRAT) MOS. The Occupational Field modernization resulted in an increase to structure, personnel, and capability to support concepts of employment in the Information Environment. Due to the OccField change, in FY23, the Combat Camera System (CCS) and Public Affairs Systems (PAS) Program of Record will modernize to Digital Media System (DMS). These increases and changes result in the demand for more equipment and capabilities to support both the legacy CCS and PAS programs as well as DMS.

The Military Information Support Operations (MISO) Family of Systems (FoS), which consists of the Fly-Away Broadcast System (FABS), Next-Generation Loud Speaker (NGLS), Radio-In-A-Box (RIAB), and Marine Corps SOF Integration Node (MSIN), provides the Marine Air-Ground Task Force (MAGTF) Commander the ability to plan, develop, deliver and assess messages and actions to influence select foreign groups and promote themes to change those groups' attitudes and reduce civilian interference, minimize collateral damage, and increase the population's support for MAGTF operations. The MISO was established in response to multiple Marine Requirements Oversight Council Memorandums, and the approval of a MISO Organizational and Operational (O&O) Concept, 16 June 2015. MISO capabilities are critical to the success of the MAGTF mission, enabling commanders to shape the information environment, counter enemy propaganda, misinformation, disinformation, and adversarial narratives.

The Signature Management (SIGMAN) capability will support MAGTF Operations with a baseline capability to include blue-force electromagnetic signature monitoring, assessment and projection. SIGMAN will be utilized by the Marine Corps Information Operations Center (MCIOC) SIGMAN platoon to provide commanders the ability

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 3772 / *Information Related Capabilities (IRC)*

to understand their own forces electrometric signatures and the ability to disrupt or deceive adversary units. Prior to FY21, SIGMAN was funded within the Military Information Support Operations (MISO) Family of Systems (FoS) portfolio.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Public Affairs System (PAS): Product Development	0.092	0.390	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2020 Plans: - Initiate procurement of Public Affairs Live Media Engagement System (PALMES) Next Generation test asset. - Procure test articles in support of the next generation of the Public Affairs Tablet (PAT). - Continue research and evaluation of PALMES in support of modernization and incorporation of the capability to transmit imagery and engage publics via traditional and social media via Military Satellite Communications (MILSATCOM).					
FY 2021 Base Plans: N/A					
FY 2021 OCO Plans: N/A					
FY 2020 to FY 2021 Increase/Decrease Statement: Decrease of $0.390M from FY20 to FY21 reflects X-Band integration transitioning to test and evaluation.					
Title: Public Affairs Systems (PAS): Test and Evaluation	0.000	0.000	0.225	0.000	0.225
Articles:	-	-	-	-	-
FY 2020 Plans: N/A					
FY 2021 Base Plans: - Conduct assessment to identify potential system upgrades for COMMSTRAT and continue X-Band integration. - Purchase of test articles in support of Marine Corps Tactical Systems Support Activity (MCTSSA) test events to focus on developmental testing on Hub environment upgrades, Windows 10 improvements, and PALMES improvements. - Initiate development efforts to identify potential system upgrades for COMMSTRAT in support of DMS.					
FY 2021 OCO Plans: N/A					
FY 2020 to FY 2021 Increase/Decrease Statement:					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 3772 / *Information Related Capabilities (IRC)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Increase of $0.225M from FY20 to FY21 reflects X-Band integration and initiation of development efforts to identify potential system upgrades for COMMSTRAT in support of DMS.					
Title: Military Information Support Operations (MISO): Product Development	1.080	2.062	0.931	0.000	0.931
Articles:	-	-	-	-	-
Description: The MISO Family of Systems (FoS), which consists of the Fly-Away Broadcast System (FABS), Next-Generation Loud Speaker (NGLS), Radio-In-A-Box (RIAB), and Marine Corps SOF Integration Node (MISN), provides the Marine Air-Ground Task Force (MAGTF) Commander the ability to plan, develop, deliver and assess messages and actions to influence select foreign groups and promote themes to change those groups' attitudes and reduce civilian interference, minimize collateral damage, and increase the population's support for MAGTF operations. Initiates product development of the Fly-Away Broadcast System (FABS) in preparation for a MS C decision.					
FY 2020 Plans: - Initiate Air integration efforts for FABS. - Continue research and development efforts for Signature Management (SIGMAN) capability for blue-force electromagnetic signature monitoring and capabilities.					
FY 2021 Base Plans: - Continue research and development efforts of the Fly-Away Broadcast System for technical advising support and technology modernization.					
FY 2021 OCO Plans: N/A					
FY 2020 to FY 2021 Increase/Decrease Statement: Decrease of $1.131M from FY20 to FY21 is due to delineating Signature Management (SIGMAN) funding in test and evaluation as a discrete effort. Prior to FY21, SIGMAN funding was included in the MISO funding profile.					
Title: MISO: Test and Evaluation	2.858	1.900	0.000	0.000	0.000
Articles:	3	-	-	-	-
Description: The MISO Family of Systems (FoS), which consists of the Fly-Away Broadcast System (FABS), Next-Generation Loud Speaker (NGLS), Radio-In-A-Box (RIAB), and Marine Corps SOF Integration Node (MISN), provides the Marine Air-Ground Task Force (MAGTF) Commander the capability to conduct planned operations to convey selected information and indicators to foreign adversary, neutral and friendly target					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 3772 / *Information Related Capabilities (IRC)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
audiences to influence their emotions, motives, objective reasoning, providing an operational advantage. Initiates product development of the Fly-Away Broadcast System (FABS) in preparation for a MS C decision. ***FY 2020 Plans:*** - Continue test and evaluation activities transitioning to research and development efforts of the Fly-Away Broadcast System in support of production verification and user evaluation. - Complete research and development of Signature Management (SIGMAN) capability for blue-force electromagnetic signature monitoring and capabilities. ***FY 2021 Base Plans:*** N/A ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** A decrease of $1.900M from FY20 to FY21 is largely due to the delineation of Signature Management (SIGMAN) funding in test and evaluation as a discrete effort.					
Title: MARCIMS: Product Development ***Articles:*** ***Description:*** Marine Civil Information Management System (MARCIMS) is a system of systems comprised of people, process and technology that operates in the full Joint, Interagency, Intergovernmental, and Multinational (JIIM) environment. It is a force multiplier for the commander that allows him to leverage the process of Planning, Collection, Consolidation, Analysis, Production, and sharing of civil information in order to support the visualization and understanding of the civil environment to the military commander's decision making process. ***FY 2020 Plans:*** - Initiate development of MARCIMS 2.0. - Conduct test and identification of the next generation of MARCIMS mobile devices. ***FY 2021 Base Plans:*** N/A ***FY 2021 OCO Plans:***	0.000 -	0.439 -	0.000 -	0.000 -	0.000 -

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 3772 / *Information Related Capabilities (IRC)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** A decrease of $0.439M from FY20 to FY21 reflects MARCIMS every-other-year test procurement schedule in support of system refresh.					
Title: Signature Management (SIGMAN): Test and Evaluation ***Articles:*** ***Description:*** The Signature Management (SIGMAN) capability will support MAGTF Operations with a baseline capability to include blue-force electromagnetic signature monitoring, assessment and projection. SIGMAN will be utilized by the Marine Corps Information Operations Center (MCIOC) SIGMAN platoon to provide commanders the ability to understand their own forces electrometric signatures and the ability to disrupt or deceive adversary units. Prior to FY21, SIGMAN was funded within the Military Information Support Operations (MISO) Family of Systems (FoS) portfolio. ***FY 2020 Plans:*** N/A ***FY 2021 Base Plans:*** - Continue research and development efforts for Signature Management (SIGMAN) capability for blue-force electromagnetic signature monitoring and capabilities. - Initiate research and development efforts for Signature Management (SIGMAN) related to electromagnetic signature emitter devices. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Increase of $1.979M from FY20 to FY21 is due to Signature Management (SIGMAN) becoming a stand-alone effort, removing SIGMAN from the Military Information Support Operations (MISO) Family of System (FoS) funding profile.	0.000 -	0.000 -	1.979 -	0.000 -	1.979 -
Accomplishments/Planned Programs Subtotals	4.030	4.791	3.135	0.000	3.135

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 3772 / *Information Related Capabilities (IRC)*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• PMC/4620AA: *MARCIMS*	0.296	0.000	0.302	-	0.302	0.000	0.308	0.000	0.314	Continuing	Continuing
• PMC/4620BB: *PAS*	2.427	0.691	0.694	-	0.694	0.706	0.719	0.734	0.749	Continuing	Continuing
• PMC/4620CC: *MISO*	2.976	6.289	4.987	-	4.987	4.038	3.853	4.171	4.243	Continuing	Continuing
• PMC/4620DD: *SIGMAN*	0.000	0.000	5.716	-	5.716	7.105	5.300	4.250	4.500	Continuing	Continuing

Remarks

D. Acquisition Strategy

MARCIMS continues to maintain an every-other-year procurement strategy to modernize and refresh hardware. MARCIMS retains configuration control of the system to ensure system best supports the Fleet.

