| Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy | | | | | | | | | | | Date: March 2023 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)* | | | | | R-1 Program Element (Number/Name)<br>PE 0604212M *I Other Helicopter Development* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2022** | **FY 2023** | **FY 2024 Base** | **FY 2024 OCO** | **FY 2024 Total** | **FY 2025** | **FY 2026** | **FY 2027** | **FY 2028** | **Cost To Complete** | **Total Cost** |
| Total Program Element | 0.000 | 0.000 | 0.000 | 101.209 | - | 101.209 | 136.218 | 136.224 | 135.244 | 137.041 | Continuing | Continuing |
| 3406: *Attack and Utility Replacement Aircraft* | 0.000 | 0.000 | 0.000 | 101.209 | - | 101.209 | 136.218 | 136.224 | 135.244 | 137.041 | Continuing | Continuing |

**Note**

This effort transitions from PE 0604212N to PE 0604212M in FY 2024 and is not a New Start.

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

This Program Element includes funding for the development of USMC Vertical Take-Off and Landing (VTOL) Family of Systems (FoS) capability. VTOL FoS is a USMC initiative to address vertical lift capability requirements and determine feasible and affordable solutions in support of the Warfighter. This PE will include development and prototype efforts developed to progress high-risk technology areas in support of future Marine capabilities. This effort is not a FY 2024 new start.

| B. Program Change Summary ($ in Millions) | FY 2022 | FY 2023 | FY 2024 Base | FY 2024 OCO | FY 2024 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 0.000 | 0.000 | 5.536 | - | 5.536 |
| Current President's Budget | 0.000 | 0.000 | 101.209 | - | 101.209 |
| Total Adjustments | 0.000 | 0.000 | 95.673 | - | 95.673 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | - | - | | | |
| • Program Adjustments | 0.000 | 0.000 | 95.140 | - | 95.140 |
| • Rate/Misc Adjustments | 0.000 | 0.000 | 0.533 | - | 0.533 |

**Change Summary Explanation**

Funds increase from FY 2023 to FY 2024 due to transfer of effort from PE 0604212N to PE 0604212M beginning in FY 2024. This effort is not a new start.

FY22 and FY23 activities shown on the R4 & R4A were funded in 0604212N.

Technical: Not applicable.

| Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy | Date: March 2023 |
|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)* | **R-1 Program Element (Number/Name)**<br>PE 0604212M *I Other Helicopter Development* |

Schedule: Not applicable.

| Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy | | | Date: March 2023 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 5 | R-1 Program Element (Number/Name)<br>PE 0604212M / *Other Helicopter Development* | Project (Number/Name)<br>3406 / *Attack and Utility Replacement Aircraft* | |

| COST ($ in Millions) | Prior Years | FY 2022 | FY 2023 | FY 2024 Base | FY 2024 OCO | FY 2024 Total | FY 2025 | FY 2026 | FY 2027 | FY 2028 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3406: *Attack and Utility Replacement Aircraft* | 0.000 | 0.000 | 0.000 | 101.209 | - | 101.209 | 136.218 | 136.224 | 135.244 | 137.041 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

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

USMC Vertical Take-Off and Landing (VTOL) Family of Systems (FoS) is a United States Marine Corps (USMC) Future Vertical Lift (FVL) initiative addressing vertical lift capability requirements that are feasible and affordable in support of the USMC Warfighter. This is a supporting element of the USMC's Force Design 2030 guidance. USMC VTOL FoS will facilitate developmental and operational prototyping and demonstration of capabilities in alignment with co-developed mission focused areas supporting Assault/Support, Attack/Strike, and Aviation Sustainment. USMC VTOL FoS will continue the transition of science and technology efforts into meaningful Warfighter capability, which includes OSD Joint Capability Technology Demonstration (JCTD) and Rapid Defense Experiment Reserve (RDER) projects such as Long Range Attack Missile (LRAM) and Penetrating Affordable Autonomous Collaborative Killer- Portfolio (PAACK-P). The USMC VTOL FoS is closely aligned with the OSD-sponsored FVL FoS initiative and will look to leverage any aspects of the Joint Service programs that may benefit the USMC through accelerated development and/or reduced life cycle costs. USMC VTOL FoS will be a force multiplier with superior performance, payload, survivability, agility, endurance, and reliability that enables warfighters to win in a future dynamic battlespace. USMC VTOL FoS will increase the Marine Air Ground Task Force's (MAGTF) capacity for long-range fires, Assault/Support, Attack/Strike, and Aviation Sustainment through the development of capabilities such as a logistics connector. This directly supports and enables Force Design 2030 by enabling the support of the Stand-in Force (SiF), Expeditionary Advanced Basing Operations (EABO), and Littoral Operations in a Contested Environment (LOCE).

