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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Navy **Date:** April 2022

Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy / BA 7: Operational Systems Development</i>					R-1 Program Element (Number/Name) PE 0206624M / <i>Marine Corps Cmbt Services Supt</i>							
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	221.774	9.832	21.185	26.522	-	26.522	27.221	33.013	46.488	56.018	Continuing	Continuing
2316: <i>Combat Service Support Eng Equip</i>	111.822	4.668	6.423	7.734	-	7.734	9.949	12.362	13.845	5.909	Continuing	Continuing
2509: <i>Motor Transport Mod</i>	55.651	1.218	1.706	8.580	-	8.580	8.876	14.600	27.347	39.986	Continuing	Continuing
2510: <i>MAGTF CSSE & SE</i>	41.602	3.324	4.413	9.524	-	9.524	7.698	5.343	4.574	9.389	Continuing	Continuing
2929: <i>Testing Measuring Diag Equip & SE</i>	12.699	0.622	0.643	0.684	-	0.684	0.698	0.708	0.722	0.734	Continuing	Continuing
9999: <i>Congressional Adds</i>	0.000	0.000	8.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	8.000

A. Mission Description and Budget Item Justification

This program element (PE) provides funding for Marine Air-Ground Task Force requirements for Combat Service Support equipment improvement. It will enhance combat breaching capabilities of the ground combat elements, logistics, maintenance and transportation. The PE also provides improvements in all areas of Combat Service Support Equipment Vehicles by determining the replacement for the light fleet of vehicles. This includes projects such as: Alternative Power Sources for Communications Equipment (APSCE) which is a suite of devices that provide the commander with the capability to use existing power to operate his communication equipment, computers and peripheral equipment instead of using batteries or fossil fuel generators; the Marine Corps Family of Automatic Test Systems (ATS), formerly TETS, which provides automatic testing capability for use by technicians both in garrison and forward edge of the battlefield; improvements in all areas of the M1A1 main battle tank, LVSR & MTRV; the High Performance Capabilities for Military Vehicles Project which is dedicated to applying the best practices of the motor sports industry to military vehicles including engineering expertise, equipment, and technology.

B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	10.421	13.185	0.000	-	0.000
Current President's Budget	9.832	21.185	26.522	-	26.522
Total Adjustments	-0.589	8.000	26.522	-	26.522
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	8.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.387	0.000			
• SBIR/STTR Transfer	-0.202	0.000			
• Program Adjustments	0.000	0.000	0.000	-	0.000
• Rate/Misc Adjustments	0.000	0.000	0.000	-	0.000

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Navy	Date: April 2022
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Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0206624M I <i>Marine Corps Cmbt Services Supt</i>
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• Adjustments to Budget Year	-	-	26.522	-	26.522
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Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 9999: *Congressional Adds*

Congressional Add: *Field-based airborne power generation systems*

Congressional Add Subtotals for Project: 9999

Congressional Add Totals for all Projects

	FY 2021	FY 2022
	0.000	8.000
Congressional Add Subtotals for Project: 9999	0.000	8.000
Congressional Add Totals for all Projects	0.000	8.000

Change Summary Explanation

The net increase of \$5.337M from FY 2022 to FY 2023 is primarily attributed to the initiation of the MTV Technology Demonstration effort, the planned prototype contract award for Energy Storage Unit in support of Intelligent Power Management System (IPMS), and development of a new Hybrid Environmental Control Unit (ECU) capability.

The FY 2023 funding request was adjusted by \$1.596M to account for the availability of prior year execution balances.

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy										Date: April 2022		
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0206624M / Marine Corps Cmbt Services Supt				Project (Number/Name) 2316 / Combat Service Support Eng Equip			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
2316: <i>Combat Service Support Eng Equip</i>	111.822	4.668	6.423	7.734	-	7.734	9.949	12.362	13.845	5.909	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Engineer Mods and Tool Kits line funds modifications and initiatives which are required to address operational priorities, engineering change proposals, safety concerns, support equipment inefficiencies, product quality deficiencies and other issues that affect equipment reliability, availability and readiness. This approach ensures proper equipment sustainment and life cycle management in response to evolving needs of the Marine Corps fleet. Operational needs to provide personnel survivability on engineer equipment is essential to current and future operations. Research and development funding develops and integrates new lighter, compact armor technology and supports ballistic testing for applications to existing and future acquisitions.

Corrosion Prevention and Control (CPAC): The useful life of Marine Corps assets will be extended through a comprehensive CPAC RDT&E program aimed at identifying and certifying new corrosion control products, materials, processes and procedures for legacy and new acquisitions. The CPAC RDT&E Program works to standardize and substantially improve strategies, objectives and processes to prevent, detect, and treat corrosion and its impacts on Marine Corps ground vehicles and weapons systems. This mission responds to the Congressional directives, DoD and SECNAV instruction to reduce the negative operational effects of corrosion and reduce associated total ownership cost of Marine Corps ground equipment and weapons systems.

Family of Explosive Ordnance Disposal Equipment (FEOD): Funding supports the Rapid Statement of Need (RSON) development, testing and evaluation of the Amphibious Unmanned Ground Vehicle (AUGV) under-water robot to locate, identify, and neutralize those threats.

Explosive Hazard Defeat System (EHDS): Funding supports testing and development of the Standoff Radar Imaging Detection Systems (SoRIDS) that support USMC Full Force Design Enhancements to avoid or neutralize explosive threats.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Engineer Mods and Tool Kits	1.190	0.531	0.478	0.000	0.478
Articles:	-	-	-	-	-
FY 2022 Plans: - Initiate development and testing of Mine Clearing Line Charge (MCLC) replacements.					
FY 2023 Base Plans:					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206624M / <i>Marine Corps Cmbt Services Supt</i>	Project (Number/Name) 2316 / <i>Combat Service Support Eng Equip</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
- Complete development and testing of Mine Clearing Line Charge (MCLC) replacements. FY 2023 OCO Plans: N/A FY 2022 to FY 2023 Increase/Decrease Statement: Net Decrease of \$0.053M from FY 2022 to FY 2023 supports the completion of the development and testing of Mine Clearing Line Charge (MCLC) replacements.					
Title: Family of EOD Equipment Articles:	0.000 -	3.001 -	1.026 -	0.000 -	1.026 -
FY 2022 Plans: - Initiate development and testing of Littoral Explosive Ordnance Neutralization (LEON) Amphibious Unmanned Ground Vehicle (AUGV) robot and LEON Payloads. FY 2023 Base Plans: - Continue testing AUGV and LEON Payloads. FY 2023 OCO Plans: N/A FY 2022 to FY 2023 Increase/Decrease Statement: Decrease of \$1.975M from FY 2022 to FY 2023 is due to completion of AUGV prototype development.					
Title: Explosive Hazard Defeat System (EHDS) Articles:	0.000 -	0.000 -	3.300 -	0.000 -	3.300 -
FY 2022 Plans: N/A FY 2023 Base Plans: -Initiates testing and development of SoRIDS. FY 2023 OCO Plans: N/A FY 2022 to FY 2023 Increase/Decrease Statement: -Increase of \$3.300M from FY 2022 to FY 2023 is due to the initiation of SoRIDS.					
Title: Corrosion Prevention and Control (CPAC)	3.478	2.891	2.930	0.000	2.930

