Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy											Date: May 2017	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0206623M *I MC Ground Cmbt Spt Arms Sys*							
COST ($ in Millions)	**Prior Years**	**FY 2016**	**FY 2017**	**FY 2018 Base**	**FY 2018 OCO**	**FY 2018 Total**	**FY 2019**	**FY 2020**	**FY 2021**	**FY 2022**	**Cost To Complete**	**Total Cost**
Total Program Element	537.373	55.058	51.835	66.009	-	66.009	72.811	78.119	97.093	132.960	Continuing	Continuing
1555: *Lt Armored Vehicle Prog*	107.475	10.732	13.879	13.650	-	13.650	7.445	4.931	4.723	3.242	Continuing	Continuing
1557: *Next Gen Armored Reconnaissance Vehicle (LAV replacement)*	0.000	0.000	0.000	0.000	-	0.000	15.622	21.000	37.960	79.279	Continuing	Continuing
1901: *MC Grnd Wpnry Prod Improvement*	36.645	4.155	3.689	3.512	-	3.512	5.921	5.514	5.300	5.404	Continuing	Continuing
2086: *Soldier/Marine Enhancement*	28.447	2.140	3.140	3.340	-	3.340	4.707	4.251	3.992	4.069	Continuing	Continuing
2237: *Amphibious Vehicle Test*	3.164	6.324	0.991	2.861	-	2.861	2.833	2.897	2.963	3.025	Continuing	Continuing
2315: *Training Devices/ Simulators*	118.038	11.848	17.183	23.927	-	23.927	16.882	19.481	22.356	19.791	Continuing	Continuing
2503: *Initial Issue*	44.483	1.775	3.462	4.656	-	4.656	5.336	4.842	4.492	4.579	Continuing	Continuing
2513: *Body Armor*	45.501	2.863	2.746	4.380	-	4.380	5.015	4.900	4.823	4.919	Continuing	Continuing
2928: *Exp Indirect Fire Gen Supt Wpn Sys*	11.464	1.316	1.054	2.990	-	2.990	2.632	2.161	2.207	2.249	Continuing	Continuing
3098: *Fire Support System*	138.392	13.391	5.242	6.145	-	6.145	5.871	7.606	7.727	5.842	Continuing	Continuing
4002: *Family of Raid Reconnaissance*	3.764	0.514	0.449	0.548	-	0.548	0.547	0.536	0.550	0.561	Continuing	Continuing

A. Mission Description and Budget Item Justification

This PE provides modification to Marine Corps Expeditionary Ground Force Weapon Systems to increase lethality, range, survivability and operational effectiveness. In addition, the PE provides for the development of AAV7A1 reliability, maintainability, operational and safety modifications, improvements in command and control, and product improvements to the family of LAVs. The Amphibious Vehicle Test Branch (AVTB) provides facilities and personnel which perform a broad range of testing, repair and technical services to amphibious vehicles. This program is funded under Operational Systems Development Program Element (PE) because it encompasses engineering and manufacturing and manufacturing development for upgrades of existing systems.

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy					Date: May 2017
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development*		**R-1 Program Element (Number/Name)** PE 0206623M *I MC Ground Cmbt Spt Arms Sys*			
B. Program Change Summary ($ in Millions)	**FY 2016**	**FY 2017**	**FY 2018 Base**	**FY 2018 OCO**	**FY 2018 Total**
Previous President's Budget	48.590	47.877	47.582	-	47.582
Current President's Budget	55.058	51.835	66.009	-	66.009
Total Adjustments	6.468	3.958	18.427	-	18.427
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	7.690	0.000			
• SBIR/STTR Transfer	-1.223	0.000			
• Program Adjustments	0.000	3.958	18.420	-	18.420
• Rate/Misc Adjustments	0.001	0.000	0.007	-	0.007

Change Summary Explanation

The increase from FY17 to FY18 of $14.174M can be attributed to the Training devices/simulators program requirement to move the SAVT into the capability arena to inter-operate with other training devices, and AVTB program for increased test support for the Amphibious Combat Vehicle and Assault Amphibious Vehicle.

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy			Date: May 2017
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	Project (Number/Name) 1555 / *Lt Armored Vehicle Prog*	

COST ($ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
1555: *Lt Armored Vehicle Prog*	107.475	10.732	13.879	13.650	-	13.650	7.445	4.931	4.723	3.242	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Family of Light Armored Vehicles (FOLAV) consists of six fielded LAV configurations and one communications/intelligence-configured asset on an LAV chassis. The FOLAV provides a logistically self-contained, highly mobile, and lethal combined arms combat system to the Marine Air Ground Task Force (MAGTF). The LAV Product Improvement Program funds modification and sustainment activities and the development and testing of modifications. These programs will ensure that the FOLAV is capable of conducting its assigned missions by enhancing lethality and survivability; reliability, availability, maintainability and durability; as well as reducing operations and support costs.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: LAV Obsolescence (OB)	10.732	13.879	12.576	0.000	12.576
Articles:	-	8	-	-	-
Description: The decrease of $.229M from FY17 to FY18 can be attributed to the reduction in the Obsolescence effort and the start of the C4ISR Cryptographic modernization testing and integration effort, Joint Battle Command-Platform (JBC-P) integration, the Enhanced Position Location Reporting System (EPLRS)/117G data radio conversion/integration.					
FY 2016 Accomplishments: -Continued Engineering Change Proposal (ECP), Integrated Logistic Support (ILS) data development, Technical Publications Development, Critical Design Review for the Obsolescence Kits consisting of Power pack, Driveline, Steering, Driver's Instrument Panel (DIP), LAV-25 Slip Ring, and Program Management (PM) support. -Initiated Modification Instruction development for the LAV.					
FY 2017 Plans: -Continue Engineering Change Proposal (ECP), Modification Instruction development, Integrated Logistics Support (ILS) Data Development, Technical Publications Development, and PM support. -Initiate Test Planning for Developmental Test and effort to build 8 prototype vehicles.					
FY 2018 Base Plans: -Continue PM support. -Complete modification instruction development, complete 8 vehicle prototype builds, technical manual development, and execute Developmental Testing.					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 1555 / *Lt Armored Vehicle Prog*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
-Initiate preparation towards Milestone C and preparation for Obsolescence Production Kit contract. Production contract consists of the OB Kits and completion of Logistics Products (technical manuals, provisioning, etc), Training (New Equipment Training, Instructor & Key Personnel Training, etc), Field Service Representative Support, Systems Technical Support, Initial Spares, Special Tools and Test Equipment, Test Vehicle Refurbishment, and Packaging support. ***FY 2018 OCO Plans:*** N/A					
Title: LAV Modifications and Sustainment ***Articles:*** ***FY 2016 Accomplishments:*** N/A ***FY 2017 Plans:*** N/A ***FY 2018 Base Plans:*** Initiate efforts for the design, configuration, prototyping, and testing of communication assets related to the Family of Light Armored Vehicles (FOLAV) to include; the Enhanced Position Location Reporting System (EPLRS)/117G data radio conversion, Joint Battle Command-Platform (JBC-P) implementation to meet situational awareness (blue force tracker) requirement, C4ISR Crypto Modernization to comply with National Security Agency (NSA) cryptographic requirements, and Global Positioning Satellite (GPS) M-Code. ***FY 2018 OCO Plans:*** N/A	0.000 -	0.000 -	1.074 -	0.000 -	1.074 -
Accomplishments/Planned Programs Subtotals	10.732	13.879	13.650	0.000	13.650

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• PMC/2038: *LAV PIP*	88.756	53.423	17.244	-	17.244	44.697	63.676	66.206	57.503	Continuing	Continuing
• PMC/7000: *LAV Spares*	1.275	0.628	1.006	-	1.006	5.830	5.990	6.157	6.271	Continuing	Continuing

Remarks

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 1555 / *Lt Armored Vehicle Prog*

D. Acquisition Strategy

The LAV Modification & Sustainment program funds important vehicle modifications, support equipment and tools, and other projects that increase LAV reliability and readiness while simultaneously reducing operations and support costs. The Marine Corps Program Management LAV Modification Team uses multi-disciplined integrated project teams consisting of engineering, logistical, contracting and financial personnel to manage Modification projects. Currently the LAV Modification and Sustainment program will capture the ACAT IV(M) Obsolescence program (OB). The OB program will address the Family of Light Armored Vehicles (FOLAV) automotive system obsolescence and reduced performance due to increased Gross Vehicle Weight (GVW). The OB program will improve fleet reliability and availability by addressing the three sub-systems (power pack, driveline and steering) that specifically account for 95% of total system downtime. Also, fields a modern driver's instrument panel and LAV-25 Slip Ring. This effort will require delivery of 8 kits (7 installed on vehicles, 1 stand-alone kit) during the Engineering & Manufacturing Development (EMD) phase to support Developmental Testing (DT), fielding, Integrated Logistics Support (ILS) products, Modification Instructions (MI) and Engineering Change Proposals (ECP).

E. Performance Metrics

Milestone Reviews

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy			Date: May 2017
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	Project (Number/Name) 1555 / *Lt Armored Vehicle Prog*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
C4ISR Crypto MOD Integration	MIPR	SPAWAR : Charleston, NC	0.000	0.000		0.000		1.074	Nov 2017	-		1.074	0.000	1.074	-
ILS DATA DEV (MOD)	C/CPFF	GDLS : London Ontario, Canada	13.351	1.535	Jul 2016	2.245	Apr 2017	1.625	Dec 2017	-		1.625	Continuing	Continuing	Continuing
PRODUCT DEV/ PROTOTYPES (MOD)	C/CPFF	GDLS : London Ontario, Canada	28.822	6.865	Jul 2016	8.907	Apr 2017	5.975	Dec 2017	-		5.975	Continuing	Continuing	Continuing
Proj 1555: Prior Years Cumulative Funding	Various	N/A : N/A	37.397	0.000		0.000		0.000		-		0.000	0.000	37.397	-
		Subtotal	79.570	8.400		11.152		8.674		-		8.674	-	-	-

Remarks

The decrease from FY17 to FY18 is reduced effort on the Obsolescence contract and an increase in support of the C4ISR Crypto modernization integration, Joint Battle Command-Platform (JBC-P) integration, the Enhanced Position Location Reporting System (EPLRS)/117G data radio conversion/integration.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Proj 1555: Prior Years Cumulative Funding	Various	N/A : N/A	11.860	0.000		0.000		0.000		-		0.000	0.000	11.860	-
Program Mgmt (MOD)	MIPR	TACOM : Warren, MI	7.396	2.332	Dec 2015	2.551	Dec 2016	2.268	Dec 2017	-		2.268	Continuing	Continuing	Continuing
		Subtotal	19.256	2.332		2.551		2.268		-		2.268	-	-	-

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Proj 1555: Prior Years Cumulative Funding	Various	N/A : N/A	6.105	0.000		0.000		0.000		-		0.000	0.000	6.105	-
Devl/Oper T&E (MOD)	MIPR	RTC : AL	1.464	0.000		0.176	Nov 2016	2.708	Jan 2018	-		2.708	Continuing	Continuing	Continuing
		Subtotal	7.569	0.000		0.176		2.708		-		2.708	-	-	-

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy			Date: May 2017
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	Project (Number/Name) 1555 / *Lt Armored Vehicle Prog*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract

Remarks

The increase from FY17 to FY18 is in support of the Obsolescence program developmental testing.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Proj 1555: Prior Years Cumulative Funding	Various	N/A : N/A	1.080	0.000		0.000		0.000		-		0.000	0.000	1.080	-
		Subtotal	1.080	0.000		0.000		0.000		-		0.000	0.000	1.080	-

	Prior Years	FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	107.475	10.732		13.879		13.650		-		13.650	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 1555 / *Lt Armored Vehicle Prog*

OB_Summary_Program_Plan_EMD Based on GDLS Sched Rev L

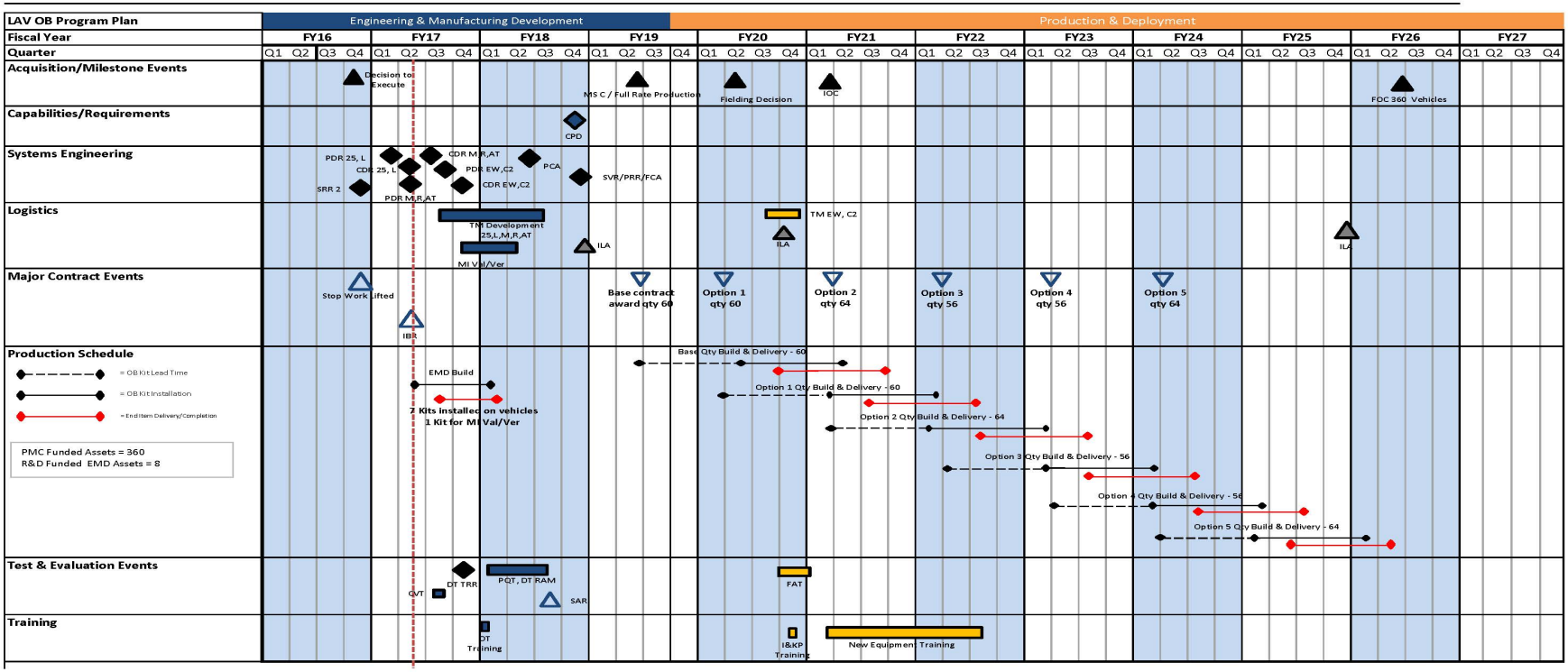

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 1555 / *Lt Armored Vehicle Prog*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
LAV Modification and Sustainment				
Integration Contract	1	2016	2	2019
TM Development	3	2017	3	2018
Contractor Verification Test	3	2017	3	2017
EMD Vehicle Delivery	3	2017	1	2018
Developmental Testing	1	2018	3	2018
Mod Instruction Val/Ver	4	2017	2	2018
MS-C	2	2019	2	2019
Base Contract Award	2	2019	2	2019
Option 1 Award	1	2020	1	2020
Fielding Decision	2	2020	2	2020
IOC	1	2021	1	2021
Option 2 Award	1	2021	1	2021
Option 3 Award	1	2022	1	2022

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy											Date: May 2017	
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0206623M / *MC Ground Cmbt Spt Arms Sys*				Project (Number/Name) 1557 / *Next Gen Armored Reconnaissance Vehicle (LAV replacement)*			
COST ($ in Millions)	**Prior Years**	**FY 2016**	**FY 2017**	**FY 2018 Base**	**FY 2018 OCO**	**FY 2018 Total**	**FY 2019**	**FY 2020**	**FY 2021**	**FY 2022**	**Cost To Complete**	**Total Cost**
1557: *Next Gen Armored Reconnaissance Vehicle (LAV replacement)*	0.000	0.000	0.000	0.000	-	0.000	15.622	21.000	37.960	79.279	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Armored Reconnaissance Vehicle (ARV) is a replacement for the legacy light armored vehicle in the Light Armored Reconnaissance (LAR) battalions within the Marine Divisions. ARV equipped LAR Battalions perform combined arms, all weather, sustained reconnaissance and security missions in support the Ground Combat Element. The ARV is the core capability that underpins the next generation armored reconnaissance capability concept. The ARV will be a modern combat vehicle system, capable of fighting for information, that balances competing capability demands to sense, shoot, move, communicate and remain transportable as part of the naval expeditionary force.

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy			Date: May 2017
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	Project (Number/Name) 1901 / *MC Grnd Wpnry Prod Improvement*	

COST ($ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
1901: *MC Grnd Wpnry Prod Improvement*	36.645	4.155	3.689	3.512	-	3.512	5.921	5.514	5.300	5.404	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project develops joint and Marine Corps unique improvements to infantry weapons technology, non-lethal systems technology, improvements for Night Vision Equipment, Rifle Combat Optics, Family of Individual Optics, and monitors national and international weapons developments.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Escalation of Force-Equipment (EoF-E)	0.085	0.038	0.085	0.000	0.085
Articles:	-	-	-	-	-
Description: Escalation of Force Equipment (EoF-E) is a mod funding line to support/sustain all fielded EoF equipment and capabilities. Additionally, EoF-E supports type-classification, testing and procurement of new advancements and technologies to provide an increased capability over existing or obsolescent equipment currently in or associated with the Escalation of Force Mission Modules (EoF-MMs). ***FY 2016 Accomplishments:*** -Continued assessment of upgrades and replacements to the EoF-MM to sustain/support equipment and capabilities. -Completed assessment of upgrades and replacements to the LA-9/P Lasers to sustain/support equipment and capabilities. ***FY 2017 Plans:*** -Continue assessment of upgrades and replacements to the EoF-MM to sustain/support equipment and capabilities. ***FY 2018 Base Plans:*** -Continue assessment of upgrades and replacements to the EoF-MM to sustain/support equipment and capabilities. ***FY 2018 OCO Plans:*** N/A					
Title: Combat Optics	0.796	1.748	1.722	0.000	1.722

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 1901 / *MC Grnd Wpnry Prod Improvement*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Articles:	-	-	-	-	-

Description: Combat Optics is a program that provides for research and development, as well as ammunition to support testing and assessment of optical systems and implementation of modifications for these systems as well as life-cycle management efforts. The research and development of future capabilities include, but are not limited to, fused/multi-spectral (e.g., combined image intensifier, thermal imaging, and short wave infrared) optical and laser systems. Additionally, this line supports the procurement of over 600,000 magnified day optics, thermal imagers, image intensifier, lasers, and illuminators principle end items (PEI) due to combat losses, wash-outs, and increases in Approved Acquisition Objectives. Sustainment efforts include sustainment of optics capabilities and/or improvements to the performance, maintainability, supportability, service life, ergonomics, and safety enhancements.

