| Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Office of the Secretary Of Defense | Date: March 2024 |
|---|---|
| **Appropriation/Budget Activity**<br>0400: *Research, Development, Test & Evaluation, Defense-Wide I* BA 2: *Applied Research* | **R-1 Program Element (Number/Name)**<br>PE 0602251D8Z *I Applied Research for the Advancement of S&T Priorities* |

| COST ($ in Millions) | Prior Years | FY 2023 | FY 2024 | FY 2025 Base | FY 2025 OCO | FY 2025 Total | FY 2026 | FY 2027 | FY 2028 | FY 2029 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Program Element | 0.000 | 60.877 | 66.866 | 51.555 | - | 51.555 | 54.154 | 59.352 | 59.869 | 60.295 | Continuing | Continuing |
| 227: *Applied Research for the Advancement of S&T Priorities* | 0.000 | 60.877 | 66.866 | 51.555 | - | 51.555 | 54.154 | 59.352 | 59.869 | 60.295 | Continuing | Continuing |

**Note**

New Start (Y/N): No

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

This program supports the Department's initiatives to Build a Sustainable Technical Advantage, build a Resilient Joint Force and Defense Ecosystem, and Taking Care of People.

The Applied Research for the Advancement of Science and Technology (S&T) Priorities (ARAP) program builds strong Department of Defense (DoD) future technical workforce and laboratory capabilities in critical emerging technology areas within the Under Secretary of Defense for Research and Engineering (USD(R&E)) Technology Vision for an Era of Competition to enable future leap-ahead capabilities that outpace our competitors. This program funds tri-Service applied researchers to work with university and industry partners, accelerating DoD learning and technology development for new capabilities. Programs continually have follow-on activities funded by the individual Services and Agencies, which reflects the foundational research capabilities and overall value of the investment.

Specific projects support the design, development, and improvement of immature, DoD needed, technologies and new concepts to achieve general mission requirements and to translate promising research into solutions for military needs. In addition, the program enables concept exploration efforts and enables studies of alternative concepts.

The research projects are aligned with the DoD S&T priorities and designated focus areas that include non-system specific technology efforts and feasibility assessments and are formulated and managed by teams of subject matter experts drawn from the Office of the Secretary of Defense, the Military Services, and the Defense Agencies.

The program also provides support to the S&T Communities of Interest (CoIs) to ensure multi-agency collaboration and coordination. The S&T CoIs produce Joint S&T Roadmaps to contribute to the USD(R&E) Modernization Priority Roadmaps.

| Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Office of the Secretary Of Defense | Date: March 2024 |
|---|---|
| **Appropriation/Budget Activity**<br>0400: *Research, Development, Test & Evaluation, Defense-Wide I* BA 2: *Applied Research* | **R-1 Program Element (Number/Name)**<br>PE 0602251D8Z *I Applied Research for the Advancement of S&T Priorities* |

| B. Program Change Summary ($ in Millions) | FY 2023 | FY 2024 | FY 2025 Base | FY 2025 OCO | FY 2025 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 62.904 | 66.866 | 66.948 | - | 66.948 |
| Current President's Budget | 60.877 | 66.866 | 51.555 | - | 51.555 |
| Total Adjustments | -2.027 | 0.000 | -15.393 | - | -15.393 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | -2.021 | - | | | |
| • Program Adjustments | -0.006 | - | -15.497 | - | -15.497 |
| • Economic Assumptions | - | - | 0.104 | - | 0.104 |

**Change Summary Explanation**

The decrease of $15.497 million in FY 2025 is the result of a realignment of -$6.000 million to Program Element 0603288D8Z, Science and Technology Analytic Assessments to support net technical assessments and analyses of global emerging threats and collaborative analysis with international partners, a $3.000 million to Program Element 0606300D8Z to support Defense Science Board (DSB) directed study requirements and a reduction of $6.497 was applied to meet DoD overall funding reductions, which were spread to mitigate impact. Funding increase of $0.104 million in FY 2025 for Economic Assumptions.

| Exhibit R-2A, RDT&E Project Justification: PB 2025 Office of the Secretary Of Defense | | | Date: March 2024 |
|---|---|---|---|
| Appropriation/Budget Activity<br>0400 / 2 | R-1 Program Element (Number/Name)<br>PE 0602251D8Z / *Applied Research for the Advancement of S&T Priorities* | Project (Number/Name)<br>227 / *Applied Research for the Advancement of S&T Priorities* | |

| COST ($ in Millions) | Prior Years | FY 2023 | FY 2024 | FY 2025 Base | FY 2025 OCO | FY 2025 Total | FY 2026 | FY 2027 | FY 2028 | FY 2029 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 227: *Applied Research for the Advancement of S&T Priorities* | 0.000 | 60.877 | 66.866 | 51.555 | - | 51.555 | 54.154 | 59.352 | 59.869 | 60.295 | Continuing | Continuing |