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206624M / Marine Corps Cmbt Services Supt	Project (Number/Name) 2316 / Combat Service Support Eng Equip

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
<p align="right"><i>Articles:</i></p> <p>FY 2022 Plans:</p> <ul style="list-style-type: none"> - Continue research, test, and evaluation of new corrosion control products, materials, processes and procedures that improve Marine Corps corrosion control through Science and Technology (S&T) initiatives such as: Light Armored Vehicle (LAV) Strut Cap, Ultra Light Tactical Vehicle (UTV)-MRZR, Chemical Agent Resistant Coating (CARC) Adhesion to Aluminum Roll-Up Doors, Study of Cost Effective Corrosion Preventative Compounds (CPCs), and CARC Failure Analysis. - Continue stewardship of Corrosion Prevention Products and Materials (CPPMs) which provides for vendor submission and evaluation by the Marine Corps. - Continue field evaluations, product test and environmental monitoring in advance of fielding to determine suitability. - Continue to support field evaluation of equipment and environmental characterization of equipment at geolocations through the Fleet Marine Force (FMF) and supporting establishment. - Continue to introduce new technologies, processes and advance materials. - Initiate technical publication updates. <p>FY 2023 Base Plans:</p> <ul style="list-style-type: none"> - Continue research, test, and evaluation of new corrosion control products, materials, processes and procedures that improve the corrosion condition of Marine Corps ground equipment through corrosion control Research, Development, Testing, Evaluation (RDT&E) initiatives. These initiatives will support and or improve the corrosion condition of equipment such as the Amphibious Combat Vehicle (ACV), Light Armored Vehicle (LAV), Logistics Vehicle System-Replacement (LVSR), study of cost effective CPCs. - Continue stewardship of CPPMs which provides for vendor product submissions, evaluation and approved use by the Marine Corps. - Continue field evaluations, product test and environmental monitoring in advance of fielding to determine suitability. - Continue to support field evaluation of equipment and environmental characterization of equipment at geolocations through the Fleet Marine Force (FMF) and supporting establishment. - Continue to introduce new technologies, processes and advance materials. - Continue technical publication updates. - Initiate Cooperative Research and Development Agreement (CRADA) with CHEMEON. <p>FY 2023 OCO Plans:</p>	-	-	-	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy	Date: April 2022
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Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206624M / <i>Marine Corps Cmbt Services Supt</i>	Project (Number/Name) 2316 / <i>Combat Service Support Eng Equip</i>
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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
N/A					
<i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> Increase of \$0.039M from FY 2022 to FY 2023 aligns with the establishment of a CPAC Technology Roadmap to monitor corrosion operations to reduce cost and mitigate corrosion with new materials and process improvements.					
Accomplishments/Planned Programs Subtotals	4.668	6.423	7.734	0.000	7.734

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• PMC/6670: <i>Items Less Than \$5 Million</i>	9.174	4.402	26.433	-	26.433	9.372	8.793	18.674	19.043	Continuing	Continuing
• PMC/6520: <i>Family of EOD Equipment</i>	17.349	94.472	201.047	-	201.047	259.860	270.557	113.069	111.064	Continuing	Continuing

Remarks

D. Acquisition Strategy

(U) Engineer Mods and Tool Kits: This is a roll-up line of various engineering efforts, modifications and other related items less than \$5 Million each. This program provides for significant improvements to various pieces of engineering equipment by enhancing their capabilities and improving readiness.

(U) Corrosion Prevention and Control (CPAC) Program: The Program will execute the RDT&E Program with engineering support from the Naval Surface Warfare Center - Carderock Division Corrosion Research and Engineering Branch for a comprehensive program aimed at identifying, evaluating, and certifying new corrosion control products, materials, processes and procedures for legacy and new acquisitions.

(U) Family of Explosive Ordnance Disposal Equipment (FEOD): The program will execute the RDT&E with product development and testing and evaluation support with Naval Integration Warfare Center Pacific for an AUGV under-water robot to locate, identify, and neutralize those threats.

(U) Explosive Hazard Defeat System (EHDS): The program will execute the RDT&E with product development and testing and evaluation support with Office of Naval Research (ONR) for a SoRIDS to conduct stand-off detection, marking and reporting of buried, on/off -route explosive obstacles (mines, IEDs, and UXOs) from the beach exit zone to the inland objective and in wide area clearance to avoid or neutralize explosive threats.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy **Date:** April 2022

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206624M / Marine Corps Cmbt Services Supt	Project (Number/Name) 2316 / Combat Service Support Eng Equip
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Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
FEOD	C/CPFF	DIU : Arlington, VA	0.000	0.000		2.701	Mar 2022	0.000		-		0.000	0.000	2.701	-
Prior Year Cumulative Funding	Various	Various : Various	77.673	0.000		0.000		0.000		-		0.000	0.000	77.673	-
EHDS	WR	ONR : Washington, DC	0.000	0.000		0.000		2.800	Feb 2023	-		2.800	0.000	2.800	-
FEOD	WR	NSWC PAC : San Diego, VA	0.000	0.000		0.000		0.500	Feb 2023	-		0.500	0.000	0.500	-
Subtotal			77.673	0.000		2.701		3.300		-		3.300	0.000	83.674	N/A

Remarks

FEOD: Decrease of \$2.201M from FY 2022 to FY 2023 is due to completion of AUGV prototype development.
 EHDS: Increase of \$2.800M from FY 2022 to FY 2023 is due to the initiation of the development of SoRIDS.