FY 2016 Accomplishments:
-Continued technology development and evaluation to support life cycle extension and improvement of current optics and inform future optics requirements generation to address capability gaps.
-Continued coordination with United States Army on long wave and short wave infrared technologies.
-Initiated procurement of Sniper Range Finder test articles, for testing and eventual selection of system for procurement.
-Completed source selection for award of contract to initiate and complete design of a Dual-Channel Heavy Sight (DCHS) prototype to inform the development of a joint capability document for future production.

FY 2017 Plans:
-Continue technology development and evaluation to support life cycle extension and improvement of current optics and inform future optics requirements generation to address capability gaps.
-Continue coordination with United States Army on long wave and short wave infrared technologies.
-Complete procurement of Sniper Range Finder system test articles for testing and eventual selection of system for procurement.
-Initiate contract award efforts for the design and development of Dual-Channel Heavy Sight prototype system.

FY 2018 Base Plans:
-Continue technology development and evaluation to support life cycle extension and improvement of current optics and inform future optics requirements generation to address capability gaps.
-Continue prototype development and build of Dual-Channel Heavy Sight system for testing

FY 2018 OCO Plans:

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 1901 / *MC Grnd Wpnry Prod Improvement*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
N/A					
Title: Family of Infantry Weapons Systems (FIWS)	2.553	1.409	1.306	0.000	1.306
Articles:	-	-	-	-	-

Description: Family of Infantry Weapons Systems (FIWS) is a program that provides for continuous monitoring, research and development, assessment of and implementation of Joint Service and USMC unique system modifications. Efforts such as: sustain weapon capability, enhance Gunner's Protection Kits (GPK) and/or improve the performance, maintainability, supportability, service life, ergonomics, and safety enhancements of Infantry Weapons Systems.

FY 2016 Accomplishments:
-Continued Product Improvement Program testing for various emergent requirements.
-Continued efforts to analyze, design, develop, and field modifications for Infantry Weapons (to include Gunner's Protection Kits).
-Continued performance evaluation on various types of ammunition currently under development.
-Initiated product improvement of GPK in order to meet requirements outlined in the GPK Requirements Memorandum.
-Initiated efforts to analyze, design, and develop a GPK that meets emergent requirements for vehicle stowage aboard ships while maintaining existing protection levels.
-Initiated effort to lighten Sniper Rifles.

FY 2017 Plans:
-Continue Product Improvement Program testing for various emergent requirements.
-Continue efforts to analyze, design, develop, and field modifications (to include GPKs).
-Continue performance evaluation of various types of ammunition currently under development.
-Continue product improvement of GPK in order to meet requirements outlined in Requirements Memorandum for GPK.
-Continue efforts to analyze, design, and develop a Reducible Height GPK that meets emergent requirements for vehicle stowage aboard ships while maintaining existing protection levels.
-Continue product improvements on Sniper and Special Purpose Weapons and ancillary equipment and ammo.

FY 2018 Base Plans:
-Continue Product Improvement Program testing for various emergent requirements.
-Continue efforts to analyze, design, develop, and field modifications (to include GPKs).

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 1901 / *MC Grnd Wpnry Prod Improvement*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
-Continue performance evaluation of various types of ammunition currently under development. -Continue product improvement of GPK in order to meet requirements outlined in Requirements Memorandum for GPK. -Continue efforts to analyze, design, and develop a Reducible Height GPK that meets emergent requirements for vehicle stowage aboard ships while maintaining existing protection levels. -Continue product improvement of Sniper and Special Purpose systems and ancillary support equipment in order to meet established or emerging requirements. ***FY 2018 OCO Plans:*** N/A					
Title: Company and Battalion Mortars ***Articles:*** ***Description:*** This funding is used to provide system development and demonstration efforts and pre-Milestone C activities, for the Next Generation of Lightweight Handheld Mortar Ballistic Computer (LHMBC) software and hardware integration. Funding also supports development of system upgrades for the 60mm and 81mm mortar and associated equipment. ***FY 2016 Accomplishments:*** -Continued system and software development and demonstration efforts. -Continued pre-Milestone C activities. ***FY 2017 Plans:*** -Continue system and software development, and demonstration efforts. -Continue pre-Milestone C activities (including Developmental Testing). -Initiate testing and evaluation of candidate systems for Company and Battalion Mortars, and for the development of software for LHMBC. ***FY 2018 Base Plans:*** -Complete system and software development, and demonstration efforts. -Complete Milestone C activities. -Purchase NDI for testing and evaluation of candidate systems and modifications for Company and Battalion Mortars, and for the development of software for LHMBC. ***FY 2018 OCO Plans:***	0.721 -	0.494 -	0.399 -	0.000 -	0.399 -

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 1901 / *MC Grnd Wpnry Prod Improvement*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
N/A					
Accomplishments/Planned Programs Subtotals	4.155	3.689	3.512	0.000	3.512

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• RDTEN/2319 - MPM: *Mission Payload Module-Joint Non-Lethal Weapons Directorate*	6.826	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• PMC/2208: *Escalation of Force - Equip (EoF-E)*	0.449	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	54.349
• PMC/4930: *Combat Optics*	1.680	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1,505.448
• PMC/2220-01: *Family of Infantry Weapons Systems*	1.721	5.247	5.331	-	5.331	17.505	17.432	5.396	5.500	Continuing	Continuing
• PMC/2220-02: *Company and Battalion Mortars*	6.124	0.000	0.810	-	0.810	3.339	3.407	3.474	3.543	Continuing	Continuing
• RDTEN/2319 - OI: *Ocular Interruption-Joint Non-Lethal Weapons Directorate*	1.608	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3.984
• PMC/4620: *Combat Optics*	0.000	11.572	12.793	-	12.793	9.355	9.554	9.742	9.942	Continuing	Continuing
• PMC/2220-03: *Escalation of Force - Equip (EoF-E)*	0.000	1.898	1.748	-	1.748	1.398	1.426	1.454	1.483	Continuing	Continuing

Remarks

D. Acquisition Strategy

These programs range from off-the-shelf modifications to developmental items for safety, reliability, and technology upgrades to meet Marine Corps requirements.

E. Performance Metrics

Milestone Reviews

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy			Date: May 2017
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	Project (Number/Name) 2086 / *Soldier/Marine Enhancement*	

COST ($ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
2086: *Soldier/Marine Enhancement*	28.447	2.140	3.140	3.340	-	3.340	4.707	4.251	3.992	4.069	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Marine Expeditionary Rifle Squad (MERS) mission is to manage the infantry squad, "squad as a system", by conducting integration, systems engineering, human factors, and modernization efforts across all the products that are worn, carried, and consumed by the rifle squad. Physical integration, capability analysis, modeling and simulation, ergonomics, and usability assessments are facilitated by this program in working with the various program managers and project officers in the development of their unique items that contribute to the squads overall capabilities. MERS operates and manages the Gruntworks Squad Integration Facility, including facilities sustainment, restoration and modernization of the facility, to meet mission requirements in order to support integration and assessments of equipment. MERS is engaging industry and academia in search of innovative technologies that can enhance infantry capabilities via a Partnership Intermediary Agreement. Weight and volume management are fundamental considerations in the insertion or modernization of any squad equipment. MERS works with Joint and NATO soldier modernization programs to harvest new technologies to increase the capability of the rifle squad. The program also ensures the integration of the rifle squad into the various mobility platforms currently in service and being developed to ensure a Marine and his equipment can operate effectively. This program is essential to ensure the combined synergistic equipment effects enhance the war-fighting functions of the Marine rifle squad towards the strategic Marine Corps war fighting vision for the future.

Ammunition Life Cycle Management Program responsibility for Total Life Cycle Management for ground conventional munitions. Accordingly, PM Ammo is a member of the joint services Ammunition Logistics Research and Development IPT (ALR&D IPT). Each year the IPT solicits R&D projects from all of the services. The IPT looks for innovative ideas to enhance logistical support for munitions. Approximately 20 Ammo Logistics R&D projects are voted on each year by the IPT. They are prioritized by voting actions of the Senior Review Board and funding sources are identified. Since the funding for ammunition will likely decrease as the Marine Corps draws down and we end our participation in OEF, ammunition logistics R&D projects designed to extend the shelf life of our current inventory, provide enhanced packaging to protect our munitions, and other such projects will go a long way to ensure the Marine Corps can maintain a reliable conventional ammunition inventory into the future.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Marine Expeditionary Rifle Squad (MERS)	1.665	2.441	2.731	0.000	2.731
Articles:	-	-	-	-	-
Description: The increase from FY17 to FY18 of $.0290M supports continued investments in MERS Infantry Working Group prioritized projects.					
FY 2016 Accomplishments:					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2086 / *Soldier/Marine Enhancement*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
-Continued to support all the Marine Corps Systems Command program offices that provide equipment to the Marine rifle squad or provide mobility platforms that support the squad. -Continued to resource, improve, and utilize the Gruntworks Squad Integration Facility as an asset to execute integration projects, prototyping, and usability trials. -Continued to conduct human performance trials utilizing MC-LEAP and other data collection methodologies in order to develop mobility metrics. -Continued to conduct usability trials, requirements generation workshops, and limited user evaluations for digital interoperability, handheld devices and applications at the infantry platoon and squad level. -Continued to support integration of body armor and load bearing systems with human factors expertise. -Continued to conduct mobility experiments using the Marine Corps Load Effects Assessment Program. -Continued to develop integrated seating solutions for combat equipped Marines for ACV 1.1, ACV 1.2, JLTV and other mobility programs and synchronize seat belt and retention systems among the platforms. -Continued to conduct R&D on squad systems in conjunction with Army squad system projects. -Continued to conduct surveys with post deploying infantry battalions on usability and integration of equipment utilized during deployment. -Continued to conduct human performance testing of Marines utilizing current and prototype configurations of infantry rifle squad equipment. -Continued to evaluate and transition technologies from ONR and other S&T activities that enhance capabilities of the squad or provide a desired capability. -Continued to seek weight and volume reduction replacements for current infantry equipment that support integration of components. -Continued to implement capability requirements from MERS Initial Capabilities Document (ICD).					
FY 2017 Plans: -Continue to support all the Marine Corps Systems Command program offices that provide equipment to the Marine rifle squad or provide mobility platforms that support the squad. -Continue to resource, improve, and utilize the Gruntworks Squad Integration Facility as an asset to execute integration projects, prototyping, and usability trials. -Continue to conduct human performance trials utilizing MC-LEAP and other data collection methodologies in order to develop mobility metrics, and evaluate mobility attributer. -Continue to conduct usability trials, requirements generation workshops, and limited user evaluations for digital interoperability, handheld devices and applications at the infantry platoon and squad level. -Continue to support integration of body armor and load bearing systems with human factors expertise.					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2086 / *Soldier/Marine Enhancement*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
-Continue to conduct mobility experiments using the Marine Corps Load Effects Assessment Program. -Continue to develop integrated seating solutions for combat equipped Marines for ACV 1.1, ACV 1.2, JLTV and other mobility programs and synchronize seat belt and retention systems among the platforms. -Continue to conduct R&D on squad systems in conjunction with Army squad system projects. -Continue to conduct surveys with post deploying infantry battalions on usability and integration of equipment utilized during deployment. -Continue to conduct human performance testing of Marines utilizing current and prototype configurations of infantry rifle squad equipment. -Continue to evaluate and transition technologies from ONR and other S&T activities that enhance capabilities of the squad or provide a desired capability. -Continue to seek weight and volume reduction replacements for current infantry equipment that support integration of components. -Continue to implement capability requirements from MERS Initial Capabilities Document (ICD). -Initiate ability to rapidly evaluate innovative technologies with industry and academia. Prioritize projects with the Infantry Working Group and utilize the Partnership Intermediary Agreement as a mediation to pursue innovation and technology.					
FY 2018 Base Plans: -Continue to support all the Marine Corps Systems Command program offices that provide equipment to the Marine rifle squad or provide mobility platforms that support the squad. -Continue to resource improvements and operating costs to support the mission of Gruntworks Squad Integration Facility. This includes resourcing minor construction for facilities sustainment, restoration and modernization efforts, below the MILCON threshold. -Continue to utilize the Gruntworks Squad Integration Facility as an asset to execute innovation and technology searches and projects, R&D integration projects, prototyping, rapid assessment of technologies, and usability trials. -Continue investment into Gruntworks Squad Integration Facility enablers and capabilities. -Continue to conduct human performance trials utilizing MC-LEAP and other data collection methodologies in order to develop mobility metrics. -Continue to conduct usability trials, requirements generation workshops, and limited user evaluations for digital interoperability, handheld devices and applications at the infantry platoon and squad level. -Continue to support integration of body armor and load bearing systems with human factors expertise.					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2086 / *Soldier/Marine Enhancement*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
-Continue to conduct mobility experiments using the Marine Corps Load Effects Assessment Program and associated Policy Letters and Requirements Documents. -Continue to develop integrated seating solutions for combat equipped Marines for ACV 1.1, ACV 1.2, JLTV and other mobility programs and synchronize seat belt and retention systems among the platforms. -Continue to conduct R&D on squad systems in conjunction with Army squad system projects. -Continue to conduct surveys with post deploying infantry battalions on usability and integration of equipment utilized during deployment. -Continue to conduct human performance testing of Marines utilizing current and prototype configurations of infantry rifle squad equipment. -Continue to evaluate and transition technologies from ONR and other S&T activities that enhance capabilities of the squad or provide a desired capability. -Continue to seek weight and volume reduction replacements for current infantry equipment that support integration of components. -Continue to implement capability requirements from MERS Initial Capabilities Document (ICD). -Continue to prioritize projects with the Infantry Working Group and utilize the Partnership Intermediary Agreement as mediation to pursue innovation and technology. ***FY 2018 OCO Plans:*** N/A					
Title: Ammunition Life Cycle Management	0.475	0.699	0.609	0.000	0.609
Articles:	-	-	-	-	-
FY 2016 Accomplishments: -Initiated R&D efforts for the Retrograde Pallet Box, Ammunition Packaging Layer Elimination Study, Phosphine Indicator, and the small arms muzzle flash testing. These projects will enhance the readiness and safety for ammunition and explosives. ***FY 2017 Plans:*** -Continue to support the Ammunition Logistics R&D IPT by funding the Phosphine Indicator project in support of 81mm Red Phosphorus mortars and the 155mm ExpressPak reusable pallet system. Funds will also support all facets of ammunition related research, development, studies, test and evaluation, product improvement efforts performed by contractors and government installations, including procurement of end items, weapons,					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2086 / *Soldier/Marine Enhancement*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
equipment, components, ammunition, materials and services requirement for development of ammunition related equipment, material, or computer application software. ***FY 2018 Base Plans:*** -Continue to support the Ammunition Logistics R&D IPT by funding the Propellent Temperature project, Emergency resupply project, thermoformed dunnage project, site planning project, and the Logistics Study for AM (3D) printing project. ***FY 2018 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	2.140	3.140	3.340	0.000	3.340

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Non Developmental Item/Commercial off the Shelf (NDI/COTS).

E. Performance Metrics

N/A

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy			Date: May 2017
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	Project (Number/Name) 2237 / *Amphibious Vehicle Test*	

COST ($ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
2237: *Amphibious Vehicle Test*	3.164	6.324	0.991	2.861	-	2.861	2.833	2.897	2.963	3.025	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Amphibious Vehicle Test Branch (AVTB) is a component of Marine Corps Systems Command (MCSC) and is responsible for the operation and management of their test facility, which is the Department of Defense's only certified amphibious vehicle test capability. The AVTB is responsible for the generation of test plans, executes, analyzes and reports results of developmental and integrated test and evaluation events. They predominately supporting the development and performance validation of amphibious and ground combat vehicle system capabilities. AVTB conducts and supports testing for the MCSC; Navy PEOs and Program Management Offices; the Office of Naval Research; and HQMC PP&O and CD&I, as directed. The AVTB mission is to plan, execute, analyze and report developmental and integrated test and evaluation of USMC and Joint Service tracked, wheeled and ground combat vehicles and other demonstration events in order to characterize the performance of amphibious and ground combat vehicle systems and enable informed acquisition decisions for the future warfighting capabilities.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Contracts and Test and Evaluation Support Assets	6.324	0.991	2.861	0.000	2.861
Articles:	-	-	-	-	-
Description: NOTE: The $1.870M increase from FY17 to FY18 reflects increased test support for the Amphibious Combat Vehicle and Assault Amphibious Vehicle beginning in FY18.					
FY 2016 Accomplishments: -Continued LAV variant water testing.					
-Continued to maintain operations and facilities fully functional and provide technical expertise to ONR's Exercise Trident Warrior; and provide test support to other MCSC, Navy PEOs, and Joint Service acquisitions.					
-Completed HTR testing					
-Completed ACV inc 1.1 Reliability Growth Testing (RGT), Survivability, Human Factors, C2, Water mode Operational Assessments, and support the ACV design development and technology risk reduction efforts.					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2237 / *Amphibious Vehicle Test*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
-Completed AAV baseline and survivability upgrade DT&E RGT with increase focus testing to inform the upgrade acquisition and contracting process for survivability upgrade. ***FY 2017 Plans:*** -Continue ACV inc 1.1 DT&E water testing -Continue LAV variant water testing. -Continue AAV baseline and survivability upgrade DT&E RGT with increase focus testing to inform the upgrade acquisition and contracting process for survivability upgrade. -Continue to provide resources and technical expertise to ONR's Exercise Trident Warrior; and provide test support to other MCSC, Navy PEOs, and Joint Service acquisitions. ***FY 2018 Base Plans:*** -Continue ACV inc 1.1 DT&E water testing -Continue LAV variant water testing. -Continue AAV baseline and survivability upgrade DT&E RGT with increase focus testing to inform the upgrade acquisition and contracting process for survivability upgrade. -Continue to provide resources and technical expertise to ONR's Exercise Trident Warrior. -Continue to resource operating costs and provide test support to other MCSC, Navy PEOs, and Joint Service acquisitions. ***FY 2018 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	6.324	0.991	2.861	0.000	2.861

C. Other Program Funding Summary ($ in Millions)

N/A

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2237 / *Amphibious Vehicle Test*

C. Other Program Funding Summary ($ in Millions)

Remarks

D. Acquisition Strategy

Work will be led in-house by the Amphibious Vehicle Test Branch (AVTB). As DoD's only certified amphibious test and evaluation capability, AVTB will provide technical and user information regarding the performance of amphibious and ground combat vehicles during developmental testing, capabilities demonstrations and assessments, integrated and follow-on test evaluations events for Marine Corps and Joint Service Program Managers of system activities to support future warfighting capabilities. Required DT&E test assets will be resourced organically with military and civilian personnel, and as required contracted by the MCSC, such as boat operations and maintenance, professional data collection and reduction, test instrumentation and test-peculiar programming and technical writing.

E. Performance Metrics

N/A

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy			Date: May 2017
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	Project (Number/Name) 2315 / *Training Devices/Simulators*	

COST ($ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
2315: *Training Devices/ Simulators*	118.038	11.848	17.183	23.927	-	23.927	16.882	19.481	22.356	19.791	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

NOTE: The overall increase of $6.744M from FY17 to FY 18 is attributable to: increased support for FoFTS development and integration activities for enhancements to instrumentation systems; DVTE Virtual Battle Space (VBS) software development improvements and upgrades; MTWS Reengineering baseline software and FoFTS development and integration activities; RTAM continuous support of TVCS Mobile enhancements; and the SAVT requirement to move into the capability arena to inter-operate with other training devices.

