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**Exhibit R-2, RDT&E Budget Item Justification:** PB 2017 Navy **Date:** February 2016

<b>Appropriation/Budget Activity</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy / BA 5: System Development &amp; Demonstration (SDD)</i>	<b>R-1 Program Element (Number/Name)</b> PE 0604262N / V-22A
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COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	9,078.016	50.188	76.483	174.423	-	174.423	145.342	97.583	64.184	67.500	209.793	9,963.512
1425: V-22	9,078.016	50.188	76.483	174.423	-	174.423	145.342	97.583	64.184	67.500	209.793	9,963.512

**Program MDAP/MAIS Code:** 212

**A. Mission Description and Budget Item Justification**

The V-22 Osprey is an Acquisition Category IC Joint Program led by the Department of the Navy for the purpose of developing, testing, evaluating, procuring and fielding a tilt rotor, vertical takeoff and landing aircraft for Joint Service application. The V-22 program is designed to provide an aircraft to meet the amphibious/vertical assault needs of the Marine Corps, the Carrier Onboard Delivery needs of the Navy, and the special operations needs of the Air Force and the United States Special Operations Command. The V-22 is replacing the CH-46E and CH53A/D in the Marine Corps with the MV-22; will supplement the H-60 in the Navy with the MV-22; and replace the MH-53J and MH-53M as well as augment the C-130 in the Air Force and USSOCOM with the CV-22. The V-22 is capable of flying over 2,100 nautical miles, with a single refueling, giving the services the advantage of a Vertical/Short Take-off and Landing aircraft that can rapidly self-deploy to any location in the world. This program is funded under Engineering Manufacturing and Development for correction of deficiencies and includes Block A and Block B upgrades which encompassed engineering and manufacturing development of new end-items prior to the production incorporation decision as well as Block C suitability and effectiveness development upgrades. Capability Development Document interoperability requirements were addressed through a spiral upgrade acquisition strategy. It was the first spiral providing Key Enabling Department of Defense mandated open systems architecture upgrades for the mission computer hardware and software while simultaneously addressing required interoperability common avionics upgrades and current avionics obsolescence issues. Future development efforts will include Pre-Planned-Product-Improvements in the Capability Development Document and Re-design efforts to correct critical Reliability, Maintainability and Availability issues in support of readiness Operational Safety Improvement Program as prioritized by the United States Marine Corps or a Urgent Universal Needs Statement. Development efforts include Block C Upgrade, Mission System Upgrade, Electrical System Upgrades, Mid-Wing Process Unit, ARC 210 Generation 5 Radio, Mission Computer Obsolescence Initiative, Weapon Systems Development, AAR-47 Hostile Fire Indicator, Time on Wing, Digital Interoperability, and Blue Force Tracker/Netted Weather.

FY17 will provide for additional Aircraft Mission Maneuvering Envelope Expansion, Velocity Not to Exceed Expansion, Digital Interoperability, Software Reprogrammable Payload, Time on Wing and Reliability Improvement efforts such as Improved Inlet Solution (IIS), Condition Based Maintenance Plus (CBM+) development as well as development and testing of Additive Manufacturing processes for selected MV-22 components.

The MV-22 Hardware Development Airframe continues to fund development efforts by Bell-Boeing. Continue development in support of MV-22 Block upgrades and Time on Wing and efforts such as IIS and CBM+. Continue engineering, logistics, flight test, flight test support and address the correction of deficiencies and obsolescence. Continue MV-22 software development/mission computer obsolescence initiatives such as modular software, transition tech demo and map replacement demo. Continue V-22 Integrated Aircraft Survivability Equipment to include correcting deficiencies of the current radar warning system, integration with an upgraded missile warning and active infrared countermeasure system, and providing integrated threat warning information on the aircraft main flight displays.

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<b>Exhibit R-2, RDT&amp;E Budget Item Justification:</b> PB 2017 Navy		<b>Date:</b> February 2016
<b>Appropriation/Budget Activity</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy / BA 5: System Development &amp; Demonstration (SDD)</i>	<b>R-1 Program Element (Number/Name)</b> PE 0604262N / V-22A	
<p>MV-22 Hardware Development Propulsion will continue to fund the flight/engine hours necessary for developmental testing at the Patuxent River squadron. Rolls-Royce will continue to provide engine support and development of MV-22 flight testing.</p> <p>FY17 continues MV-22 Digital Interoperability (DI), United States Marine Corps Aviation wide implementation of software defined radios, such as Software Reprogrammable Payload, capable of migration to advanced waveforms and payloads, providing enhanced digital connectivity between forces using dissimilar waveforms and/or protocols. DI will enable fleet integration of new capability through the use of tablets with custom applications. Digital Interoperability is also envisioned to include logistics tracking (cargo and personnel) with the use of Radio Frequency Identification technology, advanced Electronic Warfare/Cyber capability, and threat data capturing/off-boarding.</p> <p>FY17 continues MV-22 Software Reprogrammable Payload is a single common payload module that is open architecture, government owned, flexible, and reconfigurable to support simultaneous missions and applications making maximum use of available bandwidth and ensuring interoperability. Provides a bridge and translator to allow various systems/waveforms to collaborate and provides the V-22 operator and passenger with a common operating picture. MV-22 is the lead platform for integration of Software Reprogrammable Payload Spiral II.</p> <p>FY17 continues effort started under PE: 0605525N. The Navy Variant Hardware Development consists of an Engineering Change Proposal (ECP) to modify MV-22 into the Navy Variant configuration to perform the Carrier Onboard Delivery (COD) mission. The ECP will add such things as (1) the capability to meet the range requirements that the COD mission demands (2) a high frequency radio to transmit/receive beyond line of sight over water and (3) a public address system for use while transporting passengers.</p> <p>FY17 continues the V-22 Aerial Refueling System (VARs) capability. VARs will provide V-22 tanker capability to the Marine Air Ground Task Force, enabling safe and efficient execution of all missions, tactical or humanitarian. The system will allow the V-22 to provide fuel to other Air Combat Element aircraft, such as F-35B and CH-53E/K, while en-route, in the objective area, or during recovery, extending the operational reach/duration. With the V-22 deployed onboard, amphibious assault ships would gain an organic aerial refueling capability, maximizing response time and agility.</p> <p>FY17 continues Electrical System re-design and reliability improvement effort started in the Hardware Development Airframe line. This effort will assess and select engineering solutions to improve the Variable Frequency Generator and Generator Control Unit components. Increased V-22 electrical system reliability and capacity is required to accommodate demands on electrical power system as additional systems are added to the V-22.</p> <p><b>JUSTIFICATION FOR BUDGET ACTIVITY:</b> This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate funding in the current or subsequent fiscal year.</p>		