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
CPAC	WR	NSWC-CD : Bethesda, MD	0.075	0.072	Jan 2021	0.070	Feb 2022	0.072	Feb 2023	-		0.072	Continuing	Continuing	Continuing
CPAC	C/FFP	NSWC-CD : Bethesda, MD	4.952	1.236	Apr 2021	1.223	Feb 2022	1.358	Mar 2023	-		1.358	Continuing	Continuing	Continuing
Subtotal			5.027	1.308		1.293		1.430		-		1.430	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Engineer Modification Kits	Various	Various : Various	4.450	1.190	Jul 2021	0.531	Feb 2022	0.478	Feb 2023	-		0.478	Continuing	Continuing	Continuing
CPAC	WR	NSWC-CD : Bethesda, MD	15.648	2.170	Aug 2021	1.598	Apr 2022	1.500	Mar 2023	-		1.500	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy **Date:** April 2022

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206624M / Marine Corps Cmbt Services Supt	Project (Number/Name) 2316 / Combat Service Support Eng Equip
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Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
FEOD	WR	NIWC-PAC : San Diego, CA	0.000	0.000		0.300	Jul 2022	0.526	Jan 2023	-		0.526	0.000	0.826	-
Prior Year Cumulative Funding	Various	Various : Various	9.024	0.000		0.000		0.000		-		0.000	0.000	9.024	-
EHDS	WR	ONR : Washington, DC	0.000	0.000		0.000		0.500	Feb 2023	-		0.500	0.000	0.500	-
Subtotal			29.122	3.360		2.429		3.004		-		3.004	Continuing	Continuing	N/A

Remarks
 FEOD: Increase of \$0.226M from FY 2022 to FY 2023 is due to continued testing and evaluation of AUGV and LEON Payloads.
 EHDS: Increase of \$0.500M from FY 2022 to FY 2023 is due to the initiation of testing and evaluation of SoRIDS.

	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	111.822	4.668	6.423	7.734	-	7.734	Continuing	Continuing	N/A

Remarks
 FY 2022 FEOD first year of RDT&E.
 FY 2023 EHDS first year of RDT&E.

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Navy **Date:** April 2022

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206624M / Marine Corps Cmbt Services Supt	Project (Number/Name) 2316 / Combat Service Support Eng Equip
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CPAC	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
NSWC Carderock																												
CPPM Product Review and Test Plan Development	CPPM & Test Plan																											
Technical Publication review and update	Tech Pubs																											
CARC Compatibility	CARC																											
NSWC Carderock																												
Corrosion Repair Process Review (CRPR)	CRPR																											
Cooperative Research and Development Agreement (CRADA)	CRADA																											

2023PB - 0206624M - 2316

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Navy **Date:** April 2022

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206624M / Marine Corps Cmbt Services Supt	Project (Number/Name) 2316 / Combat Service Support Eng Equip
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FEOD	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027							
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q				
NIWC-PAC																																
LEON Payload Development and Integration					LEON Development & Integration																											
DIU																																
AUGV Development					AUGV Development																											

2023PB - 0206624M - 2316

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Navy **Date:** April 2022

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206624M / Marine Corps Cmbt Services Supt	Project (Number/Name) 2316 / Combat Service Support Eng Equip
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EHDS	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
ONR																												
Development and Integration																												
Testing and Evaluation																												

2023PB - 0206624M - 2316

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206624M / <i>Marine Corps Cmbt Services Supt</i>	Project (Number/Name) 2316 / <i>Combat Service Support Eng Equip</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
CPAC				
NSWC Carderock: CPPM Product Review and Test Plan Development: Schedule Detail	2	2021	4	2027
NSWC Carderock: Technical Publication review and update: Schedule Detail	1	2021	4	2027
NSWC Carderock: CARC Compatibility: Schedule Detail	1	2021	4	2022
NSWC Carderock: Corrosion Repair Process Review (CRPR): Schedule Detail	3	2021	4	2022
NSWC Carderock: Cooperative Research and Development Agreement (CRADA): Schedule Detail	2	2023	4	2027
FEOD				
NIWC-PAC: LEON Payload Development and Integration: Schedule Detail	2	2022	2	2027
DIU: AUGV Development: Schedule Detail	2	2022	2	2023
EHDS				
ONR: Development and Integration: Schedule Detail	2	2023	2	2027
ONR: Testing and Evaluation: Schedule Detail	2	2023	2	2027

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy										Date: April 2022		
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0206624M / Marine Corps Cmbt Services Supt				Project (Number/Name) 2509 / Motor Transport Mod			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
2509: Motor Transport Mod	55.651	1.218	1.706	8.580	-	8.580	8.876	14.600	27.347	39.986	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Medium Tactical Vehicle Replacement (MTVR) Modification program line funds numerous modifications and initiatives required to address operational priorities, engineering change proposals, safety concerns, support equipment and other issues that affect vehicle reliability, availability, maintainability, readiness, as well as energy efficiency. A proactive and focused approach ensures proper vehicle sustainment and life-cycle management and allows the program office to develop and implement improvements as required to respond to the evolving needs of the Marine Corps. MTVR funding will support Technology Demonstration (TD) efforts for a Medium Tactical Vehicle (MTV) that will determine maturity of technology advancements within the scope of industry production capabilities and address DoD Energy Efficiency goals while maintaining effectiveness and suitability in operational environments. The intended purpose of the TD effort is informing requirements and cost in support of a MTVR replacement program.

The Marine Corps Tactical Motor Transport Modification (MTM) Light Tactical Vehicle Modification (LTVM) project manages procurement and life cycle sustainment for more than 12,500 light fleet vehicle and tactical trailer principal end items. A sustained effort is maintained in the Marine Corps for development and testing in support of the light tactical vehicle quality deficiency resolutions, safety initiatives, environmental/state transportation mandated vehicle changes, and system component refresh modification efforts. This includes addressing deficiencies of High Mobility Multipurpose Wheeled Vehicles (HMMWVs) due to up armoring and age degradation of the fleet as well as engineering change proposals identified for the Light Tactical Vehicles. Since transportation asset operational availability declines at a steady rate over time, fleet overhauls, and enhanced depot level modifications are essential in maintaining a viable transportation capability in the Fleet Marine Force.

The Mine Resistant Ambush Protected (MRAP) Family of Vehicles (FoV) provides tactical mobility for Warfighters with multi-mission vehicles designed to support operational needs and protect personnel from the effects of improvised explosive devices (IEDs), underbody mines and small arms fire threats. Multiple vehicle categories (CATs) have been procured, fielded and sustained: Category I - Urban combat operations, ambulance; Category II - Multi-mission ops-convoy lead, troop transport, ambulance, utility vehicle; and, Category III - Mine/IED clearance ops, explosive ordnance disposal. Operational needs to provide personnel survivability is essential to current and future operations. Research and Development funding allows for the development and integration of efforts such as ballistic glass, other safety issues and ballistic testing.

The Family of Medium/Heavy Tactical Trailers & Ancillary Equipment (FT&AE) management strategy will use RDT&E funding to explore new technology that can be used to achieve optimum lift within the desired weight and cube constraints in support of the "Lightening the MAGTF" initiative, as well as improving capabilities, to include re-engineering the ground clearance on various trailers to improve off-road mobility. Transportation and expeditionary goals will be considered in the research and development for the medium/heavy trailer fleet to include (but not limited to) the M1076 PLS (Palletized Load System) Trailer, MK1077 Flatrack, MK593 MTVR Trailer, M870 40/50 Ton Low Bed, MK970 Tactical Refueler and the Flatrack Refueler Capability (FRC).

