| Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy | | | | | | | | | | | Date: February 2020 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 0604264N *I Air Crew Systems Development* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2019** | **FY 2020** | **FY 2021 Base** | **FY 2021 OCO** | **FY 2021 Total** | **FY 2022** | **FY 2023** | **FY 2024** | **FY 2025** | **Cost To Complete** | **Total Cost** |
| Total Program Element | 142.735 | 30.005 | 19.172 | 21.445 | - | 21.445 | 23.043 | 4.828 | 3.661 | 3.725 | Continuing | Continuing |
| 0606: *Aircrew System Development* | 141.808 | 20.351 | 19.172 | 16.448 | - | 16.448 | 19.946 | 2.931 | 1.763 | 1.799 | Continuing | Continuing |
| 9099: *Physiological Episodes* | 0.000 | 0.000 | 0.000 | 4.997 | - | 4.997 | 3.097 | 1.897 | 1.898 | 1.926 | Continuing | Continuing |
| 9999: *Congressional Adds* | 0.927 | 9.654 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 10.581 |

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

The Aircrew Systems Development program provides Engineering and Manufacturing Development of Aviation Life Support Systems to protect aircrew and flight deck personnel from current and future threats including: directed energy weapons, chemical/biological/radiological agents/fallout, ballistic projectiles, temperature extremes, heat/fire, low concentration oxygen environments, high dynamic forces during emergency egress, hearing loss, and high "G" forces. The program also provides development for the following capabilities: night vision capability, hearing and head protection, aircrew endurance, aircrew performance, man mounted data display, communications, clothing, in flight restraint and stability emergency egress and descent, escape and evasion, survival and rescue, crash protection, and anthropometric sizing for small aircrew. Acquisition initiatives include: competition, the application of streamlining initiatives, use of non-developmental items, joint and tri-service developments, and the pursuit of NATO/allied cooperative ventures, which expedite introduction of new products into Navy and Marine Corps fixed and rotary wing aircraft, reduce costs, and promote commonality.

NOTE: Proj 9099 is not a New Start in FY2021 as these efforts have been funded previously in Proj 0606. In FY21, funds will be used for assured pilot performance integrity. Development and fielding of a system that monitors pilot physiological parameters and warns of state of health or performance degradation that may result in loss of consciousness or ability to safely conduct the flight. This system performs as a failsafe that provides the operator with enough advance warning to abort the mission and safely recover the aircraft in the event that there is loss of integrity with the oxygen provisioning system or cockpit air environment. There are several solution options undergoing evaluation.

JUSTIFICATION FOR BUDGET ACTIVITY:
This program is funded under SYSTEM DEVELOPMENT AND DEMONSTRATION because it includes projects that have passed Milestone B approval and are conducting engineering and manufacturing development tasks aimed at meeting validated requirements prior to full-rate production decision.

| Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy | Date: February 2020 |
|---|---|
| **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 0604264N *I Air Crew Systems Development* |

| B. Program Change Summary ($ in Millions) | FY 2019 | FY 2020 | FY 2021 Base | FY 2021 OCO | FY 2021 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 30.980 | 21.172 | 19.932 | - | 19.932 |
| Current President's Budget | 30.005 | 19.172 | 21.445 | - | 21.445 |
| Total Adjustments | -0.975 | -2.000 | 1.513 | - | 1.513 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | -2.000 | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | -0.975 | 0.000 | | | |
| • Program Adjustments | 0.000 | 0.000 | 1.441 | - | 1.441 |
| • Rate/Misc Adjustments | 0.000 | 0.000 | 0.072 | - | 0.072 |

| Congressional Add Details ($ in Millions, and Includes General Reductions) | FY 2019 | FY 2020 |
|---|---|---|
| **Project:** 9999: *Congressional Adds* | | |
| Congressional Add: *Advance Aircrew Physiological Monitoring* | 9.654 | 0.000 |
| Congressional Add Subtotals for Project: 9999 | 9.654 | 0.000 |
| Congressional Add Totals for all Projects | 9.654 | 0.000 |

**Change Summary Explanation**

FY 2021: The FY 2021 funding request was increased by $1.513 million to account for the realignment of Aircrew Hearing Protection under the State of the Art program. The Physiological Episodes funding ($5M) was realigned to Proj 9099 in FY21 and out. The FY 2021 funding request was reduced by $3.077 million to account for the availability of prior year execution balances.

Schedule:
NOTE: The LEP Program was assessed as low risk, so these schedule changes were made to accelerate the program and accept moderate risk.

1. Acquisition Milestones:
A. Laser Eye Protection (LEP) - Milestone C (MS C) moved from 2Q FY23 to 4Q FY21, Full Rate Production Decision Review (FRPDR) moved from 4Q FY23 to 4Q FY22, and Initial Operational Capability (IOC) moved from 1Q FY24 to 4Q FY22.

| Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy | Date: February 2020 |
|---|---|
| **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 0604264N *I Air Crew Systems Development* |

2. System Development:
A. LEP - System Verification Review/Production Readiness Review moved from 4Q FY22 to 4Q FY21; Physical Configuration Audit moved from 4Q FY23 to 3Q FY22.

3. Test and Evaluation:
A. LEP - Developmental Test shifted from 1Q FY21 to 3Q FY20.

4. Production Milestones:
A. LEP - Low Rate Initial Production (LRIP) and Full Rate Production (FRP) contract award dates changed to align with milestone decisions.

5. Deliveries:
A. Laser Eye Protection Spectacles (LEP) - Low Rate Initial Production (LRIP) 1 and Full Rate Production (FRP) 1 deliveries moved to align with Production Milestone Contract Awards.

Technical: N/A

| Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy | | | Date: February 2020 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 5 | R-1 Program Element (Number/Name)<br>PE 0604264N / *Air Crew Systems Development* | Project (Number/Name)<br>0606 / *Aircrew System Development* | |

| COST ($ in Millions) | Prior Years | FY 2019 | FY 2020 | FY 2021 Base | FY 2021 OCO | FY 2021 Total | FY 2022 | FY 2023 | FY 2024 | FY 2025 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0606: *Aircrew System Development* | 141.808 | 20.351 | 19.172 | 16.448 | - | 16.448 | 19.946 | 2.931 | 1.763 | 1.799 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

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

AIRCREW SYSTEMS: Laser Eye Protection (LEP), Enhanced Visual Acuity (EVA), and Aircrew Systems (AS).