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<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>
Previous President's Budget	57.749	87.918	138.217	-	138.217
Current President's Budget	50.188	76.483	174.423	-	174.423
Total Adjustments	-7.561	-11.435	36.206	-	36.206
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-11.435			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-6.147	0.000			
• SBIR/STTR Transfer	-1.413	0.000			
• Program Adjustments	0.000	0.000	22.071	-	22.071
• Rate/Misc Adjustments	-0.001	0.000	14.135	-	14.135

**Change Summary Explanation**

The FY 2017 funding request was reduced by \$2.518M to account for the availability of prior year execution balances.

Schedule: Added Additional detail to FY2017 schedule for Navy Variant (also formally referred to as HV-22) to reflect Engineering Development Model (1) article milestones. Also Production Quantity change from 8 per year to 6 per year. Expanded OT to reflect planned OT events across the FYDP. Software Reprogrammable Payload development schedule was moved out to 3rd FY18 to account for the \$6M recession. Development Test and Evaluation (DT&E) was updated to adjust for actuals.

Technical: Not applicable

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2017 Navy										<b>Date:</b> February 2016		
<b>Appropriation/Budget Activity</b> 1319 / 5					<b>R-1 Program Element (Number/Name)</b> PE 0604262N / V-22A				<b>Project (Number/Name)</b> 1425 / V-22			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
1425: V-22	9,078.016	50.188	76.483	174.423	-	174.423	145.342	97.583	64.184	67.500	209.793	9,963.512
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

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FY17 will provide for additional Aircraft Mission Maneuvering Envelope Expansion, Velocity Not to Exceed Expansion, Digital Interoperability, Software Reprogrammable Payload, Time on Wing and Reliability Improvement efforts such as Improved Inlet Solution (IIS), Condition Based Maintenance Plus (CBM+) development as well as development and testing of Additive Manufacturing processes for selected MV-22 components.

The MV-22 Hardware Development Airframe continues to fund development efforts by Bell-Boeing. Continue development in support of MV-22 Block upgrades and Time on Wing and efforts such as IIS and CBM+. Continue engineering, logistics, flight test, flight test support and address the correction of deficiencies and obsolescence. Continue MV-22 software development/mission computer obsolescence initiatives such as modular software, transition tech demo and map replacement demo. Continue V-22 Integrated Aircraft Survivability Equipment to include correcting deficiencies of the current radar warning system, integration with an upgraded missile warning and active infrared countermeasure system, and providing integrated threat warning information on the aircraft main flight displays.

MV-22 Hardware Development Propulsion will continue to fund the flight/engine hours necessary for developmental testing at the Patuxent River squadron. Rolls-Royce will continue to provide engine support and development of MV-22 flight testing.

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<b>Appropriation/Budget Activity</b> 1319 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604262N / V-22A	<b>Project (Number/Name)</b> 1425 / V-22
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FY17 continues MV-22 Digital Interoperability (DI), United States Marine Corps Aviation wide implementation of software defined radios, such as Software Reprogrammable Payload, capable of migration to advanced waveforms and payloads, providing enhanced digital connectivity between forces using dissimilar waveforms and/or protocols. DI will enable fleet integration of new capability through the use of tablets with custom applications. Digital Interoperability is also envisioned to include logistics tracking (cargo and personnel) with the use of Radio Frequency Identification technology, advanced Electronic Warfare/Cyber capability, and threat data capturing/off-boarding.

FY17 continues MV-22 Software Reprogrammable Payload is a single common payload module that is open architecture, government owned, flexible, and reconfigurable to support simultaneous missions and applications making maximum use of available bandwidth and ensuring interoperability. Provides a bridge and translator to allow various systems/waveforms to collaborate and provides the V-22 operator and passenger with a common operating picture. MV-22 is the lead platform for integration of Software Reprogrammable Payload Spiral II.

