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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy **Date:** February 2018

Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>					R-1 Program Element (Number/Name) PE 0603635M / <i>Marine Corps Grnd Cmbt/Supt Sys</i>							
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	33.891	1.043	1.428	1.828	-	1.828	1.855	1.886	1.915	1.943	Continuing	Continuing
1964: <i>Anti-Armor Weapon System</i>	4.097	0.776	1.023	0.962	-	0.962	0.980	1.004	1.026	1.047	Continuing	Continuing
2614: <i>SMAW Follow-On</i>	29.794	0.267	0.405	0.866	-	0.866	0.875	0.882	0.889	0.896	Continuing	Continuing

A. Mission Description and Budget Item Justification

This PE supports the demonstration and validation of Marine Corps Ground/Supporting Arms Systems for utilization in Marine Air-Ground Expeditionary Force amphibious operations. This program is funded under Demonstration & Validation because it develops and integrates hardware for experimental tests related to specific ground weapon systems.

<u>B. Program Change Summary (\$ in Millions)</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>
Previous President's Budget	1.303	1.428	1.355	-	1.355
Current President's Budget	1.043	1.428	1.828	-	1.828
Total Adjustments	-0.260	0.000	0.473	-	0.473
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.228	0.000			
• SBIR/STTR Transfer	-0.032	0.000			
• Rate/Misc Adjustments	0.000	0.000	0.473	-	0.473

Change Summary Explanation

The increase in funding from FY17 to FY18 is due to efforts to improve the Saber power system and the Global Positioning System (GPS) of the Saber system.

The decrease in funding from FY18 to FY19 is due to efforts to improve the Saber power system and the Global Positioning System (GPS) of the Saber system in FY18.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy										Date: February 2018		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603635M / Marine Corps Grnd Cmbt/ Supt Sys				Project (Number/Name) 1964 / Anti-Armor Weapon System			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
1964: Anti-Armor Weapon System	4.097	0.776	1.023	0.962	-	0.962	0.980	1.004	1.026	1.047	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
The M41A7 Saber system is the primary heavy, anti-armor launch system for the TOW Missile within the Ground Combat Element of the Marine Corps. The Anti-Armor Weapons System-Heavy (AAWS-H) program, working in concert with the U.S. Army, will develop and integrate technology improvements into the Improved Target Acquisition System (ITAS) to meet Increment II system requirements as jointly agreed. Improvements centered on integration of sight image enhancements were concluded in FY13. Other efforts have focused on providing engineering and technical support such as the study of densified propellant and battery replacement for the Saber system (far-target location accuracy improvements). Laser designation capability has been postponed due to prioritization.												
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)								FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Saber Battery Replacement Articles: FY 2018 Plans: -Continue research of a replacement battery for Saber to address safety concerns, while maintaining the same or increased capabilities for power and longevity. This is an on-going effort through FY19. FY 2019 Base Plans: -Continue efforts for Saber battery through reliability testing to enhance capabilities. -Initiate qualification testing of the replacement battery for Saber. FY 2019 OCO Plans: N/A FY 2018 to FY 2019 Increase/Decrease Statement: No significant change from FY 2018 to FY 2019.								0.557	0.508	0.562	0.000	0.562
								-	-	-	-	-
Title: Management Support Articles:								0.000	0.420	0.200	0.000	0.200
Description: The decrease in funding from FY18 to FY19 (\$0.220M) is due to reduced management support efforts.								-	-	-	-	-

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Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603635M / Marine Corps Grnd Cmbt/ Supt Sys		Project (Number/Name) 1964 / Anti-Armor Weapon System		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
FY 2018 Plans: -Initiate support for product improvement upgrades for the Saber System, engineering, logistics, and program office support.						
FY 2019 Base Plans: -Continue support for product improvement upgrades for the Saber System, engineering, logistics, and program office support. -Initiate support for qualification testing of the replacement battery for Saber.						
FY 2019 OCO Plans: N/A						
FY 2018 to FY 2019 Increase/Decrease Statement: No significant change from FY 2018 to FY 2019.						
Title: Global Positioning System (GPS) Improvement		0.219	0.095	0.200	0.000	0.200
Articles:		-	-	-	-	-
FY 2018 Plans: -Continue research for improvements to future GPS for the Saber system. -Continue prototype testing of the Far-Target Locator and assess results.						
FY 2019 Base Plans: -Continue research for improvements to future GPS for the Saber system. -Continue prototype testing of the Far-Target Locator and assess results. -Initiate the review of Army test reports and prototypes for Marine Corps evaluation.						
FY 2019 OCO Plans: N/A						
FY 2018 to FY 2019 Increase/Decrease Statement: No significant change from FY 2018 to FY 2019.						
Accomplishments/Planned Programs Subtotals		0.776	1.023	0.962	0.000	0.962

