

# UNCLASSIFIED

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 0206629M I (U)Amphibious Assault Vehicle							
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	87.940	41.363	38.020	58.728	-	58.728	26.810	14.223	6.365	6.741	Continuing	Continuing
2938: Amphibious Assault Vehicle	87.940	41.363	38.020	58.728	-	58.728	26.810	14.223	6.365	6.741	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.

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	45.110	38.020	58.303	-	58.303
Current President's Budget	41.363	38.020	58.728	-	58.728
Total Adjustments	-3.747	0.000	0.425	-	0.425
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-2.967	0.000			
• SBIR/STTR Transfer	-0.780	0.000			
• Rate/Misc Adjustments	0.000	0.000	0.425	-	0.425

## Change Summary Explanation

The increase from FY17 to FY18 (\$20.708M) represents the start of AAV's Survivability Upgrade 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). The increase also reflects the procurement of 3 C-variant Engineering, Manufacturing and Development (EMD) vehicles.

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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 0206629M / (U)Amphibious Assault Vehicle				Project (Number/Name) 2938 / Amphibious Assault Vehicle			
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
2938: Amphibious Assault Vehicle	87.940	41.363	38.020	58.728	-	58.728	26.810	14.223	6.365	6.741	Continuing	Continuing
Quantity of RDT&E Articles		-	4	3	-	3	-	-	-	-		

**Note**

The increase from FY17 to FY18 (\$20.708M) represents the start of AAV's Survivability Upgrade 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). The increase also reflects the procurement of 3 C-variant Engineering, Manufacturing and Development (EMD) vehicles.

**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)**

	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018 Base</b>	<b>FY 2018 OCO</b>	<b>FY 2018 Total</b>
<b>Title:</b> Product Development	22.981	24.273	29.341	0.000	29.341
<b>Articles:</b>	-	4	3	-	3
<p><b>Description:</b> 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.</p> <p>The increase from FY17 to FY18 of \$5.068M is due to development activities for R7 Modernization, Survivability Upgrade Hydraulic Moderation and continued electrical modernization for legacy AAV's and for the addition of C-variant requirements, which include the procurement of 2 Engineering and Manufacturing Development (EMD) vehicles (C-variants) and 1 Live Fire Test &amp; Evaluation vehicle (C-variant).</p> <p><b>FY 2016 Accomplishments:</b> -Initiated prime contractor support for Developmental, Operational, and Live Fire Test and Evaluation (LFT&amp;E).</p>					

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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 0206629M / (U)Amphibious Assault Vehicle		Project (Number/Name) 2938 / Amphibious Assault Vehicle		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<div>-Initiated nonrecurring engineering effort for 3D Modeling for C-Variant.</div> <div>-Initiated Amphibious Remote Weapon Station (ARWS) integration and engineering analyses.</div> <div>FY 2017 Plans:</div> <div>-Complete prime contractor support for Developmental, Operational, and Live Fire Test and Evaluation (LFT&amp;E).</div> <div>-Initiate the procurement of four P-variant test articles for Full-Up System Level (FUSL) testing.</div> <div>-Initiate the Corrective Action Period (CAP) for EMD.</div> <div>-Initiate nonrecurring efforts for Electrical Modernization for development design, integration and test.</div> <div>-Continue Amphibious Remote Weapon Station (ARWS) integration and engineering analyses.</div> <div>FY 2018 Base Plans:</div> <div>-Continue nonrecurring efforts for legacy vehicle Electrical Modernization for design, development, integration, and test.</div> <div>-Initiate prime contractor IOT&amp;E and FUSL test support.</div> <div>-Initiate the procurement of two (2) EMD vehicles (C-variant) vehicles and one (1) Live Fire Test &amp; Evaluation (LFT&amp;E) vehicle (C-variant).</div> <div>-Initiate efforts in Hydraulic Modernization and R7 improvements for Survivability Upgrade.</div> <div>-Complete Amphibious Remote Weapon Station (ARWS) integration and engineering analyses.</div> <div>FY 2018 OCO Plans:</div> <div>N/A</div>						
<div>Title: Support</div> <div>Articles:</div> <div>Description: Provide government engineering and technical support for AAV safety, obsolescence, and performance modifications, and Survivability Upgrade support.</div> <div>FY 2016 Accomplishments:</div> <div>- Continued nonrecurring engineering and design for AAV electrical modernization, and command and control (C2) systems modernization.</div> <div>- Continued to provide technical and engineering services in support of AAV obsolescence and performance modifications.</div> <div>- Initiated nonrecurring engineering and design for AAV hydraulic modernization and hydrodynamics.</div>		5.163 -	4.652 -	3.666 -	0.000 -	3.666 -