A. Mission Description and Budget Item Justification

(U) Training simulators supported by this program element include Combined Arms Command & Control Training Upgrade System (CACCTUS), Deployable Virtual Training Environment (DVTE), Force on Force Training Systems (FoFTS), Marine Air/Ground Task Force (MAGTF) Tactical Warfare Simulation (MTWS) Enhancements, Ranges and Training Area Management (RTAM) [Formerly Range Modernization/Transformation], Supporting Arms Virtual Trainer (SAVT), Immersive Training Range Support (ITRS) [formerly Squad Immersive Training Environment (SITE)], and Training Support. These training systems provide tactical weapons and decision-making skill training from entry level through MAGTF staff level. Systems will be interoperable and will allow for mission planning, mission rehearsal and concept evaluation in a valid synthetic environment with objective and timely feedback. Through live, virtual and constructive simulation, the Marine Corps will have the means to train jointly, educate, develop doctrine and tactics, formulate and assess operational plans, assess warfighting situations, and define operational requirements.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Combined Arms Command and Control Trainer Upgrade System (CACCTUS)	6.672	6.603	5.719	0.000	5.719
Articles:	-	-	-	-	-
Description: CACCTUS is a combined arms staff training system that when fully fielded will enable comprehensive Marine Corps staff, unit, and team training both at home station Combined Arms Staff Training (CAST) facilities and through Distributed training involving CAST facilities across the Marine Corps. CACCTUS is an upgrade to the USMC's CAST that provides fire support training for the Marine Air Ground Task Force (MAGTF) elements up to and including Marine Expeditionary Brigade (MEB) level. Using the system components and simulation capabilities, two dimensional (2D)and three dimensional (3D) visuals, interfaced Command, Control, Communications, Computers and Intelligence (C4I),synthetic terrain, and an After Action Review (AAR), the concept of operations for the CACCTUS system is to immerse the trainees in a realistic,					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2315 / *Training Devices/Simulators*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
scenario-driven environment to enable commands and their battle staffs to train or rehearse combined arms tactics, techniques and procedures for decision-making processes.					
FY 2016 Accomplishments: - Continued Acquisition Program Engineering support. - Completed and fielded version 6.0.4 which included additional virtualization efforts. - Completed development of first phase of Distributed Ops - Continued development of warfare specific software applications in support of Battalion Regimental staffs to Marine Expeditionary Brigade (MEB) training requirements. - Continued development of After Action Review (AAR) functionality. - Continued development of new architecture to support maturing hardware platforms. - Initiated integration of new 3D viewer software					
FY 2017 Plans: - Continue Acquisition Program engineering support. - Continue development of phase 2 Distributed Ops. - Continue integration of new 3D viewer software. - Continue development of After Action Review (AAR) functionality. - Continue development of new architecture to support maturing hardware platforms. - Initiate development of software to support centralized system architecture. - Initiate transition to new system communication environment. - Initiate new C4i interoperability.					
FY 2018 Base Plans: - Continue Acquisition Program engineering support. - Continue integration of new 3D viewer software. - Continue additional training system interoperability to include new C4i devices. - Continue development of After Action Review (AAR) functionality. - Continue development of software to support centralized system architecture. - Continue transition to new system communication environment. - Complete development of new architecture to support maturing hardware platforms. - Complete development of Distributed Ops.					
FY 2018 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2315 / *Training Devices/Simulators*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
N/A					
Title: Force on Force Training Systems (FoFTS) ***Articles:***	0.000 -	0.250 -	1.914 -	0.000 -	1.914 -
Description: FoFTS provides realistic, non-live-fire capabilities to perform force-on-force training and supports realistic, live-fire force-on-target training. The program develops, fields, and supports for a suite of tactical engagement systems that allow Marines to receive feedback in non-live fire FOF training by using low velocity projectiles or advanced, instrumented, laser-based tactical engagement systems. NOTE: The $1.664M increase from FY17 to FY18 reflects funds for development and integration activities for enhancements of additional Force on Force instrumentation systems. ***FY 2016 Accomplishments:*** N/A ***FY 2017 Plans:*** - Initiate the Combat Vehicle-Tactical Engagement Simulation System (CV-TESS) integration for LAV-25, LAV-AT and M1A1 simulators. - Initiate testing for blank fire of AK-47. - Initiate Augmented Immersive Team Trainer (AITT) Joint Tactical Air Controller (JTAC) task enhancements. ***FY 2018 Base Plans:*** - Continue the Combat Vehicle-Tactical Engagement Simulation System (CV-TESS) integration for LAV-25, LAV-AT and M1A1 simulators. - Continue Augmented Immersive Team Trainer (AITT) Joint Tactical Air Controller (JTAC) task enhancements. - Complete testing for blank fire of AK-47. ***FY 2018 OCO Plans:*** N/A					
Title: Deployable Virtual Training Environment (DVTE) ***Articles:***	0.558 -	2.075 -	2.369 -	0.000 -	2.369 -
Description: DVTE is a laptop Personal Computer (PC) based simulation system capable of emulating organic and supporting Infantry Battalion weapons systems and training scenarios to facilitate training and readiness based training. Its portable configuration allows Marines to train in areas where there are few options for training					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2315 / *Training Devices/Simulators*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
in garrison, aboard ship, at remote reserve locations, and deployed. DVTE training includes language and culture training, platoon and squad level tactics, employment of supporting arms, and various Recognition of Combatants (ROC) packages. DVTE is part of a Commander's "training toolkit" contributing to the building block approach to standards based training focusing on achieving an improved level of combat readiness. NOTE: The increase in RDTE funding from FY17 to FY18 is due to DVTE development for Virtual Battle Space (VBS) to support the warfighter virtual training improvements and upgrades. ***FY 2016 Accomplishments:*** - Continued incremental DVTE network infrastructure development by focusing on capabilities identified as DVTE application enhancements in the development plan. - Continued the additional efforts specified under the DVTE Software Capability Development Document (CDD) Increment II for Virtual Battlespace (VBS) release that includes improved Call For Fire (CFF) and Close Air Support (CAS) capability to replace/decrease actual live training events. - Initiated development of Tactical Air Control Party Green Gear modeling and Digital Fire Control System (DFCS) modeling for the Virtual Battlespace (VBS) release. - Initiated action to improve Flight Dynamics of Close Air Support (CAS) weapon platforms to more accurately represent live Joint Terminal Attack Controller (JTAC) training for the Virtual Battlespace (VBS) release. - Initiated enhancement and integration of Comm Gear and After Action Review (AAR) for the Virtual Battlespace (VBS) release. ***FY 2017 Plans:*** - Continue incremental DVTE network infrastructure development by focusing on capabilities identified as DVTE application enhancements in the development plan. - Continue the additional efforts specified under the DVTE Software Capability Development Document (CDD) Increment II for Virtual Battlespace (VBS) release that includes improved Call For Fire (CFF) and Close Air Support (CAS) capability to replace/decrease actual live training events. - Continue development of Tactical Air Control Party Green Gear modeling and Digital Fire Control System (DFCS) modeling for the Virtual Battlespace (VBS) release. - Continue to improve Flight Dynamics of Close Air Support (CAS) weapon platforms to more accurately represent live Joint Terminal Attack Controller (JTAC) training for the Virtual Battlespace (VBS) release.					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2315 / *Training Devices/Simulators*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
- Continue enhancement and integration of Comm Gear and After Action Review (AAR) for the Virtual Battlespace (VBS) release. ***FY 2018 Base Plans:*** - Continue incremental DVTE network infrastructure development by focusing on capabilities identified as DVTE application enhancements in the development plan. - Continue the additional efforts specified under the DVTE Software Capability Development Document (CDD) Increment II for Virtual Battlespace (VBS) release that includes improved Call For Fire (CFF) and Close Air Support (CAS) capability to replace/decrease actual live training events. - Continue development of Tactical Air Control Party Green Gear modeling and Digital Fire Control System (DFCS) modeling for the Virtual Battlespace (VBS) release. - Continue to improve Flight Dynamics of Close Air Support (CAS) weapon platforms to more accurately represent live Joint Terminal Attack Controller (JTAC) training for the Virtual Battlespace (VBS) release. - Continue enhancement and integration of Comm Gear and After Action Review (AAR) for the Virtual Battlespace (VBS) release. ***FY 2018 OCO Plans:*** N/A					
Title: Marine Air/Ground Task Force (MAGTF) Tactical Warfare Simulation (MTWS) Enhancements ***Articles:*** ***Description:*** The MAGTF Tactical Warfare Simulation (MTWS) is the Marine Corps' only constructive, aggregate-level simulation system used to support the training of Marine commanders and their battle staffs in MAGTF war-fighting principles/concepts and associated command and control procedures. Using complex computer-simulated behavior models, MTWS provides an interactive, decision-based, real-time, war game representing the six war-fighting functional areas of fires, command and control, force protection, logistics, maneuver, and intelligence. It's modeling breadth and flexibility enables users to represent and exercise a wide variety of combat scenarios to prepare leaders to face the military challenges of today's world. MTWS is designed to support the training of commanders and their staffs in exercises involving live and simulated land, air, and naval forces at all operational command levels. The system supports all levels of command throughout the Marine Expeditionary Force (MEF) and Joint Task Force (JTF). MTWS can be used as a multi-sided war game, including red, blue, civilian, and non-aligned sides. The system can also be used to validate specific operational plans against a variety of enemy and environmental situations. Thus command personnel may examine alternative tactical solutions on a "what if" basis.	2.029 -	3.084 -	7.757 -	0.000 -	7.757 -

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2315 / *Training Devices/Simulators*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
NOTE: The reason for increase in RDTE funding from FY17 to FY18 is due to MTWS re-engineering of software baseline. ***FY 2016 Accomplishments:*** - Continued interoperability development of MTWS integration into Joint Live Virtual and Constructive (JLVC) Federation, with primary focus on amphibious landings. - Continued development to increase levels of software capability to meet the changing operational environment that Marines fight in daily. - Initiated Live, Virtual and Constructive (LVC) simulation integration. ***FY 2017 Plans:*** - Continue interoperability development of MTWS integration into Joint Live Virtual and Constructive (JLVC) Federation, with primary focus on amphibious landings. - Continue development to increase levels of software capability to meet the changing operational environment that Marines fight in daily. - Continue Live, Virtual and Constructive (LVC) simulation integration. ***FY 2018 Base Plans:*** - Continue interoperability development of MTWS integration into Joint Live Virtual and Constructive (JLVC) Federation. - Continue development to increase levels of software capability to meet the changing operational environment that Marines fight in daily. - Continue Live, Virtual and Constructive (LVC) simulation integration. - Initiate contractual efforts to re-engineer the MTWS software baseline. ***FY 2018 OCO Plans:*** N/A					
Title: Ranges and Training Area Management (RTAM) [formerly Range Modernization/Transformation (RM/T)] ***Articles:*** ***Description:*** Ranges and Training Area Management (RTAM) developments are associated with modernizing live training ranges at major USMC bases and stations. This development effort enhances After Action Review (AAR) with ground truth feedback, realistic representation of Opposing Forces (OPFOR), and will upgrade the	0.942 -	0.783 -	1.101 -	0.000 -	1.101 -

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
range and exercise control capabilities. RM/T integrates Live, Virtual, and Constructive training technologies, thereby, enhancing fielded live-fire, force-on-target, and force-on-force training capabilities. NOTE: The $0.318M increase in RDTE funding from FY17 to FY18 supports continuance of TVCS Mobile enhancements. ***FY 2016 Accomplishments:*** - Continued to perform minimum software upgrades to add capability to the Range Instrumentation Systems Exercise Controller (RISCon) through the integration of numerous live/target systems. ***FY 2017 Plans:*** - Continue to perform minimum software upgrades to add capability to the Range Instrumentation Systems Exercise Controller (RISCon) through the integration of numerous live/target systems. - Initiate enhancements of TRACR software for Friend-and-Foe target control and scenario development, to include integration with Range Instrumentation System Controller (RISCon) - Initiate enhancements Tactical Video Capture System (TVCS) Mobile (RISCon) ***FY 2018 Base Plans:*** - Continue to perform minimum software upgrades to add capability to the Range Instrumentation Systems Exercise Controller (RISCon) through the integration of numerous live/target systems. - Continue enhancements of TRACR software for Friend-and-Foe target control and scenario development, to include integration with Range Instrumentation System Controller (RISCon) - Continue enhancements of the Tactical Video Capture System (TVCS) Mobile (RISCon) ***FY 2018 OCO Plans:*** N/A					
Title: Supporting Arms Virtual Trainer (SAVT) ***Articles:*** ***Description:*** The SAVT will advance the training capability, operational readiness, and tactical proficiency of USMC Joint Terminal Attack Controllers (JTACS), Forward Observers (FOs), and Forward Air Controllers (FACs). The personnel will use training scenarios that require the placement of tactical ordnance on selected targets using Joint Close Air Support	0.000 -	0.000 -	2.203 -	0.000 -	2.203 -

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
(JCAS) procedures and observed fire procedures for Naval Surface Fire Support (NSFS),artillery and mortar fire to perform destruction, neutralization, suppression, illumination/coordinated illumination, interdiction and harassment fire missions. NOTE: The $2.203M increase from FY17 to FY18 funds the requirement to move the SAVT into the capability arena to inter-operate with other training devices in the Live Virtual Constructive (LVC) mode. SAVT will be required to operate at a Mission Assurance Category (MAC) III level to incorporate the required security classification. ***FY 2016 Accomplishments:*** N/A ***FY 2017 Plans:*** N/A ***FY 2018 Base Plans:*** - Initiate and complete development and integration of Battlefield effects and aircraft behaviors software. - Initiate and complete information Assurance and networkability in order to interoperate with other Simulations in Live Virtual Constructive (LVC). - Initiate and complete enhancements of command features and flight models. - Initiate and complete development and integration of Fixed and Rotary Wing flight profiles. - Initiate and complete post engineer support and developmental installation and operational testing. ***FY 2018 OCO Plans:*** N/A					
Title: Immersive Training Range Support (ITRS) [formerly Squad Immersive Training Environment (SITE)] ***Articles:*** ***Description:*** The Immersive Training Range Support (ITRS) [formerly Squad Immersive Training Environment (SITE)] is an integrating construct or "toolkit" of Live, Virtual and Constructive (LVC) training capabilities used to significantly improve infantry squad operational readiness and squad leader tactical decision-making skills. The collection of LVC training capabilities within SITE will enhance opportunities for squad collective training to increase tactical proficiency, confidence, and readiness for real world operations. SITE will enhance skill transfer	1.355 -	4.350 -	2.829 -	0.000 -	2.829 -

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
and assessment by enabling squads to finish, test, and remediate training in preparation for a capstone exercise such as pre-deployment training. ***FY 2016 Accomplishments:*** - Continued to produce additional documentation associated with product development to include (1) Systems Design Specification; (2) Interface Design Document; and (3) an overarching System Engineering Master Plan (SEMP) crossing current training systems to steer development of standards and a roadmap for system capability upgrades and sustained interoperability. - Completed Training Effectiveness Evaluation events for system enhancements for Instrumented-Tactical Engagement Simulation System II (I-TESS II) Shoulder-Launched Multipurpose Assault Weapon (SMAW) and Javelin weapons, and One Tactical Engagement Simulation System (OneTESS) with Range Instrumentation Systems Exercise Controller (RISCon). - Completed development efforts for the anti-armor TOW/Saber and MK19 simulated weapons systems capability. - Initiated integration of Augmented Immersive Team Training (AITT) system upon completion of transition from ONR into existing programs of record. - Initiated System Training Effectiveness Evaluation Event for Tube-launched Optically-tracked Wire-guided (TOW)/Saber and MK19 capability. - Initiated development of the Employ Munitions capability within I-TESS II. ***FY 2017 Plans:*** - Continue to produce additional documentation associated with product development to include (1) Systems Design Specification; (2) Interface Design Document; and (3) an overarching System Engineering Master Plan (SEMP) crossing current training systems to steer development of standards and a roadmap for system capability upgrades and sustained interoperability. - Continue the integration of the Augmented Immersive Team Trainer (AITT) within the OneTESS Mortar capability and produce the prototype items for testing. - Complete System Training Effectiveness Evaluation Event for TOW/Saber and MK19 capability. - Complete development of the Employ Munitions capability within I-TESS II. - Initiate and complete the training effectiveness evaluation of the Employ Munitions development. - Initiate and complete the Live and Virtual integration activities for I-TESS II with Virtual Battle Space (VBS). ***FY 2018 Base Plans:***					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
- Continue to produce additional documentation associated with product development to include (1) Systems Design Specification; (2) Interface Design Document; and (3) an overarching System Engineering Master Plan (SEMP) crossing current training systems to steer development of standards and a roadmap for system capability upgrades and sustained interoperability. - Complete the integration of the AITT within the OneTESS Mortar capability and produce the prototype items for testing. - Initiate virtual integration tasks for CCS, SAVT, DVTE gateways and database commonality. ***FY 2018 OCO Plans:*** N/A					
Title: Training Support ***Articles:*** ***Description:*** Provide training solution development efforts for the modernization of training systems by providing high fidelity, immersive simulations and capabilities. Integrates existing live, virtual, and constructive training capabilities to provide fully coordinated Marine Air Ground Training Force (MAGTF) training exercises that realistically simulate the operating environment. ***FY 2016 Accomplishments:*** - Continued interoperability development of MAGTF Tactical Warfare Simulation (MTWS) integration to Joint Live, Virtual and Constructive (JLVC) Federation, with primary focus on amphibious landings. - Completed server virtualization testing. - Initiated Live, Virtual and Constructive (LVC) simulation integration. ***FY 2017 Plans:*** - Continue interoperability development of MAGTF Tactical Warfare Simulation (MTWS) integration to Joint Live, Virtual and Constructive (JLVC) Federation, with primary focus on amphibious landings. - Continue Live, Virtual and Constructive (LVC) simulation integration. ***FY 2018 Base Plans:*** - Continue interoperability development of MAGTF Tactical Warfare Simulation (MTWS) integration to Joint Live, Virtual and Constructive (JLVC) Federation, with primary focus on amphibious landings. - Continue Live, Virtual and Constructive (LVC) simulation integration. ***FY 2018 OCO Plans:***	0.292 -	0.038 -	0.035 -	0.000 -	0.035 -

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
N/A					
Accomplishments/Planned Programs Subtotals	11.848	17.183	23.927	0.000	23.927

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• PMC/6532-01: *Training Devices, CACCTUS*	1.001	3.515	4.659	-	4.659	3.909	3.990	4.067	4.148	Continuing	Continuing
• PMC/6532-02: *Training Devices, RTAM*	7.150	14.766	19.481	-	19.481	31.790	26.974	27.759	28.583	Continuing	Continuing
• PMC/4630: *Common Computer Resources, MTWS*	0.786	0.724	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• PMC/6532-03: *Training Devices, SAVT*	0.000	4.061	4.212	-	4.212	0.000	0.000	0.000	0.000	0.000	8.273
• PMC/6532-04: *Training Devices, DVTE*	0.000	2.229	2.538	-	2.538	1.447	1.476	4.076	4.158	Continuing	Continuing
• PMC/6532-05: *Training Devices, Force on Force Training Systems*	0.000	3.400	7.456	-	7.456	8.853	9.098	9.277	9.463	0.000	47.547
• PMC/6532-06: *Training Devices, Immersive Training Range Support/SITE*	0.000	0.000	25.012	-	25.012	0.000	0.000	0.000	0.000	0.000	25.012
• PMC/6532-07: *Training Devices, MTWS*	0.000	0.000	0.904	-	0.904	0.752	0.765	0.779	0.795	0.000	3.995

Remarks

D. Acquisition Strategy

(U) CACCTUS - MIPRs to Army and exercise task orders on competitive contract (C/IDIQ).
(U) DVTE - Exercise task orders off of new sole source IDIQ for Virtual Battleship Space (VBS) Software (SW) Development.
(U) MTWS - Exercise task orders off of IDIQ contract awarded December 2016, period of performance is January 2017 - December 2017.
(U) RTAM - MIPR to the Army-PEO STRI planned for award on existing Consolidated Product-line Management Contract.
(U) SAVT - New competitive (C/FFP) contract supporting the Joint Terminal Attack Controller (JTAC) Memorandum of Agreement (MOA) awarding Base contract in July 2017 and awarding task order to support this effort in Mar 2018.