FY17 continues effort started under PE: 0605525N. The Navy Variant Hardware Development consists of an Engineering Change Proposal (ECP) to modify MV-22 into the Navy Variant configuration to perform the Carrier Onboard Delivery (COD) mission. The ECP will add such things as (1) the capability to meet the range requirements that the COD mission demands (2) a high frequency radio to transmit/receive beyond line of sight over water and (3) a public address system for use while transporting passengers.

FY17 continues the V-22 Aerial Refueling System (VARS) capability. VARS will provide V-22 tanker capability to the Marine Air Ground Task Force, enabling safe and efficient execution of all missions, tactical or humanitarian. The system will allow the V-22 to provide fuel to other Air Combat Element aircraft, such as F-35B and CH-53E/K, while en-route, in the objective area, or during recovery, extending the operational reach/duration. With the V-22 deployed onboard, amphibious assault ships would gain an organic aerial refueling capability, maximizing response time and agility.

FY17 continues Electrical System re-design and reliability improvement effort started in the Hardware Development Airframe line. This effort will assess and select engineering solutions to improve the Variable Frequency Generator and Generator Control Unit components. Increased V-22 electrical system reliability and capacity is required to accommodate demands on electrical power system as additional systems are added to the V-22.

**JUSTIFICATION FOR BUDGET ACTIVITY:** This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate funding in the current or subsequent fiscal year.

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

	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
<b>Title:</b> New V-22 Instrumented Aircraft (NVIA)	2.205	0.000	0.000	0.000	0.000
<b>Articles:</b>	-	-	-	-	-
<b>Description:</b> The purpose of the NVIA is to (a) augment existing V-22 structural test capability by supplementing and eventually replacing Aircraft 90008; and (b) provide improved, comprehensive flight test data with increased reliability/maintainability over existing Aircraft 90008 to support the V-22 development roadmap. The NVIA was					

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

delivered to Pax River on 5/12/15. The aircraft completed final test configuration work and will start its utilization as a fully instrument test aircraft 3rd QTR FY15.

***FY 2015 Accomplishments:***

FY15: Final incremental funding for the NVIA, delivered 3rd quarter of FY15.

***FY 2016 Plans:***

N/A

***FY 2017 Base Plans:***

N/A

***FY 2017 OCO Plans:***

N/A

**Title:** MV-22 Hardware Development Airframe

***Articles:***

FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
22.292	14.817	40.238	0.000	40.238
-	-	-	-	-

**Description:** The MV-22 Hardware Development Airframe continues to fund development efforts by Bell-Boeing. Continue development in support of MV-22 Block upgrades and Time on Wing/Reliability Improvements efforts such as Improved Inlet Solution, Condition Based Maintenance development, development and testing of Additive Manufacturing processes for selected MV-22 components, Miniaturized Airborne Global Positioning and electrical system capacity efforts. Continue engineering, logistics, flight test, flight test support and address the correction of deficiencies and obsolescence efforts, including training upgrades and developments. Continue MV-22 software development/sustainment efforts such as modular software study, transition tech demo, map replacement demo and Mission Computer Obsolescence Initiative re-design. Continue V-22 Integrated Aircraft Survivability Equipment to include correcting deficiencies and obsolescence issues, to include the current radar warning system, integration with an upgraded missile warning and active infrared countermeasure system, cockpit interface units, electrical power system, and providing integrated threat warning information on the aircraft main flight displays. FY2017 increase supports increasing USMC Ready Basic Aircraft with development efforts such as the Infrared Suppressor Redesign and Modular Avionics.

***FY 2015 Accomplishments:***

Continue MV-22 development efforts by Bell-Boeing. Rolls-Royce will continue to provide engine support and development of MV-22 flight testing. Continue MV-22 software development/sustainment efforts. Continue development in support of MV-22 Block upgrades and Time on Wing efforts such as Improved Inlet Solution (IIS). Continue engineering, logistics, flight test and flight test support. Conduct Modular Software Study.

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

	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
<p>FY15 funds used to address correction of deficiencies and obsolescence issues in cockpit interface units and electrical power system, as well as address other obsolescence issues as part of additive manufacturing process development for V-22 components.</p> <p><b>FY 2016 Plans:</b> Continue MV-22 development efforts by Bell-Boeing. Rolls-Royce will continue to provide engine support and development of MV-22 flight testing. Continue MV-22 software development/sustainment efforts. Continue development in support of MV-22 Block upgrades and Time on Wing efforts such as IIS. Continue engineering, logistics, flight test, flight test support and address correction of deficiencies. Continue contracted development efforts on test aircraft. Continue electrical system capacity and reliability improvement efforts.</p> <p><b>FY 2017 Base Plans:</b> FY2017 increase supports increasing USMC Ready Basic Aircraft with development efforts such as the Infrared Suppressor Redesign and Modular Avionics. Continue MV-22 development efforts by Bell-Boeing. Rolls-Royce will continue to provide engine support and development of MV-22 flight testing. Continue MV-22 software development/sustainment efforts such as Mission Computer Obsolescence Initiative re-design and modular software. Continue development in support of MV-22 Block upgrades and Time on Wing/Reliability Improvement efforts such as Improved Inlet Solution and Condition Based Maintenance Plus. Continue V-22 Integrated Aircraft Survivability Equipment effort. Continue engineering, logistics, flight test, flight test support and address correction of deficiencies and obsolescence efforts, including training upgrades and developments. Continue reliability improvement efforts such as Additive manufacturing, and Miniaturized Airborne Global Positioning as well as Re-design efforts to correct critical Reliability, Maintainability and Availability issues in support of readiness Operational Safety Improvement Program.</p> <p><b>FY 2017 OCO Plans:</b> N/A</p>					
<p><b>Title:</b> MV-22 Hardware Development Propulsion/Mission Care</p> <p align="right"><b>Articles:</b></p> <p><b>Description:</b> The funding of Mission Care relates to our RDT&amp;E program as it funds the flight/engine hours necessary for developmental testing at the Patuxent River squadron. In addition, it pays for Rolls Royce engine support at Patuxent River.</p> <p><b>FY 2015 Accomplishments:</b></p>	0.306 -	0.298 -	0.280 -	0.000 -	0.280 -

