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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
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Appropriation/Budget Activity	R-1 Program Element (Number/Name)											
1319: <i>Research, Development, Test & Evaluation, Navy I BA 7: Operational Systems Development</i>	PE 0206629M I (U) <i>Amphibious Assault Vehicle</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	129.181	36.571	58.728	22.637	-	22.637	15.708	7.163	5.768	6.049	Continuing	Continuing
2938: <i>Amphibious Assault Vehicle</i>	129.181	36.571	58.728	22.637	-	22.637	15.708	7.163	5.768	6.049	Continuing	Continuing

Note

NOTE: Prior funding is reflected in P.E. 0206623M/Project 0021.

A. Mission Description and Budget Item Justification

The Assault Amphibious Vehicle (AAV) program provides life-cycle support to ensure cost-effective combat readiness for the AAV Family of Vehicles (FOV). This is accomplished through engineering changes resulting from continuous review of sub-systems to maintain system supportability, safety, reduce total ownership costs, improve fleet readiness, address obsolescence issues, and improve vehicle survivability and performance. The AAV program also includes a survivability upgrade which will increase P-Variant and C-Variant survivability and force protection while maintaining the required land and water mobility performance.

<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	38.020	58.728	26.810	-	26.810
Current President's Budget	36.571	58.728	22.637	-	22.637
Total Adjustments	-1.449	0.000	-4.173	-	-4.173
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.561	0.000			
• SBIR/STTR Transfer	-0.888	0.000			
• Program Adjustments	0.000	0.000	-3.845	-	-3.845
• Rate/Misc Adjustments	0.000	0.000	-0.328	-	-0.328

Change Summary Explanation

The FY 2019 funding request was reduced by (\$3.845) million to account for the availability of prior year execution balances.

The decrease from FY18 to FY19 (\$36.091M) represents the transition of AAV's Survivability Upgrade into the final year of P (Personnel)-variant testing. P-variant Initial Operational Test and Evaluation efforts (IOT&E), Full-Up System Level testing (FUSL) and developmental efforts for Production Qualification Testing/Reliability Qualification Testing (PQT/RQT) will be complete in FY19. The decrease also reflects the transition from P-variant Engineering and

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PE 0206629M: (U)Amphibious Assault Vehicle
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Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy										Date: February 2018		
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0206629M / (U)Amphibious Assault Vehicle				Project (Number/Name) 2938 / Amphibious Assault Vehicle			
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
2938: Amphibious Assault Vehicle	129.181	36.571	58.728	22.637	-	22.637	15.708	7.163	5.768	6.049	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

The decrease from FY18 to FY19 (\$36.091M) represents the transition of AAV's Survivability Upgrade into the final year of P (Personnel)-variant testing. P-variant Initial Operational Test and Evaluation efforts (IOT&E), Full-Up System Level testing (FUSL) and developmental efforts for Production Qualification Testing/Reliability Qualification Testing (PQT/RQT) will be complete in FY19. The decrease also reflects the transition from P-variant Engineering and Manufacturing Development (EMD) to C (Command)-variant Production Qualification Testing (PQT), Live Fire Test & Evaluation (LFT&E), Full Up System Level Testing (FUSL), and Reliability, Availability, Maintainability (RAM) testing.

The FY 2019 funding request was reduced by \$3.845M to account for the availability of prior year execution balances.

A. Mission Description and Budget Item Justification

The Assault Amphibious Vehicle (AAV) program provides life-cycle support to ensure cost-effective combat readiness for the AAV Family of Vehicles (FOV). This is accomplished through engineering changes resulting from continuous review of sub-systems to maintain system supportability, safety, reduce total ownership costs, improve fleet readiness, address obsolescence issues, and improve vehicle survivability and performance. The AAV program also includes a survivability upgrade which will increase P-Variant and C-Variant survivability and force protection while maintaining the required land and water mobility performance.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Product Development	30.268	29.341	5.543	0.000	5.543
Articles:	4	3	-	-	-
Description: AAV Survivability Upgrade will improve the legacy AAV Force Protection capability. Improvements include improved underbelly protection, integrated blast mitigating seats, integrated spall liners, protected fuel storage, sponson armor, and selected improvements to maintain required water and land mobility. AAV modifications will provide Nonrecurring Engineering (NRE) and design for AAV safety, obsolescence, and performance improvement engineering change proposals.					
FY 2018 Plans: -Continue nonrecurring efforts for design, development, integration, and test for legacy vehicle Electrical Modernization.					