Under the above projects, LEP provides eye protection solutions that will provide Fixed, Rotary Wing and Patrol pilots and aircrew with multiple wavelength fixed threat and hazard protection during day and night unaided and Night Vision Goggle aided missions. LEP will consist of a suite of products to include spectacles, goggles and visors. The LEP (visor, spectacle or goggle format) is being developed for compatibility with all required USN/USMC Aviation Life Support Equipment as well as cockpit displays, night vision and fire control systems. EVA provides advanced day/night vision/Head Up Display (HUD) capability to address critical capability gaps in low and no light illumination levels (night vision). EVA will be integrated on current aircraft through a common interface allowing incremental, modular approach to fielding full capability and future upgrades. Future increments will provide enhanced aircrew situational awareness in degraded visual environment. Aircrew Systems includes State of the Art (SOA) and Survival Systems which provides for the yearly evaluation of the survival, clothing and other aircrew systems that evaluate performance, fill capability gaps, develop aircrew endurance and performance, safety and enhance survivability.

AIRCRAFT SYSTEMS: Aircraft Systems include studies for Advanced Crash Protection, SOA, and Survival Systems. SOA provides for the yearly evaluation of the survival systems that evaluate performance, develop endurance, fill capability gaps for safety and enhanced survivability.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2019 | FY 2020 | FY 2021 Base | FY 2021 OCO | FY 2021 Total |
|---|---|---|---|---|---|
| ***Title:*** Aircrew System Development | 19.803 | 18.650 | 15.926 | 0.000 | 15.926 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** Laser Eye Protection (LEP) provides Spectacles (both Self Protection and Multi-Wavelength), goggles, step-in visor and Laser Eye Protection Improvement Program (LEPIP) which monitors emerging threats and changes to technology. Enhanced Visual Acuity (EVA) provides advanced night vision/Head Up Display (HUD) capability to address critical capability gaps in low and no light illumination (Night Vision). Future increments will provide enhanced visibility in degraded visual environments. AS includes SOA. | | | | | |
| ***FY 2020 Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy | | Date: February 2020 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 5 | **R-1 Program Element (Number/Name)**<br>PE 0604264N / *Air Crew Systems Development* | **Project (Number/Name)**<br>0606 / *Aircrew System Development* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2019 | FY 2020 | FY 2021 Base | FY 2021 OCO | FY 2021 Total |
|---|---|---|---|---|---|
| Laser Eye Protection (LEP): Continue research and development of the next increment of threat spectacle, complete Critical Design Review (CDR), complete Technical Readiness Review (TRR), and deliver 91 Engineering Development Models (EDM).<br>Enhanced Visual Acuity (EVA): Continue critical technology development, complete Preliminary Design Review (PDR) and System Requirements Review 2 (SRR2).<br>State of the Art (SOA): Continue a yearly evaluation and authorization of the survival, clothing, and other aircrew systems items. Identification, testing and approval of items that provide upgraded performance, fill capability gaps, improve aircrew endurance, improve aircrew performance and safety and enhance survivability.<br>Physiological Episode Protection: Mitigate risk of loss of aircrew and Tactical and Training jet platforms due to Physiological Episodes using monitoring and alert systems. Develop, prototype, and test a physiological monitoring system that detects physiological episodes and provides a warning in time to enable the aircrew to execute emergency procedures and recover safely.<br>***FY 2021 Base Plans:***<br>Laser Eye Protection (LEP): Continue research and development of the next increment of threat spectacle, complete Developmental Testing (DT) and System Verification Review/ Production Readiness Review (SVR/ PRR).<br>Enhanced Visual Acuity (EVA): Complete Critical Design Review (CDR), Cyber Table Top (CTT), begin laboratory, ground and integration lab developmental testing (DT), and deliver four Engineering Mass Models to support laboratory testing.<br>State of the Art (SOA): Continue a yearly evaluation and authorization of the survival, clothing, and other aircrew systems items. Identification, testing and approval of items that provide upgraded performance, fill capability gaps, improve aircrew endurance, improve aircrew performance and safety and enhance survivability.<br>***FY 2021 OCO Plans:***<br>N/A<br>***FY 2020 to FY 2021 Increase/Decrease Statement:***<br>FY 2020 to FY 2021 Decrease due to realignment of Physiological Episodes into Proj 9099. | | | | | |
| ***Title:*** Aircraft Systems Development | 0.548 | 0.522 | 0.522 | 0.000 | 0.522 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** Aircraft Systems include studies for Advanced Crash Protection, and State of the Art (SOA). | | | | | |
| ***FY 2020 Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy | | Date: February 2020 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 5 | **R-1 Program Element (Number/Name)**<br>PE 0604264N / *Air Crew Systems Development* | **Project (Number/Name)**<br>0606 / *Aircrew System Development* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2019 | FY 2020 | FY 2021 Base | FY 2021 OCO | FY 2021 Total |
|---|---|---|---|---|---|
| State of the Art (SOA): Continue a yearly evaluation and authorization to include identification, testing and approval of items that provide upgraded performance, fill capability gaps, improve endurance, improve performance and safety and enhance survivability.<br>Oxygen Cart (Peculiar Support Equipment (PSE)): The Emergency Oxygen Source (EOS) in the F/A-18 Navy Aircrew Common Ejection Seat (NACES) survival kit will be changed to afford the pilot more emergency oxygen in the event of a physiological event. This change will drive a requirement for PSE O2 servicing cart used to service the EOS cylinder. This part of the effort will develop, prototype and test an oxygen cart to reach the pressures required.<br>***FY 2021 Base Plans:***<br>State of the Art (SOA): Continue a yearly evaluation and authorization to include identification, testing and approval of items that provide upgraded performance, fill capability gaps, improve endurance, improve performance and safety and enhance survivability.<br>Oxygen Cart (Peculiar Support Equipment (PSE)): The Emergency Oxygen Source (EOS) in the F/A-18 Navy Aircrew Common Ejection Seat (NACES) survival kit will be changed to afford the pilot more emergency oxygen in the event of a physiological event. This change will drive a requirement for PSE O2 servicing cart used to service the EOS cylinder. This part of the effort will develop, prototype and test an oxygen cart to reach the pressures required.<br>***FY 2021 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 20.351 | 19.172 | 16.448 | 0.000 | 16.448 |