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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 0206629M / (U)Amphibious Assault Vehicle		Project (Number/Name) 2938 / Amphibious Assault Vehicle		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<p>- Continued to provide material and travel associated with these efforts.</p> <p><b>FY 2017 Plans:</b></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><b>FY 2018 Base Plans:</b></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><b>FY 2018 OCO Plans:</b></p> <p>N/A</p>						
<p><b>Title:</b> Test and Evaluation</p> <p align="right"><b>Articles:</b></p> <p><b>Description:</b> 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.</p> <p>The increase from FY17 to FY18 of \$16.181M reflects the initiation of Full-Up System Level (FUSL) testing, Initial Operational Test and Evaluation (IOT&amp;E), and Developmental Testing efforts for Production Qualification Testing/Reliability Qualification Testing (PQT/RQT).</p> <p><b>FY 2016 Accomplishments:</b></p> <p>-Initiated Developmental Testing for Survivability Upgrade and initiated Operational Assessment and Live Fire Test and Evaluation activities in support of Survivability Upgrade.</p> <p>-Completed EAAK Phase III and E3 Co-site testing.</p> <p><b>FY 2017 Plans:</b></p> <p>- Continue Developmental Testing and Live Fire Test and Evaluation activities in support of Survivability Upgrade.</p>		6.902 -	5.059 -	21.240 -	0.000 -	21.240 -

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Appropriation/Budget Activity 1319 / 7		R-1 Program Element (Number/Name) PE 0206629M I (U)Amphibious Assault Vehicle		Project (Number/Name) 2938 I Amphibious Assault Vehicle	
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)					
	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<p>- Initiate hot and cold environmental testing for the Survivability Upgrade.</p> <p><b>FY 2018 Base Plans:</b></p> <p>- Continue Developmental Testing and Live Fire Test and Evaluation activities in support of Survivability Upgrade.</p> <p>- Initiate Full-Up System Level (FUSL) testing for Survivability Upgrade.</p> <p>- Initiate government labor associated with the Initial Operational Test and Evaluation (IOT&amp;E) in support of the Survivability Upgrade.</p> <p>- Initiate Developmental Testing (DT) efforts for Production Qualification Testing/Reliability Qualification Testing (PQT/RQT).</p> <p>- Initiate Amphibious Remote Weapon Station (ARWS) Developmental Testing and Operational Testing.</p> <p><b>FY 2018 OCO Plans:</b></p> <p>N/A</p>					
<p><b>Title:</b> Management and Engineering Technical Services</p> <p><b>Articles:</b></p> <p><b>Description:</b> Management support services and technical support for program office and field activities.</p> <p><b>FY 2016 Accomplishments:</b></p> <p>- Continued program management services in support of Engineering Change Proposal (ECP) development, trade studies and analysis, supply chain and government property management in support of AAV sustainment modification efforts.</p> <p>- Completed program management services in support of AAV Survivability Upgrade.</p> <p><b>FY 2017 Plans:</b></p> <p>- Continue program management services in support of Engineering Change Proposals (ECP) development, trade studies and analysis, supply chain and government property management in support of AAV sustainment modification efforts.</p> <p><b>FY 2018 Base Plans:</b></p> <p>- Continue program management services in support of ECP development, trade studies and analysis, supply chain and government property management in support of AAV sustainment modification efforts.</p>					
	6.317	4.036	4.481	0.000	4.481
	-	-	-	-	-

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Navy				<b>Date:</b> May 2017							
<b>Appropriation/Budget Activity</b> 1319 / 7		<b>R-1 Program Element (Number/Name)</b> PE 0206629M / (U)Amphibious Assault Vehicle		<b>Project (Number/Name)</b> 2938 / Amphibious Assault Vehicle							
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>											
	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018 Base</b>	<b>FY 2018 OCO</b>	<b>FY 2018 Total</b>						
- Initiate non-recurring logistic support for systems integration.											
<b>FY 2018 OCO Plans:</b> N/A											
<b>Accomplishments/Planned Programs Subtotals</b>	41.363	38.020	58.728	0.000	58.728						
<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<b>Line Item</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018 Base</b>	<b>FY 2018 OCO</b>	<b>FY 2018 Total</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
• PMC/2021: AAV Product Improvement Program	20.365	73.785	107.665	-	107.665	180.750	312.152	299.658	39.132	20.645	2,029.470
<b>Remarks</b>											
<b>D. Acquisition Strategy</b>											
<p>The USMC competitively awarded two contracts in FY14 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&amp;E funded competitive designs and contract options for Engineering and Manufacturing Development(EMD). Initial Operational Capability (IOC) is scheduled for FY19.</p>											
<b>E. Performance Metrics</b>											
<p>Milestone Reviews:</p> <p>Milestone C: 4th quarter of FY17</p>											