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(U) IMMERSIVE TRAINING RANGE SUPPORT (formerly SITE) - MIPR to the Army-PEO STRI planned for award on existing Consolidated Product-line Management Contract; and exercise option on existing MCSC RDTE contract M67854-13-C-7802 (C/FFP).
(U) Training Support - Extended existing contract 9 months in order to continue activities in support of federate status with the Joint Live Virtual Constructive (JLVC) federation v.8, and complete in-process enhancements for Ulchi Freedom Guardian-15 (UFG-15); Exercise task order on new competitive contract (C/IDIQ).
(U) FoFTS - MIPR to Army-PEO STRI for award on existing Consolidated Product-line Management contract

E. Performance Metrics

Program Management Reviews are conducted on all PM TRASYS programs on a quarterly basis to assess program status.

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy			Date: May 2017
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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CACCTUS - SW Dev DO 2	C/IDIQ	Riptide Software, Inc. : Oviedo, FL	0.363	4.685	Dec 2015	0.000		0.500	Dec 2017	-		0.500	Continuing	Continuing	Continuing
CACCTUS - SW Dev DO 4	C/IDIQ	Riptide Software, Inc. : Oviedo, FL	0.000	1.118	Jul 2016	0.000		2.404	Dec 2017	-		2.404	Continuing	Continuing	Continuing
CACCTUS - SW Dev DO 5	C/IDIQ	Riptide Software, Inc. : Oviedo, FL	0.000	0.554	Sep 2016	0.000		2.315	Mar 2018	-		2.315	Continuing	Continuing	Continuing
CACCTUS - SW Dev TO 6	C/IDIQ	Riptide Software, Inc. : Oviedo, FL	0.000	0.000		0.596	Mar 2017	0.000		-		0.000	0.000	0.596	-
CACCTUS - SW Dev TO 7	C/IDIQ	Riptide Software, Inc. : Oviedo, FL	0.000	0.000		2.900	Apr 2017	0.000		-		0.000	0.000	2.900	-
CACCTUS - SW Dev TO 8	C/IDIQ	Riptide Software, Inc. : Oviedo, FL	0.000	0.000		3.107	Aug 2017	0.000		-		0.000	0.000	3.107	-
DVTE - SW Dev - VBS	SS/IDIQ	Bohemia Interactive : Orlando, FL	13.255	0.558	Jun 2016	2.075	Jun 2017	2.369	Dec 2017	-		2.369	Continuing	Continuing	Continuing
MTWS - SW Dev Task 2	C/IDIQ	Cole Engineering Services Inc. : Orlando, FL	0.415	1.879	Apr 2016	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
MTWS - SW Dev Task 3	C/IDIQ	Cole Engineering Services Inc. : Orlando, FL	0.000	0.150	Jun 2016	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
MTWS - SW Dev Task 4	C/IDDQ	Cole Engineering Services Inc. : Orlando, FL	0.000	0.000		0.096	Nov 2016	0.000		-		0.000	0.000	0.096	-
MTWS - SW Dev Task 6	C/IDIQ	Cole Engineering Services Inc. : Orlando, FL	0.000	0.000		0.949	Mar 2017	0.000		-		0.000	0.000	0.949	-
MTWS - SW Dev Task 7	C/IDIQ	Cole Engineering Services Inc. : Orlando, FL	0.000	0.000		0.876	Mar 2017	0.000		-		0.000	0.000	0.876	-
MTWS - SW Dev Task 8	C/IDIQ	Cole Engineering Services Inc. : Orlando, FL	1.341	0.000		1.163	May 2017	0.000		-		0.000	0.000	2.504	-

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy		Date: May 2017
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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MTWS - SW Dev Task 9	C/IDIQ	Cole Engineering Services Inc. : Orlando, FL	0.000	0.000		0.000		1.000	Dec 2017	-		1.000	0.000	1.000	-
MTWS - Reengineering	C/IDIQ	RECOMPETE : TBD NEW VENDOR	0.000	0.000		0.000		6.757	Sep 2018	-		6.757	0.000	6.757	-
RTAM RISCon Development	MIPR	PEOSTRI/TRADE : Orlando, FL	7.028	0.578	Nov 2015	0.783	Mar 2017	1.101	Dec 2017	-		1.101	Continuing	Continuing	Continuing
SAVT - SW Dev	C/FFP	TBD : TBD	0.000	0.000		0.000		1.823	Mar 2018	-		1.823	0.000	1.823	-
ITRS (SITE) - Live Core System Upgrades	C/FFP	Cubic Defense : San Diego, CA	3.322	0.241	Dec 2015	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
ITRS (SITE) - Consolidated Product Line Dev	MIPR	PEOSTRI/TRADE : Orlando, FL	1.026	1.094	Dec 2015	4.298	Mar 2017	2.829	Dec 2017	-		2.829	Continuing	Continuing	Continuing
Training Support - MTWS - SW Dev Task 2	C/IDIQ	Cole Engineering Services Inc. : Orlando, FL	0.002	0.292	Jun 2016	0.000		0.035	Dec 2017	-		0.035	Continuing	Continuing	Continuing
Training Support - MTWS - SW Dev Task 5	C/IDIQ	Cole Engineering Services Inc. : Orlando, FL	0.000	0.000		0.038	Dec 2016	0.000		-		0.000	0.000	0.038	-
FoFTS SW Development	MIPR	PEOSTRI/TRADE : Orlando, FL	0.000	0.000		0.250	Apr 2017	1.914	Dec 2017	-		1.914	0.000	2.164	-
Prior Year Cumulative Funding	Various	Not Specified : Not Specified	71.995	0.000		0.000		0.000		-		0.000	0.000	71.995	-
		Subtotal	98.747	11.149		17.131		23.047		-		23.047	-	-	-

Remarks

- CACCTUS - SW Dev - Task Order awards on existing contract are expected in FY18 Q1 and Q4 for continued development.
- MTWS - SW Dev - Task Order award on existing contract is expected in FY18 Q1. Additional new competitive contract to be awarded Q4 in FY18.
- Training Support - SW Dev - Task Order award on existing contract is expected in FY18 Q1.
- SAVT - SW Dev - New competitive contract to be awarded 1st quarter FY18, with Development Task Order to award 2nd quarter FY18.
- FoFTS -SW Dev - Army-PEO STRI for award on existing Consolidated Product-line Management contract 2nd quarter FY18 continue development efforts.
- RTAM - SW Dev - Army-PEO STRI for award on existing Consolidated Product-line Management contract 2nd quarter FY18 for continue development efforts.

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy			Date: May 2017
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Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CACCTUS - Engineering Support	WR	NAWCTSD : Orlando, FL	2.667	0.315	Oct 2015	0.000		0.500	Oct 2017	-		0.500	Continuing	Continuing	Continuing
RTAM - SW Dev Support	WR	NAWCTSD : Orlando, FL	0.802	0.364	Oct 2015	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
SAVT - Eng Support	WR	NAWC/Zenetex, LLC. : Orlando, FL	0.000	0.000		0.000		0.380	Oct 2017	-		0.380	0.000	0.380	-
ITRS (SITE) - Travel	Various	DTS : Various	0.023	0.020	Dec 2015	0.052	Mar 2017	0.000		-		0.000	0.000	0.095	-
Prior Year Cumulative Funding	Various	Not Specified : Not Specified	15.797	0.000		0.000		0.000		-		0.000	0.000	15.797	-
		Subtotal	19.289	0.699		0.052		0.880		-		0.880	-	-	-

Remarks

- CACCTUS - Recurring Engineering Support effort TBD/Negotiated with NAWCTSD in FY18.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Cumulative Funding	Various	Not Specified : Not Specified	0.002	0.000		0.000		0.000		-		0.000	0.000	0.002	-
		Subtotal	0.002	0.000		0.000		0.000		-		0.000	0.000	0.002	-

	Prior Years	FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	118.038	11.848		17.183		23.927		-		23.927	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy		Date: May 2017
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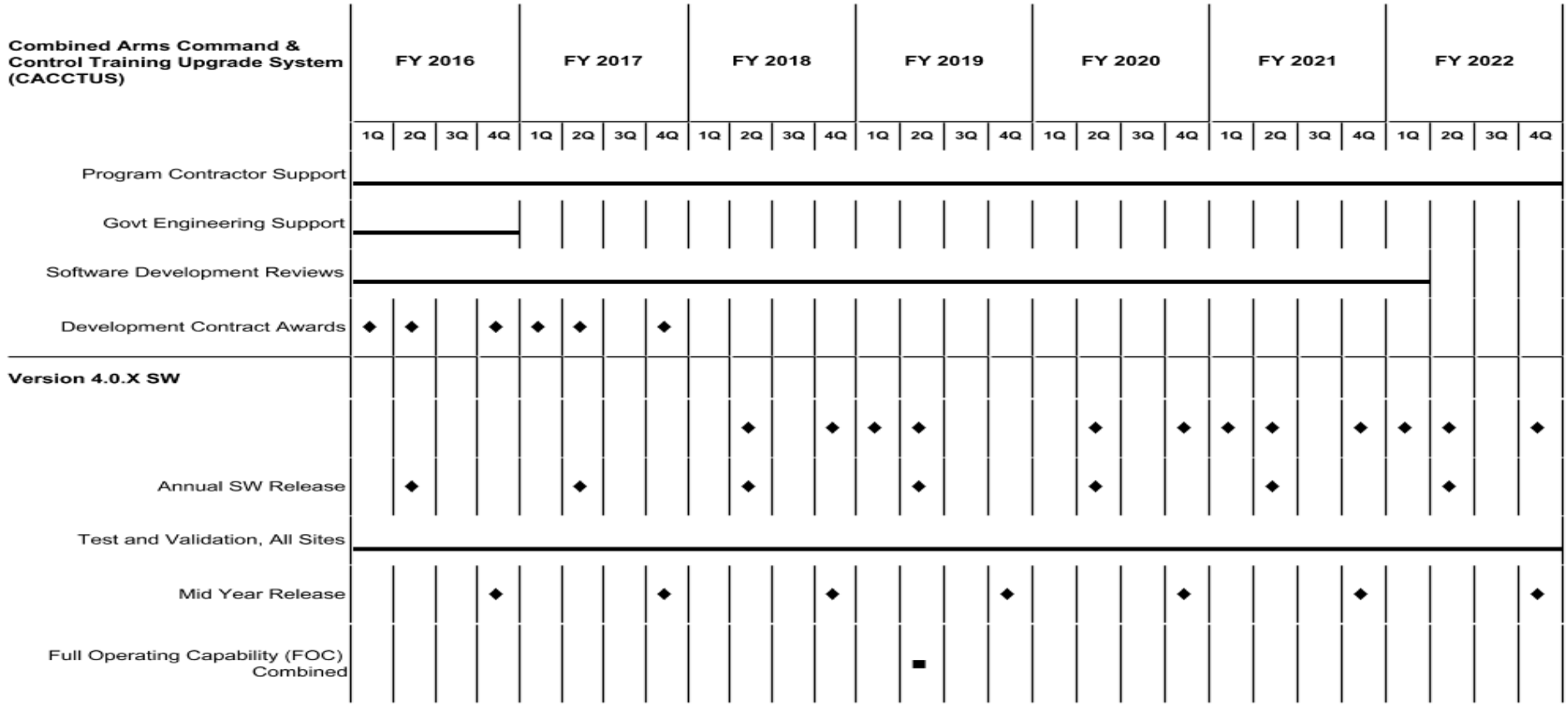

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy		Date: May 2017
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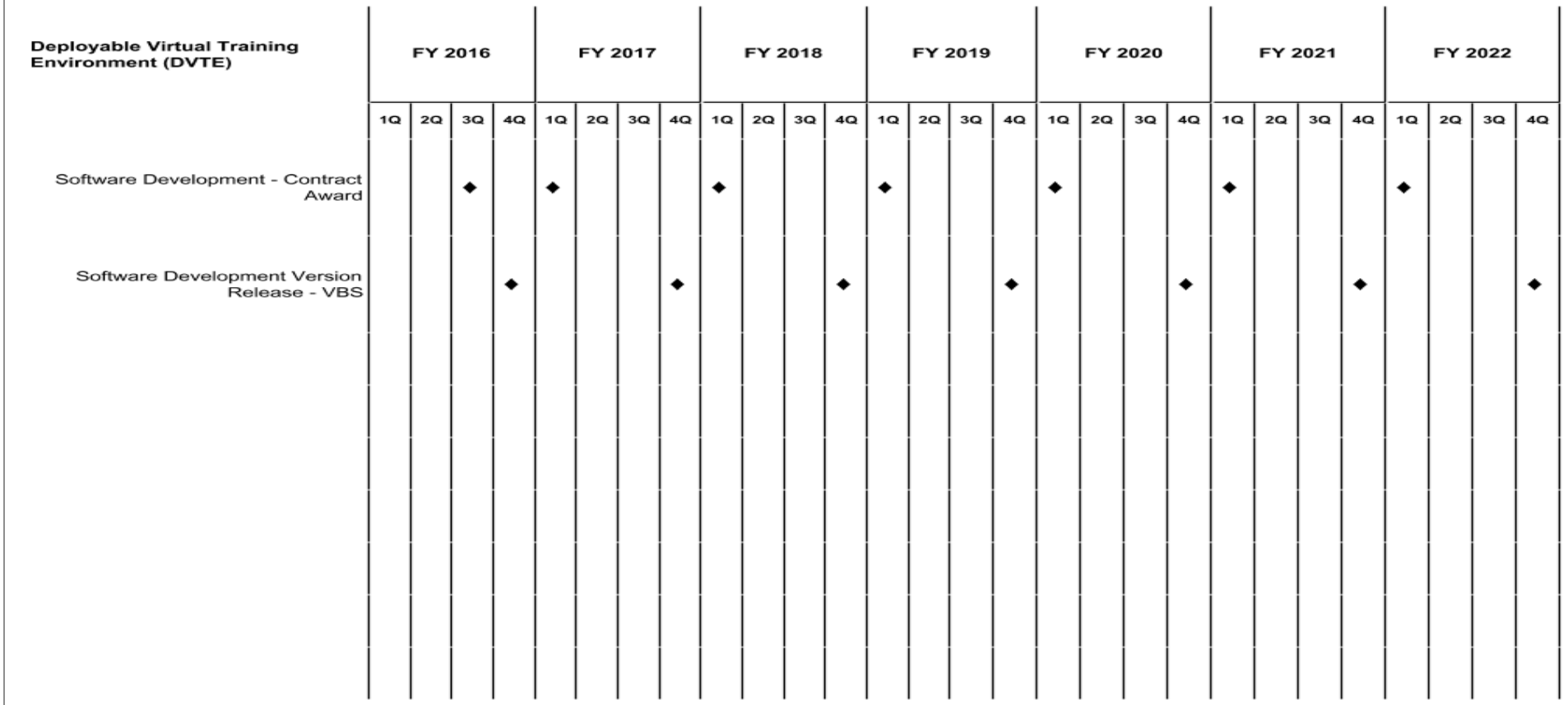

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy		Date: May 2017
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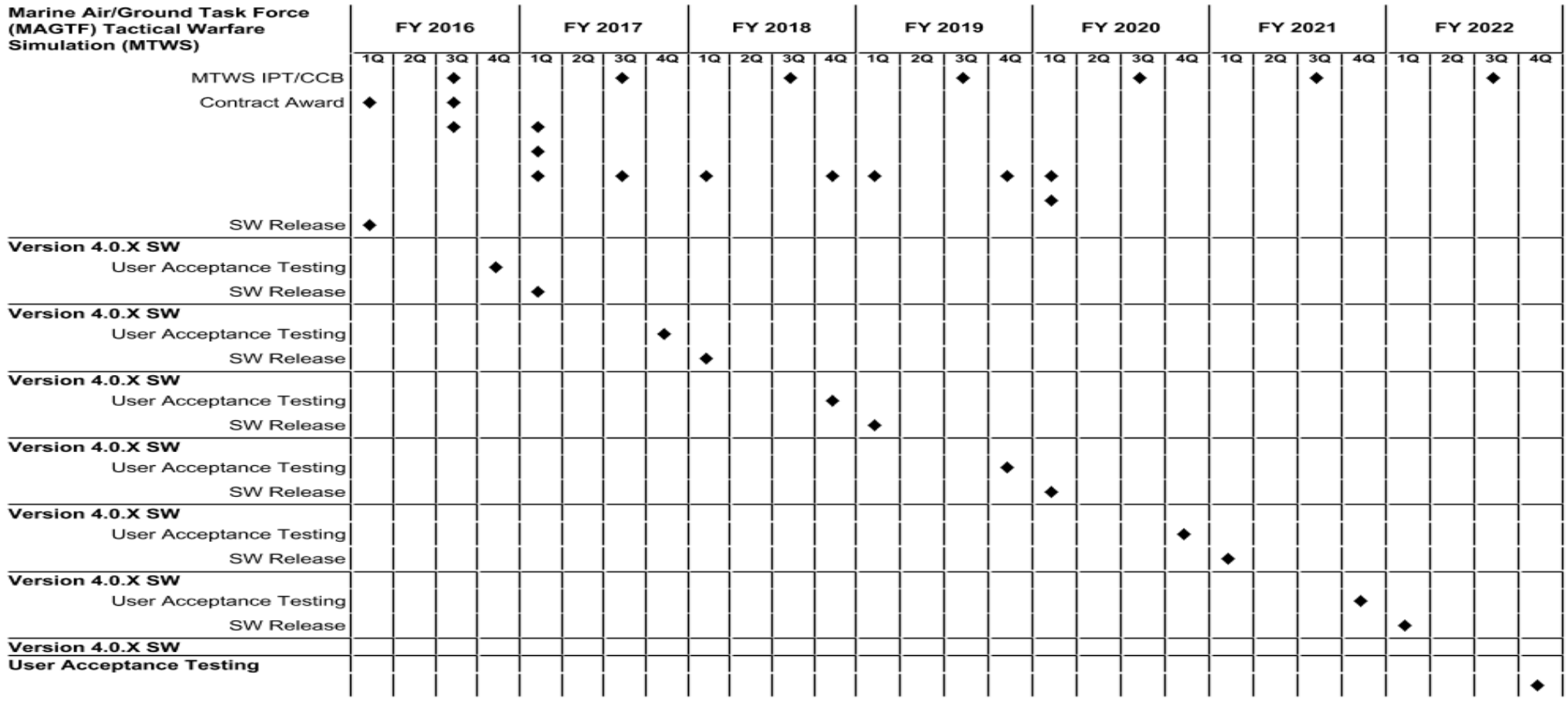