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

| Line Item | FY 2019 | FY 2020 | FY 2021 Base | FY 2021 OCO | FY 2021 Total | FY 2022 | FY 2023 | FY 2024 | FY 2025 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • OPN/4268: *Aviation Life Support* | 14.570 | 33.362 | 33.904 | - | 33.904 | 47.376 | 66.458 | 67.286 | 63.538 | Continuing | Continuing |
| • APN/0575: *Aviation Life Support Mods* | 15.864 | 39.762 | 40.401 | - | 40.401 | 2.658 | 5.868 | 6.007 | 6.145 | 10.299 | 147.372 |

**Remarks**

Note: Aviation Life Support is only a portion of OPN Line Item 4268.

| Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy | | Date: February 2020 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 5 | **R-1 Program Element (Number/Name)**<br>PE 0604264N / *Air Crew Systems Development* | **Project (Number/Name)**<br>0606 / *Aircrew System Development* |

**D. Acquisition Strategy**

Commercial Off-The-Shelf /Non-Developmental Items where possible, cost type contracts. The LEP program was assessed to be low risk so the program was accelerated and moderate risk was accepted. Ground testing was reduced from 22 platforms to 5 and flight testing will be conducted on H-60 only.

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy | | Date: February 2020 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 5 | **R-1 Program Element (Number/Name)**<br>PE 0604264N / *Air Crew Systems Development* | **Project (Number/Name)**<br>0606 / *Aircrew System Development* |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2019 Cost | FY 2019 Award Date | FY 2020 Cost | FY 2020 Award Date | FY 2021 Base Cost | FY 2021 Base Award Date | FY 2021 OCO Cost | FY 2021 OCO Award Date | FY 2021 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Systems Eng Laser Eye Protection (LEP) | WR | NAWCAD : Patuxent River, MD | 11.046 | 1.172 | Dec 2018 | 1.000 | Dec 2019 | 0.500 | Dec 2020 | - | | 0.500 | Continuing | Continuing | Continuing |
| Systems Eng Laser Eye Protection (LEP) | C/FFP | NAVAIR : Patuxent River, MD | 1.210 | 1.771 | Dec 2018 | 1.700 | Dec 2019 | 0.436 | Dec 2020 | - | | 0.436 | 3.035 | 8.152 | 8.152 |
| Systems Eng Aircrew Systems | WR | Various : Various | 16.971 | 0.525 | Dec 2018 | 1.359 | Feb 2020 | 1.374 | Feb 2021 | - | | 1.374 | Continuing | Continuing | Continuing |
| Systems Eng Aircraft Systems | WR | Various : Various | 45.427 | 0.548 | Feb 2019 | 0.522 | Feb 2020 | 0.522 | Feb 2021 | - | | 0.522 | Continuing | Continuing | Continuing |
| System Eng Enhanced Visual Acuity | C/CPFF | Various : Various | 3.712 | 10.000 | Mar 2019 | 8.761 | Feb 2020 | 9.824 | Oct 2020 | - | | 9.824 | Continuing | Continuing | Continuing |
| System Eng Enhanced Visual Acuity | WR | Various : Patuxent River, MD | 12.504 | 3.870 | Nov 2018 | 2.982 | Dec 2019 | 2.985 | Oct 2020 | - | | 2.985 | Continuing | Continuing | Continuing |
| Systems Eng Physiological Episode Protection | WR | NAWCAD : Patuxent River, MD | 2.422 | 1.518 | Nov 2018 | 1.800 | Nov 2019 | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| Systems Eng O2 Cart | C/CPFF | NAWCAD : Patuxent River, MD | 0.700 | 0.900 | Dec 2018 | 1.000 | Dec 2019 | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| Prior year Prod Dev cost no longer funded in the FYDP | Various | Various : Various | 34.569 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 34.569 | - |
| | | **Subtotal** | 128.561 | 20.304 | | 19.124 | | 15.641 | | - | | 15.641 | Continuing | Continuing | N/A |

**Remarks**

*Physiological Episodes decrease from FY20 to FY21 due to realignment of funds into Proj 9099.

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

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2019 Cost | FY 2019 Award Date | FY 2020 Cost | FY 2020 Award Date | FY 2021 Base Cost | FY 2021 Base Award Date | FY 2021 OCO Cost | FY 2021 OCO Award Date | FY 2021 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T&E Enhanced Visual Acuity | WR | Various : Patuxent River, MD | 0.000 | 0.000 | | 0.000 | | 0.758 | Oct 2020 | - | | 0.758 | 0.000 | 0.758 | - |
| | | **Subtotal** | 0.000 | 0.000 | | 0.000 | | 0.758 | | - | | 0.758 | 0.000 | 0.758 | N/A |

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy | | Date: February 2020 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 5 | **R-1 Program Element (Number/Name)**<br>PE 0604264N / *Air Crew Systems Development* | **Project (Number/Name)**<br>0606 / *Aircrew System Development* |