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy	Date: April 2022
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Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206624M / Marine Corps Cmbt Services Supt	Project (Number/Name) 2509 / Motor Transport Mod
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The Family of Logistics Vehicle System Replacement (LVSR) is the Marine Air-Ground Task Force (MAGTF) Heavy Lift Capability system. This line funds numerous modifications and initiatives that are required to address operational priorities, engineering change proposals, safety concerns, support equipment and other issues that affect vehicle reliability, availability, maintainability and readiness. A proactive and focused approach ensures proper vehicle sustainment and life-cycle management and allows the flexibility to develop and implement improvements as required to respond to the evolving needs of the Marine Corps.

The Family of P-19 Replacement (P-19R) replaced the obsolete A/S32P-19A Crash Fire Rescue fleet in support of expeditionary airfield operations and the supporting establishment. The vehicle is outfitted with advanced fire suppression equipment. It provides rescue and aircraft fire fighting capabilities to permanent and expeditionary airfields throughout the Marine Corps. The P-19 Replacement is also employed to fight structural fires in support of base camps and as firefighting support to other elements of the Marine Air Ground Task Force (MAGTF), such as ammunition supply points, Petroleum, Oil and Lubricant (POL) distribution points or hazardous material storage facilities.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
<p>Title: Light Tactical Vehicle Modification</p> <p align="right">Articles:</p> <p>FY 2022 Plans: Continue to support the development of engineering change proposals in support of the Light Tactical Vehicles for efforts such as tire durability study and HMMWV modifications identified by the operating forces that will have lasting effects on future light tactical platforms and supported systems.</p> <p>FY 2023 Base Plans: Continue to support the development of engineering change proposals ensuring readiness, safety and reliability of the Light Tactical Family of Vehicles.</p> <p>FY 2023 OCO Plans: N/A</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding decrease from FY 2022 to FY 2023 for \$0.418M is due to realignment of funds to higher priority Marine Corps programs.</p>	0.145	0.604	0.186	0.000	0.186
	-	-	-	-	-
<p>Title: Medium Tactical Vehicle Replacement (MTVR)</p> <p align="right">Articles:</p> <p>FY 2022 Plans: - Continue conducting Engineering Change Proposals (ECP)/safety mods of the MTVR as required.</p>	0.101	0.105	7.617	0.000	7.617
	-	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206624M / <i>Marine Corps Cmbt Services Supt</i>	Project (Number/Name) 2509 / <i>Motor Transport Mod</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
<p>- Continue Test & Evaluation efforts supporting ECP/safety mods of the MTVR as required to provide survivability upgrades in response to continual changes in the threat environment to protect the warfighter and vehicle from possible catastrophic events, in order to meet current and future operations.</p> <p>- Continue addressing ongoing obsolescence issues related to an aging fleet of vehicles.</p> <p>- Continue distribution of HIMARS Resupply Vehicles to 10th Marines in support of Force Design.</p> <p>FY 2023 Base Plans:</p> <p>- Initiate Medium Tactical Vehicle (MTV) Technology Demonstration (TD) efforts. Award contract(s) for product development and design efforts with a focus on priorities such as technology maturity, operational effectiveness, and energy efficiency considerations.</p> <p>- Continue ECP/safety mods of the MTVR as required.</p> <p>- Continue Test & Evaluation efforts supporting ECP/safety mods of the MTVR as required to provide survivability upgrades in response to continual changes in the threat environment to protect the warfighter and vehicle from possible catastrophic events, in order to meet current and future operations.</p> <p>- Continue addressing ongoing obsolescence issues related to an aging fleet of vehicles through on-going science and engineering support, to include material characterizations, modeling and simulation, root-cause analyses, and design & process improvement recommendations from the Production Quality Deficiency Reports (PQDR).</p> <p>FY 2023 OCO Plans: N/A</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: The increase of \$7.512M from FY 2022 to FY 2023 is due to the initiation of the MTV Technology Demonstration effort.</p>					
<p>Title: Mine Resistant Ambush Protected (MRAP) Family of Vehicles (FoV)</p> <p align="right">Articles:</p>	0.518 -	0.562 -	0.382 -	0.000 -	0.382 -
<p>FY 2022 Plans:</p> <p>- Continue research and development of Engineering Change Proposals (ECPs) efforts such as "material improvements" to ballistic glass, other safety issues and new armor ballistic testing in support of survivability and mobility upgrades.</p> <p>FY 2023 Base Plans:</p>					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206624M / Marine Corps Cmbt Services Supt	Project (Number/Name) 2509 / Motor Transport Mod

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
<p>- Continue research and development of Engineering Change Proposals (ECPs) efforts such as "material improvements" to ballistic glass, other safety issues and new armor ballistic testing in support of survivability and mobility upgrades.</p> <p>FY 2023 OCO Plans: N/A</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Marine Corps re-phased program funding by \$0.180M to account for FY 2021 under execution.</p>					
<p>Title: Logistics Vehicle System Replacement (LVSR)</p> <p align="right">Articles:</p> <p>FY 2022 Plans: - Continue autonomous driver testing and demonstration.</p> <p>FY 2023 Base Plans: - Continue autonomous driver testing and demonstration, perform test and evaluation on LVSR anti-idle capability, and support ECP/Safety modifications.</p> <p>FY 2023 OCO Plans: N/A</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Marine Corps re-phased program funding by \$0.005M to account for FY 2021 under execution.</p>	0.252 -	0.220 -	0.215 -	0.000 -	0.215 -
<p>Title: Family of Medium/Heavy Tactical Trailers & Ancillary Equipment (FT&AE)</p> <p align="right">Articles:</p> <p>FY 2022 Plans: - Continue M870 testing efforts to ensure effectiveness of the Medium/Heavy Tactical Trailers designed for the Medium Tactical Vehicle Replacement (MTVR)/Logistics Vehicle System Replacement (LVSR), enabling the fleet to meet increased mobility requirements.</p> <p>FY 2023 Base Plans:</p>	0.202 -	0.215 -	0.180 -	0.000 -	0.180 -

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206624M / <i>Marine Corps Cmbt Services Supt</i>	Project (Number/Name) 2509 / <i>Motor Transport Mod</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
- Continue testing/analysis efforts to ensure effectiveness and safety of the Medium/Heavy Tactical Trailers designed for the Medium Tactical Vehicle Replacement (MTVR)/Logistics Vehicle System Replacement (LVSR), enabling the fleet to meet increased mobility requirements. FY 2023 OCO Plans: N/A FY 2022 to FY 2023 Increase/Decrease Statement: Marine Corps re-phased program funding by \$0.035M to account for FY 2021 under execution.					
Accomplishments/Planned Programs Subtotals	1.218	1.706	8.580	0.000	8.580