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Appropriation/Budget Activity 1319 / 4				R-1 Program Element (Number/Name) PE 0603635M / <i>Marine Corps Grnd Cmbt/ Supt Sys</i>				Project (Number/Name) 1964 / <i>Anti-Armor Weapon System</i>			
C. Other Program Funding Summary (\$ in Millions)											
			<u>FY 2019</u>	<u>FY 2019</u>	<u>FY 2019</u>					<u>Cost To</u>	
<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>Base</u>	<u>OCO</u>	<u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Complete</u>	<u>Total Cost</u>
• PMC/3017: <i>Anti-Armor Weapon Systems-Heavy</i>	17.080	56.577	59.702	-	59.702	39.092	40.968	42.956	33.778	Continuing	Continuing
Remarks											
D. Acquisition Strategy											
The Saber system is a joint program with the U.S. Army. Funding supports the development, integration, and qualification of incremental improvements to meet objective requirements and assesses emergent technologies.											
E. Performance Metrics											
N/A											

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy												Date: February 2018			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603635M / <i>Marine Corps Grnd Cmbt/ Supt Sys</i>				Project (Number/Name) 1964 / <i>Anti-Armor Weapon System</i>					

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Anti Armor	WR	NSWC Indian Head : Indian Head, MD	2.622	0.000		0.000		0.000		-		0.000	0.000	2.622	-
Saber Battery Replacement Testing and Research	WR	NSWC Crane : Crane, IN	1.475	0.557	Oct 2016	0.508	Jan 2018	0.562	Feb 2019	-		0.562	0.000	3.102	-
Global Positioning System (GPS) Improvement	MIPR	CCWS Redstone Arsenal : Huntsville, AL	0.000	0.219	Feb 2017	0.095	Apr 2018	0.200	Apr 2019	-		0.200	Continuing	Continuing	Continuing
Subtotal			4.097	0.776		0.603		0.762		-		0.762	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Management Support	C/FFP	Not Specified : Not Specified	0.000	0.000		0.420	Mar 2018	0.200	Mar 2019	-		0.200	0.000	0.620	-
Subtotal			0.000	0.000		0.420		0.200		-		0.200	0.000	0.620	N/A

			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			4.097	0.776		1.023		0.962		-		0.962	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy			Date: February 2018		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603635M / <i>Marine Corps Grnd Cmbt/ Supt Sys</i>			Project (Number/Name) 1964 / <i>Anti-Armor Weapon System</i>

	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Proj 1964																												
Saber Battery Replacement: Saber Battery Replacement																												
GPS Improvement: Future GPS Improvement																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603635M / <i>Marine Corps Grnd Cmbt/ Supt Sys</i>	Project (Number/Name) 1964 / <i>Anti-Armor Weapon System</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Proj 1964</i>				
Saber Battery Replacement: Saber Battery Replacement	1	2017	2	2020
GPS Improvement: Future GPS Improvement	2	2017	4	2021

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy										Date: February 2018		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603635M / Marine Corps Grnd Cmbt/ Supt Sys				Project (Number/Name) 2614 / SMAW Follow-On			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
2614: SMAW Follow-On	29.794	0.267	0.405	0.866	-	0.866	0.875	0.882	0.889	0.896	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
Follow on to Shoulder-Launched Multipurpose Assault Weapon (SMAW) (FOTS): The solution to the Follow on to SMAW (FOTS) capability requirement is a Family of Marine-portable Rocket Systems. This Family of Systems is composed of separate lightweight, short range, fire-and-forget weapons. Marine Expeditionary Forces will employ the Family of Systems across the spectrum of conflict, under all environmental conditions, to neutralize or destroy a variety of ground targets including personnel, thin-skinned vehicles, and positions. The Family of Systems include various systems, such as SMAW Mod 2 and M3A1 Multi-purpose Anti-Armor Weapon System (MAAWS), with future capability for expansion to additional systems. SMAW Mod 2 consists of a new launcher with an integrated laser range finder and thermal sight. MAAWS consists of a new launcher and integrated fire control system. Future systems and capabilities include similar Marine-portable fire-and-forget shoulder-launched rocket systems with anti-armor, anti-personnel, anti-material, and assault capabilities.												
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)								FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Engineer and technical support. Articles:								0.267	0.405	0.866	0.000	0.866
								-	-	-	-	-
FY 2018 Plans: -Continue engineering support for the development and testing of the Densified Propellant. -Continue qualification of Densified Propellant in accordance with Technology Transition Agreement (TTA). -Continue development of replacement bore sight kit. -Continue qualification of current millijoule meter. -Initiate MAAWS qualification, performance testing and Marine-specific tests include E3 and Navy/Marine Corps transportation requirements unique to the Marine Corps. Other Marine-unique tests may include support equipment and potential modifications to existing FOTS support equipment.												
FY 2019 Base Plans: -Continue engineering support for the development and testing of the Densified Propellant. -Continue qualification of Densified Propellant in accordance with Technology Transition Agreement (TTA). -Continue development of replacement bore sight kit. -Complete qualification of current millijoule meter. -Initiate integration and transition of Densified Propellant and other technology developments into the program.												