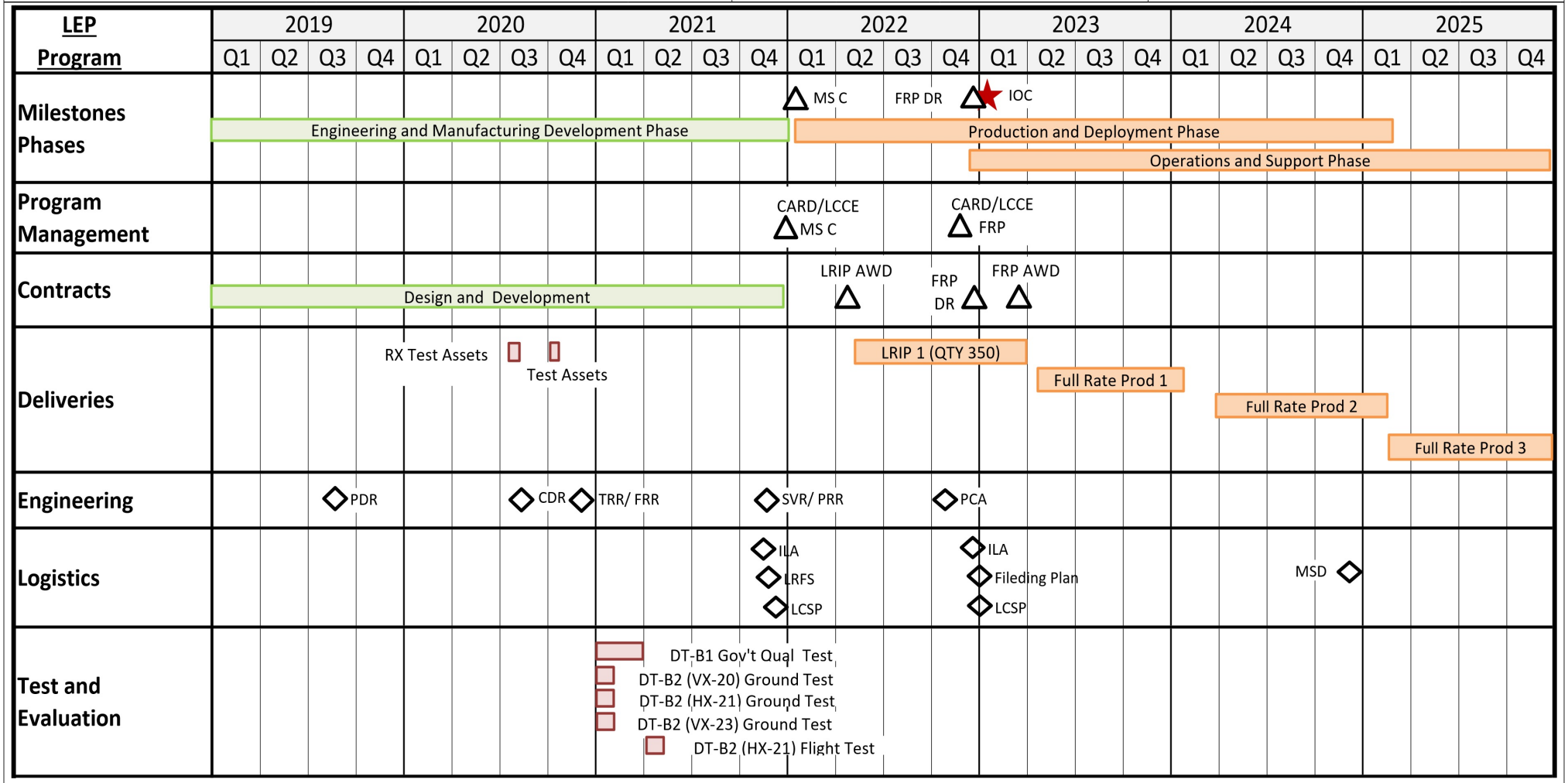
**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2019 Cost | FY 2019 Award Date | FY 2020 Cost | FY 2020 Award Date | FY 2021 Base Cost | FY 2021 Base Award Date | FY 2021 OCO Cost | FY 2021 OCO Award Date | FY 2021 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Travel | WR | Various : Various | 1.324 | 0.047 | Dec 2018 | 0.048 | Dec 2019 | 0.049 | Dec 2020 | - | | 0.049 | Continuing | Continuing | Continuing |
| Prior year Mgmt Svcs no longer funded in the FYDP | Various | Various : Various | 11.923 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 11.923 | - |
| | | **Subtotal** | 13.247 | 0.047 | | 0.048 | | 0.049 | | - | | 0.049 | Continuing | Continuing | N/A |

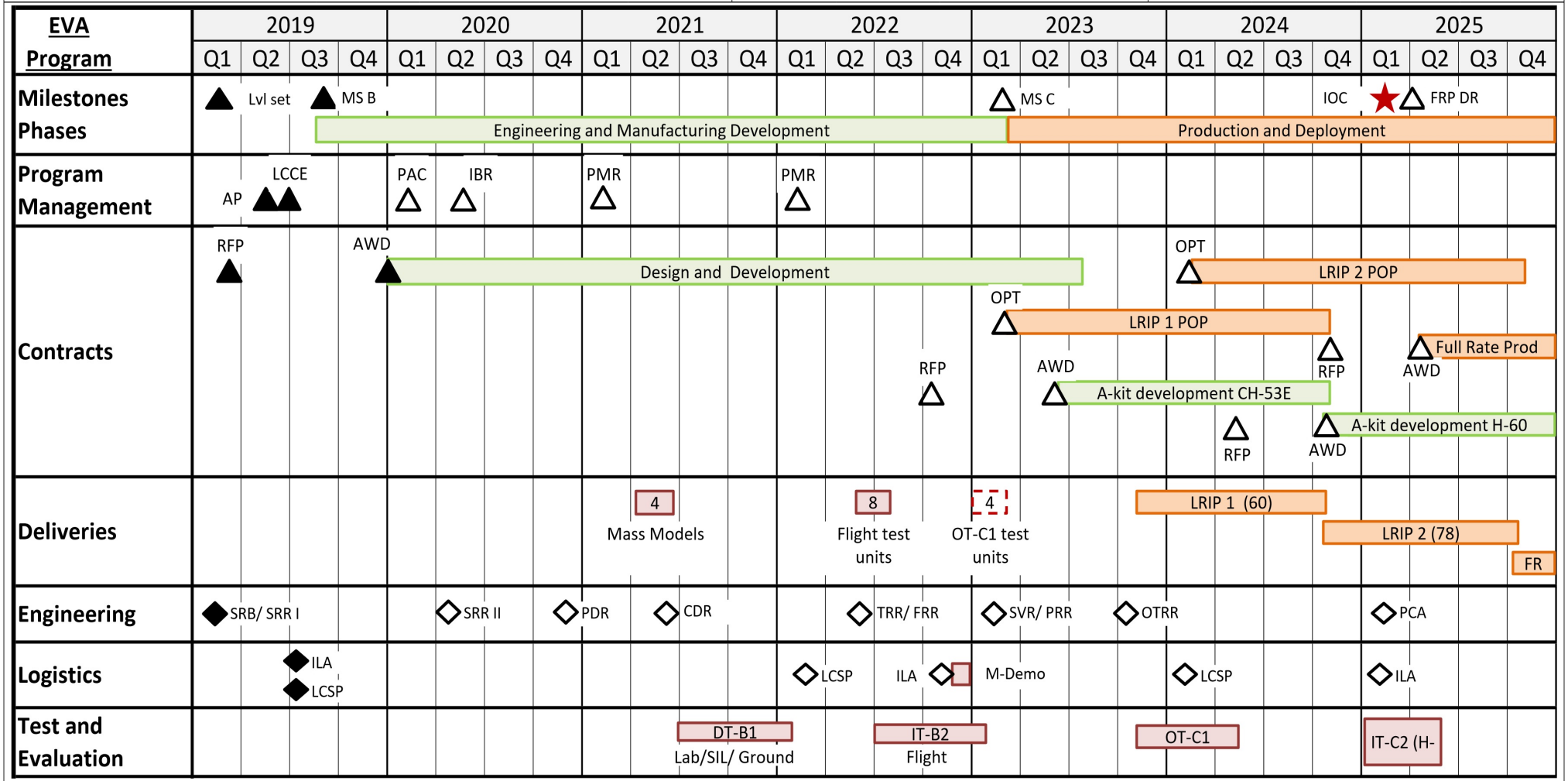
| | Prior Years | FY 2019 | | FY 2020 | | FY 2021 Base | | FY 2021 OCO | | FY 2021 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 141.808 | 20.351 | | 19.172 | | 16.448 | | - | | 16.448 | Continuing | Continuing | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy | | Date: February 2020 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 5 | **R-1 Program Element (Number/Name)**<br>PE 0604264N / *Air Crew Systems Development* | **Project (Number/Name)**<br>0606 / *Aircrew System Development* |



| Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy | | Date: February 2020 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 5 | **R-1 Program Element (Number/Name)**<br>PE 0604264N / *Air Crew Systems Development* | **Project (Number/Name)**<br>0606 / *Aircrew System Development* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy | | Date: February 2020 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 5 | **R-1 Program Element (Number/Name)**<br>PE 0604264N / *Air Crew Systems Development* | **Project (Number/Name)**<br>0606 / *Aircrew System Development* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***Laser Eye Protection (LEP)*** | | | | |
| Acquisition Milestones: Milestones: LEP: Milestone C | 1 | 2022 | 1 | 2022 |
| Acquisition Milestones: Milestones: LEP: FRP Decision | 4 | 2022 | 4 | 2022 |
| Acquisition Milestones: Milestones: LEP IOC | 1 | 2023 | 1 | 2023 |
| Acquisition Milestones: Phases: LEP EMD Phase | 1 | 2019 | 4 | 2021 |
| Acquisition Milestones: Phases: LEP Production & Deployment | 1 | 2022 | 1 | 2025 |
| Acquisition Milestones: Phases: LEP Operations & Support | 4 | 2022 | 1 | 2025 |
| System Development: Reviews: LEP PDR | 3 | 2019 | 3 | 2019 |
| System Development: Reviews: LEP CDR | 3 | 2020 | 3 | 2020 |
| System Development: Reviews: LEP TRR | 4 | 2020 | 4 | 2020 |
| System Development: Reviews: LEP SVR/PRR | 4 | 2021 | 4 | 2021 |
| System Development: Reviews: LEP PCA | 4 | 2022 | 4 | 2022 |
| System Development: Reviews: LEP MSD | 4 | 2024 | 4 | 2024 |
| Test & Evaluation: DT | 1 | 2021 | 2 | 2021 |
| Production Milestones: Contract Awards: LEP LRIP 1 (OPN) | 2 | 2022 | 2 | 2022 |
| Production Milestones: Contract Awards: LEP FRP 1 (OPN) | 1 | 2023 | 1 | 2023 |
| Deliveries: LEP EDM Qty 91 | 3 | 2020 | 4 | 2020 |
| Deliveries: LEP LRIP Qty 350 | 2 | 2022 | 1 | 2023 |
| Deliveries: LEP FRP 1 Qty 535 | 2 | 2023 | 1 | 2024 |
| Deliveries: LEP FRP 2 Qty | 1 | 2024 | 1 | 2025 |
| Deliveries: LEP FRP 3 | 1 | 2025 | 4 | 2025 |
| ***Enhanced Visual Acuity (EVA)*** | | | | |

| Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy | | Date: February 2020 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 5 | **R-1 Program Element (Number/Name)**<br>PE 0604264N / *Air Crew Systems Development* | **Project (Number/Name)**<br>0606 / *Aircrew System Development* |

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| Acquisition Milestones: Milestones: EVA Milestone B | 3 | 2019 | 3 | 2019 |
| Acquisition Milestones: Milestones: EVA Milestone C | 1 | 2023 | 1 | 2023 |
| Acquisition Milestones: Milestones: EVA IOC | 1 | 2025 | 1 | 2025 |
| Acquisition Milestones: Milestones: EVA FRP DR | 1 | 2025 | 1 | 2025 |
| Acquisition Milestones: Phases: EVA EMD | 3 | 2019 | 1 | 2023 |
| Acquisition Milestones: Phases: EVA Production & Deployment | 1 | 2023 | 4 | 2025 |
| System Development: Reviews: EVA PDR | 4 | 2020 | 4 | 2020 |
| System Development: Reviews: EVA SRB/SRR I | 1 | 2019 | 1 | 2019 |
| System Development: Reviews: EVA SRR II | 2 | 2020 | 2 | 2020 |
| System Development: Reviews: EVA CDR | 2 | 2021 | 2 | 2021 |
| System Development: Reviews: EVA TRR | 2 | 2022 | 2 | 2022 |
| System Development: Reviews: EVA SVR/PRR | 1 | 2023 | 1 | 2023 |
| System Development: Reviews: EVA OTRR | 4 | 2023 | 4 | 2023 |
| System Development: Reviews: EVA PCA | 1 | 2025 | 1 | 2025 |
| Test and Evaluation: EVA Developmental Testing | 2 | 2021 | 1 | 2022 |
| Test and Evaluation: EVA IT-B2 | 3 | 2022 | 1 | 2023 |
| Test and Evaluation: EVA IT-C2 | 1 | 2025 | 2 | 2025 |
| Test and Evaluation: EVA Operational Testing | 4 | 2023 | 2 | 2024 |
| Production Milestones: Contract Awards: EVA Design and Development (RDTEN) | 4 | 2019 | 4 | 2019 |
| Production Milestones: Contract Awards: EVA LRIP 1 (OPN) | 2 | 2023 | 2 | 2023 |
| Production Milestones: Contract Awards: EVA LRIP 2 (OPN) | 4 | 2024 | 4 | 2024 |
| Production Milestones: Contract Awards: EVA FRP (OPN) | 2 | 2025 | 2 | 2025 |
| Deliveries: EVA EMD (QTY 12) | 2 | 2021 | 1 | 2023 |
| Deliveries: EVA LRIP 1 (QTY 60) | 4 | 2023 | 1 | 2024 |
| Deliveries: EVA LRIP 2 (QTY 78) | 4 | 2024 | 4 | 2025 |

| Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy | | | Date: February 2020 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 5 | R-1 Program Element (Number/Name)<br>PE 0604264N / *Air Crew Systems Development* | Project (Number/Name)<br>9099 / *Physiological Episodes* | |

| COST ($ in Millions) | Prior Years | FY 2019 | FY 2020 | FY 2021 Base | FY 2021 OCO | FY 2021 Total | FY 2022 | FY 2023 | FY 2024 | FY 2025 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9099: *Physiological Episodes* | 0.000 | 0.000 | 0.000 | 4.997 | - | 4.997 | 3.097 | 1.897 | 1.898 | 1.926 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

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

Proj 9099 PHYSIOLOGICAL EPISODES (Baseline): NOTE: Not a New Start as it was previously funded in Proj 0606.
Assured pilot performance integrity. / Development and fielding of a system that monitors pilot physiological parameters and warns of state of health or performance degradation that may result in loss of consciousness or ability to safely conduct the flight. This system performs as a failsafe that provides the operator with enough advance warning to abort the mission and safely recover the aircraft in the event that there is loss of integrity with the oxygen provisioning system or cockpit air environment. There are several solution options undergoing evaluation.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2019 | FY 2020 | FY 2021 Base | FY 2021 OCO | FY 2021 Total |
|---|---|---|---|---|---|
| ***Title:*** Physiological Monitoring | 0.000 | 0.000 | 4.997 | 0.000 | 4.997 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2020 Plans:***<br>N/A | | | | | |
| ***FY 2021 Base Plans:***<br>Physiological Episode Protection: Mitigate risk of loss of aircrew and Tactical and Training jet platforms due to Physiological Episodes using monitoring and alert systems. Develop, prototype, and test a physiological monitoring system that detects physiological episodes and provides a warning in time to enable the aircrew to execute emergency procedures and recover safely. | | | | | |
| ***FY 2021 OCO Plans:***<br>N/A | | | | | |
| ***FY 2020 to FY 2021 Increase/Decrease Statement:***<br>FY 2020 to FY 2021 Increase due to realignment of Physiological Episodes from Proj 0606 into Proj 9099. | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 0.000 | 0.000 | 4.997 | 0.000 | 4.997 |

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

| Line Item | FY 2019 | FY 2020 | FY 2021 Base | FY 2021 OCO | FY 2021 Total | FY 2022 | FY 2023 | FY 2024 | FY 2025 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • OPN/4268: *Aviation Life Support* | 0.000 | 0.000 | 0.000 | - | 0.000 | 3.600 | 4.300 | 9.900 | 11.000 | Continuing | Continuing |

| Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy | | Date: February 2020 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 5 | **R-1 Program Element (Number/Name)**<br>PE 0604264N / *Air Crew Systems Development* | **Project (Number/Name)**<br>9099 / *Physiological Episodes* |

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

| Line Item | FY 2019 | FY 2020 | FY 2021 Base | FY 2021 OCO | FY 2021 Total | FY 2022 | FY 2023 | FY 2024 | FY 2025 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|

**Remarks**

Note: Physiological Monitoring is only a portion of Aviation Life Support, LI 4268.

**D. Acquisition Strategy**

PMA202 is working with the Defense Innovation Unit (DIU) to facilitate six (6) prototyping Other Transaction Authorities (OTAs) through the Army Contracting Command (ACC, NJ). Production follow-on will be likely, but strategy will vary depending on prototyping results.

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy | | Date: February 2020 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 5 | **R-1 Program Element (Number/Name)**<br>PE 0604264N / *Air Crew Systems Development* | **Project (Number/Name)**<br>9099 / *Physiological Episodes* |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2019 Cost | FY 2019 Award Date | FY 2020 Cost | FY 2020 Award Date | FY 2021 Base Cost | FY 2021 Base Award Date | FY 2021 OCO Cost | FY 2021 OCO Award Date | FY 2021 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Systems Eng Physiological Epidsodes | C/CPFF | TBD : TBD | 0.000 | 0.000 | | 0.000 | | 4.000 | Nov 2020 | - | | 4.000 | Continuing | Continuing | Continuing |
| Systems Eng O2 Cart | WR | NAWCAD : Patuxent River, MD | 0.000 | 0.000 | | 0.000 | | 0.997 | Dec 2020 | - | | 0.997 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 0.000 | 0.000 | | 0.000 | | 4.997 | | - | | 4.997 | Continuing | Continuing | N/A |