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>-Complete integration and engineering analyses for Amphibious Remote Weapon Station (ARWS).</p> <p>-Initiate prime contractor Reliability Growth Test and Production Configuration Model (formerly FUSL) test support for Survivability Upgrade.</p> <p>-Procure three (3) C-variant Engineering Change Proposal (ECP) Production test items.</p> <p>-Initiate efforts in Hydraulic Modernization and R-variant improvements for Survivability Upgrade.</p> <p>FY 2019 Base Plans:</p> <p>-Complete nonrecurring efforts for design, development, integration, and test for legacy vehicle Electrical Modernization.</p> <p>-Complete efforts in R-variant improvements for Survivability Upgrade.</p> <p>-Initiate C-variant Production Qualification Testing (PQT), Live Fire Test & Evaluation (LFT&E), Full Up System Level Testing (FUSL), and Reliability, Availability, Maintainability (RAM) testing.</p> <p>FY 2019 OCO Plans:</p> <p>N/A</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement:</p> <p>The decrease from FY18 to FY19 (\$23.798M) is due to Survivability Upgrade (SU) transitioning into the final year of P-variant contractor development and testing. The decrease also reflects the transition from P-variant Engineering and Manufacturing Development (EMD) to C-variant Production Qualification Testing (PQT), Live Fire Test & Evaluation (LFT&E), Full Up System Level Testing (FUSL), and Reliability, Availability, Maintainability (RAM) testing.</p>						
<p>Title: Support</p> <p>Articles:</p> <p>Description: Provide government engineering and technical support for AAV safety, obsolescence, and performance modifications, and Survivability Upgrade support.</p> <p>FY 2018 Plans:</p> <p>- Continue Electrical Modernization, and Command and Control (C2) systems modernization.</p> <p>- Continue to provide technical and engineering services in support of AAV obsolescence and performance modifications.</p> <p>- Continue to provide material and travel associated with these efforts.</p> <p>FY 2019 Base Plans:</p>		1.569 -	3.666 -	2.604 -	0.000 -	2.604 -

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy				Date: February 2018				
Appropriation/Budget Activity 1319 / 7		R-1 Program Element (Number/Name) PE 0206629M / (U)Amphibious Assault Vehicle		Project (Number/Name) 2938 / Amphibious Assault Vehicle				
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)				FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<div>- Continue Electrical Modernization, and Command and Control (C2) systems modernization.</div> <div>- Continue to provide technical and engineering services in support of AAV obsolescence and performance modifications.</div> <div>- Continue to provide material and travel associated with these efforts.</div> <div>FY 2019 OCO Plans: N/A</div> <div>FY 2018 to FY 2019 Increase/Decrease Statement: The decrease from FY18 to FY19 (\$1.062M) reflects a reduction to engineering management and technical support for systems integration because of the transition from AAV SU P-variant EMD to C-variant Production Qualification Testing (PQT), Live Fire Test & Evaluation (LFT&E), Full Up System Level Testing (FUSL), and Reliability, Availability, Maintainability (RAM) testing.</div>								
<div>Title: Test and Evaluation</div> <div>Articles:</div> <div>Description: Developmental, Operational and Live Fire Test and Evaluation of safety improvements, upgrades, modifications and fact of life changes to ensure operational suitability and effectiveness of the AAV family of vehicles.</div> <div>FY 2018 Plans: - Initiate Full-Up System Level (FUSL) testing for Survivability Upgrade. - Initiate Developmental Testing (DT) efforts for Production Qualification Testing/Reliability Qualification Testing (PQT/RQT) for Survivability Upgrade. - Initiate Developmental, Live Fire, and Operational Testing for Amphibious Remote Weapon Station (ARWS).</div> <div>FY 2019 Base Plans: - Complete P-variant Full-Up System Level (FUSL) testing for Survivability Upgrade. - Complete P-variant Developmental Testing (DT) efforts for Production Qualification Testing/Reliability Qualification Testing (PQT/RQT) for Survivability Upgrade. - Complete Developmental, Live Fire, and Operational Testing for Amphibious Remote Weapon Station (ARWS). - Initiate and complete Initial Operational Test and Evaluation (IOT&E) in support of the P-variant Survivability Upgrade. - Initiate Full-Up System Level (FUSL) testing for C-variant. - Initiate Live Fire Test and Evaluation (LFT&E) for C-variant.</div>				3.644 -	21.240 -	11.411 -	0.000 -	11.411 -