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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 0206629M / (U)Amphibious Assault Vehicle				Project (Number/Name) 2938 / Amphibious Assault Vehicle					
Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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	46.888	20.523	May 2016	20.069	Aug 2017	17.864	Feb 2018	-		17.864	Continuing	Continuing	Continuing
Other Product Development	C/BA	Various : Various	0.629	2.458	Feb 2016	4.204	Mar 2017	11.476	Mar 2018	-		11.476	Continuing	Continuing	Continuing
Subtotal			47.517	22.981		24.273		29.340		-		29.340	-	-	-
Remarks															
The decrease from FY17 to FY18 for System Design & Development/EMD is due to completion of the Electrical Modernization for Survivability Upgrade. The increase from FY17 to FY18 in Other Product Development is due to development activities for R7 Modernization, Survivability Upgrade Hydraulic Moderation and continued electrical modernization for legacy AAV's and for the addition of C-variant requirements, which include the procurement of 2 Engineering and Manufacturing Development (EMD) vehicles (C-variants) and 1 Live Fire Test & Evaluation vehicle (C-variant).															
Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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	0.197	0.296	Oct 2015	0.256	Oct 2016	0.249	Oct 2017	-		0.249	Continuing	Continuing	Continuing
In-House Technical Support	Various	Various : Various	19.822	4.867	Feb 2016	4.396	Feb 2017	3.418	Feb 2018	-		3.418	Continuing	Continuing	Continuing
Subtotal			20.019	5.163		4.652		3.667		-		3.667	-	-	-
Remarks															
The decrease from FY17 to FY18 in In-House Technical Support reflects less engineering and technical support due to the completion of SVR Design Assessments and preparation activities for Full-Up System Level (FUSL) test vehicles for Survivability Upgrade.															
Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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	1.291	3.929	Feb 2016	2.434	Nov 2016	10.793	Feb 2018	-		10.793	Continuing	Continuing	Continuing

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<b>Exhibit R-3, RDT&amp;E Project Cost Analysis: FY 2018 Navy</b>												<b>Date: May 2017</b>			
<b>Appropriation/Budget Activity</b> 1319 / 7						<b>R-1 Program Element (Number/Name)</b> PE 0206629M / (U)Amphibious Assault Vehicle						<b>Project (Number/Name)</b> 2938 / Amphibious Assault Vehicle			
<b>Test and Evaluation (\$ in Millions)</b>				<b>FY 2016</b>		<b>FY 2017</b>		<b>FY 2018 Base</b>		<b>FY 2018 OCO</b>		<b>FY 2018 Total</b>			
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
Operational Testing (OT)	WR	MCOTEA : Quantico, VA	0.182	0.840	May 2016	0.000		7.965	Mar 2018	-		7.965	Continuing	Continuing	Continuing
Live Fire Test and Evaluation (LFT&E)	Various	Various : Various	0.010	2.133	Dec 2015	2.625	Mar 2017	2.482	Mar 2018	-		2.482	Continuing	Continuing	Continuing
<b>Subtotal</b>			1.483	6.902		5.059		21.240		-		21.240	-	-	-
<b>Remarks</b> The increase from FY17 to FY18 for Testing reflects the initiation of Full-Up System Level (FUSL) testing, Initial Operational Test and Evaluation (IOT&E), and Developmental Testing efforts for Production Qualification Testing/Reliability Qualification Testing (PQT/RQT).															
<b>Management Services (\$ in Millions)</b>				<b>FY 2016</b>		<b>FY 2017</b>		<b>FY 2018 Base</b>		<b>FY 2018 OCO</b>		<b>FY 2018 Total</b>			
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
Management Support Svcs	C/FFP	MCSC : Quantico, VA	6.802	0.000	Apr 2016	1.466	Apr 2017	1.826	Apr 2018	-		1.826	Continuing	Continuing	Continuing
Engineering and Technical Services	Various	Various : Various	12.119	6.317	Mar 2016	2.570	Mar 2017	2.655	Mar 2018	-		2.655	Continuing	Continuing	Continuing
<b>Subtotal</b>			18.921	6.317		4.036		4.481		-		4.481	-	-	-
<b>Remarks</b> The increase from FY17 to FY18 reflects additional program management support for nonrecurring test and evaluation and logistic support for systems integration.															
			<b>Prior Years</b>	<b>FY 2016</b>		<b>FY 2017</b>		<b>FY 2018 Base</b>		<b>FY 2018 OCO</b>		<b>FY 2018 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Project Cost Totals</b>			87.940	41.363		38.020		58.728		-		58.728	-	-	-
<b>Remarks</b>															