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• PMC/5097: <i>Family of Tactical Trailers</i>	2.963	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• PMC/5050-01: <i>Motor T Mod/MTVR</i>	23.566	7.907	8.662	-	8.662	8.926	8.902	9.063	9.224	Continuing	Continuing
• PMC/5050-02: <i>Motor T Mod/LVSR</i>	1.893	0.923	1.071	-	1.071	1.092	1.113	3.187	3.251	Continuing	Continuing
• PMC/5050-03: <i>Light Tactical Vehicle Modifications (LTVM)</i>	0.000	3.425	3.495	-	3.495	3.565	3.483	3.398	3.466	Continuing	Continuing
• PMC/5050-04: <i>Motor T Mod/MRAP</i>	1.096	1.173	0.991	-	0.991	0.391	0.397	0.000	0.000	0.000	26.756
• PMC/5050-05: <i>Motor T Mod/P19-R</i>	0.367	0.373	0.403	-	0.403	0.418	11.505	11.955	12.178	Continuing	Continuing
• PMC/5050-06: <i>Family of Tactical Trailers</i>	0.000	9.562	3.185	-	3.185	3.281	3.296	3.141	3.199	Continuing	Continuing

Remarks

D. Acquisition Strategy

The Medium Tactical Vehicle Replacement (MTVR) program line funds numerous modifications and initiatives required to address operational priorities, engineering change proposals, safety concerns, support equipment and other issues that affect vehicle reliability, availability, maintainability, readiness, as well as energy efficiency. A proactive and focused approach ensures proper vehicle sustainment and life-cycle management and allows the program office to develop and implement improvements as required to respond to the evolving needs of the Marine Corps. MTVR funding will support Technology Demonstration (TD) efforts for a Medium Tactical Vehicle (MTV) that will determine maturity of technology advancements within the scope of industry production capabilities and address DoD Energy Efficiency goals while maintaining effectiveness and suitability in operational environments. The intended purpose of the TD effort is informing requirements and cost in support of

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206624M / <i>Marine Corps Cmbt Services Supt</i>	Project (Number/Name) 2509 / <i>Motor Transport Mod</i>
<p>a MTRV replacement program. The program will utilize an incentivized Independent Research And Development (IRAD) Technology Demonstration in order to attract multiple vendors to develop and assemble operationally relevant prototypes.</p> <p>Light Tactical Vehicle Modification (LTVM) focuses on streamlined acquisitions of Commercial-Off-The-Shelf/Non-Developmental Items (COTS/NDI) that can be identified, integrated, and tested in a short amount of time. Modifications are required to increase fleet readiness, safety and reliability. LTVM also focuses on System Technical Support efforts (STS) that are led by the Army. Successful modifications and tests are intended for follow-on procurement and incorporation into existing system component upgrades, or rapid COTS/NDI fielding for the Fleet Marine Forces (FMF).</p> <p>The Mine Resistant Ambush Protected (MRAP) Family of Vehicles (FoV) program executes RDT&E funds to research, develop, and evaluate survivability and mobility upgrade efforts such as ECP's, ballistic glass and other safety issues, new armor technology and ballistic testing. Work will be accomplished through centers of excellence, such as Aberdeen Test Center, Aberdeen, MD, as well as the private sector to conduct research and analysis associated with the development of modifications and modeling and simulation efforts.</p> <p>The Family of Medium/Heavy Tactical Trailers & Ancillary Equipment (FT&AE) management strategy will use RDT&E funding to explore current and new technologies options that can be used to achieve optimum lift within the desired weight and cube constraints in support of the "Lightening the MAGTF" initiative, as well as sustaining and/or improving capabilities, such as re-engineering the ground clearance on various trailers. Transportation and expeditionary goals will be considered in the research and development for the medium and heavy trailer fleet to include (but not limited to) the M1076 PLS (Palletized Load System) Trailer, MK1077 Flatrack, MK593 MTRV Trailer, M870 40/50 Ton Low Bed, MK970 Tactical Refueler and the Flatrack Refueler Capability (FRC).</p> <p>The Family of Logistics Vehicle System Replacement (LVSR) program is currently in sustainment utilizing RDT&E funding to address required Engineering Change Proposals (ECPs) for the autonomous driver testing and demonstration to maintain relevancy on the battlefield and implement system requirements.</p> <p>The Family of P-19 Replacement (P-19R) leverages COTS and NDI components in an effort to minimize costs, test requirements, and reduce development time. P-19R supplants the aging A/S32P-19A fleet in support of expeditionary airfield operations and the supporting establishment. The vehicle is outfitted with advanced fire suppression equipment. It provides rescue and aircraft fire fighting capabilities to permanent and expeditionary airfields throughout the Marine Corps. The P-19R is employed to fight structure fires in support of base camps and as firefighting support to other elements of the MAGTF, such as ammunition supply points, Petroleum, Oil, and Lubricants (POL) distribution points, or hazardous material storage facilities.</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy **Date:** April 2022

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206624M / Marine Corps Cmbt Services Supt	Project (Number/Name) 2509 / Motor Transport Mod
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Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
MRAP Modifications	Various	Various : Various	0.200	0.189	May 2021	0.191	Dec 2021	0.145	Dec 2022	-		0.145	0.000	0.725	-
MRAP Engineering	Various	Various : Various	0.299	0.140	Mar 2021	0.150	Dec 2021	0.115	Dec 2022	-		0.115	0.000	0.704	-
LVSr Leader/Follower	Various	Various : Various	1.137	0.252	Mar 2021	0.000		0.000		-		0.000	0.000	1.389	-
MTV Technology Demonstration	Various	Various : Various	0.000	0.000		0.000		7.500	Dec 2022	-		7.500	0.000	7.500	-
Prior Years Cumulative Funding	Various	Various : Various	35.637	0.000		0.000		0.000		-		0.000	0.000	35.637	-
Subtotal			37.273	0.581		0.341		7.760		-		7.760	0.000	45.955	N/A

Remarks

MRAP - decrease of \$0.081M in FY 2023 due to Marine Corps re-phasing of funding to account for FY 2021 under execution.
 MTV - increase of \$7.500M in FY 2023 due to MTV technology demonstration initiative.