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

	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
<p>Funds are provided for continued Mission Care flight &amp; engine hours for developmental testing at Patuxent River squadron.</p> <p><b>FY 2016 Plans:</b> Funds continued for Mission Care flight &amp; engine hours for developmental testing at Patuxent River squadron.</p> <p><b>FY 2017 Base Plans:</b> Funds continued for Mission Care flight &amp; engine hours for developmental testing at Patuxent River squadron.</p> <p><b>FY 2017 OCO Plans:</b> N/A</p>					
<p><b>Title:</b> MV-22 Digital Interoperability</p> <p align="right"><b>Articles:</b></p> <p><b>Description:</b> Digital Interoperability is the United States Marine Corps Aviation wide implementation of software defined radios, such as Software Reprogrammable Payload, capable of migration to advanced waveforms and payloads, providing enhanced digital connectivity between forces using dissimilar waveforms and/or protocols. Digital Interoperability will enable fleet integration of new capability through the use of tablets with custom applications. Digital Interoperability is also envisioned to include logistics tracking (cargo and personnel) with the use of Radio Frequency Identification technology, advanced Electronic Warfare/Cyber capability, and threat data capturing/off-boarding.</p> <p><b>FY 2015 Accomplishments:</b> Funds begin for MV-22 Digital Interoperability providing MV-22 Gateway functionality to provide digital connectivity between Air and Ground forces using dissimilar protocols. Begin development of Software Reprogrammable Payload Spiral II Critical Design Review, including Interface Control Document.</p> <p><b>FY 2016 Plans:</b> Funds continue for development and demonstration of Digital Interoperability, including spiral development of Software Reprogrammable Payload (SRP), tablets and the custom applications.</p> <p><b>FY 2017 Base Plans:</b> Funds continue for development and demonstration of Digital Interoperability, by incorporating lessons learned into the SRP, using additional dissimilar waveforms and Protocols, tablets and the custom applications, Radio Frequency Identification technology, Electronic Warfare/Cyber capability and threat data capturing/off-boarding.</p> <p><b>FY 2017 OCO Plans:</b></p>	6.635	4.508	9.900	0.000	9.900
	-	-	-	-	-

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

	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
N/A					
<p><b>Title:</b> MV-22 Software Reprogrammable Payload (SRP)</p> <p align="right"><b>Articles:</b></p> <p><b>Description:</b> SRP is a single common payload module that is open architecture, government owned, flexible, and reconfigurable to support simultaneous missions and applications making maximum use of available bandwidth and ensuring interoperability. Provides a bridge and translator to allow various systems/waveforms to collaborate and provides the V-22 operator and passenger with a common operating picture.</p> <p><b>FY 2015 Accomplishments:</b> N/A</p> <p><b>FY 2016 Plans:</b> Development begins for the SRP with the development of a conformal antenna and incorporation of Spiral II waveforms (Link 16, Bandwidth Efficient Common Data Link {BE-CDL}, Tactical Targeting Network Technology {TTNT} and associated hardware) into the Software Reprogrammable Payload (SRP) radio.</p> <p><b>FY 2017 Base Plans:</b> Completes remaining efforts Software Reprogrammable Payload development to include Software Integration Labs, MV-22 integration, test and development assets.</p> <p><b>FY 2017 OCO Plans:</b> N/A</p>	0.000	5.200	6.000	0.000	6.000
	-	-	-	-	-
<p><b>Title:</b> V-22 Navy Variant Development</p> <p align="right"><b>Articles:</b></p> <p><b>Description:</b> Funding supports the implementation of an Engineering Change Proposal to incorporate the new systems required for the Navy Variant configuration to perform the Carrier Onboard Delivery (COD) mission. The ECP will add (1) the capability to meet the range requirements that the COD mission demands (2) a High Frequency radio to transmit/receive beyond line of sight over water and (3) a Public Address system for use while transporting passengers.</p> <p><b>FY 2015 Accomplishments:</b> N/A</p> <p><b>FY 2016 Plans:</b></p>	0.000	17.170	71.563	0.000	71.563
	-	-	1	-	1