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Appropriation/Budget Activity 1319 / 7		R-1 Program Element (Number/Name) PE 0206629M / (U)Amphibious Assault Vehicle		Project (Number/Name) 2938 / Amphibious Assault Vehicle		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Initiate Developmental Testing efforts for Production Qualification Testing (PQT) for C-variant. FY 2019 OCO Plans: N/A FY 2018 to FY 2019 Increase/Decrease Statement: The decrease from FY18 to FY19 (\$9.829M) for Testing reflects the completion of Reliability Growth Testing (RGT) in FY18. Decrease also reflects completion in FY19 of Full-Up System Level (FUSL) testing and Developmental Testing efforts for Production Qualification Testing/Reliability Qualification Testing (PQT/RQT) for P-variant that began in FY18.						
Title: Management and Engineering Technical Services Articles: Description: Management support services and technical support for program office and field activities. FY 2018 Plans: - Continue program management services in support of ECP development, trade studies and analyses, supply chain and government property management in support of AAV sustainment modification efforts. - Initiate non-recurring logistic support for systems integration. FY 2019 Base Plans: - Continue program management services in support of ECP development, trade studies and analyses, supply chain and government property management in support of AAV sustainment modification efforts. - Continue non-recurring logistic support for systems integration. FY 2019 OCO Plans: N/A FY 2018 to FY 2019 Increase/Decrease Statement: The decrease from FY18 to FY19 (\$1.402M) in In-House Technical Support reflects less engineering and technical support required as Survivability Upgrade enters the final year of test for the P-variant.		1.090 -	4.481 -	3.079 -	0.000 -	3.079 -
Accomplishments/Planned Programs Subtotals		36.571	58.728	22.637	0.000	22.637

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy										Date: February 2018	
Appropriation/Budget Activity 1319 / 7				R-1 Program Element (Number/Name) PE 0206629M / (U)Amphibious Assault Vehicle				Project (Number/Name) 2938 / Amphibious Assault Vehicle			
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/2021: AAV Product Improvement Program	69.785	107.665	156.249	-	156.249	186.723	211.228	222.061	37.943	22.296	2,009.633
Remarks											
D. Acquisition Strategy											
<p>The USMC competitively awarded two contracts in FY 2014 for development efforts in support of upgrading 392 Personnel-variant (P-Variant) Assault Amphibious Vehicles. Down-select to one contractor for manufacture of prototype vehicles occurred in February 2015. Subsequently, the requirement was increased to upgrading 405 Assault Amphibious Vehicles including the Command-Variant (C-Variant). The program's main focus is on improving Marine force protection capabilities. To support the required capabilities, the Survivability Upgrade program will seek to incorporate Non-Developmental Items (NDI) and/or Commercial off the Shelf (COTS) solutions into the existing P-Variant and C-Variant Reliability, Availability, Maintainability/Rebuild to Standard (RAM/RS) configuration of AAV. The acquisition strategy seeks to minimize cost and schedule, and maximize value, technology readiness, and commonality, while ensuring the selected manufacturer meets the capability attributes established for the RAM/RS. RDT&E funded competitive designs and contract options for Engineering and Manufacturing Development (EMD). Initial Operational Capability (IOC) is scheduled for FY 2019.</p>											
E. Performance Metrics											
<p>Milestone Reviews: Initial Operational Capability (IOC): 3rd quarter 2019 Full Rate Production (FRP) decision: 3rd quarter 2019</p>											