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Prior Years Cumulative Funding	Various	Various : Various	0.105	0.000		0.000		0.000		-		0.000	0.000	0.105	-
Subtotal			0.105	0.000		0.000		0.000		-		0.000	0.000	0.105	N/A

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
FT&AE Test/Analysis	Various	Various : Various	0.773	0.202	Jan 2021	0.215	Dec 2021	0.180	Dec 2022	-		0.180	Continuing	Continuing	Continuing
MRAP FoV Ballistic Evaluations	Various	Various : Various	0.209	0.189	Nov 2020	0.221	Dec 2021	0.122	Dec 2022	-		0.122	0.000	0.741	-
LTVM (Light) ECPs/modifications	Various	Various : Various	1.630	0.145	Feb 2021	0.604	Dec 2021	0.186	Dec 2022	-		0.186	Continuing	Continuing	Continuing
LVSr Test/Analysis	MIPR	ATC : ATC	0.000	0.000		0.220	Feb 2022	0.215	Dec 2022	-		0.215	0.000	0.435	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy **Date:** April 2022

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206624M / Marine Corps Cmbt Services Supt	Project (Number/Name) 2509 / Motor Transport Mod
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Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
MTVR ECP Test & Evaluation	Various	Various : Various	2.453	0.101	Nov 2020	0.105	Dec 2021	0.117	Dec 2022	-		0.117	0.000	2.776	-
Prior Years Cumulative Funding	Various	Various : Various	13.208	0.000		0.000		0.000		-		0.000	0.000	13.208	-
Subtotal			18.273	0.637		1.365		0.820		-		0.820	Continuing	Continuing	N/A

Remarks
 FTAE - decrease of \$0.035M in FY 2023 due to Marine Corps re-phasing of funding to account for FY 2021 under execution.
 LTVM - decrease of \$.418M in FY 2023 due to a reduction taken for higher priority Marine Corps requirements.
 LVSR - decrease of \$0.005M in FY 2023 due to Marine Corps re-phasing of funding to account for FY 2021 under execution.
 MRAP - decrease of \$0.099M in FY 2023 due to Marine Corps re-phasing of funding to account for FY 2021 under execution.
 MTVR - increase of \$0.012M in FY 2023 due to increased science and engineering support to address PQDRs, obsolescence, and safety issues.

	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	55.651	1.218	1.706	8.580	-	8.580	Continuing	Continuing	N/A

Remarks

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206624M / <i>Marine Corps Cmbt Services Supt</i>	Project (Number/Name) 2509 / <i>Motor Transport Mod</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
MTVR				
Fuel Efficient Modifications (Install S/W) All Variants (including Armored Cargo)	1	2021	4	2023
ECP/Safety Mod Development	1	2021	4	2027
MTV Technology Demonstration	1	2023	2	2026

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy										Date: April 2022		
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0206624M / Marine Corps Cmbt Services Supt				Project (Number/Name) 2510 / MAGTF CSSE & SE			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
2510: MAGTF CSSE & SE	41.602	3.324	4.413	9.524	-	9.524	7.698	5.343	4.574	9.389	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

A key enabler in support of Expeditionary Advanced Base Operations (EABO) and austere base establishment in Littoral Operations in Contested Environments (LOCE) and Indo-Pacific, Environmental Control Equipment, Mobile Power Equipment and Advanced Power Sources are a part of Expeditionary Energy Initiatives that will ultimately support Force Design in enabling such systems and operations as Air Defense systems, C2 Degraded environment systems, Close Combat lethality systems, and Information Warfare.

A. Mission Description and Budget Item Justification

Family of Mobile Power Systems

The Family of Mobile Power Systems (MPS) consists of a wide range of current and emerging technologies for mobile power generation, storage, and distribution systems and environmental control equipment necessary to provide continuous, uninterrupted electrical power and climate control in austere and expeditionary advanced base operations (EABO) environments. MPS enables the functionality of critical weapon, optic, medical, C5ISR and life support capabilities required at Advanced Naval Bases and Advanced Base sites.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Environmental Control Equipment	0.016	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2022 Plans: N/A					
FY 2023 Base Plans: N/A					
FY 2023 OCO Plans: N/A					
FY 2022 to FY 2023 Increase/Decrease Statement: Starting FY 2022 Environmental Control Equipment merges into Family of Mobile Power Systems (MPS).					
Title: Family of Mobile Power Systems	2.408	4.413	9.524	0.000	9.524
Articles:	-	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206624M / Marine Corps Cmbt Services Supt	Project (Number/Name) 2510 / MAGTF CSSE & SE

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
<p>FY 2022 Plans:</p> <ul style="list-style-type: none"> - Continue technology development and technical support for the Intelligent Power Management System (IPMS). - Continue system requirement technical reviews for the Energy Storage Unit (ESU) in support of Intelligent Power Management System (IPMS). - Initiate developmental effort to produce a new hybrid Environmental Control Unit (ECU) capability that will consolidate two legacy materiel solutions into a single solution, resulting in lower total ownership costs, reduced fuel consumption, smaller logistics footprint, and utilize refrigerants that are less impactful on the environment. - Continue development of small unit power prototypes and concepts. - Initiate development of Unmanned Aerial Vehicle(UAV) alternate power generation technologies and Airborne power generation technologies (Marine Portable Wind Energy System) following FY 2020 congressional add in support of Expeditionary Advanced Base Operations. <p>FY 2023 Base Plans:</p> <ul style="list-style-type: none"> - Continue technology development and system requirement technical reviews for the Energy Storage Unit (ESU) in support of Intelligent Power Management System (IPMS). - Initiate prototype development for Energy Storage Unit (ESU) in support of Intelligent Power Management System (IPMS). - Continue developmental effort to produce a new hybrid Environmental Control Unit (ECU) capability that will consolidate two legacy materiel solutions into a single solution, resulting in lower total ownership costs, reduced fuel consumption, smaller logistics footprint, and utilize refrigerants that are less impactful on the environment. - Continue development of small unit/micro power prototypes and concepts. - Continue verification testing of Phase II prototypes for the Small Field Refrigeration System replacements. <p>FY 2023 OCO Plans: N/A</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding increase Of \$5.111M aligns with the planned prototype contract award for Energy Storage Unit in support of Intelligent Power Management System (IPMS), and development of a new Hybrid Environmental Control Unit (ECU) capability.</p>					
<p>Title: Advanced Power Sources</p> <p align="right">Articles:</p>	0.900	0.000	0.000	0.000	0.000
FY 2022 Plans:	-	-	-	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy **Date:** April 2022

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206624M / Marine Corps Cmbt Services Supt	Project (Number/Name) 2510 / MAGTF CSSE & SE
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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
N/A					
FY 2023 Base Plans: N/A					
FY 2023 OCO Plans: N/A					
FY 2022 to FY 2023 Increase/Decrease Statement: Starting FY 2022 Advanced Power Sources merges into Family of Mobile Power Systems (MPS).					
Accomplishments/Planned Programs Subtotals	3.324	4.413	9.524	0.000	9.524