Public Affairs System will maximize the utilization of commercial-off-the-shelf devices and software to provide best overall performance solutions to the warfighter with minimal developmental cost and schedule investments.

MISO will complete environmental testing, refine system design, and validate production requirements in support of a MS C decision in Q3, FY20. MISO plans to laterally field all three FABS variants across multiple fiscal years, completing fielding no later than Fiscal Year (FY) 2025. The program has sufficient Procurement funding budgeted across the Future Year Defense Plan (FYDP) to permit this fielding strategy.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206313M / *Marine Corps Comms Systems*	Project (Number/Name) 3772 / *Information Related Capabilities (IRC)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MISO	WR	JHU- PBL : Laurel, MD	0.000	1.080	Apr 2019	2.062	Apr 2020	0.931	Dec 2020	-		0.931	Continuing	Continuing	Continuing
PAS	WR	NIWC-PAC : San Diego, CA	0.000	0.092	Mar 2019	0.390	Mar 2020	0.000		-		0.000	Continuing	Continuing	Continuing
MARCIMS	WR	NSWC-IH : Indian Head, MD	0.000	0.000		0.439	Nov 2019	0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	0.000	1.172		2.891		0.931		-		0.931	Continuing	Continuing	N/A

Remarks

Decrease of $1.960M from FY20 to FY21 is largely due to delineating Signature Management (SIGMAN) funding from MISO Product Development and in test and evaluation as a discrete effort.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MISO	WR	NAVSEA : Laurel MD	0.000	2.858	Feb 2019	1.900	Feb 2020	0.000		-		0.000	Continuing	Continuing	Continuing
PAS	WR	MCTSSA : San Diego, CA	0.000	0.000		0.000		0.225	Mar 2021	-		0.225	0.000	0.225	-
SIGMAN	WR	NIWC : Charleston, SC	0.000	0.000		0.000		1.979	Jan 2021	-		1.979	0.000	1.979	-
		Subtotal	0.000	2.858		1.900		2.204		-		2.204	Continuing	Continuing	N/A

Remarks

Increase of $0.304M from FY20 to FY21 is largely due to PAS X-Band integration and initiation of development efforts to identify potential system upgrades for COMMSTRAT in support of DMS.

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	4.030		4.791		3.135		-		3.135	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 3772 / *Information Related Capabilities (IRC)*

SIGMAN

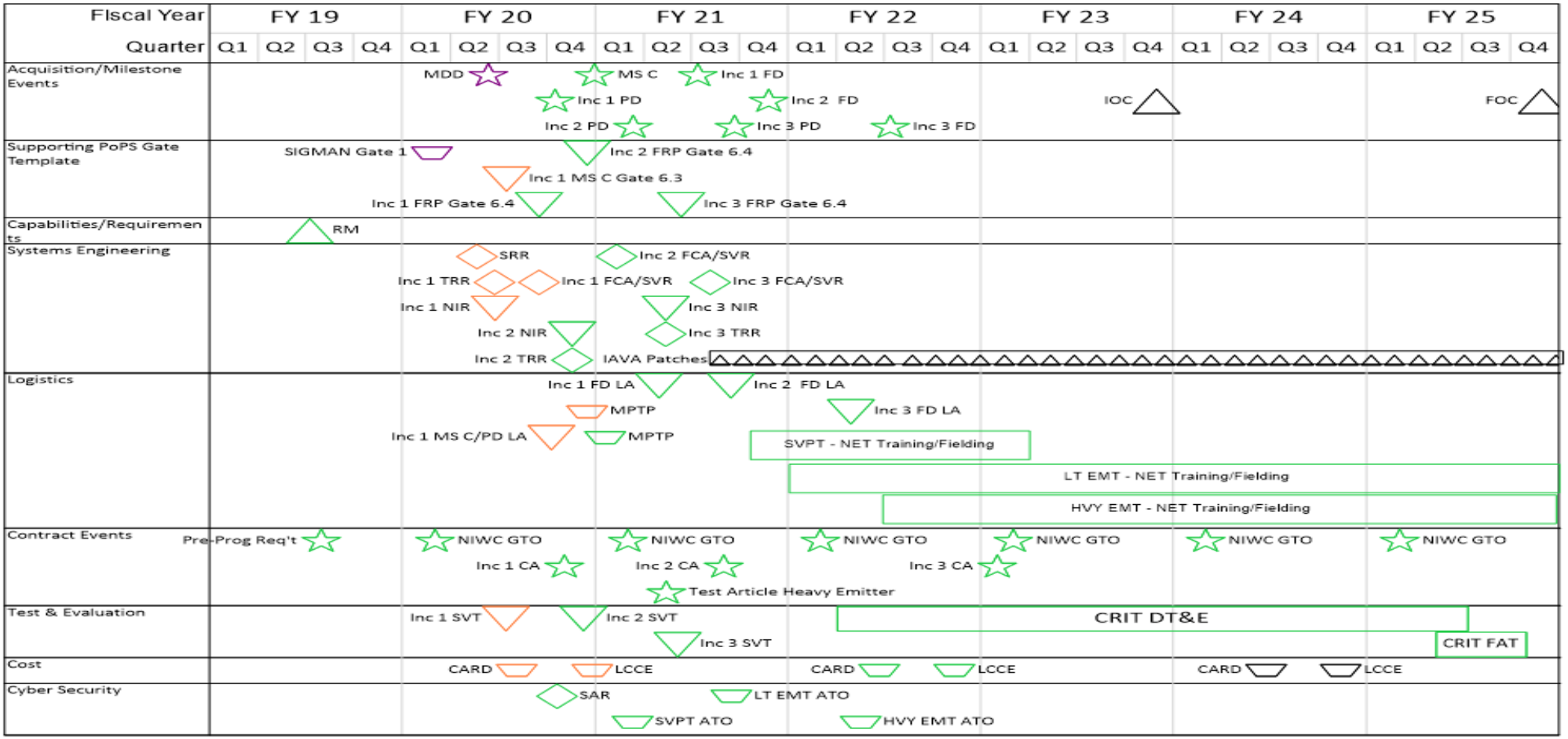


Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 3772 / *Information Related Capabilities (IRC)*