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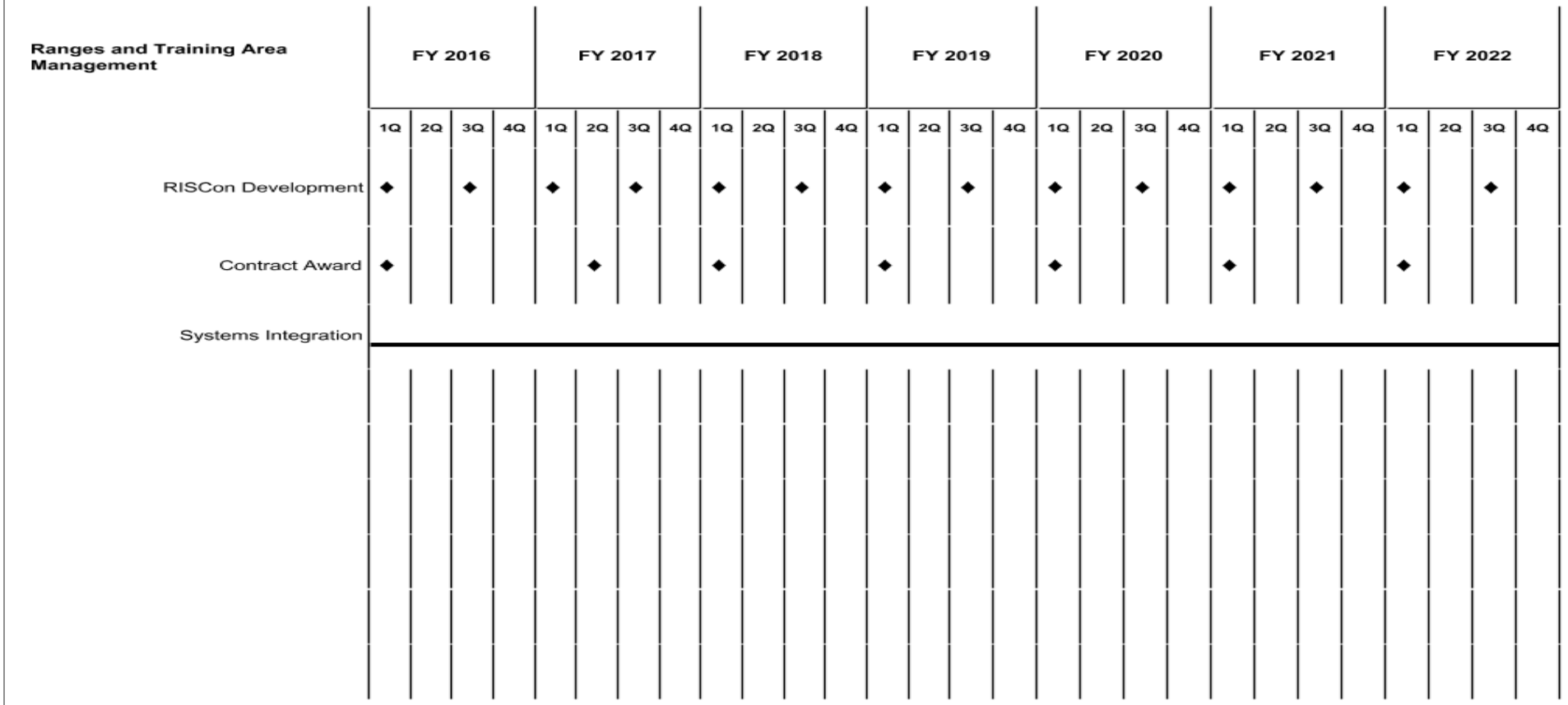
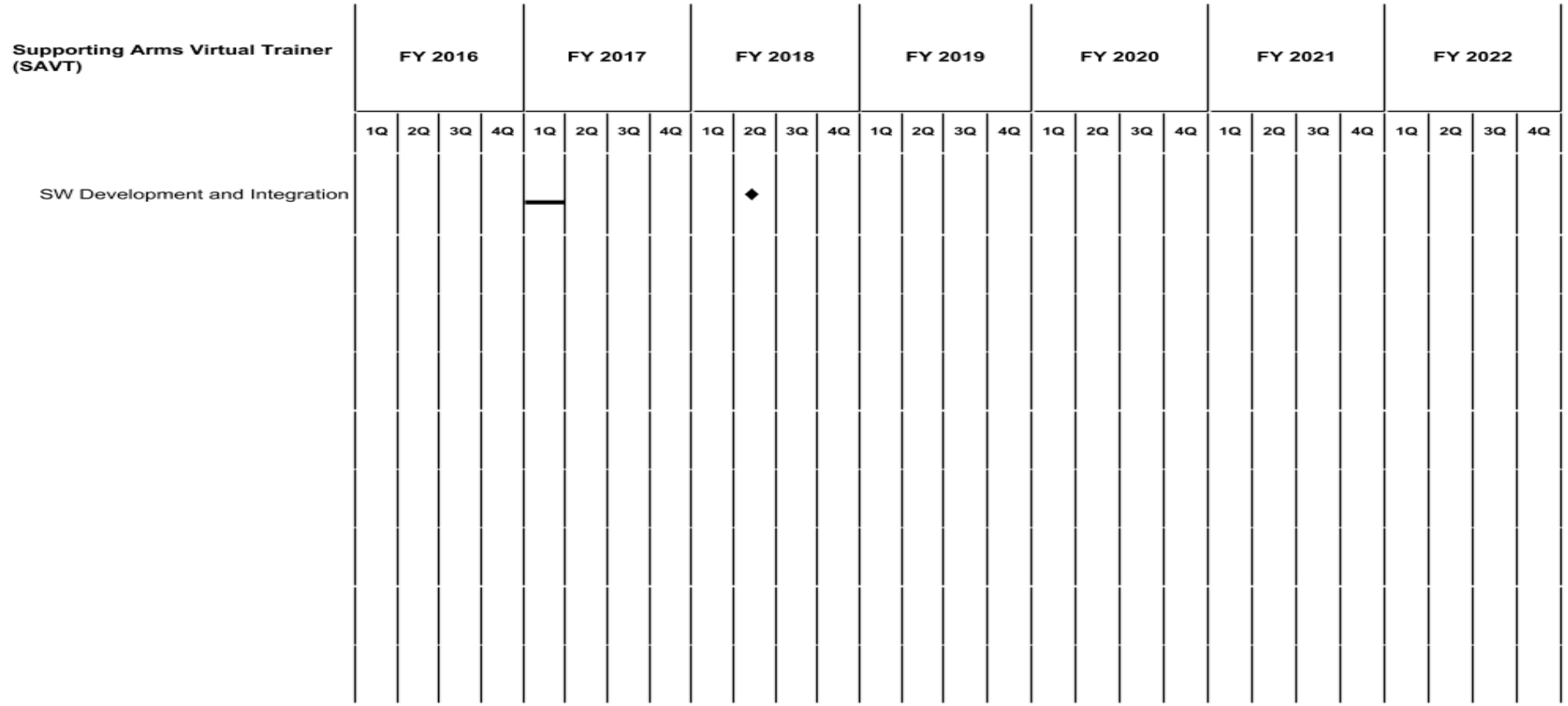
Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2315 / *Training Devices/Simulators*



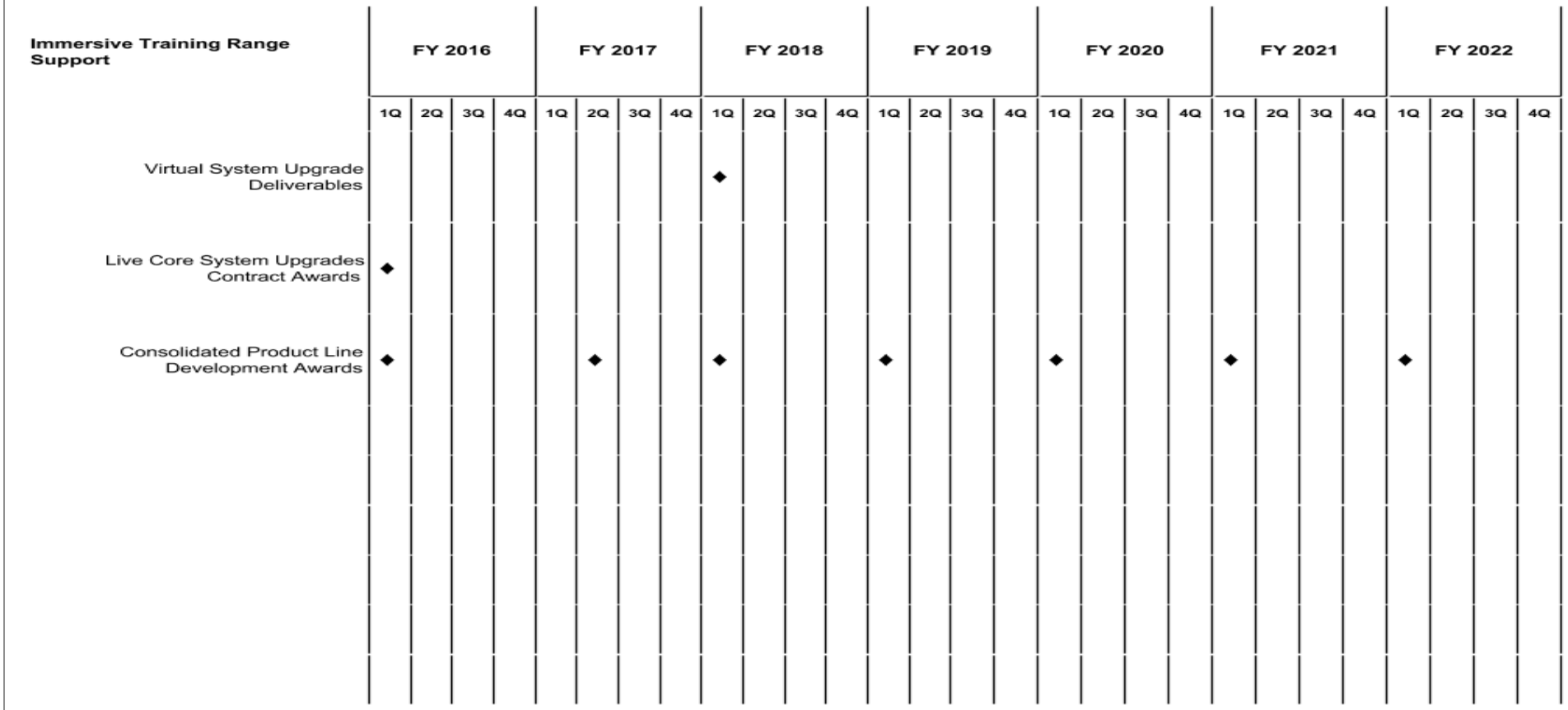
2018PB - 0206623M - 2315

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2315 / *Training Devices/Simulators*



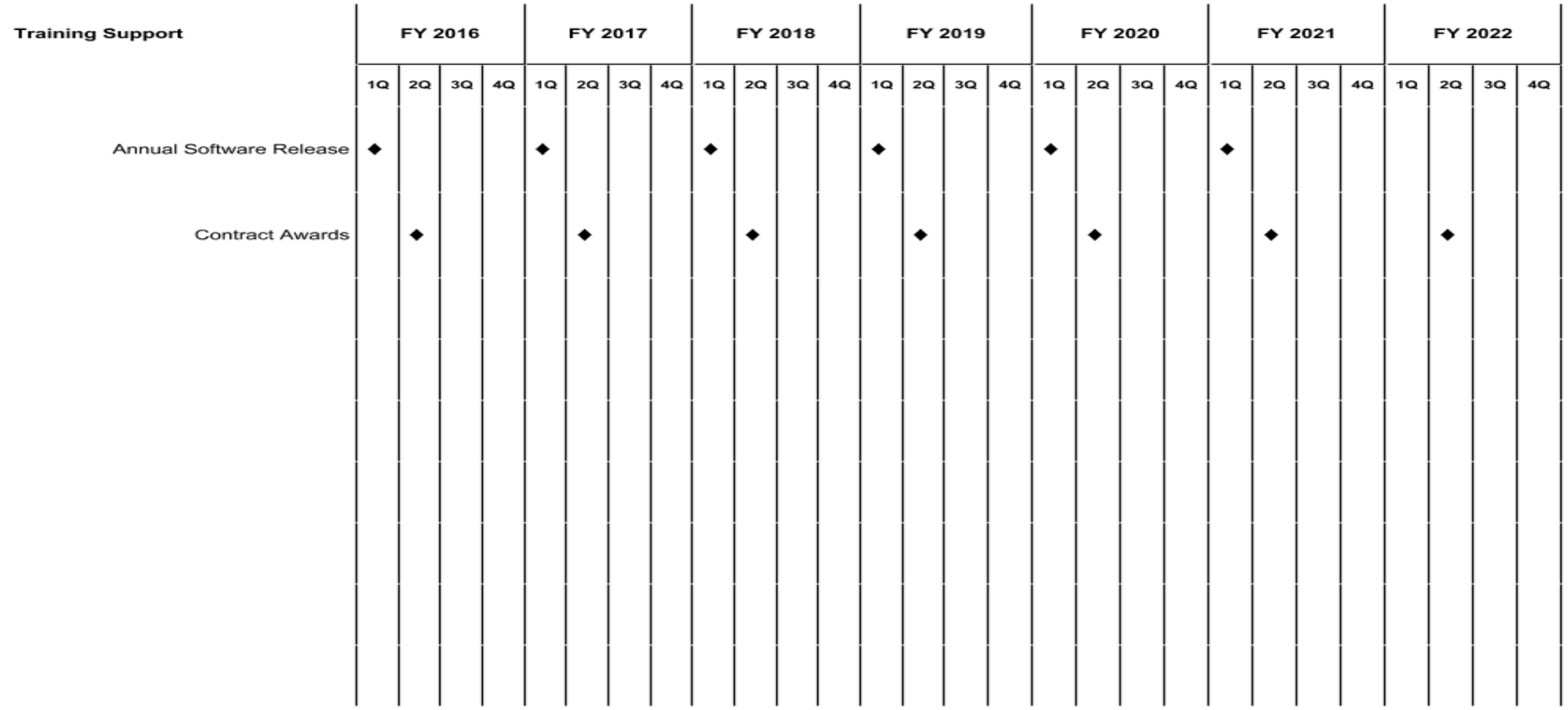
2018PB - 0206623M - 2315

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2315 / *Training Devices/Simulators*



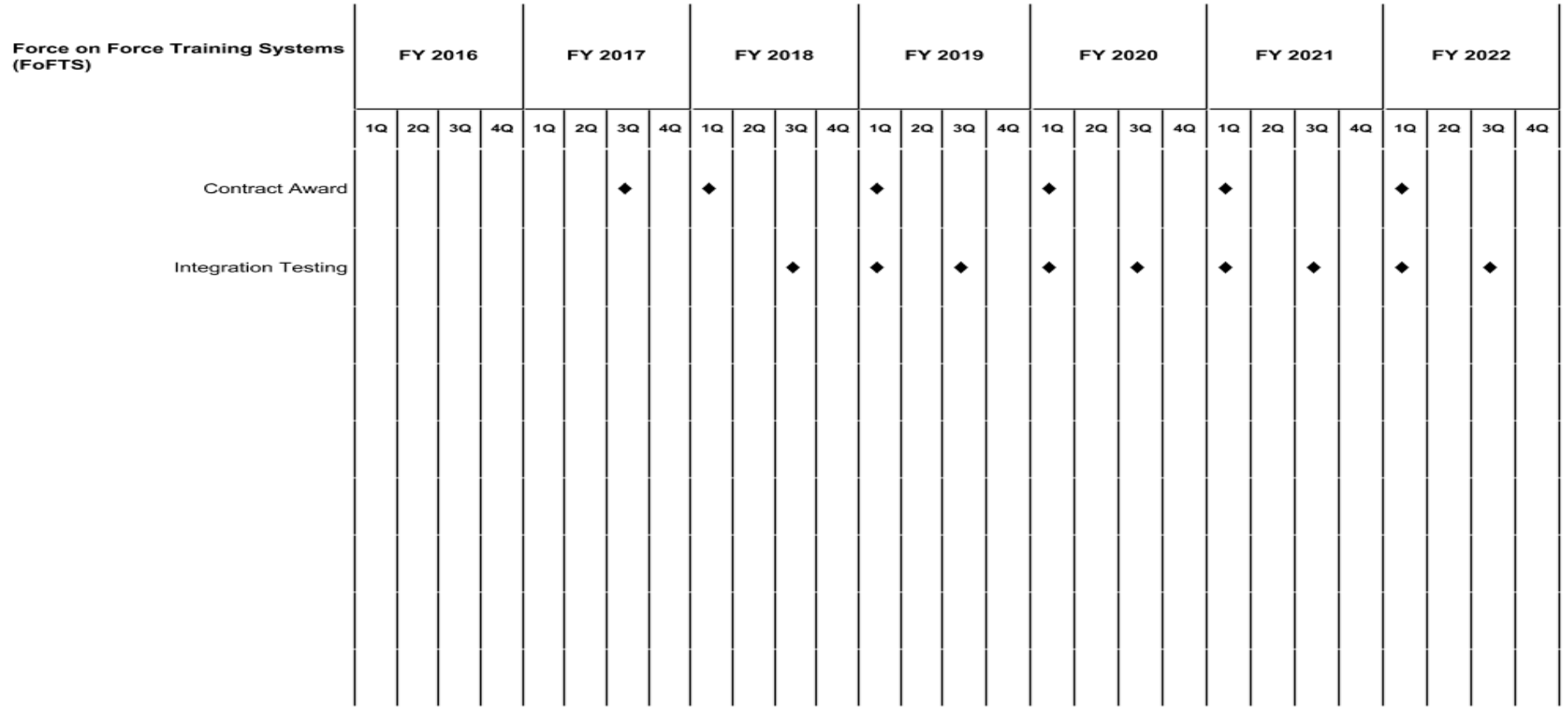
2018PB - 0206623M - 2315

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2315 / *Training Devices/Simulators*



2018PB - 0206623M - 2315

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2315 / *Training Devices/Simulators*



2018PB - 0206623M - 2315

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2315 / *Training Devices/Simulators*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Combined Arms Command & Control Training Upgrade System (CACCTUS)				
Program Contractor Support: Program Contractor Support	1	2016	4	2022
Govt Engineering Support: Govt Engineering Support	1	2016	4	2016
Software Development Reviews: Software Development Reviews	1	2016	1	2022
Development Contract Awards: FY16 Award 1	1	2016	1	2016
Development Contract Awards: FY16 Award 2	2	2016	2	2016
Development Contract Awards: FY16 Award 3	4	2016	4	2016
Development Contract Awards: FY17 Award 1	1	2017	1	2017
Development Contract Awards: FY17 Award 2 & 3	2	2017	2	2017
Development Contract Awards: FY17 Award 4	4	2017	4	2017
Version 4.0.X SW: FY18 Award 1	2	2018	2	2018
Version 4.0.X SW: FY18 Award 2	4	2018	4	2018
Version 4.0.X SW: FY19 Award 1	1	2019	1	2019
Version 4.0.X SW: FY19 Award 2	2	2019	2	2019
Version 4.0.X SW: FY20 Award 1	2	2020	2	2020
Version 4.0.X SW: FY20 Award 2	4	2020	4	2020
Version 4.0.X SW: FY21 Award 1	1	2021	1	2021
Version 4.0.X SW: FY21 Award 2	2	2021	2	2021
Version 4.0.X SW: FY21 Award 3	4	2021	4	2021
Version 4.0.X SW: FY22 Award 1	1	2022	1	2022
Version 4.0.X SW: FY22 Award 2	2	2022	2	2022
Version 4.0.X SW: FY22 Award 3	4	2022	4	2022