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

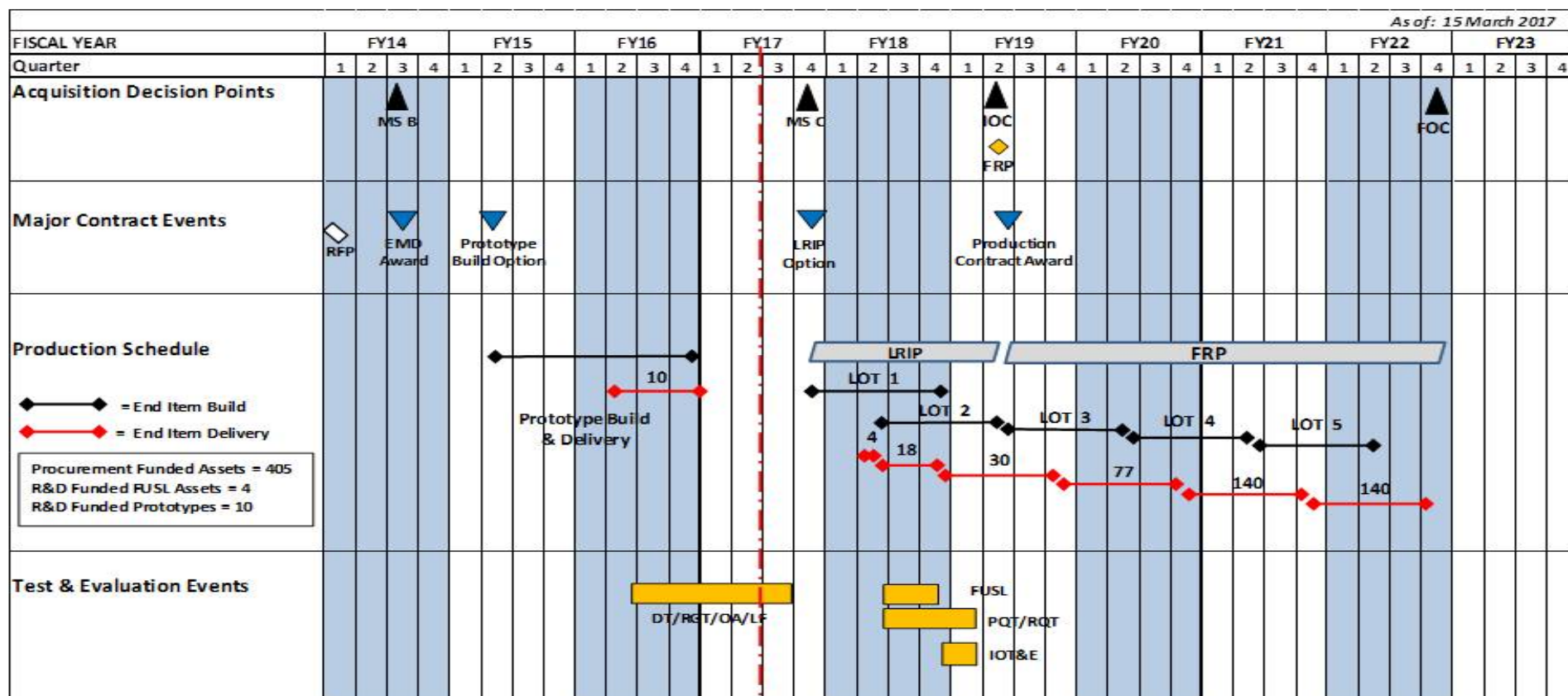
Date: May 2017

Appropriation/Budget Activity  
1319 / 7

R-1 Program Element (Number/Name)  
PE 0206629M / (U)Amphibious Assault  
Vehicle