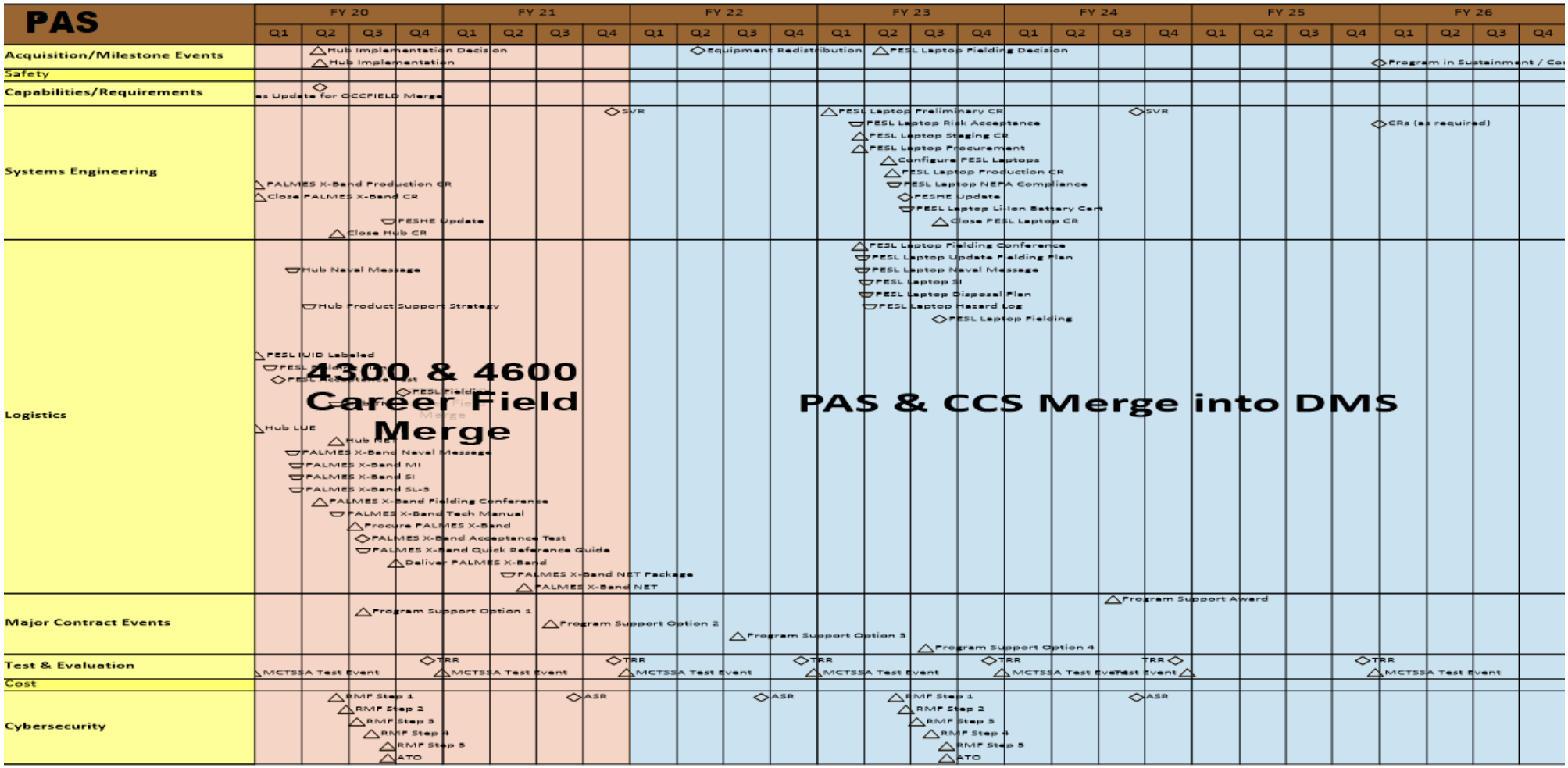


Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 3772 / *Information Related Capabilities (IRC)*

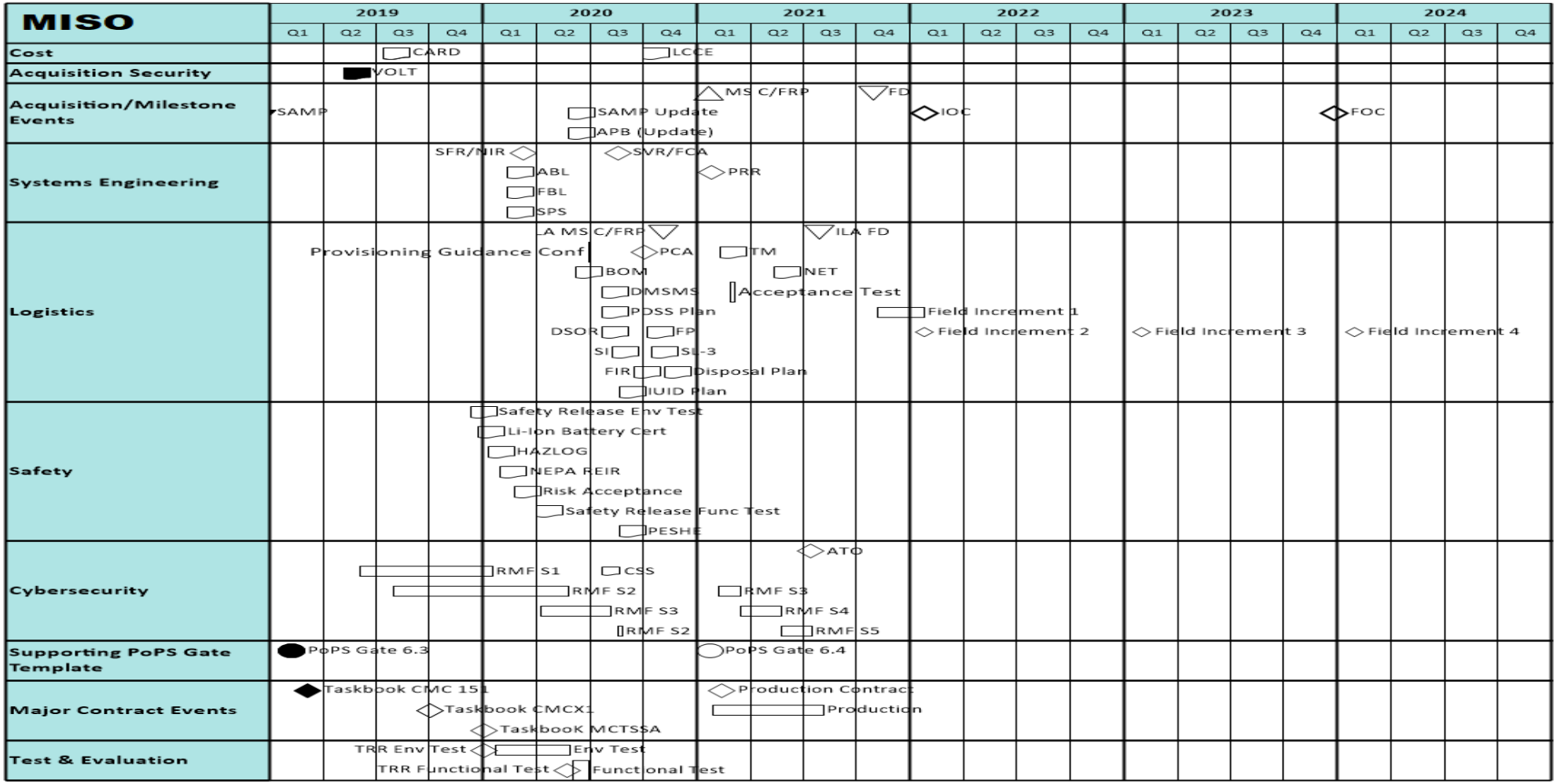


Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 3772 / *Information Related Capabilities (IRC)*