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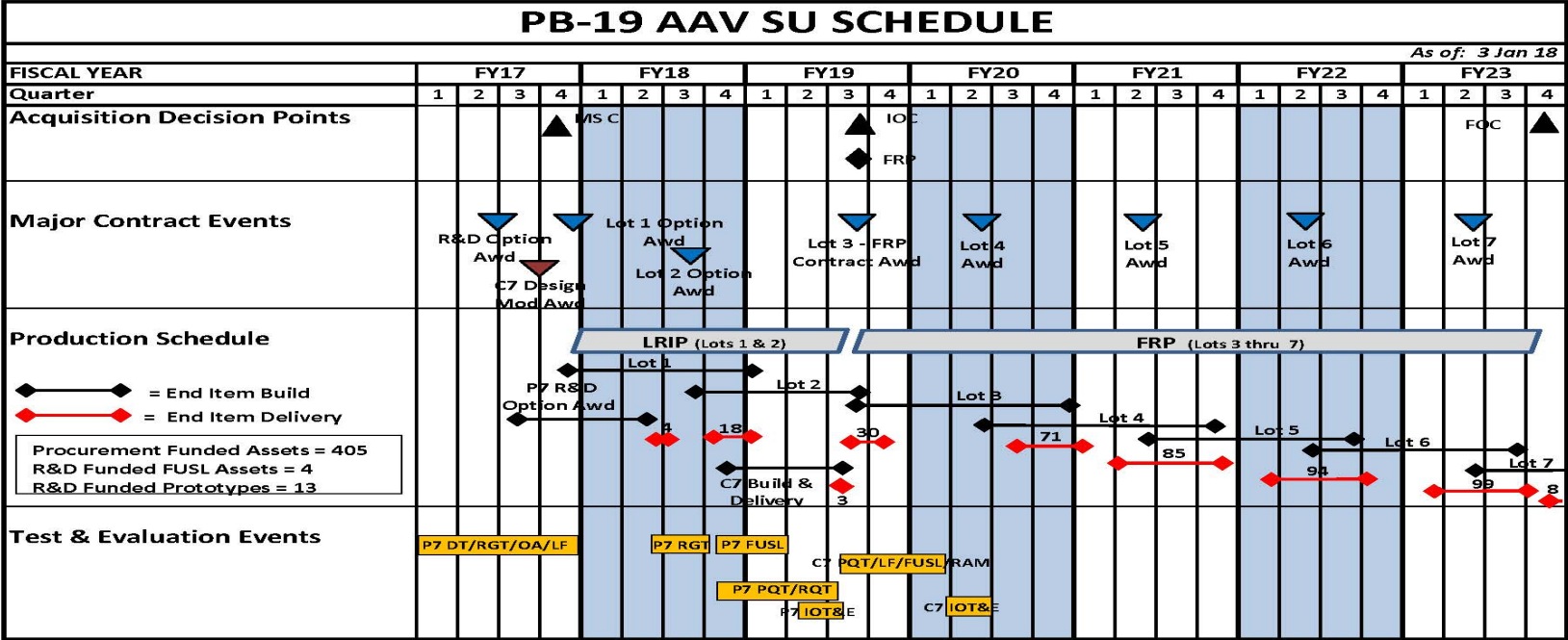
Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy												Date: February 2018			
Appropriation/Budget Activity 1319 / 7						R-1 Program Element (Number/Name) PE 0206629M / (U)Amphibious Assault Vehicle				Project (Number/Name) 2938 / Amphibious Assault Vehicle					
Product Development (\$ in 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
Syst Design & Dev / EMD	C/FFP	MCSC : Quantico, VA	82.476	28.228	Aug 2017	17.864	Feb 2018	4.336	Feb 2019	-		4.336	Continuing	Continuing	Continuing
Other Product Development	C/BA	Various : Various	3.105	2.040	Mar 2017	11.476	Mar 2018	1.207	Mar 2019	-		1.207	Continuing	Continuing	Continuing
Subtotal			85.581	30.268		29.340		5.543		-		5.543	Continuing	Continuing	N/A
Remarks															
The decrease from FY18 to FY19 (\$23.797M) is due to Survivability Upgrade (SU) transitioning into the final year of contractor development and testing for the P-variant. The decrease also reflects the transition from P-variant Engineering and Manufacturing Development (EMD) to C-variant Production Qualification Testing (PQT), Live Fire Test & Evaluation (LFT&E), Full Up System Level Testing (FUSL), and Reliability, Availability, Maintainability (RAM).															
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
Travel	Various	Various : Various	0.492	0.286	Oct 2016	0.249	Oct 2017	0.047	Oct 2018	-		0.047	Continuing	Continuing	Continuing
In-House Technical Support	Various	Various : Various	16.246	1.283	Feb 2017	3.418	Feb 2018	2.557	Feb 2019	-		2.557	Continuing	Continuing	Continuing
Subtotal			16.738	1.569		3.667		2.604		-		2.604	Continuing	Continuing	N/A
Remarks															
The decrease from FY18 to FY19 (\$1.063M) reflects a reduction to engineering management and technical support for nonrecurring test and evaluation and logistic support for systems integration because of the transition from AAV SU P-variant EMD to C-variant Production Qualification Testing (PQT), Live Fire Test & Evaluation (LFT&E), Full Up System Level Testing (FUSL), and Reliability, Availability, Maintainability (RAM).															
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
Developmental Testing (DT)	Various	Various : Various	5.220	2.171	Nov 2016	10.793	Feb 2018	2.355	Feb 2019	-		2.355	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy												Date: February 2018			