USMC VTOL FoS will utilize Doctrine, Organization, Training, Material, Leadership and Education, Personnel, and Facilities and Policy (DOTmLPF-P) analyses that will include all facets of a program with particular focus on life-cycle cost reductions through common processes, support equipment, logistic support and component commonality utilizing non-materiel solutions, such as maintenance strategies, training solutions, and infrastructure requirements. Air vehicle capabilities will include primary mechanical, electrical, pneumatic, and structural components such as drivetrain, generators, landing gear, hydraulics, controls, seats, etc. The mission subsystems will include all on and off-board components with embedded control software for those components that provide all mission functionality, cockpit displays, cockpit hardware subsystem controllers and interfaces. The architecture will include the fundamental organization of the complete system, the processing method/component(s), the platform software, the operating environment, and the on-aircraft infrastructure to facilitate integration of all subsystems and platform.

This effort is not a FY 2024 new start.

JUSTIFICATION FOR BUDGET ACTIVITY: This program element is funded for Advanced Component Development & Prototype activities, including conducting prototyping and system demonstration tasks aimed at validating requirements.

| Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy | | Date: March 2023 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 5 | **R-1 Program Element (Number/Name)**<br>PE 0604212M / *Other Helicopter Development* | **Project (Number/Name)**<br>3406 / *Attack and Utility Replacement Aircraft* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2022 | FY 2023 | FY 2024 Base | FY 2024 OCO | FY 2024 Total |
|---|---|---|---|---|---|
| ***Title:*** Attack and Utility Replacement Aircraft | 0.000 | 0.000 | 101.209 | 0.000 | 101.209 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2023 Plans:***<br>N/A | | | | | |
| ***FY 2024 Base Plans:***<br>Tasks to be performed may include: Acquisition Program Management functions, Acquisition Documentation, Engineering modeling and analysis, Test and Evaluation planning and development, a Model Based System Specification, continued Concept Development and Technology Maturation (CDTM) efforts in critical high-risk technology areas, culminating in design trade studies and prototyping on associated systems. CDTM efforts will include studies, virtual simulation, conceptual design, prototyping of VTOL FoS Air Vehicles and all associated Avionics, Propulsion and Dynamics, Communications and Navigation, Weapons and Fire Control, Missile and Associated Payloads, Human Systems Integration, Survivability and Vulnerability, Missions and Missions Systems Management, Reliability and Maintainability, Training, Logistics, Sensor, Pilotage and Targeting Systems, Flight Control, Integrated Digital Environment Development, Digital Engineering, Autonomy, Crewed/ Uncrewed Systems, and Software/Hardware architecture.<br><br>Continue advancing technologies in the area of Modular Open Systems Approach (MOSA) to systems architectures via MOSA OTA. Analytical rigor will be provided by planned VTOL FoS efforts to integrate within the USN's Navy Capabilities-Based Assessments Integration Process (NCIP) and the USMC's NCIP-Marine Corps processes, as well as continued cross-service collaboration efforts with the Army and Air Force. Joint All-Domain Operations (JADO) requirements, informed by multi-service efforts including the Joint Capability Technology Demonstration (JCTD) Long Range Attack Missile (LRAM), the Rapid Defense Experimentation Fund (RDER) Penetrating Affordable Autonomous Collaborative Killer- Portfolio (PAACK-P), and RDER Air Loitering Munitions (ALM) efforts, will be integrated with the Weapons OTA within VTOL FoS established laboratory infrastructure. Efforts will include working with transition partners across the Services to ensure effective investment strategies resulting in capability delivered to the Warfighter. The areas of concentration include: Survivability, Sensors, Weapons, Mission Systems, EW packages, and Air Vehicle high-risk technology areas. | | | | | |
| ***FY 2024 OCO Plans:***<br>N/A | | | | | |
| ***FY 2023 to FY 2024 Increase/Decrease Statement:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy | | Date: March 2023 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 5 | **R-1 Program Element (Number/Name)**<br>PE 0604212M / *Other Helicopter Development* | **Project (Number/Name)**<br>3406 / *Attack and Utility Replacement Aircraft* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2022 | FY 2023 | FY 2024 Base | FY 2024 OCO | FY 2024 Total |
|---|---|---|---|---|---|
| Funds increase from FY 2023 to FY 2024 reflects the VTOL FoS ramp prior to releasing major Engineering and Manufacturing Development (EMD) contract at Milestone B in FY 2026. Increase funding will enable risk reduction efforts to address VTOL FoS need for appropriately scaled engine power plans as well as survivability technology needs driven by Force Design 2030. This effort is not a FY 2024 new start as funds were budgeted in PE 0604212N in FY 2023 and prior. | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 0.000 | 0.000 | 101.209 | 0.000 | 101.209 |