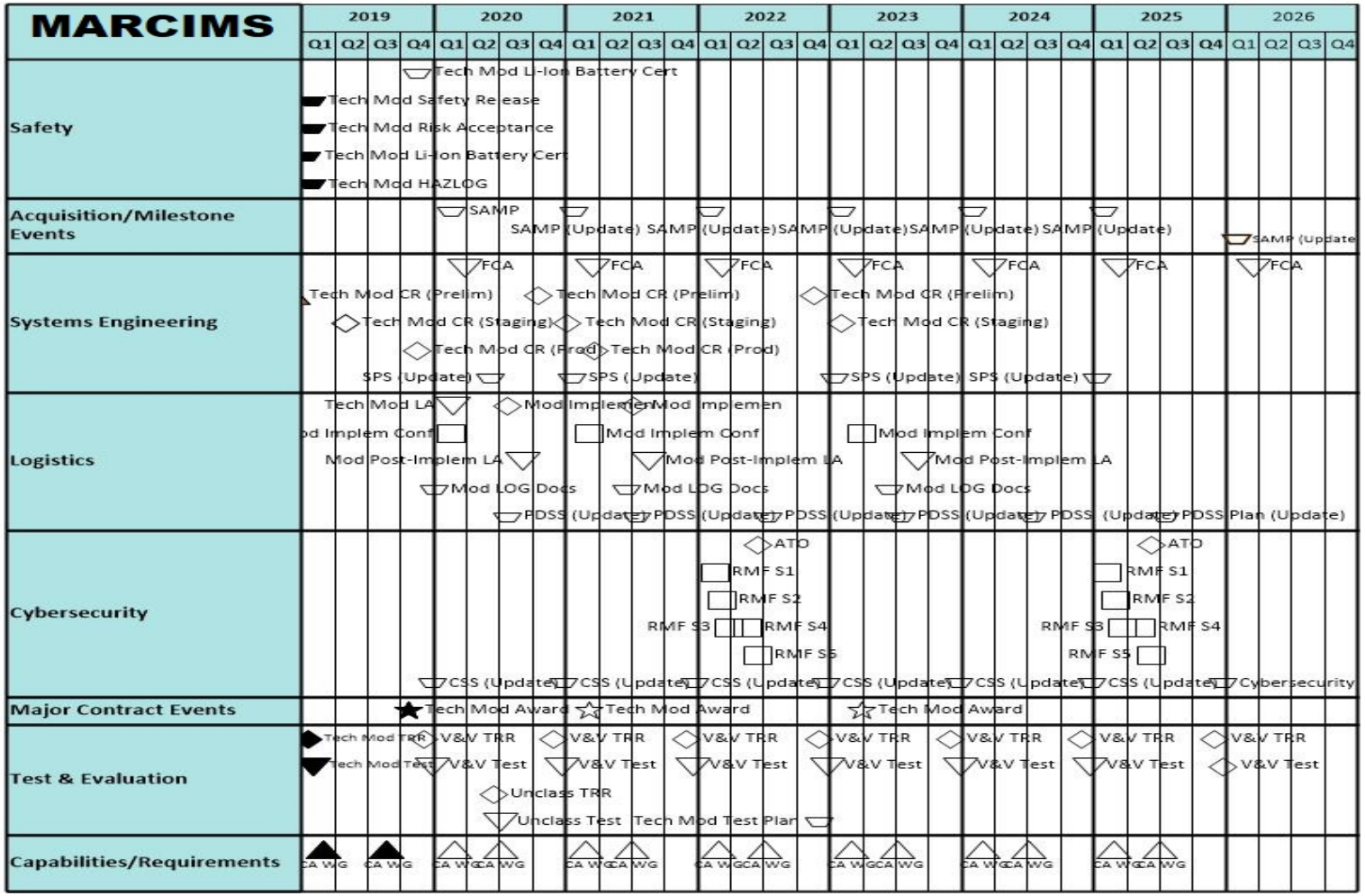


Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 3772 / *Information Related Capabilities (IRC)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3772				
MISO: MS C / LRIP	1	2021	1	2021
MISO: FABS Environmental Testing	1	2020	2	2020
MISO: FABS Functional Testing	2	2020	3	2020
MISO: FABS Production	1	2021	4	2024
MISO: FRP/FD	4	2021	4	2021
MISO: FABS Operations and Support	4	2021	4	2024
Pas: PAS Modernization	1	2019	4	2025
MARCIMS: MARCIMS SW Update	1	2019	4	2025
SIGMAN: MS C	4	2020	4	2020
SIGMAN: Inc 1 Production Decision	4	2020	4	2020
SIGMAN: Inc 2 Production Decision	1	2021	1	2021
SIGMAN: Inc 1 Fielding Decision	3	2021	3	2021
SIGMAN: Inc 3 Production Decision	3	2021	3	2021
SIGMAN: Inc 2 Fielding Decision	4	2021	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206313M / *Marine Corps Comms Systems*	Project (Number/Name) 3773 / *Fire Coordination and Sensors*	

COST ($ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
3773: *Fire Coordination and Sensors*	0.000	7.614	7.801	7.983	-	7.983	8.150	8.315	8.482	8.652	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project 3773 Fire Coordination and Sensors funds the development of critical United States Marine Corps (USMC) fire support coordination, targeting, and digital interoperability systems required for the employment of air and ground fires. Fire Coordination and Sensors provides the systems needed to develop and integrate a digital networked sensor to shooter kill chain supporting the Marine Air Ground Task Force (MAGTF). Key systems included are:

Family of Target Acquisition Systems (FTAS) - The FTAS provides the MAGTF the capability to locate, identify, and attack enemy indirect fire weapons systems and observe and direct friendly artillery fire. The FTAS consists of the AN/TPQ-46 Firefinder Radar, the AN/TPQ-49 Lightweight Counter Mortar Radar, AN/TPQ-54 Lightweight Counter Mortar Radar, Ground Counter Fire Sensor (GCFS), and the AN/TSQ-267 Target Acquisition System. The GCFS is a passive acoustic sensor enabling the detection of enemy indirect fire weapons in a contested environment. GCFS prototype 1 will tie in up to five sensor nodes and prototype 2 will tie in up to ten sensor nodes. The FTAS is critical in the execution of counterfire and the integration of target acquisition information enabling attack by MAGTF assets. The FTAS also provides artillery firing units the ability to conduct artillery registration and other friendly fire missions. The FTAS encompasses the equipment required to support target acquisition within the target acquisition platoon and is resident in the headquarters battery of each artillery regiment. The program will initiate development of replacement sensor systems and continue to address system issues that arise due to Diminishing Manufacturing Sources and Material Shortage (DMSMS) items within the FTAS.

AFATDS FoS consists of three programs: AFATDS, Back-Up Computer System (BUCS) and Mobile Tactical Shelter (MTS). The AFATDS automates the fire planning, tactical/technical fire direction, and fire support coordination required to facilitate sea control/denial and support maneuver from the sea and subsequent operations ashore. AFATDS integrates all supporting arms assets with the MAGTF, such as mortars, cannon artillery, rockets and missiles, close air support, and naval surface fires support systems. BUCS is a handheld computer system designed to provide a backup to the AFATDS in computing ballistic firing solutions, as well as provide survey and meteorological functions in support of the fires mission. The MTS is an artillery C2 platform dedicated to housing AFATDS and other fire support systems. It is a lightweight multipurpose shelter mounted on a lightweight utility vehicle. MTS enhances the capabilities and survivability of the fire support element by enabling rapid emplacement and displacement, and supports communications on the move. The MTS supports operations in all environmental conditions, day or night, while protecting the AFATDS and BUCS.

Target Hand-Off System (THS) - The THS addressed a Marine Corps operational requirement for a lightweight, handheld, and accurate target acquisition engagement coordination system. THS provides MAGTF Commanders with the only man-portable target location and video downlink capability that allows Air Officers and Fire Support Coordinators to prosecute identified targets. The THS' advance interoperability capability provides the MAGTF Commander with the only portable target acquisition system able to interoperate with all target prosecution platforms available on the battlefield. The THS is designed for the Forward Air Controllers (FACs), Forward Observers (FOs), Fire Support Teams (FSTs), Firepower Control Teams (FCTs), Tactical Air Control Parties (TACPs) and Reconnaissance Teams to quickly

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 3773 / *Fire Coordination and Sensors*

acquire targets in day, night and near-all-weather visibility conditions, in order to conduct precise, rapid indirect surface fire support, Naval Surface Fire Support (NSFS) and Close Air Support (CAS).

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: FTAS: Product Development	1.469	1.629	1.660	0.000	1.660
Articles:	-	-	-	-	-
FY 2020 Plans: - Complete development of Lightweight Counter Mortar Radar (LCMR) tech refresh system. - Continue development of Ground Counter Fire Sensor (GCFS) replacement systems.					
FY 2021 Base Plans: - Complete development of Ground Counter Fire Sensor (GCFS) replacement system prototype 1. - Initiate development of Ground Counter Fire Sensor (GCFS) replacement system prototype 2.					
FY 2021 OCO Plans: N/A					
FY 2020 to FY 2021 Increase/Decrease Statement: Increase of $0.031M from FY20 to FY21 is due to increased development of Ground Counter Fire Sensor (GCFS) replacement system.					
Title: AFATDS: Software Development and Integration	4.833	5.013	5.155	0.000	5.155
Articles:	-	-	-	-	-
FY 2020 Plans: - Continue development of AFATDS software version 7.0. - Complete development of the next generation Back-Up Computer System (BUCS). - Continue development of AFATDS software version 6.8.1.2. - Continue test and evaluation of software version 7.0. - Initiate test and evaluation of software version 6.8.1.2.					
FY 2021 Base Plans: - Complete development, test, and evaluation of AFATDS software version 6.8.1.2. - Initiate test and evaluation of software version 7.0 BLK 2. - Complete build of AFATDS software version 7.0 BLK 3. - Initiate build of AFATDS software version 7.0 BLK 4.					
FY 2021 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 3773 / *Fire Coordination and Sensors*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Increase of $0.142M from FY20 to FY21 is due to additional development efforts associated with 7.0 software build.					
Title: AFATDS: Test and Evaluation	0.000	0.100	0.100	0.000	0.100
Articles:	-	-	-	-	-
FY 2020 Plans: - Complete interoperability testing for AFATDS 6.8.1.1 P2 and BUCS software between all required Joint C2 and Fires systems. - Initiate interoperability testing for AFATDS 6.8.1.2 software between all required Joint C2 and Fires systems. ***FY 2021 Base Plans:*** - Complete interoperability testing for AFATDS 6.8.1.2 software between all required Joint C2 and Fires systems. ***FY 2021 OCO Plans:*** N/A					
Title: AFATDS: Management Services	0.650	0.650	0.650	0.000	0.650
Articles:	-	-	-	-	-
FY 2020 Plans: - Continue to provide Engineering Support personnel and travel. ***FY 2021 Base Plans:*** - Continue to provide Engineering Support personnel for AFATDS development. ***FY 2021 OCO Plans:*** N/A					
Title: THS: Product Development	0.662	0.409	0.418	0.000	0.418
Articles:	-	-	-	-	-
FY 2020 Plans: - Completion of software modem and continued development of software to insure digital interoperability with close air support (CAS) platforms. ***FY 2021 Base Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 3773 / *Fire Coordination and Sensors*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
- Initiate software development of Link-16 message formats to support digital communications with CAS (close air support) platforms and Command and Control networks. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Increase of $0.009M from FY20 to FY21 is due to a requirement to connect to a new version of AFATDS.					
Accomplishments/Planned Programs Subtotals	7.614	7.801	7.983	0.000	7.983