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Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603635M / Marine Corps Grnd Cmbt/ Supt Sys		Project (Number/Name) 2614 / SMAW Follow-On							
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)											
		FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total					
-Continue MAAWS qualification, performance testing and Marine-specific tests include E3 and Navy/Marine Corps transportation requirements unique to the Marine Corps. Other Marine-unique tests may include support equipment and potential modifications to existing FOTS support equipment. FY 2019 OCO Plans: N/A FY 2018 to FY 2019 Increase/Decrease Statement: Increase of \$0.461 supports development and qualification of upgraded components to the SMAW MOD 2 system and the M3A1 Multi-purpose Anti-Armor Weapon System (MAAWS), with future capability for expansion to additional systems.											
Accomplishments/Planned Programs Subtotals		0.267	0.405	0.866	0.000	0.866					
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• PMC/3016: Follow on to SMAW	22.918	25.174	13.760	-	13.760	13.789	13.810	13.828	13.839	Continuing	Continuing
Remarks											
D. Acquisition Strategy											
Strategy is to complete development and qualification of upgraded components to the SMAW MOD 2 system and M3A1 Multi-purpose Anti-Armor Weapon System (MAAWS), with future capability for expansion to additional systems. SMAW Mod 2 consists of a new launcher with an integrated laser range finder and thermal sight. MAAWS consists of a new launcher and integrated fire control system. Future systems and capabilities include similar Marine-portable fire-and-forget shoulder-launched rocket systems with anti-armor, anti-personnel, anti-material, and assault capabilities. MAAWS test efforts in conjunction with the Army include qualification and performance testing. In addition, Marine-specific tests include E3 and Navy/Marine Corps transportation requirements unique to the Marine Corps. Other Marine-unique tests may include support equipment and potential modifications to existing FOTS support equipment.											
E. Performance Metrics											
Milestone reviews and technical reviews.											

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Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603635M / Marine Corps Grnd Cmbt/ Supt Sys				Project (Number/Name) 2614 / SMAW Follow-On					
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Cumulative Funding	Various	Various : Various	1.748	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			1.748	0.000		0.000		0.000		-		0.000	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Cumulative Funding	Various	Various : Various	16.300	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Engineering & Technical Support	WR	NSWC Indian Head : Indian Head, VA	0.841	0.145	Jan 2017	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Engineering & Technical Support	WR	NSWC Dahlgren : Dahlgren, VA	0.000	0.122	Jan 2017	0.405	Jan 2018	0.866	Jan 2019	-		0.866	0.000	1.393	-
Subtotal			17.141	0.267		0.405		0.866		-		0.866	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Operational Testing & Support	WR	Marine Corps Operational Test & Eval Activity : Quantico, VA	5.164	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Prior year cumulative funding	Various	Various : Various	0.326	0.000		0.000		0.000		-		0.000	0.000	0.326	-
Subtotal			5.490	0.000		0.000		0.000		-		0.000	Continuing	Continuing	N/A

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Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603635M / Marine Corps Grnd Cmbt/ Supt Sys						Project (Number/Name) 2614 / SMAW Follow-On		

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior year cumulative funding	Various	Various : Various	5.415	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			5.415	0.000		0.000		0.000		-		0.000	Continuing	Continuing	N/A

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	29.794	0.267		0.405		0.866	-	0.866	Continuing

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy

Date: February 2018

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0603635M / Marine Corps Grnd Cmbt/
Supt Sys

Project (Number/Name)

2614 / SMAW Follow-On

	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Proj 2614																												
Densified Propellant Development: Densified Propellant Development																												
Densified Propellant Development: Densified Propellant Development - Continued																												
Densified Propellant Qualification: Densified Propellant Qualification																												
Densified Propellant System Verification Review: Densified Propellant System Verification Review																												
Densified Propellant Developmental Testing: Densified Propellant Developmental Testing																												
Densified Propellant Engineering Change Proposal: Densified Propellant Engineering Change Proposal																												
Millijoule Meter: Millijoule Meter																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603635M / <i>Marine Corps Grnd Cmbt/ Supt Sys</i>	Project (Number/Name) 2614 / <i>SMAW Follow-On</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Proj 2614</i>				
Densified Propellant Development: Densified Propellant Development	1	2017	4	2017
Densified Propellant Development: Densified Propellant Development - Continued	1	2018	4	2018
Densified Propellant Qualification: Densified Propellant Qualification	1	2018	4	2020
Densified Propellant System Verification Review: Densified Propellant System Verification Review	1	2019	4	2020
Densified Propellant Developmental Testing: Densified Propellant Developmental Testing	3	2019	2	2020
Densified Propellant Engineering Change Proposal: Densified Propellant Engineering Change Proposal	3	2021	3	2021
Millijoule Meter: Millijoule Meter	1	2017	4	2017