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<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>
<p>Funds provided for the V-22 Navy Variant to perform the COD mission. Begin development of Engineering Change Proposal to meet External Fuel Tank, High Frequency radio and Public Address system requirements. Begin engineering and logistics support needed to develop ECP. Develop full System Engineering Development Model (EDM).</p> <p><b>FY 2017 Base Plans:</b> Continue funding for the V-22 Navy Variant to perform the COD mission. Continue development of Engineering Change Proposal to meet Extended Range, High Frequency radio and Public Address system requirements. Continue engineering and logistics support needed to develop ECP. Build and install EDM prototype ECP kit on V-22 developmental test aircraft.</p> <p><b>FY 2017 OCO Plans:</b> N/A</p>					
<p><b>Title:</b> V-22 Aerial Refueling System Development</p> <p align="right"><b>Articles:</b></p> <p><b>Description:</b> V-22 Aerial Refueling System will provide V-22 tanker capability to the Marine Air Ground Task Force, enabling safe and efficient execution of all missions, tactical or humanitarian. The system will allow the V-22 to provide fuel to other Air Combat Element aircraft, such as F-35B and CH-53E/K, while en-route, in the objective area, or during recovery, extending the operational reach/duration. With the V-22 deployed onboard, amphibious assault ships would gain an organic aerial refueling capability, maximizing response time and agility.</p> <p><b>FY 2015 Accomplishments:</b> N/A</p> <p><b>FY 2016 Plans:</b> Begin funding the V-22 Aerial Refueling System Development Capability. V-22 Aerial Refueling System will provide V-22 tanker capability to the Marine Air Ground Task Force, enabling safe and efficient execution of all missions, tactical or humanitarian. This FY16 funding will complete the initial design and allow the effort to proceed through CDR.</p> <p><b>FY 2017 Base Plans:</b> Continue funding for the V-22 Aerial Refueling System (VARS) Development Capability. VARS will provide V-22 tanker capability to the Marine Air Ground Task Force, enabling safe and efficient execution of all missions,</p>	0.000	15.000	24.752	0.000	24.752
	-	-	-	-	-



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<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>
nacelle sails, Integrated Aircraft Survivability Equipment, Nacelle Sail testing, traffic collision avoidance system, bonded tabs, aerial refueling system and refueling envelope, Tactical Training Theatre Assessment and Planning Phase III and Navy variant risk reduction.  <b>FY 2017 OCO Plans:</b> N/A					
<b>Title:</b> MV-22 Electrical System Re-design  <b>Description:</b> Continue Electrical System re-design and reliability improvement effort started in the Hardware Development Airframe line. This effort will assess and select engineering solutions to improve the Variable Frequency Generator (VFG) and Generator Control Unit (GCU) components. Increased V-22 electrical system reliability and capacity is required to accommodate demands on electrical power system as additional systems are added to the V-22.  <b>FY 2015 Accomplishments:</b> N/A  <b>FY 2016 Plans:</b> N/A  <b>FY 2017 Base Plans:</b> Continue Electrical System re-design and reliability improvement effort begun under the hardware development line. This effort will assess and select engineering solutions to improve the VFG and GCU components. Increased V-22 electrical system reliability and capacity is required to accommodate demands on electrical power system as additional systems are added to the V-22.  <b>FY 2017 OCO Plans:</b> N/A	0.000	0.000	5.200	0.000	5.200
<b>Articles:</b>	-	-	-	-	-
<b>Accomplishments/Planned Programs Subtotals</b>	50.188	76.483	174.423	0.000	174.423

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<b>Line Item</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
• APN 0164: V-22	1,546.883	1,440.208	1,283.808	-	1,283.808	663.632	730.964	664.001	1,494.884	4,740.373	36,841.949
• APN 0590: V-22 Series	109.152	145.308	141.545	8.740	150.285	171.399	196.795	169.068	181.154	895.248	2,927.876

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**Exhibit R-2A, RDT&E Project Justification:** PB 2017 Navy **Date:** February 2016

<b>Appropriation/Budget Activity</b> 1319 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604262N / V-22A	<b>Project (Number/Name)</b> 1425 / V-22
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**C. Other Program Funding Summary (\$ in Millions)**

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• APN 0605/J0164: <i>V-22 Initial Spares</i>	0.858	0.479	0.033	-	0.033	0.000	0.000	0.000	37.569	377.899	1,207.834
• RDTE 1160403BB: <i>CV-22 Special Operations, Aviation Systems</i>	176.097	0.000	15.346	-	15.346	14.259	21.635	4.961	0.000	0.000	237.191
• RDTE BA07 0401318F: <i>CV-22 USAF BA07</i>	37.698	27.776	16.702	-	16.702	17.455	16.634	14.724	14.984	0.000	145.973

**Remarks**

**D. Acquisition Strategy**

The MV-22 is a post Milestone III ACAT-IC program. As a result of mishaps during and subsequent to MV-22 Operational Evaluation (Apr and Dec 00), the program was restructured employing a phased approach to return to flight and tactical introduction. The Contractor and Government defined deficient areas within the program/ aircraft requiring correction prior to return to flight. A Block Upgrade approach was planned, with required efforts identified in Block "A", "B", and "C". Block "A" included those efforts necessary to return the V-22 to safe and operational fleet operations. Block "B" included those efforts necessary to improve the effectiveness and suitability of the aircraft. Block "C" includes mission enhancements like weather radar, cabin effectiveness suitability improvements, i.e., Environmental Control System, and Forward Firing ALE-47. Non-recurring development activities are to be initiated and completed for all efforts identified in Block "A", "B", and "C". The Contractor will develop specific Statements of Work and Preliminary Specification Change Notices required to integrate the Block Upgrade efforts into the baseline Program. A Systems Requirements Review, Initial Design Review, and Final Design Review was held for each of the Block efforts so the design maturity could be reviewed and the Government could redirect activities as appropriate. The CV-22 Engineering Manufacturing and Development program is also structured in Blocks to define an evolutionary approach to achieving full operational capability. Block "0" is the initial baseline CV-22 variant. Block "10" enhances mission capability with the addition of terrain following radar, additional fuel tanks, additional radios, and Block "20" includes capabilities such as radio frequency and infrared countermeasures improvements. Additional Blocks are in the planning stages to continue the growth process throughout the operational life of the weapon system. The Government will issue an RFP to the Contractor and upon award, an Integrated Baseline Review, Preliminary Design Review, Integrated Logistics Assessment and a Critical Design Review will be held to assess the design maturity of the MV-22 Navy Variant. The Navy Variant will add (1) the capability to meet the range requirements that the Carrier Onboard Delivery (COD) mission demands (2) a high frequency radio to transmit/receive beyond line of sight over water and (3) a public address system for use while transporting passengers in support of the COD mission.