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• PMC/473300: *Family of Target Acq Systems (FTAS)*	2.867	2.943	3.002	-	3.002	3.061	3.122	3.184	3.247	Continuing	Continuing
• PMC/473301: *Advanced Field Artillery Tactical Data Family of Systems (AFATDS FoS)*	12.521	12.852	14.067	-	14.067	14.411	14.748	14.973	15.304	Continuing	Continuing
• PMC/47330: *Target Handoff System (THS)*	23.893	2.439	2.487	-	2.487	2.537	2.588	2.640	2.693	Continuing	Continuing

Remarks

D. Acquisition Strategy

AFATDS is managed through the Army Futures Command, Fire Support Command and Control, Aberdeen Proving Ground MD. R&D efforts for the next AFATDS v7.0.X.X, will be a combined effort between the software developer, the Army PM, and the USMC for software through the Defense Information Systems Agency (DISA). Current software enhancements are performed by the U.S. Army, Fort Sill, OK for v6.8.X.X. MTS redesign is managed by Naval Information Warfare Center (NIWC) Atlantic for transition to the lightweight utility vehicle.

Family of Target Acquisition Systems (FTAS) - FTAS consists of 4 major components: AN/TPQ-46 Firefinder Radar, AN/TPQ-49 Lightweight Counter Mortar Radar (LCMR), Ground Counter Fire Sensor (GCFS), and the AN/TSQ-267 Target Processing Set (TPS). The replacement of the AN/TPQ-46 by the Ground/Air Task Oriented Radar (G/ATOR) began in 2018. Activities during 2020 and beyond will be limited to maintaining the authority to operate (ATO) accreditation and supporting remaining systems. USMC activities on the AN/TPQ-49 are escalating due to the fact the US Army divested from the AN/TPQ-49, and the USMC assumed the responsibilities of the primary inventory control activity (PICA). The Program Office awarded an IDIQ contract in 2018 to address obsolescence and lifecycle support challenges, as well as

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 3773 / *Fire Coordination and Sensors*

provide a contract vehicle for Foreign Military Sales and U.S. Government procurements. The Program Office will conduct a competitive award of the GCFS replacement in order to transition this capability from the Science and Technology (S&T) phase into the acquisition cycle and continue development by exploiting recent technology improvements. The improved acoustic sensor procurement will consist of multiple contract awards with USMC as system integrator.

THS: The acquisition of components (software/hardware) for the THS initiative will maximize the use of existing Commercial-Off-The-Shelf (COTS), Government-Off-The-Shelf (GOTS), Non-Developmental Item (NDI), and Government Furnished Equipment (GFE). Software must maintain compatibility with five Programs of Record (POR) and seven Operational Flight Programs (OFP). Equipment is purchased from multiple vendors with Aviation Missile Command (AvMC) acting as the lead integrator for the USMC.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 3773 / *Fire Coordination and Sensors*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FTAS (LCMR/GCFS-R)	MIPR	CECOM/MITRE : Ft. Monmouth, NJ	0.000	0.097	May 2019	0.000		0.000	Dec 2020	-		0.000	0.000	0.097	-
FTAS (GCFS-R/DATA FUSION)	MIPR	AMRDEC : Huntsville, AL	0.000	1.054	Feb 2019	0.550	Feb 2020	1.066	Feb 2021	-		1.066	0.000	2.670	-
FTAS (LCMR)	MIPR	TYAD : Tobyhanna, PA	0.000	0.318	Nov 2018	0.300	Jan 2020	0.094	Nov 2020	-		0.094	0.000	0.712	-
FTAS (LCMR/GCFS-R)	WR	NSWC DD : Dahlgren, VA	0.000	0.000		0.450	Nov 2019	0.000		-		0.000	0.000	0.450	-
FTAS (LCMR/GCFS-R)	C/CPFF	NIWC LANT : Charleston, SC	0.000	0.000		0.329	Feb 2020	0.000	May 2021	-		0.000	0.000	0.329	-
THS	MIPR	Army : Huntsville, AL	0.000	0.662	Jan 2019	0.409	Jan 2020	0.418	Jan 2021	-		0.418	Continuing	Continuing	Continuing
AFATDS	MIPR	DISA : Belleville, IL	0.000	2.267	Feb 2019	2.547	Feb 2020	4.239	Feb 2021	-		4.239	0.000	9.053	-
AFATDS	MIPR	FSED : Ft. Sill, OK	0.000	1.843	Nov 2018	1.800	Jan 2020	0.250	Dec 2020	-		0.250	0.000	3.893	-
AFATDS	MIPR	ARDEC : Picatinny Arsenal, NJ	0.000	0.305	May 2019	0.305	Mar 2020	0.305	Mar 2021	-		0.305	0.000	0.915	-
AFATDS	C/FFP	CECOM/MITRE : Ft. Monmouth, NJ	0.000	0.418	Nov 2018	0.361	Dec 2019	0.361	Dec 2020	-		0.361	0.000	1.140	-
		Subtotal	0.000	6.964		7.051		6.733		-		6.733	Continuing	Continuing	N/A

Remarks

AFATDS - Development of 7.0 will be done in an iterative process. Test and evaluation will occur while the software continues development.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AFATDS	C/FFP	MCTSSA : Camp Pendleton, CA	0.000	0.000	Feb 2019	0.100	Feb 2020	0.100	Mar 2021	-		0.100	0.000	0.200	-
FTAS (LCMR/GCFS-R)	WR	NSWC DD : Dahlgren, VA	0.000	0.000		0.000		0.500	Nov 2020	-		0.500	0.000	0.500	-
		Subtotal	0.000	0.000		0.100		0.600		-		0.600	0.000	0.700	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206313M / *Marine Corps Comms Systems*	Project (Number/Name) 3773 / *Fire Coordination and Sensors*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AFATDS	C/CPFF	CECOM/MITRE : Ft. Monmouth, NJ	0.000	0.650	Nov 2018	0.650	Dec 2019	0.650	Dec 2020	-		0.650	0.000	1.950	-
		Subtotal	0.000	0.650		0.650		0.650		-		0.650	0.000	1.950	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	7.614		7.801		7.983		-		7.983	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 3773 / *Fire Coordination and Sensors*