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• PMC/6054: <i>Environmental Control Equipment</i>	0.455	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	90.930
• PMC/6366-1: <i>Mobile Power Equipment</i>	10.703	26.625	5.841	-	5.841	28.890	29.487	30.046	30.617	Continuing	Continuing
• PMC/6366-2: <i>Advanced Power Sources</i>	12.587	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	151.653

Remarks

D. Acquisition Strategy
Family of Mobile Power Systems

The Family of Mobile Power System (MPS) acquisition strategy is to develop, procure, and provide life cycle sustainment for a portfolio of power generation, storage, and distribution systems and environmental control equipment. The acquisition strategy provides the engineering, software, and logistics resources necessary to equip the Warfighter with required power systems and environmental control equipment that enables the functionality of critical weapon, optic, medical, C5ISR and life support capabilities required at Advanced Naval Bases and Advanced Base sites. Multiple developmental, procurement, and sustainment efforts are executed from MPS to support and enhance hybrid, renewable, scalable, and modular solutions that will power tomorrow's battlefield. These efforts include, but are not limited to, the Mobile Electric Hybrid Power System, Intelligent Power Management System, Environmental Control Units, Field Refrigeration Systems, and Small Unit Power/Micro Power programs.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy **Date:** April 2022

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206624M / Marine Corps Cmbt Services Supt	Project (Number/Name) 2510 / MAGTF CSSE & SE
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Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
IPMS Micro Grid Storage	C/FFP	AFLCMC : HANSCOM AFB	4.865	0.585	Mar 2021	0.493	Jan 2022	0.580	Jan 2023	-		0.580	Continuing	Continuing	Continuing
IPMS IPD EMD	C/FFP	MCSC : Quantico, VA	2.072	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
IPMS IPD Prototype Testing	C/FFP	ATC : Aberdeen, MD	0.867	0.000	Nov 2020	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
SFRS Replacement	MIPR	NSRDEC : NATICK, MA	0.768	0.016	Sep 2021	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Small Unit Power	MIPR	NSWC-CD : Bethesda, MD	0.000	1.654	Mar 2021	0.462	Jan 2022	0.000		-		0.000	0.000	2.116	-
IPMS Metering & Monitoring Dashboard	WR	DOTC : Picatinny, NJ	0.106	0.000		0.000		0.000		-		0.000	0.000	0.106	-
IPMS Metering & Monitoring	WR	C5ISR-EIO : Aberdeen, MD	0.100	0.000		0.000		0.000		-		0.000	0.000	0.100	-
IPMS Energy Storage Unit	TBD	TBD : TBD	0.000	0.000		1.945	Jun 2022	4.079	Jun 2023	-		4.079	0.000	6.024	-
Hybrid Environmental Control Unit	TBD	TBD : TBD	0.000	0.000		0.556	Jan 2022	2.931	Jan 2023	-		2.931	0.000	3.487	-
Small Unit Power - Micro Power Prototype	C/FFP	TBD : TBD	0.000	0.000		0.000		1.934	Jan 2023	-		1.934	0.000	1.934	-
Prior Years Cumulative Funding	Various	Various : Various	19.605	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			28.383	2.255		3.456		9.524		-		9.524	Continuing	Continuing	N/A

Remarks

Starting FY 2022 Environmental Control Equipment and Advanced Power Sources merge into Family of Mobile Power Systems (MPS).

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Marine Portable Wind Energy System	WR	NRL : Washington, DC	0.000	0.500	Jul 2021	0.957	Dec 2021	0.000		-		0.000	0.000	1.457	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy **Date:** April 2022

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206624M / Marine Corps Cmbt Services Supt	Project (Number/Name) 2510 / MAGTF CSSE & SE
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Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Small Unit Power	MIPR	A TEC : Aberdeen, MD	0.000	0.200	Mar 2021	0.000		0.000		-		0.000	0.000	0.200	-
IPMS Energy Storage	MIPR	C5ISR-EIO : Aberdeen, MD	0.000	0.282	Mar 2021	0.000		0.000		-		0.000	0.000	0.282	-
IPMS Energy Storage	MIPR	ATC : Aberdeen, MD	0.000	0.087	Mar 2021	0.000		0.000		-		0.000	0.000	0.087	-
Prior Years Cumulative Funding	Various	Various : Various	0.059	0.000		0.000		0.000		-		0.000	0.000	0.059	-
Subtotal			0.059	1.069		0.957		0.000		-		0.000	0.000	2.085	N/A

Remarks
Starting FY 2022 Environmental Control Equipment and Advanced Power Sources merge into Family of Mobile Power Systems (MPS).

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
SFRS Replacement Test & Evaluation	MIPR	ABERDEEN TEST CENTER : ABERDEEN MD	0.516	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
MEHPS User Evaluation	MIPR	NSWC CARDEROCK : CARDEROCK MD	0.760	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
IPMS IPD Developmental Testing	WR	ABERDEEN TEST CENTER : ABERDEEN MD	0.591	0.000		0.000		0.000		-		0.000	0.000	0.591	-
Prior Years Cumulative Funding	Various	Various : Various	8.868	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			10.735	0.000		0.000		0.000		-		0.000	Continuing	Continuing	N/A

Remarks
Starting FY 2022 Environmental Control Equipment and Advanced Power Sources merge into Family of Mobile Power Systems (MPS).

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy **Date:** April 2022

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206624M / Marine Corps Cmbt Services Supt	Project (Number/Name) 2510 / MAGTF CSSE & SE
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Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
PM support for development and test mgmt	C/FFP	MCSC : Quantico, VA	2.425	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			2.425	0.000		0.000		0.000		-		0.000	Continuing	Continuing	N/A

Remarks
Starting FY 2022 Environmental Control Equipment and Advanced Power Sources merge into Family of Mobile Power Systems (MPS).

	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	41.602	3.324	4.413	9.524	-	9.524	Continuing	Continuing	N/A

Remarks
Environmental Control Equipment, Mobile Power Equipment and Advanced Power Sources are part of Expeditionary Energy Initiatives.