**E. Performance Metrics**

Milestone Reviews.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy** **Date:** February 2016

<b>Appropriation/Budget Activity</b> 1319 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604262N / V-22A	<b>Project (Number/Name)</b> 1425 / V-22
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<b>Product Development (\$ in Millions)</b>				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
MV-22 Instrumented A/C	SS/FPIF	Bell Boeing : Ridley Park, PA	25.784	2.205	Nov 2014	0.000		0.000		-		0.000	0.000	27.989	27.989
MV-Hardware Dev Airframe	SS/CPIF	Bell Boeing : Ridley Park, PA	45.138	22.292	Jan 2015	14.817	Jan 2016	40.238	Jan 2017	-		40.238	198.034	320.519	320.519
MV-22 Hardware Dev Propulsion	SS/CPIF	Rolls-Royce Corp. : Indianapolis, IN	196.600	0.306	Jan 2015	0.298	Jan 2016	0.280	Jan 2017	-		0.280	2.231	199.715	199.715
MV-22 Digital Interoperability	WR	NAWCWD : China Lake, CA	0.000	6.635	Jan 2015	4.508	Jan 2016	9.900	Jan 2017	-		9.900	49.250	70.293	-
MV-22 Software Reprogrammable Payload (SRP)	WR	NAWCWD : China Lake, CA	0.000	0.000		5.200	Jan 2016	6.000	Jan 2017	-		6.000	6.000	17.200	-
MV-22 Navy Variant Development	C/CPIF	Bell Boeing : Ridley Park, PA	0.000	0.000		17.170	Jan 2016	71.563	Jan 2017	-		71.563	108.787	197.520	197.520
V-22 Aerial Refueling System Development	SS/CPIF	Bell Boeing : Ridley Park, PA	0.000	0.000		15.000	Jan 2016	24.752	Jan 2017	-		24.752	22.864	62.616	62.616
V-22 Electrical System Re-Design	C/BA	Bell Boeing : Ridley Park, PA	0.000	0.000		0.000		5.200	Jan 2017	-		5.200	37.400	42.600	42.600
Prior year Prod Dev no longer funded in the FYDP	Various	Various : Various	5,078.483	0.000		0.000		0.000		-		0.000	0.000	5,078.483	-
<b>Subtotal</b>			5,346.005	31.438		56.993		157.933		-		157.933	424.566	6,016.935	-

**Remarks**  
 NVIA Aircraft delivered in 3rd Qtr of FY15.  
 FY16 begins Software Reprogrammable Payload, Navy Variant and V-22 Aerial Refueling System.  
 FY17 shows Electrical System Re-Design effort seperately from Hardware Development Airframe line.  
 FY17 Hardware Dev Airframe Increase FY2017 supports Infrared Suppressor Redesign and Modular Avionics.  
 FY17 Navy Variant Development increase is attributed to the continued development of the Navy Variant ECP to meet extended range, high frequency radio and public address system requirements. FY17 includes the build and install of the EDM prototype ECP kit on V-22 developmental Test Aircraft.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy** **Date:** February 2016

<b>Appropriation/Budget Activity</b> 1319 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604262N / V-22A	<b>Project (Number/Name)</b> 1425 / V-22
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<b>Support (\$ in Millions)</b>				<b>FY 2015</b>		<b>FY 2016</b>		<b>FY 2017 Base</b>		<b>FY 2017 OCO</b>		<b>FY 2017 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</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>			
MV-22 Govt Engineering Sppt	WR	NAWCAD : Pax River, MD	1,104.317	2.367	Nov 2014	2.415	Nov 2015	2.279	Nov 2016	-		2.279	19.235	1,130.613	-
MV-22 Navy Variant Govt Engineering Sppt	WR	NAWCAD : Pax River, MD	0.000	0.000		1.350	Nov 2015	1.397	Nov 2016	-		1.397	4.746	7.493	-
Prior Year Support no longer funded in the FYDP	Various	Various : Various	189.718	0.000		0.000		0.000		-		0.000	0.000	189.718	-
<b>Subtotal</b>			1,294.035	2.367		3.765		3.676		-		3.676	23.981	1,327.824	-