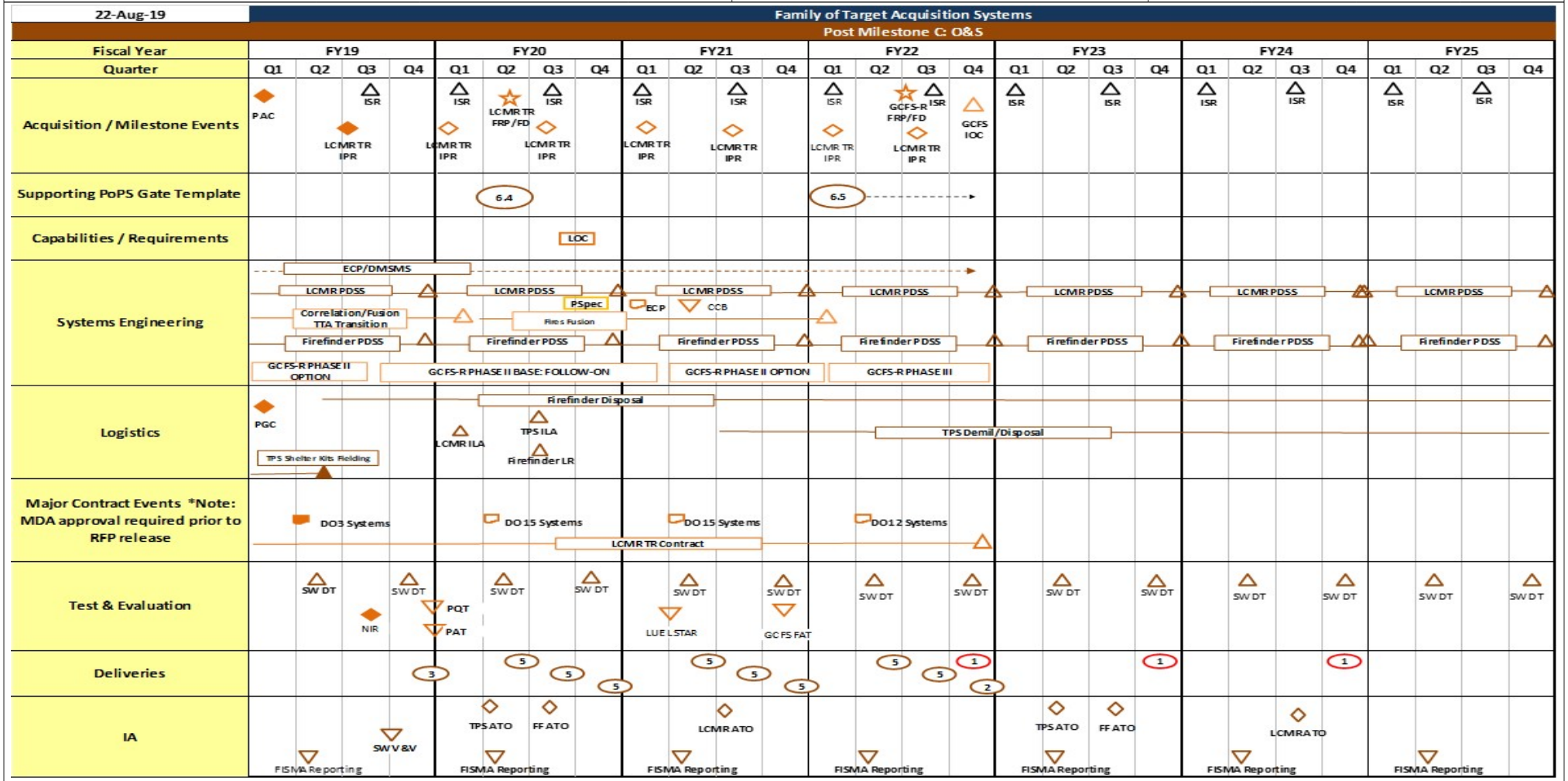


Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 3773 / *Fire Coordination and Sensors*

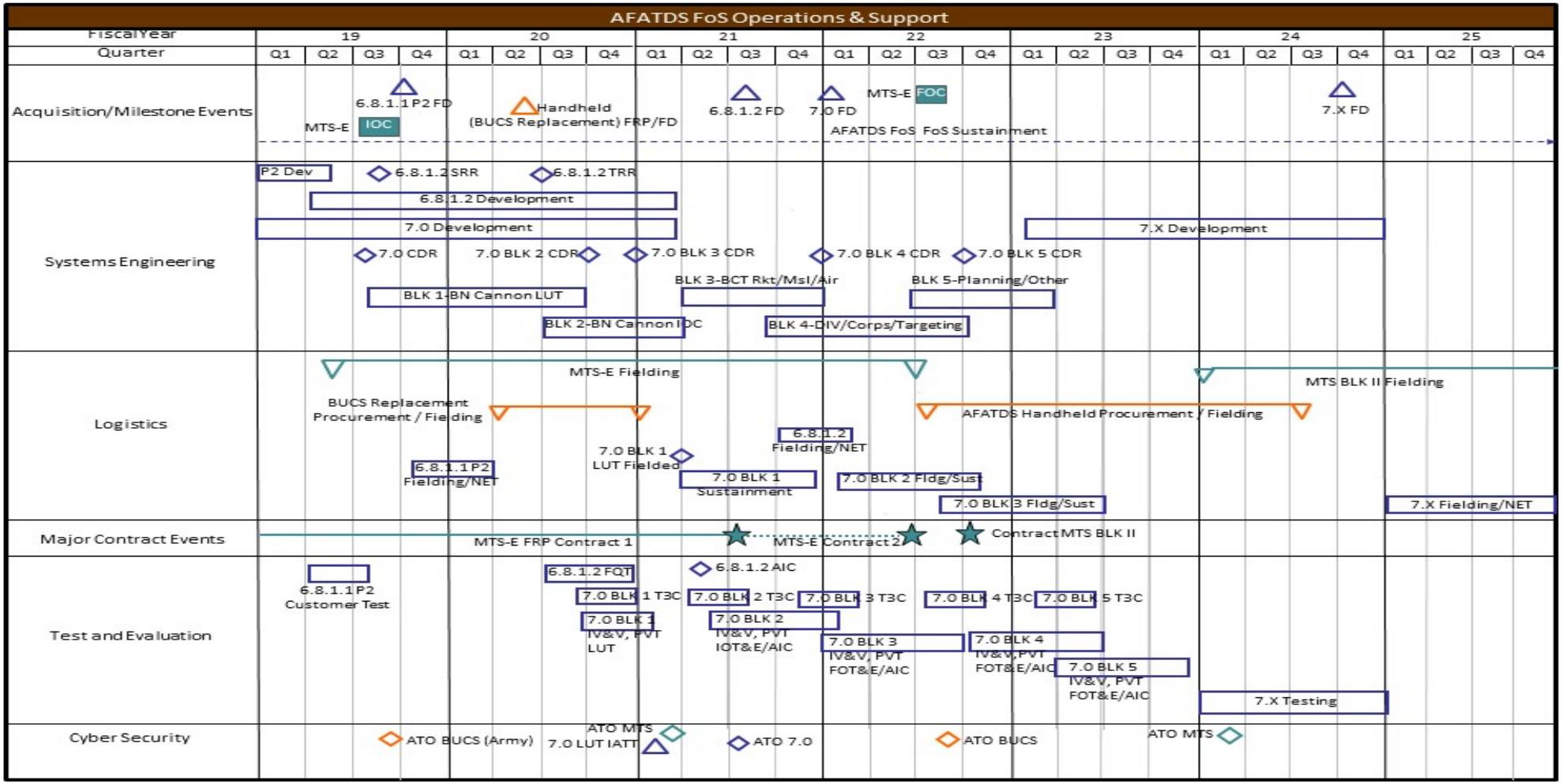


Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 3773 / *Fire Coordination and Sensors*