**C. Other Program Funding Summary ($ in Millions)**

N/A

**Remarks**

**D. Acquisition Strategy**

The Analysis of Alternatives (AoA) was initiated in 3QFY2017 to begin the assessment of the technical feasibility, operational feasibility, technical risk, and affordability of potential solutions. The AoA was completed in FY2019 resulting in OSD Sufficiency. In FY 2021, acquisition and requirements documentation refinement continued. MBSE Broad Agency Announcements (BAAs) awarded and execution progressed, allowing the Program to gain insight alongside Industry in implementing Digital Engineering for systems design. In FY 2022, a Capabilities Based Assessment (CBA) was completed, requirements analysis and document generation continued and multiple MOSA OTAs were awarded. Reductions in the technical risk associated with the Program justifies a direct Milestone B entry. In FY 2023, MOSA OTA execution will continue, multiple Weapons OTA awards will occur, a VTOL FoS Capabilities Development Document (CDD) will be routed for Marine Corps Requirements Oversight Council (MROC) approval, and concept development and technology maturation efforts will continue. In FY2024, Concept Development and Tech Maturation (CDTM) will continue to support Logistics Connector development with Pre-MS B activities. This will include Milestone and Acquisition documentation, component risk reduction, and Science and Technology (S&T) transition activities to the Program of Record. CDTM will continue the execution of the Weapons OTA and include the addition of critical technology risk areas including engines and survivability.

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy | | | Date: March 2023 |
|---|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 5 | **R-1 Program Element (Number/Name)**<br>PE 0604212M / *Other Helicopter Development* | **Project (Number/Name)**<br>3406 / *Attack and Utility Replacement Aircraft* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2022 Cost | FY 2022 Award Date | FY 2023 Cost | FY 2023 Award Date | FY 2024 Base Cost | FY 2024 Base Award Date | FY 2024 OCO Cost | FY 2024 OCO Award Date | FY 2024 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Industry Technology Collaboration | C/CPFF | Various : Various | 0.000 | 0.000 | | 0.000 | | 25.525 | Dec 2023 | - | | 25.525 | Continuing | Continuing | Continuing |
| Joint All Domain Operations (JADO)/TAC Demo | C/CPFF | Various : Various | 0.000 | 0.000 | | 0.000 | | 17.462 | Nov 2023 | - | | 17.462 | Continuing | Continuing | Continuing |
| Concept Development and Technology Maturation (CDTM) | C/CPFF | Various : Various | 0.000 | 0.000 | | 0.000 | | 38.344 | Dec 2023 | - | | 38.344 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 0.000 | 0.000 | | 0.000 | | 81.331 | | - | | 81.331 | Continuing | Continuing | N/A |

**Remarks**

Funds increase from FY 2023 to FY 2024 due to modeling and analysis efforts and industry collaboration that will provide validated capability solutions.