**Remarks**  
Begin Govt Engineering Support for MV-22 Navy Variant efforts in FY16.

<b>Test and Evaluation (\$ in Millions)</b>				<b>FY 2015</b>		<b>FY 2016</b>		<b>FY 2017 Base</b>		<b>FY 2017 OCO</b>		<b>FY 2017 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</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>			
MV-22 Dev Test & Evaluation	WR	NAWCAD : Pax River, MD	1,016.297	11.694	Nov 2014	11.765	Nov 2015	8.831	Nov 2016	-		8.831	65.254	1,113.841	-
MV-22 Operational Test & Evaluation	WR	OT&E Force : Norfolk, VA	53.209	2.388	Dec 2014	1.776	Dec 2015	1.834	Dec 2016	-		1.834	42.609	101.816	-
Prior Year T & E no longer funde in the FYDP	Various	Various : Various	48.200	0.000		0.000		0.000		-		0.000	0.000	48.200	-
<b>Subtotal</b>			1,117.706	14.082		13.541		10.665		-		10.665	107.863	1,263.857	-

<b>Management Services (\$ in Millions)</b>				<b>FY 2015</b>		<b>FY 2016</b>		<b>FY 2017 Base</b>		<b>FY 2017 OCO</b>		<b>FY 2017 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</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>			
MV-22 Engineering Tech Sppt	Various	Various : Various	1,046.918	0.258	Nov 2014	0.274	Nov 2015	0.277	Nov 2016	-		0.277	6.609	1,054.336	-
MV-22 Management Sppt Svc	Various	Various : Various	156.184	0.700	Nov 2014	0.630	Nov 2015	0.624	Nov 2016	-		0.624	7.542	165.680	-
MV-22 Program Mgmt Support	WR	NAWCAD : Pax River, MD	59.795	1.095	Nov 2014	1.043	Nov 2015	1.013	Nov 2016	-		1.013	11.541	74.487	-



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**Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy** **Date:** February 2016

<b>Appropriation/Budget Activity</b> 1319 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604262N / V-22A	<b>Project (Number/Name)</b> 1425 / V-22
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	FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
<b>V-22 Hardware Development</b>																												
<b>Acquisition Milestones</b>																												
<b>Engineering Milestones</b>																												
Reviews																												
	IIS Development																											
Acquisition Documentation																												
<b>Test &amp; Evaluation</b>																												
Test & Evaluation																												
Development Test																												
Operational Evaluation																												
Kit Deliveries & Installs																												
<b>Production Milestones</b>																												
Deliveries																												

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**Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy** **Date:** February 2016

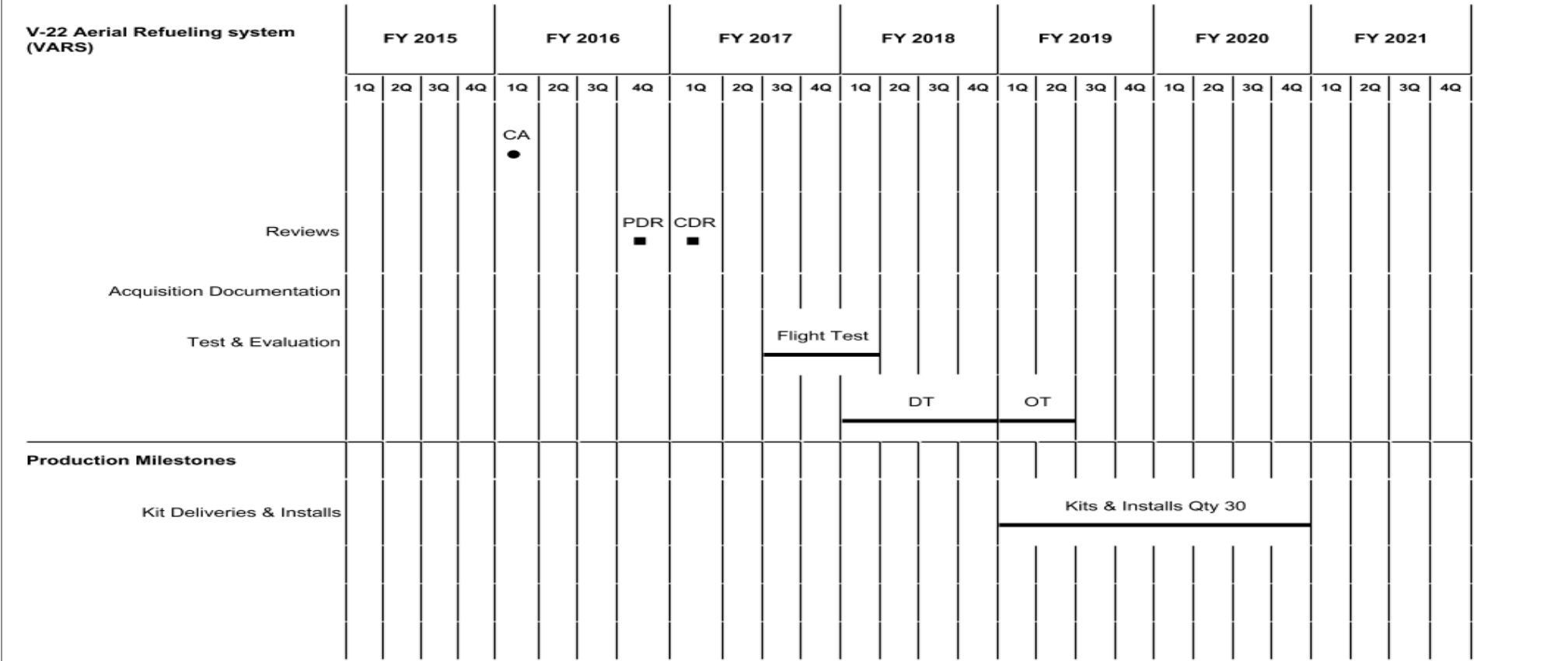
<b>Appropriation/Budget Activity</b> 1319 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604262N / V-22A	<b>Project (Number/Name)</b> 1425 / V-22
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Digital Interoperability (DI)	FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021							
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q				
	Design & Demonstration																															
	SRP Dev.																															