Nov-19

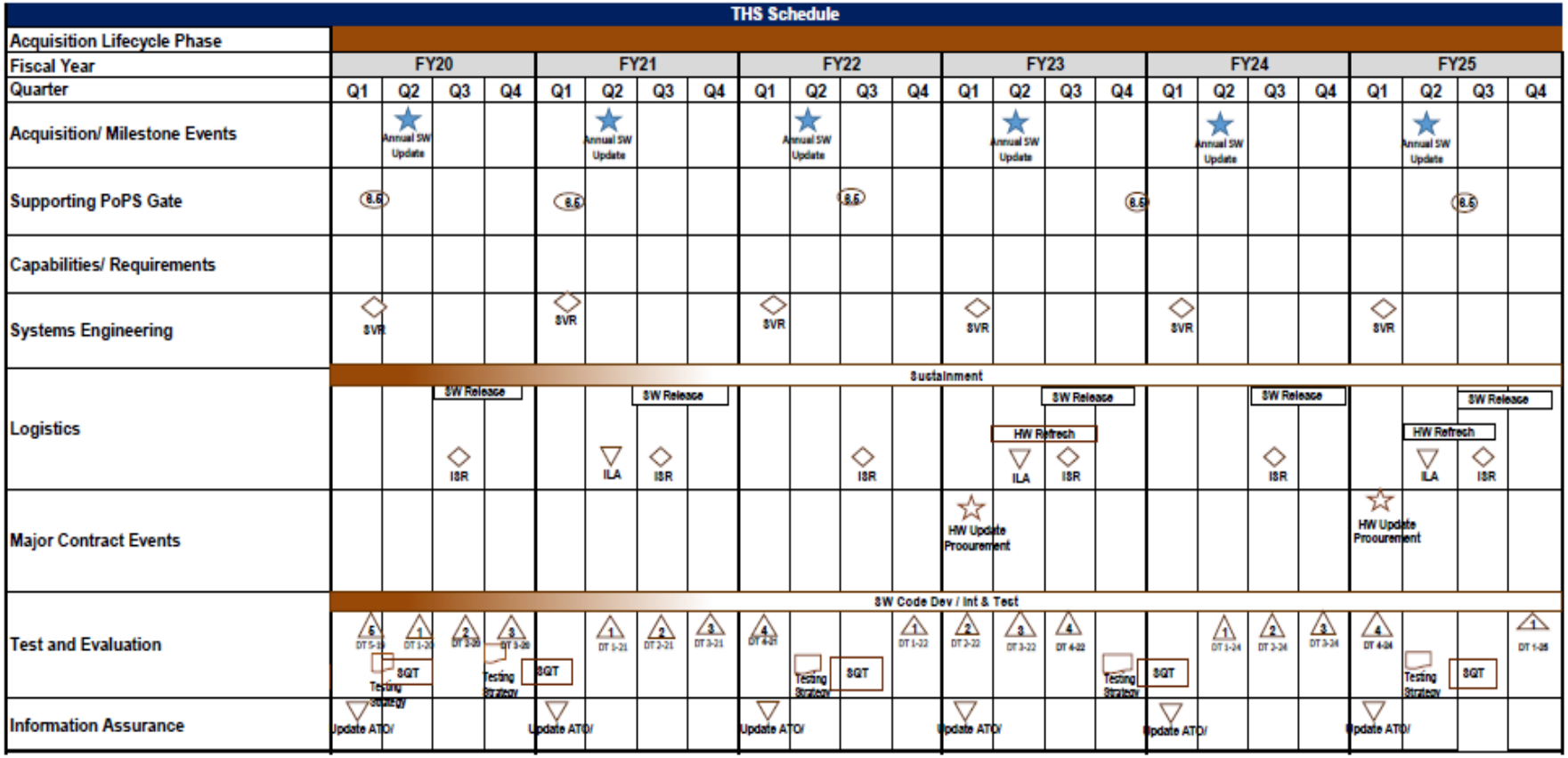


Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 3773 / *Fire Coordination and Sensors*

Nov-19

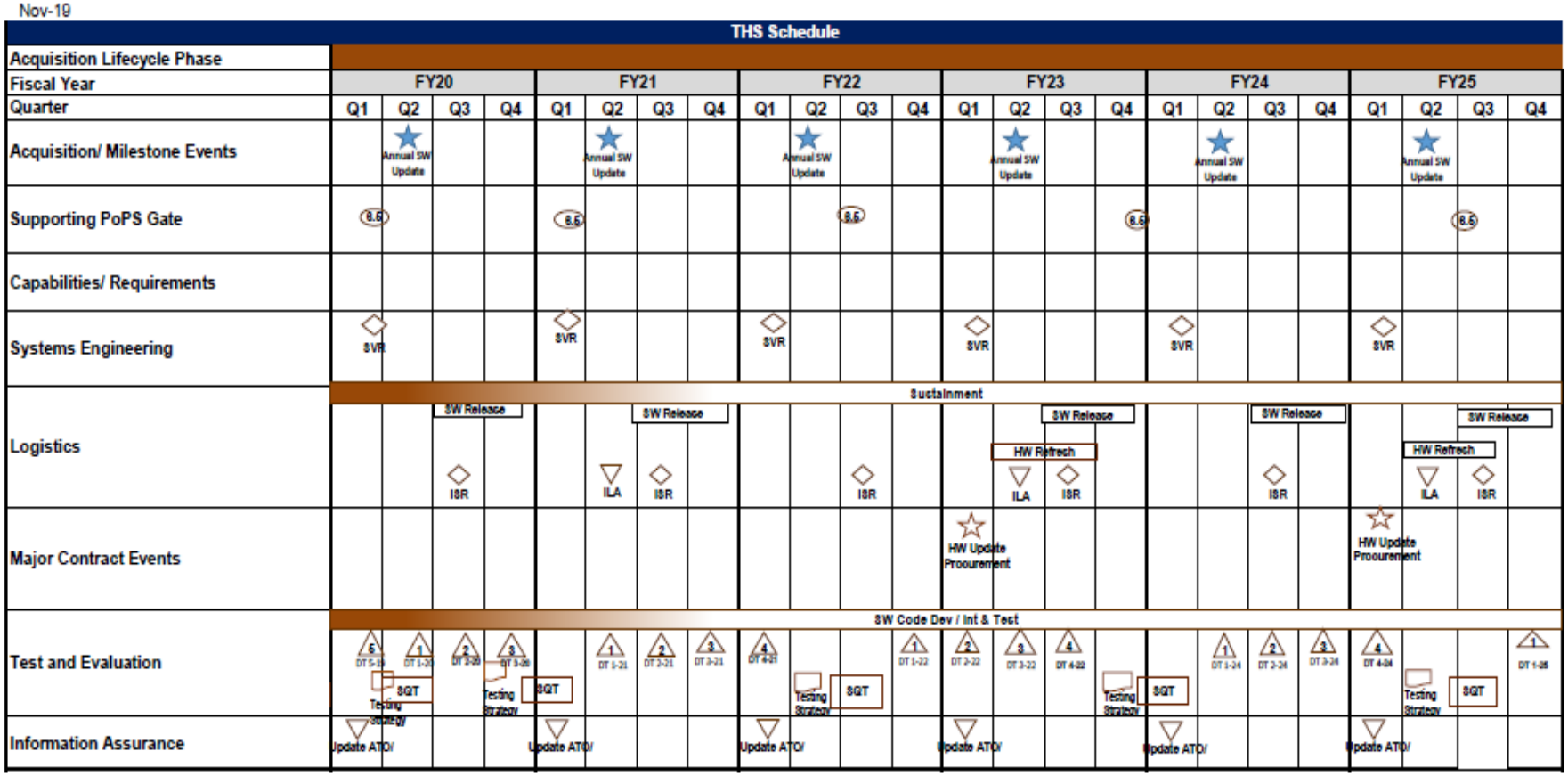


Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 3773 / *Fire Coordination and Sensors*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3773				
AFATDS 7.0 Software Development	1	2019	1	2021
AFATDS 7.0 BLK 1Testing	3	2020	4	2020
FTAS - Data Fusion Tech Transition	1	2020	1	2020
FTAS - Fires Fusion	1	2020	1	2022
THS Cyber Security Accreditation 2020 (New ATO)	1	2020	1	2020
THS Cyber Security Accreditation 2022 (New ATO)	4	2022	4	2022
THS EUD Update 2020	1	2020	2	2020
THS EUD Update 2021	2	2021	4	2021
THS EUD Update 2024	2	2024	3	2024

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206313M / *Marine Corps Comms Systems*	Project (Number/Name) 9999 / *Congressional Adds*	

COST ($ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
9999: *Congressional Adds*	0.000	0.000	12.990	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	12.990
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Networking On The Move (NOTM): NOTM provides a command and control (C2) capability by integrating tactical data systems with on the move satellite communications (SATCOM) for beyond line-of-sight communication that allows commanders to have uninterrupted two-way access to digital data, anywhere on the battlefield. NOTM provides Marine Air-Ground Task Force (MAGTF) commanders and staffs with full Common Operational Picture (COP) access, virtually unlimited situational awareness and a powerful ability to issue digital orders (fires, maneuver, planning) to Ground Combat Element (GCE), Air Combat Element (ACE) and Logistics Combat Element (LCE) units at all echelons while on-the-move or at-the-halt. NOTM also provides Marine units the capability to link with and extend Defense Information System Network (DISN) services; SIPRNet, NIPRNet, and Defense Switched Networks (DSN). Integrated full motion video (receipt and retransmission), tactical voice communications, plus three options for secure wireless local area network (LAN) connectivity between staff members makes this capability a crucial asset to all elements of the MAGTF. Currently the USMC has three variants depending on the type of transportation being used; the NOTM Ground Combat Vehicle (GCV), NOTM Utility Task Vehicle (UTV), and NOTM Airborne (NOTM-A).