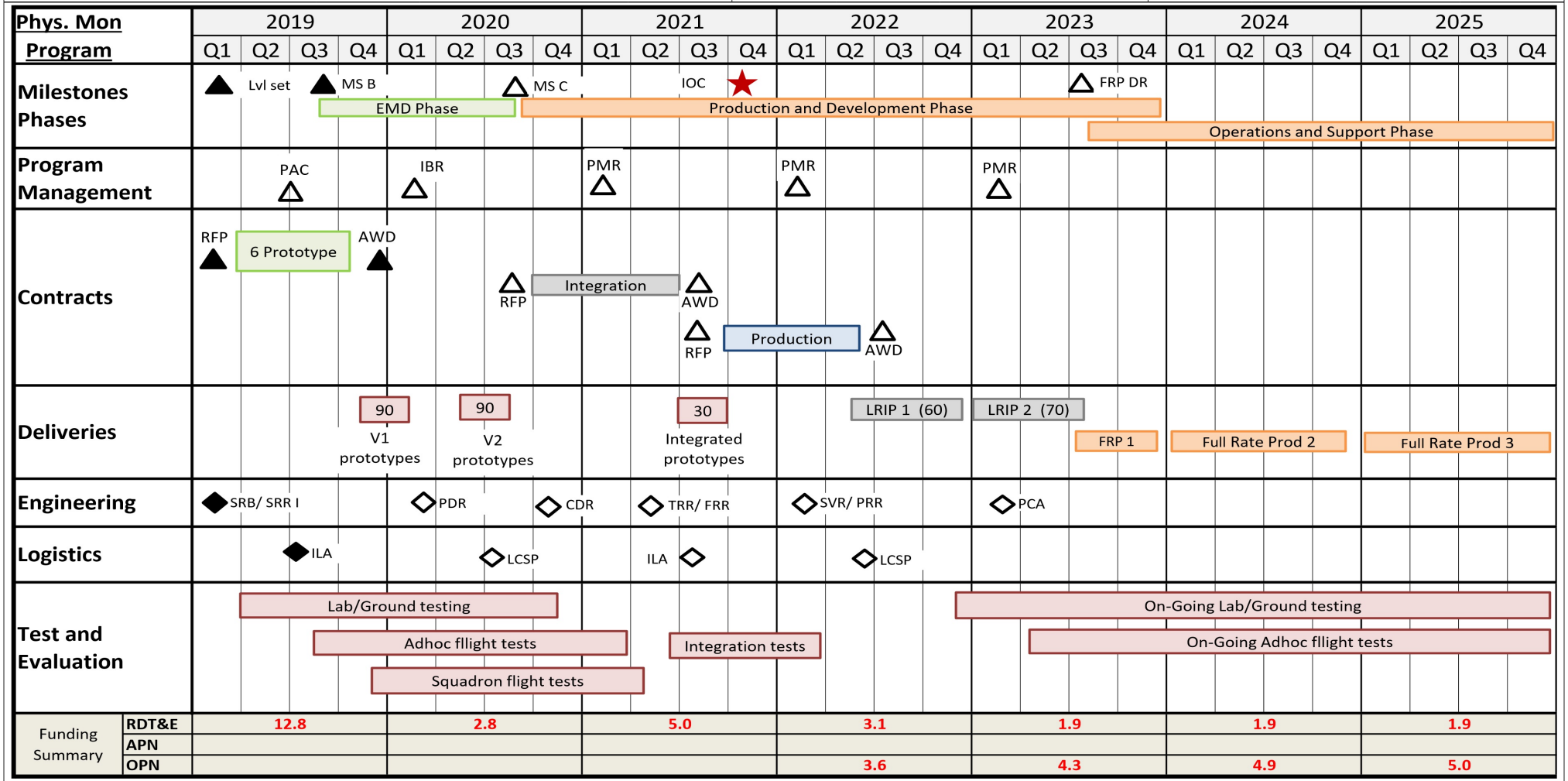
**Remarks**

*Physiological Episodes increase from FY20 to FY21 for human performance monitor/alert to mitigate risk of loss of aircrew and Tactical and Training jet platforms due to Physiological Episodes. Funds realigned from Proj 0606 to Proj 9099.

| | Prior Years | FY 2019 | | FY 2020 | | FY 2021 Base | | FY 2021 OCO | | FY 2021 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 0.000 | 0.000 | | 0.000 | | 4.997 | | - | | 4.997 | Continuing | Continuing | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy | | Date: February 2020 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 5 | **R-1 Program Element (Number/Name)**<br>PE 0604264N / *Air Crew Systems Development* | **Project (Number/Name)**<br>9099 / *Physiological Episodes* |




| Funding Summary | | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 |
|---|---|---|---|---|---|---|---|---|
| | RDT&E | 12.8 | 2.8 | 5.0 | 3.1 | 1.9 | 1.9 | 1.9 |
| | APN | | | | | | | |
| | OPN | | | | 3.6 | 4.3 | 4.9 | 5.0 |

| Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy | | Date: February 2020 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 5 | **R-1 Program Element (Number/Name)**<br>PE 0604264N / *Air Crew Systems Development* | **Project (Number/Name)**<br>9099 / *Physiological Episodes* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***Physiological Episodes*** | | | | |
| Acquisition Milestones: Milestones: Schedule Detail1 | 1 | 2020 | 1 | 2020 |
| Acquisition Milestones: Milestones: Schedule Detail2 | 4 | 2020 | 4 | 2020 |
| Acquisition Milestones: Milestones: Schedule Detail3 | 2 | 2021 | 2 | 2021 |
| System Development: Reviews: Schedule Detail1 | 1 | 2020 | 4 | 2021 |
| System Development: Reviews: Schedule Detail2 | 1 | 2022 | 1 | 2022 |
| System Development: Reviews: Schedule Detail3 | 3 | 2019 | 4 | 2021 |
| Test & Evaluation: Schedule Detail1 | 2 | 2022 | 1 | 2023 |
| Test & Evaluation: Schedule Detail2 | 2 | 2023 | 3 | 2023 |
| Test & Evaluation: Schedule Detail3 | 1 | 2020 | 1 | 2020 |
| Test & Evaluation: Schedule Detail4 | 3 | 2020 | 3 | 2020 |
| Test & Evaluation: Schedule Detail5 | 4 | 2022 | 4 | 2025 |
| Production Milestones: Contract Award: Schedule Detail1 | 1 | 2022 | 1 | 2022 |
| Production Milestones: Contract Award: Schedule Detail2 | 4 | 2023 | 4 | 2023 |

| Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy | | | Date: February 2020 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 5 | R-1 Program Element (Number/Name)<br>PE 0604264N / *Air Crew Systems Development* | Project (Number/Name)<br>9999 / *Congressional Adds* | |

| COST ($ in Millions) | Prior Years | FY 2019 | FY 2020 | FY 2021 Base | FY 2021 OCO | FY 2021 Total | FY 2022 | FY 2023 | FY 2024 | FY 2025 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9999: *Congressional Adds* | 0.927 | 9.654 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 10.581 |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

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

FY19 Base Plans - Proj. 9999 Congressional Add: NAVAIR PMA-202 will work with the Defense Innovation Unit (DIU), a Department of Defense (DoD) organization focused on accelerating commercial technologies in the U.S. Military, to develop wearable physiological monitoring systems and algorithms, as prototypes, to monitor for, predict, and/or alert aircrew to impending degradations in performance. The scope of this project will be consistent with the Research, Development, Test & Evaluation (RDT&E) of physiological monitoring systems.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2019 | FY 2020 |
|---|---|---|
| ***Congressional Add:*** Advance Aircrew Physiological Monitoring | 9.654 | 0.000 |
| ***FY 2019 Accomplishments:*** Physiological Episode Protection: Mitigate risk of loss of aircrew and Tactical and Training jet platforms due to Physiological Episodes using monitoring and alert systems. Develop, prototype, and test a physiological monitoring system that detects physiological episodes and provides a warning in time to enable the aircrew to execute emergency procedures and recover safely. | | |
| ***FY 2020 Plans:*** N/A | | |
| **Congressional Adds Subtotals** | 9.654 | 0.000 |

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

N/A

**Remarks**

**D. Acquisition Strategy**

Not applicable.