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Navy **Date:** April 2022

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206624M / Marine Corps Cmbt Services Supt	Project (Number/Name) 2510 / MAGTF CSSE & SE
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SFRS	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	
						Dev & Validation Testing									Production														

2023PB - 0206624M - 2510

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Navy **Date:** April 2022

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206624M / Marine Corps Cmbt Services Supt	Project (Number/Name) 2510 / MAGTF CSSE & SE
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IPMS ESU	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
			SYSTEM REQUIREMENT TECH REVIEWS								CA ▲				DT													

2023PB - 0206624M - 2510

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Navy **Date:** April 2022

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206624M / Marine Corps Cmbt Services Supt	Project (Number/Name) 2510 / MAGTF CSSE & SE
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SMALL UNIT/MICRO POWER	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027							
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q				
	SYSTEM REQUIREMENT TECH REVIEWS								CA ▲	DT																						

2023PB - 0206624M - 2510

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Navy **Date:** April 2022

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206624M / Marine Corps Cmbt Services Supt	Project (Number/Name) 2510 / MAGTF CSSE & SE
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Marine Portable Wind Energy System (MPWES)	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027							
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q				
	DT																															

2023PB - 0206624M - 2510

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206624M / <i>Marine Corps Cmbt Services Supt</i>	Project (Number/Name) 2510 / <i>MAGTF CSSE & SE</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
SFRS				
TEST & EVALUATION - PHASE II	2	2022	2	2023
MS C	2	2024	2	2024
IPMS ESU				
TECHNICAL REVIEWS	3	2021	3	2022
CONTRACT AWARD (PROTOTYPE)	3	2023	3	2023
DEVELOPMENT TESTING	3	2024	3	2025
SMALL UNIT/MICRO POWER				
TECHNICAL REVIEWS	2	2021	4	2022
CONTRACT AWARD	2	2023	2	2023
DEVELOPMENT TESTING	2	2024	2	2025
Marine Portable Wind Energy System (MPWES)				
DEVELOPMENTAL TESTING	1	2021	4	2022
Hybrid Environmental Control Unit				
TECHNICAL REVIEWS	2	2022	2	2023
CONTRACT AWARD	3	2023	3	2023
DEVELOPMENTAL TESTING	1	2024	1	2024

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy										Date: April 2022		
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0206624M / Marine Corps Cmbt Services Supt				Project (Number/Name) 2929 / Testing Measuring Diag Equip & SE			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
2929: Testing Measuring Diag Equip & SE	12.699	0.622	0.643	0.684	-	0.684	0.698	0.708	0.722	0.734	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Family of Automatic Test Systems (ATS) provides organic test capabilities for use by Marine Corps maintainers in garrison and deployed environments to support activities aligned to condition/predictive based maintenance, equipment diagnostics, and fault isolation on multiple platforms such as radio test sets that will be employed in the Expeditionary Advanced Base Operations (EABO) and littoral operational environment. ATS funding strategy supports Force Design 2030 initiatives and EABO by providing automatic test capabilities to the lowest level possible in order diagnose/repair as forward as possible.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Automatic Test Systems (ATS)	0.622	0.643	0.684	0.000	0.684
Articles:	-	-	-	-	-
FY 2022 Plans: -Continue developmental and testing efforts associated with the General Purpose Automatic Test System Electro Optic Controller. This capability provides Marine Corps maintainers the ability to execute fault diagnostics and test a multitude of ground platforms that contain optics or fiber optic capabilities.					
FY 2023 Base Plans: -Initiate development of self test scripts for Hand-Held Radio Test Sets (HHRTS). The HHRTS supports organic testing of software defined crypto-compliment ground radio platforms. -Initiate artificial intelligence various Automatic Test Equipment (ATE). Artificial Intelligence will eliminate user interaction for running user test scripts, reducing manpower requirements.					
FY 2023 OCO Plans: N/A					
FY 2022 to FY 2023 Increase/Decrease Statement: The increase of \$0.041M from FY 2022 to FY 2023 supports the initiation of artificial intelligence for various Automatic Test Equipment (ATE).					
Accomplishments/Planned Programs Subtotals	0.622	0.643	0.684	0.000	0.684

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206624M / Marine Corps Cmbt Services Supt	Project (Number/Name) 2929 / Testing Measuring Diag Equip & SE

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

Line Item	FY 2021	FY 2022	FY 2023	FY 2023	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	Cost To	
			Base	OCO	Total					Complete	Total Cost
• PMC/4181: Automatic Test Systems (ATS)	4.602	4.644	17.597	-	17.597	5.028	5.082	6.304	6.423	0.000	128.667

Remarks

D. Acquisition Strategy

Automatic Test Systems (ATS) acquisition is being done through U.S. Army Armament Research, Development & Engineering Center (ARDEC), Picatinny, NJ both in-house and contracts; In-house at Marine Corps Logistics Command (MCLC), Albany, GA; In-house at Naval Surface Warfare Center, Crane, and through Marine Corps Systems Command contracts.

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Navy **Date:** April 2022

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206624M / Marine Corps Cmbt Services Supt	Project (Number/Name) 2929 / Testing Measuring Diag Equip & SE
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Proj 2929	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
ATS Product Development																												
Empty grid for data entry																												

2023DON - 0206624M - 2929

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206624M / <i>Marine Corps Cmbt Services Supt</i>	Project (Number/Name) 2929 / <i>Testing Measuring Diag Equip & SE</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 2929				
ATS Product Development	1	2021	4	2027

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy **Date:** April 2022

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206624M / Marine Corps Cmbt Services Supt	Project (Number/Name) 9999 / Congressional Adds
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
9999: Congressional Adds	0.000	0.000	8.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	8.000
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Field-based airborne power generation systems efforts will focus on achieving the Marine Corps goal of lightening the Marine Air-Ground Task Force (MAGTF) through reduced logistical fuel resupply needs. These are Small Business Innovation Research (SBIR) efforts to capture energy at high altitudes utilizing wind energy through unmanned aerial vehicle (UAV) and airborne assets.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022
Congressional Add: Field-based airborne power generation systems	0.000	8.000
FY 2021 Accomplishments: N/A		
FY 2022 Plans: Field-based airborne power generation system technologies - Continue development of Field-based airborne power generation system technologies		
Congressional Adds Subtotals	0.000	8.000

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

N/A

Remarks

D. Acquisition Strategy

Field-based airborne power generation systems efforts are Small Business Innovation Research (SBIR) efforts and acquisition strategies do not apply to SBIRs.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy **Date:** April 2022

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206624M / Marine Corps Cmbt Services Supt	Project (Number/Name) 9999 / Congressional Adds
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Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Field-based airborne power generation systems	TBD	TBD : TBD	0.000	0.000		8.000	Sep 2023	0.000		-		0.000	0.000	8.000	-
Subtotal			0.000	0.000		8.000		0.000		-		0.000	0.000	8.000	N/A

Remarks
Decrease of \$8.000M from FY 2022 to FY 2023 is due to the FY 2022 congressional add for Field-based airborne power generation system technologies.

	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000	8.000	0.000	-	0.000	0.000	8.000	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Navy **Date:** April 2022

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206624M / Marine Corps Cmbt Services Supt	Project (Number/Name) 9999 / Congressional Adds
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Field-based airborne power generation systems	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027							
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q				
Contract Award												◆																				

2023PB - 0206624M - 9999

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206624M / <i>Marine Corps Cmbt Services Supt</i>	Project (Number/Name) 9999 / <i>Congressional Adds</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Field-based airborne power generation systems</i>				
Contract Award: Contract Award	4	2023	4	2023