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2315 / *Training Devices/Simulators*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Version 4.0.X SW: Annual SW Release: Annual SW Release 2016	2	2016	2	2016
Version 4.0.X SW: Annual SW Release: Annual SW Release 2017	2	2017	2	2017
Version 4.0.X SW: Annual SW Release: Annual SW Release 2018	2	2018	2	2018
Version 4.0.X SW: Annual SW Release: Annual SW Release 2019	2	2019	2	2019
Version 4.0.X SW: Annual SW Release: Annual SW Release 2020	2	2020	2	2020
Version 4.0.X SW: Annual SW Release: Annual SW Release 2021	2	2021	2	2021
Version 4.0.X SW: Annual SW Release: Annual SW Release 2022	2	2022	2	2022
Version 4.0.X SW: Test and Validation, All Sites: Test and Validation 1, All Sites 2016	1	2016	4	2022
Version 4.0.X SW: Mid Year Release: Mid Year Release 2016	4	2016	4	2016
Version 4.0.X SW: Mid Year Release: Mid Year Release 2017	4	2017	4	2017
Version 4.0.X SW: Mid Year Release: Mid Year Release 2018	4	2018	4	2018
Version 4.0.X SW: Mid Year Release: Mid Year Release 2019	4	2019	4	2019
Version 4.0.X SW: Mid Year Release: Mid Year Release 2020	4	2020	4	2020
Version 4.0.X SW: Mid Year Release: Mid Year Release 2021	4	2021	4	2021
Version 4.0.X SW: Mid Year Release: Mid Year Release 2022	4	2022	4	2022
Version 4.0.X SW: Full Operating Capability (FOC) Combined: Full Operating Capability (FOC)/Full Development (FD)	2	2019	2	2019
Deployable Virtual Training Environment (DVTE)				
Software Development - Contract Award: Software Development - Contract Award 2016	3	2016	3	2016
Software Development - Contract Award: Software Development - Contract Award 2017	1	2017	1	2017
Software Development - Contract Award: Software Development - Contract Award 2018	1	2018	1	2018
Software Development - Contract Award: Software Development - Contract Award 2019	1	2019	1	2019

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2315 / *Training Devices/Simulators*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Software Development - Contract Award: Software Development - Contract Award 2020	1	2020	1	2020
Software Development - Contract Award: Software Development - Contract Award 2021	1	2021	1	2021
Software Development - Contract Award: Software Development - Contract Award 2022	1	2022	1	2022
Software Development Version Release - VBS: Software Development Version Release - VBS (2016)	4	2016	4	2016
Software Development Version Release - VBS: Software Development Version Release - VBS (2017)	4	2017	4	2017
Software Development Version Release - VBS: Software Development Version Release - VBS (2018)	4	2018	4	2018
Software Development Version Release - VBS: Software Development Version Release - VBS (2019)	4	2019	4	2019
Software Development Version Release - VBS: Software Development Version Release - VBS (2020)	4	2020	4	2020
Software Development Version Release - VBS: Software Development Version Release - VBS (2021)	4	2021	4	2021
Software Development Version Release - VBS: Software Development Version Release - VBS (2022)	4	2022	4	2022
Marine Air/Ground Task Force (MAGTF) Tactical Warfare Simulation (MTWS)				
MTWS IPT/CCB: MTWS IPT/CCB 2016	3	2016	3	2016
MTWS IPT/CCB: MTWS IPT/CCB 2017	3	2017	3	2017
MTWS IPT/CCB: MTWS IPT/CCB 2018	3	2018	3	2018
MTWS IPT/CCB: MTWS IPT/CCB 2019	3	2019	3	2019
MTWS IPT/CCB: MTWS IPT/CCB 2020	3	2020	3	2020
MTWS IPT/CCB: MTWS IPT/CCB 2021	3	2021	3	2021
MTWS IPT/CCB: MTWS IPT/CCB 2022	3	2022	3	2022

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2315 / *Training Devices/Simulators*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Contract Award: Contract Award New Development	1	2016	1	2016
Contract Award: TO 2 Award	3	2016	3	2016
Contract Award: TO 3 Award	3	2016	3	2016
Contract Award: TO 4 Award	1	2017	1	2017
Contract Award: TO 6 Award	1	2017	1	2017
Contract Award: TO 7 Award	1	2017	1	2017
Contract Award: TO 8 Award	3	2017	3	2017
Contract Award: TO 9 Award	1	2018	1	2018
Contract Award: Contract Award Reengineering	4	2018	4	2018
Contract Award: TO 10 Award	1	2019	1	2019
Contract Award: Contract Opt 1 Reengineering	4	2019	4	2019
Contract Award: TO 11 Award	1	2020	1	2020
Contract Award: Contract Opt 2 Reengineering	1	2020	1	2020
SW Release: SW Release	1	2016	1	2016
Version 4.0.X SW: User Acceptance Testing: User Acceptance Testing 2016	4	2016	4	2016
Version 4.0.X SW: SW Release: SW Release 2017	1	2017	1	2017
Version 4.0.X SW: User Acceptance Testing: User Acceptance Testing 2017	4	2017	4	2017
Version 4.0.X SW: SW Release: SW Release 2018	1	2018	1	2018
Version 4.0.X SW: User Acceptance Testing: User Acceptance Testing 2018	4	2018	4	2018
Version 4.0.X SW: SW Release: SW Release 2019	1	2019	1	2019
Version 4.0.X SW: User Acceptance Testing: User Acceptance Testing 2019	4	2019	4	2019
Version 4.0.X SW: SW Release: SW Release 2020	1	2020	1	2020
Version 4.0.X SW: User Acceptance Testing: User Acceptance Testing 2020	4	2020	4	2020
Version 4.0.X SW: SW Release: SW Release 2021	1	2021	1	2021
Version 4.0.X SW: User Acceptance Testing: User Acceptance Testing 2021	4	2021	4	2021

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2315 / *Training Devices/Simulators*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Version 4.0.X SW: SW Release: SW Release 2022	1	2022	1	2022
User Acceptance Testing: User Acceptance Testing 2022	4	2022	4	2022
Ranges and Training Area Management				
RISCon Development: RISCon SW Integration Testing 1st Qtr FY16	1	2016	1	2016
RISCon Development: RISCon SW Integration Testing 3rd Qtr FY16	3	2016	3	2016
RISCon Development: RISCon SW Integration Testing 1st Qtr FY17	1	2017	1	2017
RISCon Development: RISCon SW Integration Testing 3rd Qtr FY17	3	2017	3	2017
RISCon Development: RISCon SW Integration Testing 1st Qtr FY18	1	2018	1	2018
RISCon Development: RISCon SW Integration Testing 3rd Qtr FY18	3	2018	3	2018
RISCon Development: RISCon SW Integration Testing 1st Qtr FY19	1	2019	1	2019
RISCon Development: RISCon SW Integration Testing 3rd Qtr FY19	3	2019	3	2019
RISCon Development: RISCon SW Integration Testing 1st Qtr FY20	1	2020	1	2020
RISCon Development: RISCon SW Integration Testing 3rd Qtr FY20	3	2020	3	2020
RISCon Development: RISCon SW Integration Testing 1st Qtr FY21	1	2021	1	2021
RISCon Development: RISCon SW Integration Testing 3rd Qtr FY21	3	2021	3	2021
RISCon Development: RISCon SW Integration Testing 1st Qtr FY22	1	2022	1	2022
RISCon Development: RISCon SW Integration Testing 3rd Qtr FY22	3	2022	3	2022
Contract Award: Contract Award (2016)	1	2016	1	2016
Contract Award: Contract Award (2017)	2	2017	2	2017
Contract Award: Contract Award (2018)	1	2018	1	2018
Contract Award: Contract Award (2019)	1	2019	1	2019
Contract Award: Contract Award (2020)	1	2020	1	2020
Contract Award: Contract Award (2021)	1	2021	1	2021
Contract Award: Contract Award (2022)	1	2022	1	2022
Systems Integration: Systems Integration	1	2016	4	2022

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2315 / *Training Devices/Simulators*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Supporting Arms Virtual Trainer (SAVT)				
SW Development and Integration: FY18 Task Order Award	2	2018	2	2018
SW Development and Integration: Govt Engineering Support	1	2017	1	2017
Immersive Training Range Support				
Virtual System Upgrade Deliverables: Virtual System Upgrade Deliverables	1	2018	1	2018
Live Core System Upgrades Contract Awards: Live Core System Upgrades Contract Awards (2016)	1	2016	1	2016
Consolidated Product Line Development Awards: Consolidated Product Line Development (2016)	1	2016	1	2016
Consolidated Product Line Development Awards: Consolidated Product Line Development (2017)	2	2017	2	2017
Consolidated Product Line Development Awards: Consolidated Product Line Development (2018)	1	2018	1	2018
Consolidated Product Line Development Awards: Consolidated Product Line Development (2019)	1	2019	1	2019
Consolidated Product Line Development Awards: Consolidated Product Line Development (2020)	1	2020	1	2020
Consolidated Product Line Development Awards: Consolidated Product Line Development (2021)	1	2021	1	2021
Consolidated Product Line Development Awards: Consolidated Product Line Development (2022)	1	2022	1	2022
Training Support				
Annual Software Release: Version 3.5.3	1	2016	1	2016
Annual Software Release: Version 3.5.5	1	2017	1	2017
Annual Software Release: Version 3.5.7	1	2018	1	2018
Annual Software Release: Version 3.5.9	1	2019	1	2019
Annual Software Release: Version 3.5.11	1	2020	1	2020

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2315 / *Training Devices/Simulators*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Annual Software Release: Version 3.5.13	1	2021	1	2021
Contract Awards: FY16 Award	2	2016	2	2016
Contract Awards: FY17 Award	2	2017	2	2017
Contract Awards: FY18 Award	2	2018	2	2018
Contract Awards: FY19 Award	2	2019	2	2019
Contract Awards: FY20 Award	2	2020	2	2020
Contract Awards: FY21 Award	2	2021	2	2021
Contract Awards: FY22 Award	2	2022	2	2022
Force on Force Training Systems (FoFTS)				
Contract Award: FY17 Award	3	2017	3	2017
Contract Award: FY18 Award	1	2018	1	2018
Contract Award: FY19 Award	1	2019	1	2019
Contract Award: FY20 Award	1	2020	1	2020
Contract Award: FY21 Award	1	2021	1	2021
Contract Award: FY22 Award	1	2022	1	2022
Integration Testing: Integration Testing 3rd Qtr FY18	3	2018	3	2018
Integration Testing: Integration Testing 1st Qtr FY19	1	2019	1	2019
Integration Testing: Integration Testing 3rd Qtr FY19	3	2019	3	2019
Integration Testing: Integration Testing 1st Qtr FY20	1	2020	1	2020
Integration Testing: Integration Testing 3rd Qtr FY20	3	2020	3	2020
Integration Testing: Integration Testing 1st Qtr FY21	1	2021	1	2021
Integration Testing: Integration Testing 3rd Qtr FY21	3	2021	3	2021
Integration Testing: Integration Testing 1st Qtr FY22	1	2022	1	2022
Integration Testing: Integration Testing 3rd Qtr FY22	3	2022	3	2022

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy			Date: May 2017
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	Project (Number/Name) 2503 / *Initial Issue*	

COST ($ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
2503: *Initial Issue*	44.483	1.775	3.462	4.656	-	4.656	5.336	4.842	4.492	4.579	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

Load Bearing and Pack Systems now includes the Waterproof bag efforts previously included under Individual Warfighting Equipment.

A. Mission Description and Budget Item Justification

This funding provides research, development, test and evaluation on low cost items with an emphasis on Non-Developmental Items/Commercial-Off-the-Shelf (NDI/ COTS) available items. Much of the RDT&E is conducted in coordination/concert with other services and joint organizations, and in consideration of RDT&E efforts being pursued by the other Services. Items approved for procurement will transition into Operation and Maintenance Marine Corps accounts for Infantry Combat Equipment, Family of Field Medical Equipment, Family of Shelters, and Combat Field Feeding Systems. The benefits will be reduced logistics, less weight, improved combat effectiveness, better echelon I and II care for Marines, improved individual and unit protection, expeditionary feeding platforms, tactical mobility, etc. The employment of state of the art equipment will ensure Marines are equipped and supported with the best items that technology can offer.

The Infantry Combat Equipment portfolio of capabilities encompasses Marine Corps Uniforms, Cold Weather and Mountaineering, Load Bearing and Pack Systems, and Individual Warfighting Equipment research, development and testing of enhancements, upgrades and modifications to legacy systems and new developments. Funding for this capability area leverages other Services' and governmental partners' efforts to maximize returns on investment and promote coordination and cooperation for same or similar requirements and capabilities. The objective is to equip individual Marines with uniforms and combat equipment to maximize effectiveness in every environment across the full range of military operations.

The Family of Field Medical Equipment, Family of Shelters, and Combat Field Feeding System portfolio focus is to provide state of the art medical equipment (e.g. Authorized Medical Allowance List (AMAL)/Authorized Dental Allowance List (ADAL), Enroute Care, Mobile Medical Monitors, etc.), Family of Shelters (soft wall, different frames and fabrics, etc.), and Combat Field Feeding Systems (technology insertion for the Expeditionary Field Kitchen (EFK), Modernized Tray Ration Heating System. etc.).

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Marine Corps Uniforms (MCU)	1.114	0.556	0.590	0.000	0.590
Articles:	-	-	-	-	-
FY 2016 Accomplishments:					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2503 / *Initial Issue*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
- Continued research, development, testing and evaluation (RDT&E) to increase effectiveness of Flame Resistant Organizational Gear (FROG). Efforts include RDT&E on a Flame Resistant utility uniform which will be lifesaving and used for training. - Continued testing and evaluating Marine Corps Uniform Board (MCUB) and Commandant of the Marine Corps (CMC) Uniform initiatives for shade and female dress coat and skirt. - Continued research on tropical uniforms and development of affordable alternative to the Marine Corps Combat Utility Uniform (MCCUU). - Continued clothing and fabric improvement efforts leveraging advanced technologies in uniform durability, design, and footwear development. - Continued to support Marine clothing efforts, to include field and dress uniforms and certification of their associated accoutrements which includes badges, ribbons and devices. - Continued research, development and testing to enhance appearance and service life of Seabag issue, which consists of initial basic training clothing, footwear, and associated individual uniform items. - Continued research to reduce the load the Marines are required to transport by minimizing equipment. - Initiated and completed redesign of Frame Cover (Barracks Cover) used by Male and Female Marines. Previous effort was initiated as Male Dress Cap research, development, and testing. Emerging requirements incorporated the Male Dress Cap effort into larger overarching requirement for Frame Cover redesign to reduce duplication of effort.					
FY 2017 Plans: - Continue research, development, testing and evaluation (RDT&E) to increase effectiveness of Flame Resistant Organizational Gear (FROG). Efforts include RDT&E on a Flame Resistant utility uniform which will be lifesaving and used for training. - Continue testing and evaluation of emerging Marine Corps Uniform Board (MCUB), Commandant of the Marine Corps (CMC) uniform initiatives and female Dress Blue Coat (FDBC) and skirt. - Continue research and development of tropical uniforms, including footwear, and develop affordable alternatives. - Continue clothing and fabric improvement efforts leveraging advanced technologies in uniform durability, design, and footwear development. - Continue to support Marine clothing efforts, to include field and dress uniforms and certification of their associated accoutrements which includes badges, ribbons and devices. - Continue research, development and testing to enhance appearance and service life of Seabag issue, which consists of initial basic training clothing, footwear, and associated individual uniform items.					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2503 / *Initial Issue*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
- Continue research to reduce the load the Marines are required to transport by minimizing equipment. ***FY 2018 Base Plans:*** - Continue research, development, testing and evaluation (RDT&E) to increase effectiveness of Flame Resistant Organizational Gear (FROG). Efforts include RDT&E on a Flame Resistant utility uniform which will be lifesaving and used for training. - Continue testing and evaluation of emerging Marine Corps Uniform Board (MCUB) and Commandant of the Marine Corps (CMC) uniform initiatives. - Continue research and development of tropical uniforms, including footwear, and develop affordable alternatives. - Continue clothing and fabric improvement efforts leveraging advanced technologies in uniform durability, design, and footwear development. - Continue to support Marine clothing efforts, to include field and dress uniforms and certification of their associated accoutrements which includes badges, ribbons and devices. - Continue research, development and testing to enhance appearance and service life of Seabag issue, which consists of initial basic training clothing, footwear, and associated individual uniform items. - Continue research on reducing the load the Marines are required to transport by minimizing equipment. ***FY 2018 OCO Plans:*** N/A					
Title: Cold Weather and Mountaineering (CWM) ***Articles:*** ***Description:*** Increase in funding from FY17 to FY18 ($0.955M) supports the development efforts on the Extreme Cold Weather Boot, Intense Cold Weather Boot, ski systems, and all other components required for the cold weather environment that are in need of upgrade. ***FY 2016 Accomplishments:*** - Continued to conduct research and development of industry technology to further enhance existing equipment effectiveness while lightening the load of the individual Marine. - Continued to develop and field test ski systems and all components in order to further redefine stated requirements. - Continued a comparative analysis of sister services clothing items (cold weather warming layers) to leverage like items and technology, minimizing sustainment cost.	0.088 -	0.827 -	1.782 -	0.000 -	1.782 -

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2503 / *Initial Issue*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
- Continued modernization of existing suite of equipment to incorporate equipment technology advances which will drive the development of the Marine Assault Climbers Kit (MACK) to effectively and safely negotiate horizontal and vertical obstacles. - Continued Marine Corps Cold Weather Infantry Kit (MCCWIK) assessment and evaluation, including over the snow mobility in both skis and sleds. - Completed research, development and design modifications to the Marine Corps sleep system to reduce load, increase insulation values, and maximize comfort levels. - Completed Validation of a cold weather boot that would function as a ski boot and boot for non-ski borne Marines.					
FY 2017 Plans: - Continue to conduct research and development of industry technology to further enhance existing equipment effectiveness while lightening the load of the individual Marine. - Continue to develop and field test ski systems and all components, to include boots and clothing, in order to further redefine stated requirements. Intent is to leverage NATO NSNs in order to procure ski systems in FY 2019. - Continue the comparative analysis of sister services clothing items, including cold weather warming layers and develop a conclusion of liked items and technology in order to minimize sustainment cost. - Continue modernization of existing suite of equipment to incorporate equipment technology advances which will drive the development of the Marine Assault Climbers Kit (MACK) to effectively and safely negotiate horizontal and vertical obstacles. - Continue Marine Corps Cold Weather Infantry Kit (MCCWIK) assessment and evaluation. - Initiate evaluation of Extreme Cold Weather boots and Intense Cold Weather boots.					
FY 2018 Base Plans: - Continue to conduct research and development of industry technology to further enhance existing equipment effectiveness while lightening the load of the individual Marine. - Continue validation of ski systems and all components to include boots and clothing. - Continue the comparative analysis of sister services clothing items to minimize sustainment cost. - Continue modernization of existing suite of equipment to incorporate technology advances which will drive the development of the Marine Assault Climbers Kit (MACK) to effectively and safely negotiate horizontal and vertical obstacles. - Continue Marine Corps Cold Weather Infantry Kit (MCCWIK) evaluation to assess change proposals.					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2503 / *Initial Issue*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
- Continue evaluation of Extreme Cold Weather boots and Intense Cold Weather boots. ***FY 2018 OCO Plans:*** N/A					
Title: Load Bearing and Pack Systems (LBPS) ***Articles:*** ***FY 2016 Accomplishments:*** - Initiated exploration of potential avenues for product improvements and upgrades for LBPS by leveraging technological advancements of industry. - Initiated evaluations to implement minor product improvements to existing systems such as the USMC Pack System. ***FY 2017 Plans:*** - Continue exploration of potential avenues for product improvements and upgrades for LBPS by leveraging technological advancements of industry; lighten load and increase mobility of effectiveness. - Continue evaluations to implement minor product improvements to existing USMC systems. ***FY 2018 Base Plans:*** - Continue to explore potential avenues for product improvements and upgrades for LBPS by leveraging technological advancements of industry; lighten load and increase mobility of effectiveness. - Continue evaluations to implement minor product improvements to existing USMC systems. ***FY 2018 OCO Plans:*** N/A	0.403 -	0.242 -	0.310 -	0.000 -	0.310 -
Title: Individual Warfighting Equipment (IWE) ***Articles:*** ***FY 2016 Accomplishments:*** - Continued cataloging for future sustainment of Mechanical Breachers Kit (MBK) through Defense Logistics Agency (DLA). Current efforts for previously included Waterproof Bags for USMC Pack are now supported by Load Bearing Pack Systems (LBPS). - Continued modernization of existing projects by leveraging the technological advances of industry. ***FY 2017 Plans:***	0.000 -	0.217 -	0.195 -	0.000 -	0.195 -