Project (Number/Name)  
2938 / Amphibious Assault Vehicle

## AAV SURVIVABILITY UPGRADE



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

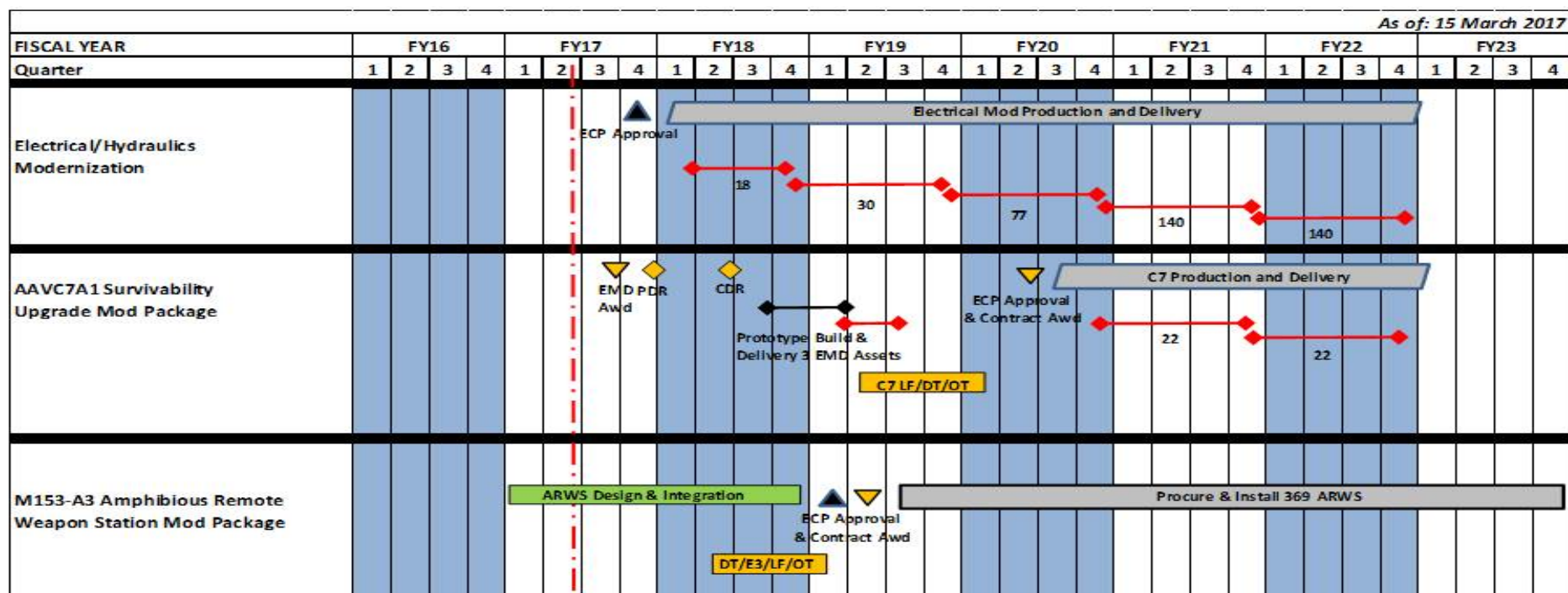
Date: May 2017

Appropriation/Budget Activity  
1319 / 7

R-1 Program Element (Number/Name)  
PE 0206629M / (U)Amphibious Assault  
Vehicle

Project (Number/Name)  
2938 / Amphibious Assault Vehicle

## AAV MOD



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<b>Exhibit R-4A, RDT&amp;E Schedule Details: FY 2018 Navy</b>			<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0206629M / (U)Amphibious Assault Vehicle	<b>Project (Number/Name)</b> 2938 / Amphibious Assault Vehicle	

**Schedule Details**

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b>Proj 2938</b>				
Developmental Test and Evaluation/Production Qualification Testing/Reliability Testing (PQT/RQT)	2	2016	1	2019
MS C	4	2017	4	2017
LRIP Option Award	4	2017	4	2017
LRIP	4	2017	2	2019
Full-Up System Level Testing (FUSL)	2	2018	4	2018
IOT&E	4	2018	1	2019
Full Rate Production	2	2019	4	2022