Appropriation/Budget Activity 1319 / 7						R-1 Program Element (Number/Name) PE 0206629M / (U)Amphibious Assault Vehicle				Project (Number/Name) 2938 / Amphibious Assault Vehicle					
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 (OT)	WR	MCOTEA : Quantico, VA	1.022	0.000		7.965	Mar 2018	5.965	Mar 2019	-		5.965	Continuing	Continuing	Continuing
Live Fire Test and Evaluation (LFT&E)	Various	Various : Various	2.173	1.473	Mar 2017	2.482	Mar 2018	3.091	Mar 2019	-		3.091	Continuing	Continuing	Continuing
Subtotal			8.415	3.644		21.240		11.411		-		11.411	Continuing	Continuing	N/A
Remarks															
The decrease from FY18 to FY19 (\$9.829M) for Testing reflects the completion of Reliability Growth Testing (RGT) in FY18. Decrease also reflects completion in FY19 of Full-Up System Level (FUSL) testing and Developmental Testing efforts for Production Qualification Testing/Reliability Qualification Testing (PQT/RQT) for the P-variant that began in FY18.															
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 Svcs	C/FFP	MCSC : Quantico, VA	6.802	0.000	Apr 2017	1.826	Apr 2018	1.996	Apr 2019	-		1.996	Continuing	Continuing	Continuing
Engineering and Technical Services	Various	Various : Various	11.645	1.090	Mar 2017	2.655	Mar 2018	1.083	Mar 2019	-		1.083	Continuing	Continuing	Continuing
Subtotal			18.447	1.090		4.481		3.079		-		3.079	Continuing	Continuing	N/A
Remarks															
The decrease from FY18 to FY19 (\$1.402M) in In-House Technical Support reflects less engineering and technical support required as Survivability Upgrade P-variant enters the final year of test.															
			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			129.181	36.571		58.728		22.637		-		22.637	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206629M / (U)Amphibious Assault Vehicle	Project (Number/Name) 2938 / Amphibious Assault Vehicle	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 2938				
MS C for Survivability Upgrade	4	2017	4	2017
LRIP Lot 1 for P-variant Survivability Upgrade	4	2017	1	2019
LRIP Lot 2 for P-variant Survivability Upgrade	3	2018	3	2019
Developmental Test and Evaluation/Production Qualification Testing/Reliability Testing (PQT/RQT) for P-variant Survivability Upgrade	4	2018	3	2019
Full-Up System Level Testing (FUSL) for P-variant Survivability Upgrade	4	2018	2	2019
IOT&E for P-variant Survivability Upgrade	2	2019	3	2019
Full Rate Production for Survivability Upgrade	3	2019	4	2023