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2022 Cost | FY 2022 Award Date | FY 2023 Cost | FY 2023 Award Date | FY 2024 Base Cost | FY 2024 Base Award Date | FY 2024 OCO Cost | FY 2024 OCO Award Date | FY 2024 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Development Support | WR | NAWCAD : Patuxent River, MD | 0.000 | 0.000 | | 0.000 | | 10.545 | Nov 2023 | - | | 10.545 | Continuing | Continuing | Continuing |
| Development Support | WR | Various : Various | 0.000 | 0.000 | | 0.000 | | 5.054 | Dec 2023 | - | | 5.054 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 0.000 | 0.000 | | 0.000 | | 15.599 | | - | | 15.599 | Continuing | Continuing | N/A |

**Remarks**

Funds increase from FY 2023 to FY 2024 due to increased support for generation of requirements documentation supporting MS B and execution of risk reduction efforts.

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2022 Cost | FY 2022 Award Date | FY 2023 Cost | FY 2023 Award Date | FY 2024 Base Cost | FY 2024 Base Award Date | FY 2024 OCO Cost | FY 2024 OCO Award Date | FY 2024 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Developmental Test & Evaluation (DT&E) | WR | Various : Various | 0.000 | 0.000 | | 0.000 | | 0.871 | Nov 2023 | - | | 0.871 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 0.000 | 0.000 | | 0.000 | | 0.871 | | - | | 0.871 | Continuing | Continuing | N/A |

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy | | Date: March 2023 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 5 | **R-1 Program Element (Number/Name)**<br>PE 0604212M / *Other Helicopter Development* | **Project (Number/Name)**<br>3406 / *Attack and Utility Replacement Aircraft* |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2022 Cost | FY 2022 Award Date | FY 2023 Cost | FY 2023 Award Date | FY 2024 Base Cost | FY 2024 Base Award Date | FY 2024 OCO Cost | FY 2024 OCO Award Date | FY 2024 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Contractor Engineering Support | C/CPIF | Various : Various | 0.000 | 0.000 | | 0.000 | | 0.871 | Nov 2023 | - | | 0.871 | Continuing | Continuing | Continuing |
| Program Management Support | WR | Various : Various | 0.000 | 0.000 | | 0.000 | | 2.450 | Nov 2023 | - | | 2.450 | Continuing | Continuing | Continuing |
| Travel | C/BA | NAVAIR : Patuxent River, MD | 0.000 | 0.000 | | 0.000 | | 0.087 | Oct 2023 | - | | 0.087 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 0.000 | 0.000 | | 0.000 | | 3.408 | | - | | 3.408 | Continuing | Continuing | N/A |