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**Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy** **Date:** February 2016

<b>Appropriation/Budget Activity</b> 1319 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604262N / V-22A	<b>Project (Number/Name)</b> 1425 / V-22
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**Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy** **Date:** February 2016

<b>Appropriation/Budget Activity</b> 1319 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604262N / V-22A	<b>Project (Number/Name)</b> 1425 / V-22
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Electrical System Re-design	FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021							
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q				
							RFP				CA																					
													NRE																			

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**Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy** **Date:** February 2016

<b>Appropriation/Budget Activity</b> 1319 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604262N / V-22A	<b>Project (Number/Name)</b> 1425 / V-22
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b><i>V-22 Hardware Development</i></b>				
Engineering Milestones: Reviews: Preliminary Design Review	4	2016	4	2016
Engineering Milestones: Reviews: Improved Inlet Solution - Contract Award/ Development effort	1	2015	4	2017
Engineering Milestones: Reviews: Critical Design Review	1	2017	1	2017
Test & Evaluation: Test & Evaluation: IIS Flight Test	1	2017	3	2017
Test & Evaluation: Development Test: Development Flight Test / Integrated Test (IT- IIID) & Continuous software sustainment developmental testing	1	2015	4	2021
Test & Evaluation: Operational Evaluation: Operational Testing	1	2015	4	2021
Test & Evaluation: Kit Deliveries & Installs: Operational Testing (OT-IIIK)	2	2015	2	2015
Test & Evaluation: Kit Deliveries & Installs: Operational Testing (OT-IIIL)	2	2016	2	2016
Test & Evaluation: Kit Deliveries & Installs: Integrated Aircraft Survivability Equipment - Operational Testing	2	2016	2	2016
Test & Evaluation: Kit Deliveries & Installs: Operational Testing (OT-IIIM)	2	2017	2	2017
Test & Evaluation: Kit Deliveries & Installs: Operational Testing (OT-IIIN)	2	2019	2	2019
Test & Evaluation: Kit Deliveries & Installs: Operational Testing (OT-IIIO)	2	2021	2	2021
Production Milestones: Deliveries: Instrumented Test Aircraft Delivery	3	2015	3	2015
<b><i>MV-22 Navy Variant Development</i></b>				
Engineering Change Proposal	2	2016	4	2020
Reviews: Integrated Baseline Review	2	2016	2	2016
Reviews: Preliminary Design Review	3	2016	3	2016
Reviews: Critical Design Review	4	2016	4	2016
Reviews: Test & Evaluation: Integrated Logistics assessment	1	2017	1	2017
Reviews: Test & Evaluation: Engineering Development Model Test	3	2017	3	2017

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**Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy** **Date:** February 2016

<b>Appropriation/Budget Activity</b> 1319 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604262N / V-22A	<b>Project (Number/Name)</b> 1425 / V-22
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<b>Events by Sub Project</b>	<b>Start</b>		<b>End</b>	
	<b>Quarter</b>	<b>Year</b>	<b>Quarter</b>	<b>Year</b>
Reviews: Reviews: Functional Configuration Audit	4	2017	4	2017
Development Deliveries: Engineering Development Model Delivery	1	2017	1	2017
Development Deliveries: Engineering Development Model Install	2	2017	2	2017
Development Deliveries: Contract Awards: Development Contract Award	2	2016	2	2016
Production Milestones: Lot 22 APN MV22 Navy Variant Qty 6	1	2018	1	2018
Production Milestones: Lot 23 APN MV22 Navy Variant Qty 6	1	2019	1	2019
Production Milestones: Lot 24 APN MV22 Navy Variant Qty 6	1	2020	1	2020
Production Milestones: Production Deliveries: Lot 22 APN Navy Variant Qty 6	1	2020	4	2020
Production Milestones: Production Deliveries: Lot 23 APN Navy Variant Qty 6	1	2021	4	2021
<b>Digital Interoperability (DI)</b>				
System Design & Demonstration	2	2015	4	2019
Software Reprogrammable Payload (SRP)	2	2016	3	2018
SRP Contract Award	2	2016	2	2016
<b>V-22 Aerial Refueling system (VARs)</b>				
Contract Award	1	2016	1	2016
Reviews: Preliminary Design Review	4	2016	4	2016
Reviews: Critical Design Review	1	2017	1	2017
Test & Evaluation: Prototype Test	3	2017	1	2018
Test & Evaluation: Developmental Testing	1	2018	4	2018
Test & Evaluation: Operational Testing	1	2019	2	2019
Production Milestones: Kit Deliveries & Installs: Kits & Installs Qty 30	1	2019	4	2020
<b>Electrical System Re-design</b>				
RFP Release	4	2016	4	2016
Contract Award	3	2017	3	2017
NRE	3	2017	3	2020

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