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
- Continue cataloging for future sustainment of Mechanical Breachers Kit (MBK) through Defense Logistics Agency (DLA). - Continue modernization of existing projects by leveraging the technological advances of industry. ***FY 2018 Base Plans:*** - Continue cataloging for future sustainment of Mechanical Breachers Kit (MBK) through Defense Logistics Agency (DLA). - Continue modernization of existing projects by leveraging the technological advances of industry. ***FY 2018 OCO Plans:*** N/A					
Title: *Family of Field Medical Equipment (FFME)	0.000	1.386	1.245	0.000	1.245
Articles:	-	-	-	-	-
FY 2016 Accomplishments: N/A ***FY 2017 Plans:*** - Continue to test COTS/NDI medical equipment items for the ERCS (En-Route Care System), FRSS (Forward Resuscitative Surgical Suite)and STP (Shock Trauma Platoon) to determine future viability in an operational environment. - Continue testing of medical equipment items to evaluate their energy efficiency, functionality and ability to improve the quality of healthcare provided to the warfighter and reduce the logistics footprint of USMC medical equipment. - Continue testing for possible application technology for insertion. - Continue collaborative testing with Army for patient movement research. - Continue collaborative testing efforts with Army for Autonomous Critical Care System (ACCS). - Initiate collaborative testing efforts with Army for Blast Load Assessment: Sense and Test (BLAST) to determine viability in a operational environment in support of reduction of Traumatic Brain Injury (TBI) effects. ***FY 2018 Base Plans:*** - Continue to test COTS/NDI medical equipment items for the ERCS, FRSS and STP to determine future viability in an operation environment.					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2503 / *Initial Issue*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
- Continue testing of medical equipment items to evaluate their energy efficiency, functionality and ability to improve the quality of healthcare provided to the warfighter and reduce the logistics footprint of USMC medical equipment. - Continue testing for possible application technology for insertion. - Continue collaborative testing with Army for patient movement research. - Continue collaborative testing efforts with Army for ACCS. - Continue collaborative testing efforts with Army for BLAST to determine viability in a operational environment in support of reduction of Traumatic Brain Injury (TBI) effects. ***FY 2018 OCO Plans:*** N/A					
Title: *Family of Shelters and Shelter Equipment (FSSE) ***Articles:*** ***Description:*** The increase of $0.345M from FY17 to FY18 supports the continuation of testing and development of the Single Source Heater to improve energy efficiency and reduce the overall logistics burden of the USMC Soft Wall Shelters. ***FY 2016 Accomplishments:*** - Continued rigid wall composite shelter prototype development. - Initiated development of energy efficient Engineer Change Proposals (ECPs) for Family of Shelters and Shelter Equipment (FSSE). ***FY 2017 Plans:*** - Continue development of energy efficient Engineer Change Proposals (ECPs) for Family of Shelters and Shelter Equipment (FSSE). - Continue development of the Single Source Heater (SSH) (formerly identified as the Next Generation Heater) for soft wall shelters. Initiated in FY15. - Complete rigid wall composite shelter prototype development. ***FY 2018 Base Plans:*** - Continue development of energy efficient Engineer Change Proposals (ECPS) for Family of Shelters and Shelter Equipment (FSSE).	0.170 -	0.130 -	0.475 -	0.000 -	0.475 -

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2503 / *Initial Issue*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
- Continue development of the Single Source Heater (SSH) (formerly identified as the Next Generation Heater) for soft wall shelters. ***FY 2018 OCO Plans:*** N/A					
Title: *Family of Combat Field Feeding (CFFS) ***Articles:***	0.000 -	0.104 -	0.059 -	0.000 -	0.059 -
FY 2016 Accomplishments: N/A ***FY 2017 Plans:*** - Continue testing of technological improvements for use in CFFS that will reduce the overall logistics burden. - Initiate testing of phase III Small Business Innovative Research (SBIR) for alternate heating sources for Combat Field Feeding heating rations. ***FY 2018 Base Plans:*** - Continue testing of technological improvements for use in CFFS that will reduce the overall logistics burden. - Continue testing of phase III SBIR for alternate heating sources for Combat Field Feeding heating rations. ***FY 2018 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	1.775	3.462	4.656	0.000	4.656

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Cold Weather and Mountaineering, Load Bearing and Pack Systems, Individual Warfighting Equipment, Marine Corps Uniforms: Items utilize various acquisition strategies. These programs leverage heavily on current developments and technology in commercial industry. As a result, the government's R&D phase is relatively short. Contracting is performed by either Marine Corps Systems Command Contracting Directorate, the Naval Research Laboratory or the U.S. Army Natick Soldier Research, Development and Engineering Center via Indefinite Delivery/Indefinite Quantity (ID/IQ) contracts. ID/IQ contracts are used to decrease the government risk, allow maximum contract flexibility and capitalize on the savings realized by utilizing Economic Order (EO) Quantities.

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2503 / *Initial Issue*

Family of Shelters: The Shelter acquisition strategy is to modify NDI to further meet the requirements of the Marine Corps, to support development of multi-service items through inter-service agreements and to adopt COTS items.

Family of Field Medical Equipment: These programs leverage heavily on current development and technology in the commercial medical industry. The field medical acquisition strategy is to modify NDI and adopt COTS items.

Combat Field Feeding Systems: This program utilized various acquisition strategies and leverages heavily on current developments and technology in commercial industry and other Service field feeding systems. As a result, the government's RDTE phase is relatively short. Contracting is performed by either Marine Corps Systems Command Contracting Directorate or the U.S. Army Natick Soldier Research, Development and Engineering Center (DoD Executive Agent for Field Feeding) via ID/IQ contracts. ID/IQ contracts are used to decrease the government risk, allow maximum contract flexibility and capitalize on the savings realized by utilizing EO Quantities.

E. Performance Metrics

N/A

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy			Date: May 2017
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	Project (Number/Name) 2513 / *Body Armor*	

COST ($ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
2513: *Body Armor*	45.501	2.863	2.746	4.380	-	4.380	5.015	4.900	4.823	4.919	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Ballistic Protection Systems (BPS) provides the most technologically advanced protection at the lightest weight possible. It provides the critical ballistic protective systems that save lives, reduce the severity of combat injuries, and increase combat effectiveness by keeping more Marines in the fight. Major BPS programs include: Plate Carrier (PC); Enhanced Small Arms Protective Inserts (ESAPI); Light Weight Helmet (LWH); Enhanced Combat Helmet (ECH); Improved Ballistic Eyewear (IBE); and hearing protection. Key Components of all of the BPS programs are adapting ballistic protective systems to the constantly changing threat environment and leveraging emerging technologies to lighten the load and increase the mobility of each Marine.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Ballistic Protection Systems	2.863	2.746	4.380	0.000	4.380
Articles:	-	-	-	-	-
Description: RDT&E funding increases ($1.634M) from FY17 to FY18 to develop, research, and test emerging technology and advancements in products and materials related to protective equipment.					
FY 2016 Accomplishments: - Continued research with industry partners towards understanding and developing the future technology associated with next generation Personal Protective Equipment (PPE) (i.e. helmets, body armor, eyewear, and hearing protection). - Continued to research active and passive hearing protection products that provide a sense of presence and protection against transient impact noise and blocks and/or reflects harmful blast shock wave in the ear canal. - Continued testing for the next generation of eyewear, specifically the capability to adjust rapidly in varying light conditions in order to gap the need for rapid situational awareness in different light environments. - Continued testing on the efficacy of plates as they age over time in order to obtain a clear understanding of the need to consistently sustain and maintain current plates, as well as, their future ballistic capability. - Completed ECH Characterization Testing.					
FY 2017 Plans: - Continue research with industry partners towards understanding and developing the future technology associated with next generation PPE (i.e. helmets, body armor, eyewear, and hearing protection).					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2513 / *Body Armor*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
- Continue to research active and passive hearing protection products that provide a sense of presence and protection against transient impact noise and blocks and/or reflects harmful blast shock wave in the ear canal. - Continue testing for the next generation of eyewear, specifically the capability to adjust rapidly in varying light conditions in order to gap the need for rapid situational awareness in different light environments. - Continue testing on the efficacy of plates as they age over time in order to obtain a clear understanding of the need to consistently sustain and maintain current plates, as well as, their future ballistic capability. ***FY 2018 Base Plans:*** - Continue research with industry partners towards understanding and developing the future technology associated with next generation PPE (i.e. helmets, body armor, eyewear, and hearing protection). - Continue to research active and passive hearing protection products that provide a sense of presence and protection against transient impact noise and blocks and/or reflects harmful blast shock wave in the ear canal. - Continue testing for the next generation of eyewear, specifically the capability to adjust rapidly in varying light conditions in order to gap the need for rapid situational awareness in different light environments. - Complete testing on the efficacy of plates as they age over time in order to obtain a clear understanding of the need to consistently sustain and maintain current plates, as well as, their future ballistic capability. ***FY 2018 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	2.863	2.746	4.380	0.000	4.380

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Marine Corps Ballistic Protection Systems (BPS) research, development, testing & evaluation activities include seeking new developments in ballistic technology that feature reductions in weight, improvements in ballistic performance, enhanced operational effectiveness through improved product designs and the application of new material technologies to reduce total ownership costs by improving the expected service life of fielded systems. In order to accomplish these goals, Product Manager-Infantry Combat Equipment uses a broad array of government and contractor performers to achieve the desired end state. This includes partnerships with government entities and research and development contracts and partnership intermediaries where applicable. The Marine Corps also leverages advancements in industry capabilities to rapidly field non-developmental and commercially available off the shelf armor solutions. Performance is confirmed by characterizing ballistic performance and data collected during user evaluations.

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2513 / *Body Armor*

E. Performance Metrics

N/A

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy			Date: May 2017
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	Project (Number/Name) 2928 / *Exp Indirect Fire Gen Supt Wpn Sys*	

COST ($ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
2928: *Exp Indirect Fire Gen Supt Wpn Sys*	11.464	1.316	1.054	2.990	-	2.990	2.632	2.161	2.207	2.249	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

High Mobility Artillery Rocket Systems (HIMARS) is a C-130 transportable, wheeled, indirect fire, rocket/missile system capable of firing all rockets and missiles in the current and future Multiple Launch Rocket System (MLRS) Family of Munitions (MFOM). The system includes one launcher, two Re-Supply Systems, and the MFOM. HIMARS will provide the Marine Air-Ground Task Force (MAGTF)with 24 hour ground-based, responsive General Support/General Support Reinforcing (GS/GSR) indirect fires which accurately engage targets at long range (60+km), with high volumes of lethal fire under all weather conditions throughout all phases of combat operations ashore, to include irregular warfare and distributed operations. HIMARS is a significant improvement over previously fielded ground fire support systems. During a 24 hour period, the system is expected to conduct multiple moves and multiple fire missions. Guided Multiple Launch Rocket System (GMLRS) is the primary munition for USMC units fielded with the HIMARS. GMLRS provides medium, and long range precision and area fires to destroy and/or suppress threat forces. GMLRS integrates GPS guidance to achieve accuracy, requiring fewer rockets to defeat targets, and thus reduces the logistics burden.

HIMARS is a significant improvement over previously fielded ground fire support systems. During a 24 hour period, the system is expected to conduct multiple moves and multiple fire missions. Guided Multiple Launch Rocket System (GMLRS) is the primary munition for units fielded with the HIMARS. GMLRS provides close, medium, and long range precision and area fires to destroy, suppress, and shape threat forces and protect friendly forces against cannon, mortar, rocket and missile artillery, light material and armor, personnel, command and control, and air defense surface targets. GMLRS integrates guidance and control packages and an improved rocket motor achieving greater range and precision accuracy, requiring fewer rockets to defeat targets, thereby reducing the logistics burden. The GMLRS integrates a multi-mode fuse and high explosive warhead making it an all-weather, precision strike rocket. The three GMLRS variants are GMLRS with Dual Purpose Improved Conventional Munitions (DPICM), GMLRS Unitary (U), and GMLRS Alternative Warhead (AW). GMLRS U expands the MLRS target set into urban and complex environments by adding point, proximity, and delay fusing modes. GMLRS U have been fired in support of Overseas Contingency Operations (OCO), and has demonstrated high effectiveness and low collateral damage while supporting Marines in combat. GMLRS AW was developed to replace GMLRS-DPICM and meet the requirements outlined in a 25 June 2008 cluster munitions policy.

HIMARS satisfies the Marine Corps requirement for an indirect fire system that is responsive, maneuverable, and is capable of engaging targets at long range. The Reduced Range Practice Rocket (RRPR) includes training devices for tactical training, classroom training and handling exercises.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: HIMARS Expeditionary & Naval Integration Capabilities	1.316	1.054	2.990	0.000	2.990
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2928 / *Exp Indirect Fire Gen Supt Wpn Sys*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Description: NOTE: The increase of $1.936M from FY17 to FY18 is due to the initiation of the HIMARS At Sea capability. This capability will allow a HIMARS launcher to be fired from a ship. ***FY 2016 Accomplishments:*** -Continued the Marine Corps study of the capability to employ HIMARS from distributed locations and naval platforms, or surface connectors to support distributed maneuvers. -Continued development of long range precision fires capabilities for HIMARS from austere and expeditionary bases. ***FY 2017 Plans:*** -Integrate and test new radios that meet new NSA encryption standards. ***FY 2018 Base Plans:*** -Complete expeditionary radio development. -Initiate development of HIMARS At Sea capability, -Moving Target -Fire from Ship ***FY 2018 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	1.316	1.054	2.990	0.000	2.990

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• PMC/BLI 221200: *High Mobility Artillery Rocket System (HIMARS)*	16.285	53.015	59.943	5.360	65.303	40.184	48.020	211.446	380.509	Continuing	Continuing

Remarks

D. Acquisition Strategy

USMC HIMARS is procuring the Army rocket launcher, the current/future Multiple Launch Rocket System Family of Munitions (MFOM) and a Medium Tactical Vehicle Replacement (MTVR) based Resupply System (truck(s) with associated trailer(s)). The Marine Corps launcher and ammo requirements closely match U.S. Army requirements. The U.S. Army HIMARS program received increased funding and is now an Acquisition Category (ACAT) IC level program. Marine Corps Resupply System requirements are unique. Accordingly, the Marine Corps is an integrator and must ensure the required warfighting capability is fielded to the Marine Corps

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2928 / *Exp Indirect Fire Gen Supt Wpn Sys*

operating forces. The USMC has aligned funds to reflect an emphasis on not only hardware development, but also the integration of these principle end items while providing associated evaluation and oversight, and the development of associated rocket munitions in conjunction with the Army. Additionally, the Marine Corps program is establishing the training and support methodologies that will result in associated skill sets required within the Marine Corps. The Marine Corps strategy is incorporating acquisition and capability upgrades to both the systems and rocket munitions. These improvements parallel the U.S. Army's acquisition strategy.

E. Performance Metrics

Milestone Reviews

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy			Date: May 2017
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	Project (Number/Name) 3098 / *Fire Support System*	

COST ($ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
3098: *Fire Support System*	138.392	13.391	5.242	6.145	-	6.145	5.871	7.606	7.727	5.842	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project develops Joint and Marine Corps unique improvements to artillery fire support technology that supports the artillery triad of fires and fire support equipment. These initiatives include but are not limited to the following: the Expeditionary Fire Support System (EFSS), munitions development & testing (to Precision Extended Range Munition), as well as testing and development of the Family of Artillery Munitions (FAM), Common Laser Ranger Finder (CLRF) integrated capability, and the Modeled Meteorological Information Manager (MMIM).

EFSS is an all-weather, ground based indirect fire system designed to support the vertical assault element of the Ship-To-Objective Maneuver (STOM) force. The EFSS is defined as a Launcher, Mobility Platform (prime mover), Ammunition, Ammunition Supply Vehicle, and Technical Fire Direction and Control equipment necessary for orienting weapons to an azimuth of fire. EFSS supports irregular warfare and distributed operations. FY17 will complete qualification.

FAM funding is used to develop and mature artillery munitions for the Marine Corps triad of fire and includes conducting safety analysis and ship compatibility studies.

The Modeled Meteorological Information Manager (MMIM) is the primary artillery meteorological capability at the artillery battalion and regiment providing the ability to create, receive, manage, and transmit near real time gridded meteorological information supporting artillery and target acquisition systems.

The Fire Support Mod Line (FSML) is a set of Marine Corps efforts to address critical operational and logistics deficiencies in existing, fielded fire support/weapons systems and equipment. FSML provides technical refresh and development of target acquisition, artillery survey, meteorological systems, weapon systems, and fire direction control. Funding is used to ensure Clinger Cohen Act (CCA) and Information Assurance (IA) requirements are met. Provides execution of product improvements/modifications, and upgrades to system hardware and software for the Ground Counter Fire Sensor (GCFS), Marine Artillery Survey Set (MASS), Modeled Meteorological Information Manager (MMIM), Global Positioning System Survey (GPS-S) and the Improved Position Azimuth Determining System (IPADS), Lightweight Target Designator (LTD), the Joint Terminal Attack Controller-Laser Target Designator (JTAC-LTD), and the Common Laser Range Finder (CLRF). Funding is also used for upgrades, engineering change proposals (ECPs), and modifications for guided munitions and fire control systems which fall within Fire Support Systems for the Marine Corps.

The Family of Internally Transportable Vehicles (FITV) are light weight and internally transportable in the V-22, CH-53D & CH53E helos. The FITV provide deployed Marine Air-Ground Task Force (MAGTF) and Marine Expeditionary Unit (Special Operations Capable) (MEU (SOC)) with vehicles that are internally transportable in selected rotary and fixed wing aircraft. The FITV are expeditionary vehicles supporting over-the-horizon amphibious operations, irregular warfare and enhanced company operations. It is then fielded to Reconnaissance, Marine Corps Forces Special Operations Command (MARSOC), and artillery batteries as part of the Expeditionary Fire Support System (EFSS). The FITV also provide Special Operations Forces (SOF) with platforms to support their primary and secondary missions. Speed, maneuverability, and the use of cover and concealment are the crew's primary means of survival. In FY20 the Marine Corps will establish the Internally

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
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Transportable Vehicle Replacement (ITV-R) initiative. The ITV-R will replace the current Family of Internally Transportable Vehicles (FITV) and Utility Task Vehicle (UTV). Research, testing and developmental efforts will begin in FY19 for the ITV-R.