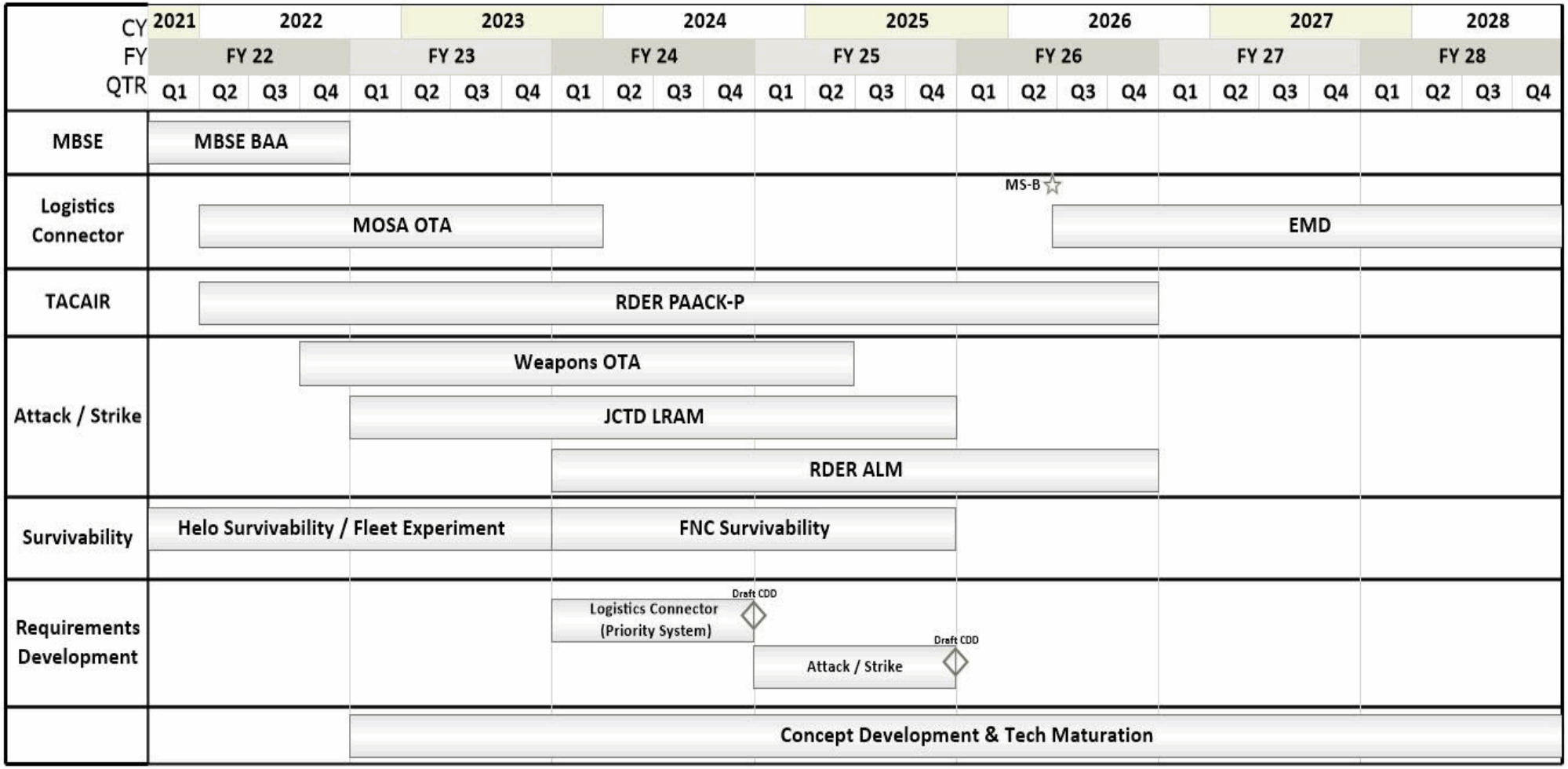
**Remarks**

Funds increase from FY 2023 to FY 2024 due to increased management requirements supporting acquisition documentation for MS B.

| | Prior Years | FY 2022 | | FY 2023 | | FY 2024 Base | | FY 2024 OCO | | FY 2024 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 0.000 | 0.000 | | 0.000 | | 101.209 | | - | | 101.209 | Continuing | Continuing | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy | | Date: March 2023 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 5 | **R-1 Program Element (Number/Name)**<br>PE 0604212M / *Other Helicopter Development* | **Project (Number/Name)**<br>3406 / *Attack and Utility Replacement Aircraft* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy | | Date: March 2023 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 5 | **R-1 Program Element (Number/Name)**<br>PE 0604212M / *Other Helicopter Development* | **Project (Number/Name)**<br>3406 / *Attack and Utility Replacement Aircraft* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***Vertical Take Off and Landing Family of Systems*** | | | | |
| Acquisition Milestones: Milestone B: Milestone B | 2 | 2026 | 2 | 2026 |
| Systems Development: Concept Development and Tech Maturation: Concept Development and Tech Maturation | 1 | 2023 | 4 | 2028 |
| Systems Development: Weapons OTA: Weapons OTA | 4 | 2022 | 2 | 2025 |
| Systems Development: MOSA OTA: MOSA OTA | 2 | 2022 | 1 | 2024 |
| Systems Development: EMD: EMD | 3 | 2026 | 4 | 2028 |