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy | | Date: February 2020 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 5 | **R-1 Program Element (Number/Name)**<br>PE 0604264N / *Air Crew Systems Development* | **Project (Number/Name)**<br>9999 / *Congressional Adds* |

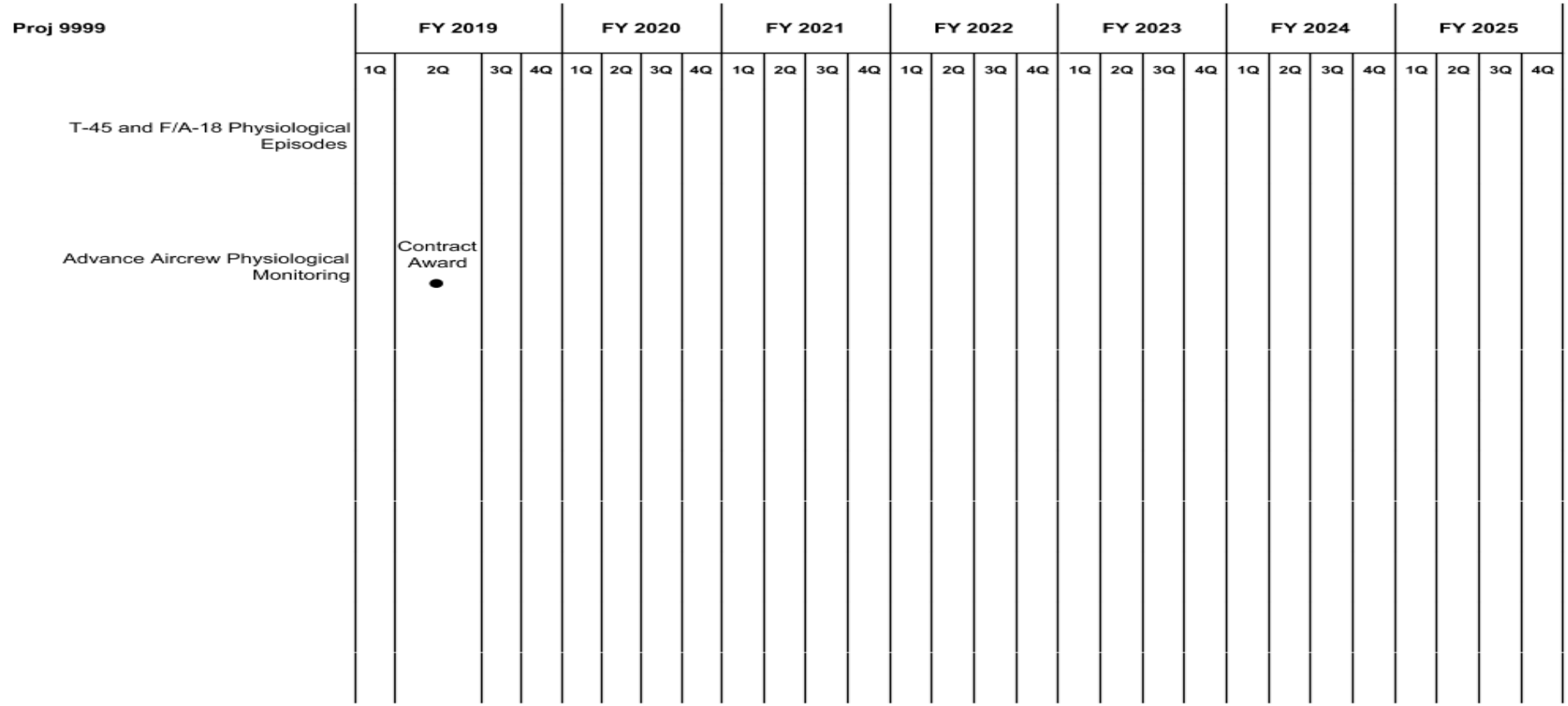
**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2019 Cost | FY 2019 Award Date | FY 2020 Cost | FY 2020 Award Date | FY 2021 Base Cost | FY 2021 Base Award Date | FY 2021 OCO Cost | FY 2021 OCO Award Date | FY 2021 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T-45 and F/A-18 Physiological Episodes | C/CPFF | Various : Various | 0.927 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.927 | 0.927 |
| Advance Aircrew Physiological Monitoring | C/CPFF | Various : Various | 0.000 | 9.654 | Feb 2019 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 9.654 | 9.654 |
| | | **Subtotal** | 0.927 | 9.654 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 10.581 | N/A |

| | Prior Years | FY 2019 Cost | FY 2019 Award Date | FY 2020 Cost | FY 2020 Award Date | FY 2021 Base Cost | FY 2021 Base Award Date | FY 2021 OCO Cost | FY 2021 OCO Award Date | FY 2021 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 0.927 | 9.654 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 10.581 | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy | | Date: February 2020 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 5 | **R-1 Program Element (Number/Name)**<br>PE 0604264N / *Air Crew Systems Development* | **Project (Number/Name)**<br>9999 / *Congressional Adds* |




*2021DON - 0604264N - 9999*

| Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy | | Date: February 2020 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 5 | **R-1 Program Element (Number/Name)**<br>PE 0604264N / *Air Crew Systems Development* | **Project (Number/Name)**<br>9999 / *Congressional Adds* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***Proj 9999*** | | | | |
| Advance Aircrew Physiological Monitoring: Schedule Detail | 2 | 2019 | 2 | 2019 |