Conventional Ground Ammunition is a project that identifies and develops Insensitive Munitions (IM) Technologies to address IM shortfalls in new Marine Corps development or improvements to legacy Conventional Ground Ammunition to meet OSD mandated IM compliance requirements. These IM Technology investments directly support the development of the bi-annual Marine Corps Insensitive Munitions Strategic Plan (IMSP) to address the identified IM technology needs of the Marine Corps.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Modeled Meteorological Information Manager (MMIM)	0.823	0.242	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: The Modeled Meteorological Information Manager (MMIM) is the primary artillery meteorological capability at the artillery battalion and regiment providing the ability to create, receive, manage, and transmit near real time gridded meteorological information supporting artillery and target acquisition systems significantly enhancing the accuracy of meteorological information. NOTE: Decrease of $0.242M from FY17 to FY18 is due to realignment of MMIM to Fire Support Mods (FSM) beginning in FY18. ***FY 2016 Accomplishments:*** - Initiated research and technical support efforts to enhance communication of meteorological data that will support the production of computer meteorological messages for use with Advanced Field Artillery Tactical Data System (AFATDS) to support battalion artillery operations. ***FY 2017 Plans:*** - Complete testing of MMIM forecast capability. ***FY 2018 Base Plans:*** - Shift funding and capability from Modeled Meteorological Manager (MMIM) to Fire Support Mods (FSM) for lifecycle sustainment. ***FY 2018 OCO Plans:*** N/A					
Title: Expeditionary Fire Support Systems (EFSS)	10.271	2.868	2.293	0.000	2.293
Articles:	-	-	-	-	-

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Description: EFSS is an all-weather, ground based indirect fire system designed to support the vertical assault element of the Ship-To-Objective Maneuver (STOM) force. EFSS is defined as a Launcher, Mobility Platform (prime mover), Ammunition, Ammunition Supply Vehicle, and Technical Fire Direction and control equipment necessary for orienting weapons to an azimuth of fire. EFSS supports irregular warfare and distributed operations. NOTE: The decrease of $0.566M from FY17 to FY18 is due to the completion of Precision Extended Range Munition (PERM) round development and entering fielding. FY17 will complete qualification. ***FY 2016 Accomplishments:*** -Initiated the development of Low Rate Initial Production (LRIP) test assets that will be destroyed during test. -Initiated the development of Tabular Firing Tables, Centaur and Advanced Field Artillery Tactical Data System (AFATDS) updates and final Gunner Display Unit - Marine (GDU-M) software development, all for use in support of PERM Type Qualification Testing (TQT) and LRIP testing. ***FY 2017 Plans:*** -Complete PERM qualification testing. -Continue tabular Firing Table development for PERM. ***FY 2018 Base Plans:*** - Continue development of the EFSS fire control system for PERM. Incorporating PERM upgrades and Miniature Mission Setter (MMS) software development. ***FY 2018 OCO Plans:*** N/A					
Title: Fire Support Mods (FSM)	1.197	1.099	2.750	0.000	2.750
Articles:	-	-	-	-	-
Description: Funding is used for upgrades, engineering change proposals (ECP), and modifications to system hardware and software for the Ground Counter Fire Sensor (GCFS), Marine Artillery Survey Set (MASS), Meteorological Information Manager (MMIM), Global Positioning System Survey (GPS-S), the Improved Position Azimuth Determining System (IPADS), and the Joint Terminal Attack Controller-Laser Target Designator (JTAC-LTD) as well as technical refresh for target acquisition, and artillery survey and meteorological systems. Funding					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 3098 / *Fire Support System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
is also used for upgrades, Engineering Change Proposals (ECPs) and modifications for guided munitions and fire control systems which falls within Fire Support Systems for the Marine Corps. NOTE: Increase of $1.651M from FY17 to FY18 is due to MMIM realignment under FSML Line and increased research and development efforts associated with IPADS advanced components, developmental acoustic detection system testing, and MMIM communication reach-back efforts. ***FY 2016 Accomplishments:*** - Completed procurement of IPADS Control and Display Unit hardware replacement and software upgrade. - Continued engineering and research efforts to determine future IPADS capability requirements to support future artillery survey. - Initiated integration of AIM/FNC into fire support systems which will provide near 100% 2 mil azimuth availability to support targeting. The AIM/FNC program goal is to demonstrate a handheld, lightweight, affordable inertial navigation system (INS) capable of accurate azimuth determination in all environments, which will significantly improve the capabilities of ground-based, small unit fires. - Initiated development testing of acoustic detection system with a digital communications capability to replace GCFS system. ***FY 2017 Plans:*** - Continue development of acoustic detection system to replace GCFS system. - Continue product improvements to increase performance capability of legacy targeting and other fire support systems. ***FY 2018 Base Plans:*** - Continue development of acoustic detection system to replace GCFS system. - Continue product improvements to increase performance capability of legacy targeting and other fire support systems. - Initiate development of advanced components for the IPADS replacement system. - Shift funding and capability from Modeled Meteorological Manager (MMIM) to Fire Support Mods (FSM) for lifecycle sustainment. ***FY 2018 OCO Plans:*** N/A					
Title: Family of Artillery Munitions (FAM)	0.293	0.310	0.316	0.000	0.316

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 3098 / *Fire Support System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Articles:	-	-	-	-	-
Description: FAM - Efforts include acquisition planning for future munitions, replacement of existing stockpiles, and providing technologically enhanced artillery munitions in order to mitigate/fill capability gaps in range, accuracy, and lethality and reduce undue logistical burden. Additionally, the program office addresses Weapon System Explosives Safety Review Board (WSESRB) requirements for naval transportation issues for all artillery projectiles, propellants, and fuzes. ***FY 2016 Accomplishments:*** - Continued to monitor and support joint development with U.S. Army artillery ammunition programs in order to leverage and influence Army developmental efforts. Provide USMC specific safety analysis for M1122, M1123 (IR) and M1124 (VL). ***FY 2017 Plans:*** -Continue to monitor and support joint development with U.S. Army artillery ammunition programs in order to leverage and influence Army developmental efforts. Provide USMC specific safety analysis for M1122, M1123 (IR) and M1124 (VL). ***FY 2018 Base Plans:*** -Continue to monitor and support joint development with U.S. Army artillery ammunition programs in order to leverage and influence Army developmental efforts. Provide USMC specific safety analysis for Dual Purpose Improved Conventional Munitions (DPICM) replacement munition and Precision Guidance Kit (PGK) anti-jam development. ***FY 2018 OCO Plans:*** N/A					
Title: Family of Internally Transportable Vehicle (FITV)	0.332	0.253	0.253	0.000	0.253
Articles:	-	-	-	-	-
Description: Family of Internally Transportable Vehicle (FITV) program fields expeditionary vehicles to ground units to support various operations. Provides the Marine Air-Ground Task Force (MAGTF) ground combat units with vehicles transportable in the MV-22 and CV-22 tilt-rotor aircraft as well as the CH53. The FITV is an integral part of the Expeditionary Fire Support System (EFSS). ***FY 2016 Accomplishments:***					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 3098 / *Fire Support System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Initiated comparative analysis and modeling to support proposed modification recommendations required to increase the FITV system readiness, safety and reliability. Engineering efforts to improve the system readiness of the FITV. ***FY 2017 Plans:*** -Initiate 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. FITV funding will continue modifications required to increase the FITV system readiness, safety and reliability. Successful modifications and tests are intended for follow-on procurement and incorporation into existing system component upgrades, Service Life Extension Programs (SLEPs), or rapid COTS/NDI fielding for the Fleet Marine Forces (FMF). ***FY 2018 Base Plans:*** -Continue 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. FITV funding will continue modifications required to increase the FITV system readiness, safety and reliability. Successful modifications and tests are intended for follow-on procurement and incorporation into existing system component upgrades, Service Life Extension Programs (SLEPs), or rapid COTS/NDI fielding for the Fleet Marine Forces (FMF). ***FY 2018 OCO Plans:*** N/A					
Title: Conventional Ground Ammunition	0.475	0.470	0.533	0.000	0.533
Articles:	-	-	-	-	-
Description: All DoD services are required to field munitions that are insensitive munitions (IM) compliant. IM compliancy is measured by the performance of munitions to six tests; Fast Cook-Off, Slow Cook-Off, Bullet Impact, Fragment Impact, Sympathetic Detonation, and Shape Charge Jet. Services are required to submit IM Strategic Plans annually delineating how they intend on executing their Service IM effort to maximize IM improvements to both new development and legacy conventional ground ammunition. These IM Strategic Plans, Supporting Plan of Actions, and Milestones, with funding trial, are submitted to the JROC, demonstrating each Service's commitment to the continuing effort to improve IM characteristics of Conventional Ground Ammunition, for approval. In order to achieve the system's IM performance, the Conventional Ground Ammunition developer/ owner must have new technology identified and available to address IM shortfalls at the onset of the ammunition development or available for insertion during improvement opportunities for legacy ammunition. Under this					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 3098 / *Fire Support System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
program, the USMC invests in IM technology which will improve its existing munitions IM reactions or ability to reliably initiate IM technologies and complies with the OSD mandate for maximum feasible IM compliance. ***FY 2016 Accomplishments:*** Funded Multi-point Initiation (Naval Surface Warfare Center Indian Head Explosive Ordnance Disposal Technology Division, Indian Head, MD) -Evaluated reliability of different multi-point arrays in mortar systems -Procured Fiber Bragg system to measure propagation of detonation in multi-point arrays Funded Insensitive Munitions Compliant 120mm Tail Charge (U.S. Army Armament Research Development and Engineering Center, Picatinny, NJ) -Completed IM propellant formulation development -Manufactured small scale quantities of propellant -Completed charge 0 ballistic testing of legacy TCA ***FY 2017 Plans:*** Continue - (1) Multi-point Initiation (Naval Surface Warfare Center Indian Head Explosive Ordnance Disposal Technology Division, Indian Head, MD) -Utilize Fiber Bragg system to measure propagation of detonation and evaluate improvement in lethal effect with multi-point array (2) IM Compliant 120mm Tail Charge (U.S. Army Armament Research Development and Engineering Center, Picatinny, NJ) -Complete SCO tests -Perform closed bomb testing of propellant -Procure hardware for ballistic testing Funded Thermally Initiated Venting System (Systima Technologies, Inc., Kirkland WA) -Evaluate feasibility of TIVS technology in Mk22 rocket motor ***FY 2018 Base Plans:*** Continue -					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 3098 / *Fire Support System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
(1) IM Compliant 120mm Tail Charge (U.S. Army Armament Research Development and Engineering Center, Picatinny NJ) -Complete ballistic testing of new TCA design -Integrate IM technology into weapon (2) Thermally Initiated Venting System (Systima Technologies, Inc., Kirkland WA) -Develop initial design of TIVS for Mk22 rocket motor ***FY 2018 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	13.391	5.242	6.145	0.000	6.145

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• PMC/2064: *Expeditionary Fire Support Systems*	0.000	3.360	0.626	-	0.626	0.066	0.070	0.071	0.071	0.000	94.326
• PMC/473301: *Modeled Meterological Information Manager (MMIM)*	0.232	0.488	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	8.402
• PMC/473302: *Fire Support Mods*	2.768	3.552	4.064	0.050	4.114	4.123	4.250	4.365	4.468	0.000	85.180
• PMC/5230: *Motor Transport Modification*	2.554	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• PMC/6545: *Family of ITV*	18.638	9.654	1.583	-	1.583	0.633	0.669	6.691	8.713	0.000	128.981
• PMC/5050: *Motor Transport Modification*	0.000	4.302	3.993	-	3.993	3.302	3.370	3.436	3.505	Continuing	Continuing

Remarks

For FITV, the PMC BLI 5050 and 5230 reflect only the LTV Mod portion of the BLI, which covers all light tactical vehicles.

D. Acquisition Strategy

These programs range from off-the-shelf modifications to developmental items. Development will typically be conducted at government labs.

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 3098 / *Fire Support System*

Expeditionary Fire Support System (EFSS) and the Precision Extended Range Munition (PERM):
EFSS: Support current readiness levels while developing the means of streamlining the acquisition of spare parts. Continue to develop and procure digital equipment used to support Expeditionary Fire Control System (EFCS)and digitize the EFSS mortar line.
PERM: Finalize testing and procure the first option buy for PERM. Conduct testing that supports EFCS development and fielding that will be conducted in coordination with PERM first options buy.

Family of Artillery Munitions (FAM):
Program includes four (4) artillery munitions which are being developed by the Army. The Army is the lead service for these programs but continues to interact with the FAM IPT to ensure USMC requirements and capability needs are met. This allows the USMC to become users of the munition and certify the round for naval transportation. The munitions include but are not limited to; XM1156 Precision Guidance Kit (PGK), M1122 and M1123 Infrared (IR) and M1124 Visual Light (VL) 155mm RAP Round. Each munitions' status is tracked to ensure Marine Corps requirements are satisfied throughout the systems lifecycle.

Fire Support Mods:
Develop an improved Acoustic Sensor capability by exploiting recent technology improvements in computation and networking to improve data fusion. An early prototype is anticipated in FY19. The improved acoustic sensor will be capable of transmitting digital information via JVMF to AFATDS in support of artillery and counter fire operations. Initiate coordination between the Army's Armament, Research and Development Engineering Center (ARDEC), and MCSC's and NSWC DD science and technology efforts to commence development of the Future Survey System. Continue liaison with the Army's PM TAS in order to leverage future efforts and increase the probability of a joint procurement. Initiate development of a MMIM communications reach back capability to allow for ingestion of meteorological data into artillery firing data for units deployed to austere locations with limited or no bandwidth communications. Procure hardware and software refreshes for the GPSS, MASS and MMIM to ensure compliance with cybersecurity policies, address obsolescence and interoperability with other C2 systems.

Family of Internally Transportable Vehicles (FITV):
The FITV program strategy is to explore, research and recommend efforts to address and identify solutions to reliability and safety design issues through government off-the-shelf (GOTS), commercial off-the-shelf (COTS) or modified off-the-shelf (MOTS) components. This effort includes the Internally Transportable Vehicle Replacement (ITV-R) initiative which will begin to replace the current Family of Internally Transportable Vehicles (FITV) and Utility Task Vehicle (UTV).

Conventional Ground Ammunition:
The Conventional Ground Ammunition strategy is to invest in Insensitive Munitions (IM) technologies to address IM shortfalls of priority programs identified in the bi-annual Marine Corps Insensitive Munitions Strategic Plan (IMSP). Once the IM technologies have been successfully demonstrated and matured, the intent is to insert the new technologies into new conventional ground ammunition development as well as provide opportunities to improve legacy munitions IM characteristics. The IM R&D effort directly addresses the mandated OSD requirement to obtain incremental IM improvement in pursuit of becoming fully IM compliant to the maximum extent practicable.

E. Performance Metrics

N/A

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy											Date: May 2017	
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0206623M / *MC Ground Cmbt Spt Arms Sys*				Project (Number/Name) 4002 / *Family of Raid Reconnaissance*			
COST ($ in Millions)	**Prior Years**	**FY 2016**	**FY 2017**	**FY 2018 Base**	**FY 2018 OCO**	**FY 2018 Total**	**FY 2019**	**FY 2020**	**FY 2021**	**FY 2022**	**Cost To Complete**	**Total Cost**
4002: *Family of Raid Reconnaissance*	3.764	0.514	0.449	0.548	-	0.548	0.547	0.536	0.550	0.561	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project supports multiple airborne/parachuting and specialized reconnaissance related programs focusing on immediate capability enhancements for numerous insertion and personnel equipment shortfalls currently within Marine Reconnaissance and Marine Raider units. These enhancements will improve airborne capability, equipment and items for direct action missions, and specialized raid equipment.

Name change from PB17 to PB18: Underwater Reconnaissance Capability (URC) to Amphibious Reconnaissance Capability.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	**FY 2016**	**FY 2017**	**FY 2018 Base**	**FY 2018 OCO**	**FY 2018 Total**
Title: Airborne Reconnaissance Equipment (ARE)	0.450	0.347	0.433	0.000	0.433
Articles:	-	-	-	-	-
FY 2016 Accomplishments: - Continued technology upgrades and evaluation of emerging reliability challenges presented by fielded systems, such as Automatic Activation Device, Enhanced Multi Mission Parachute System and system safety verification. - Initiated research and development on personnel parachute and aerial delivery fielded programs, to parachute performance testing.					
FY 2017 Plans: - Continue technology upgrades and evaluation of emerging reliability challenges presented by fielded systems, such as Automatic Activation Device, Enhanced Multi Mission Parachute System, and system safety verification. - Continue research and development on personnel parachute and aerial delivery fielded programs, such as parachute performance testing.					
FY 2018 Base Plans: - Continue technology upgrades and evaluation of emerging reliability challenges presented by fielded systems, such as the Enhanced Multi Mission Parachute System and system safety verification. - Continue research and development on personnel parachute and aerial delivery fielded programs, such as parachute performance testing.					
FY 2018 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
N/A					
Title: Amphibious Reconnaissance Capability	0.064	0.102	0.115	0.000	0.115
Articles:	-	-	-	-	-
FY 2016 Accomplishments: - Completed the test and evaluation of the Diver Propulsion Device (DPD) upgrades to support the propulsion solution to the Diver Reconnaissance Vehicle (DRV) to fulfill Amphibious Reconnaissance Capability. - Continued the test and evaluation of new Combatant Rubber Raiding Craft (CRRC) technology.					
FY 2017 Plans: - Initiate research and development efforts on improved amphibious support equipment to fulfill Amphibious Reconnaissance Capability, to include battery development and testing. - Continue the test and evaluation of new Combatant Rubber Raiding Craft (CRRC) technology.					
FY 2018 Base Plans: - Continue research and development efforts on improved amphibious support equipment to fulfill Amphibious Reconnaissance Capability, to include battery development and testing. - Continue the test and evaluation of new Combatant Rubber Raiding Craft (CRRC) technology.					
FY 2018 OCO Plans: N/A					
Accomplishments/Planned Programs Subtotals	0.514	0.449	0.548	0.000	0.548

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• PMC/6518: *Amphibious Support Equipment*	3.882	7.371	5.830	-	5.830	4.732	4.838	4.943	5.043	Continuing	Continuing

Remarks

D. Acquisition Strategy

(U) Airborne Reconnaissance Equipment (ARE) acquisition strategy is to fund engineering changes and product upgrade testing and development for various reconnaissance special purpose equipment for aerial delivery and parachuting, such as the Parachutist's High Altitude Oxygen System (PHAOS); Automatic Activation Device (AAD); and the Tandem Offset Resupply Delivery System (TORDS)/Military Tandem Tethered Bundle (MTTB) System.

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 4002 / *Family of Raid Reconnaissance*

(U) Amphibious Reconnaissance Capability acquisition strategy is to fund engineering changes and product upgrade testing and development for various reconnaissance special purpose and lifesaving equipment for Marine Corps Diving and Small Craft, such as the Marine Assault Breacher's Kit (MABK), Marine Individual Assault Kit (MIAK), Diver Propulsion Device (DPD), and Combat Rubber Raiding Craft (CRRC).

E. Performance Metrics

Milestone reviews.