Electronic Warfare (USMC CREW) System: The Multi-Function Electronic Warfare System (EWS)is a modular, multi-role electronic warfare system that will provide an initial electronic warfare capability, meeting a subset of user requirements from the Urgent Statement of Need. Through incremental development efforts, the program management office will incorporate additional capabilities. The Multi-Function Electronic Warfare system consists of the Modular Vehicle Power Adapter (MVPA) II Control Module, band amplifiers, Modi II band module kit, and the appropriate Vehicle Integration Kit (VIK) for mounted configuration (the A kit). The Multi-Function Electronic Warfare system is compatible with the Modi II as an Electronic Attack/Electronic Warfare Support (EA/ES) system, and is upgradable as modular solutions are developed through component, software, and firmware modifications. Required capability upgrades include networking, geolocation, enhanced electronic attack, user interface improvements, direction finding, and increased frequency coverage. This request seeks funding for the foundational upgrades - networking, geolocation, enhanced electronic attack, and user interface improvements.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020
Congressional Add: Shipboard integration and AI networking/NOTM	0.000	4.390
FY 2019 Accomplishments: N/A		
FY 2020 Plans: - Initiate the research of Network management/configuration tools that support future Artificial Intelligence (AI) integration. - Initiate test and development of ship to shore SATCOM linkage for L-Class vessels.		
Congressional Add: Multi function electronic warfare	0.000	8.600

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 9999 / *Congressional Adds*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020
FY 2019 Accomplishments: N/A ***FY 2020 Plans:*** - Develop increased capability packages for the MODI II and MFEW systems. Specifically, Networking and Advanced Graphical User Interface (GUI) and Integration in the MAGTF Common Handheld solution.		
Congressional Adds Subtotals	0.000	12.990

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• RDTE/0206313M/C2275: *NOTM*	6.756	1.061	4.244	-	4.244	3.074	2.096	1.118	1.140	0.000	19.489
• RDTE/0206313M/ C2274: *USMC CREW*	11.512	6.375	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	17.887
• PMC/4631AA: *NOTM*	86.042	51.373	32.956	-	32.956	14.245	14.827	15.122	15.429	0.000	229.994

Remarks

D. Acquisition Strategy

Networking on the Move (NOTM): NOTM will use an evolutionary acquisition strategy that leverages Commercial-Off-The-Shelf (COTS) and Government-Off-The-Shelf (GOTS) technology to procure, sustain, and meet emerging requirements. The design of the system provides for internal growth capability through an open system architecture enabling technology refresh to extend the system's life, maintain interoperability, Information Assurance (IA) compliance, and reduce costs due to Diminishing Manufacturing Sources and Material Shortages (DMSMS). It is envisioned that technology refresh will occur on the NOTM hardware and software periodically due to component obsolescence, user-driven requests for improvements, IA compliance, and mission-related requirements. Refresh will include investments to incorporate evolving capabilities to ensure compatibility with other systems, create lighter and more efficient equipment, and keep pace with evolving software requirements. End-of-life equipment refresh is expected throughout the program's life cycle and may be managed through kit purchases, replacement through Engineering Change Proposals (ECPs), or as replacement parts as equipment is repaired.

Electronic Warfare (USMC CREW) System: Engineering Change Proposals (ECPs) will be developed to increase capabilities through a modification of the existing Modi II procurement contract awarded to the original equipment manufacturer (OEM), Sierra Nevada Corporation (SNC). The PMO will modify the SNC contract scope to include dismounted and mounted variants (Modi II and MVPA II respectively) as a Family of Systems (FoS) and allow the inclusion of the development of additional capabilities through ECPs to both systems. The Modi II contract extension and modification is planned to be completed March 2020 to add additional CLINs for Research and Development (R&D) and engineering services for ECPs, logistical and engineering data and support for new capabilities.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 9999 / *Congressional Adds*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
USMC CREW	TBD	MCSC : QUANTICO, VA	0.000	0.000		8.600	Mar 2020	0.000		-		0.000	0.000	8.600	-
NOTM	Various	NIWC/LANT : Charleston, SC	0.000	0.000		4.390	Apr 2020	0.000		-		0.000	0.000	4.390	-
		Subtotal	0.000	0.000		12.990		0.000		-		0.000	0.000	12.990	N/A

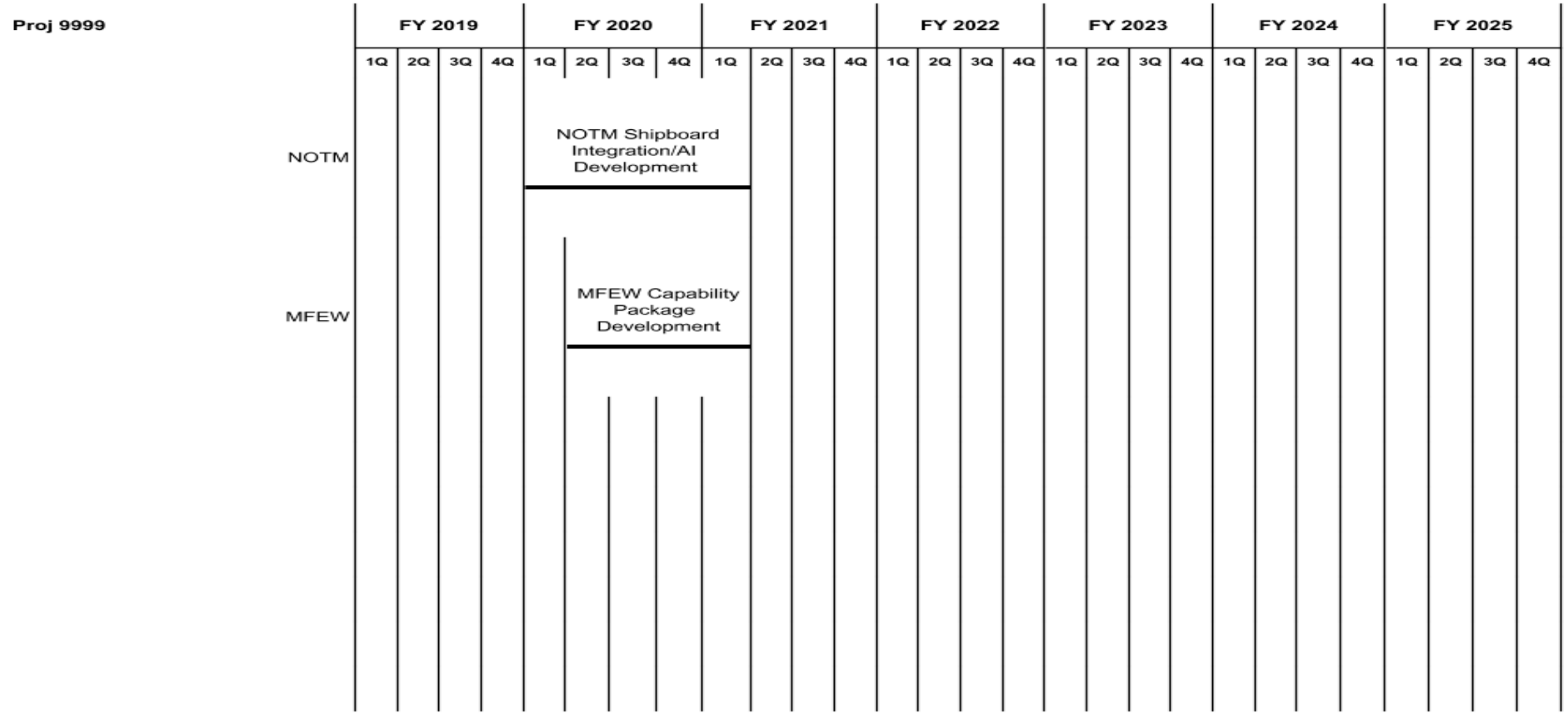
Remarks

FY20 efforts support NOTM Shipboard Integration, AI networking, and Multi function electronic warfare which is a one year congressional add.

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		12.990		0.000		-		0.000	0.000	12.990	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 9999 / *Congressional Adds*



2021PB - 0206313M - 9999

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 9999 / *Congressional Adds*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 9999				
NOTM: NOTM Shipboard Integration/AI Development	1	2020	1	2021
MFEW: MFEW Capability Package Development	2	2020	1	2021