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

The Applied Research for the Advancement of Science and Technology (S&T) Priorities program was established to implement Department-wide technology development portfolios and foster tri-Service research areas of common interest within cross-cutting S&T efforts. The program has three investment areas: (1) large, three-year applied research programs selected by the S&T Executives; (2) smaller, two-year technology 'seedling' programs nominated by the S&T Communities of Interest (CoIs) to address technology gaps or opportunities; and (3) technology assessment and study support to the CoIs. The execution of the program by the Office of the Secretary of Defense and the support it provides to the CoIs inspires and ensures joint strategic S&T oversight and multi-Service, multi-agency collaboration and coordination.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2023 | FY 2024 | FY 2025 |
|---|---|---|---|
| ***Title:*** Applied Research for the Advancement of S&T Priorities (ARAP) | 50.877 | 56.866 | 48.055 |
| ***Description:*** The program focuses on cross-cutting S&T efforts that foster tri-service research areas of common interest that give the joint warfighter a technological advantage. It focuses on emerging areas of science, building expertise within the DoD laboratories, including investment in laboratory infrastructure and people, and on research areas that are a foundation for further investments by the Services following the completion of the projects.<br><br>Cross-cutting efforts are aligned with S&T Priorities, such as Electronic Warfare, Human Systems, Autonomy, Space, Kinetic Weapons, Directed Energy and Non-Lethal Weapons, Cyber, Sensors and Processing, Command, Control, Communications, Computers and Intelligence, Air Platforms, and Ground and Sea Platforms, as well other focus areas, such as Materials and Manufacturing Processes, Advanced Electronics, Energy and Power Technologies, Biotechnology, and Armed Services Biomedical Research Evaluation and Management.<br><br>***FY 2024 Plans:***<br>Complete Surface Morphing and Adaptive Structures for Hypersonics (SMASH) (Year 3 of 3) Conduct wind tunnel testing that demonstrates initial concepts to significantly extend the speed, range, and maneuverability of hypersonics.<br><br>Continue Advanced Power Electronics and Extreme-RF (APEX) (Year 2 of 3) Development of robust, solid-state, high-power RF device technology required to meet the future needs of the warfighter and counter emerging threats from our adversaries. Investigation of higher power RF transmitter chip sets improved thermal management and establish US capabilities in ultra-wide bandgap materials. | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2025 Office of the Secretary Of Defense | | Date: March 2024 |
|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 2 | **R-1 Program Element (Number/Name)**<br>PE 0602251D8Z / *Applied Research for the Advancement of S&T Priorities* | **Project (Number/Name)**<br>*227 / Applied Research for the Advancement of S&T Priorities* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2023 | FY 2024 | FY 2025 |
|---|---|---|---|
| Initiate new ARAP project to be selected in third quarter FY 2023.<br>***FY 2025 Plans:***<br>Complete Advanced Power Electronics and Extreme-Radio Frequency (APEX) (Year 3 of 3) a Tri-service, multi-laboratory development of a robust, solid-state, high-power Radio Frequency device technology required to meet the future needs of the warfighter and counter emerging threats from our adversaries. Investigation of higher power RF transmitter chip sets improved thermal management and establish US capabilities in ultra-wide bandgap materials.<br><br>Continue Applied Research for the Advancement of Science and Technology Priorities (ARAP) project selected in FY 2023 and initiated in FY 2024, Classical-quantum Hybrid constructs to Advance Weapons Systems (CLAWS) (Year 2 of 3). CLAWS is a Tri-service, multi-laboratory effort that will develop and demonstrate novel phenomena such as new phases in 2D materials and heterostructures, and long scale atomic coherence, to create disruptive DoD- capabilities in Infrared imaging, Positioning, Navigation and Timing (PNT), and nanophotonic devices, that will provide advanced capabilities to many military systems, particularly missiles and weapons platforms.<br><br>Funding reductions will require the ARAP program to accept additional risk in on-going efforts as well as to reduce flexibility in the breadth of activities that can be supported. Specifically, the scope of the new ARAP project to be selected in third quarter FY 2024 have to be reduced to accommodate the funding adjustments.<br>***FY 2024 to FY 2025 Increase/Decrease Statement:***<br>The decrease of $8.811 million between FY 2024 and FY 2025 reflects a realignment to Program Element 0603288D8Z, Science and Technology Analytic Assessments to support net technical assessments and analyses of global emerging threats and collaborative analysis with international partners and to Program Element 0606300D8Z to support Defense Science Board (DSB) directed study requirements. | | | |
| ***Title:*** Science & Technology (S&T) Communities of Interest (CoIs) | 5.000 | 5.000 | 3.500 |
| ***Description:*** The S&T CoIs facilitate coordination and collaboration across components to reduce duplication and optimize the development of critical S&T efforts across the DoD enterprise. Their efforts include the development of joint S&T roadmaps and the planning of technology integration. The CoIs assess and address capability gaps and their multi-domain operational impact. The COIs include Advanced Electronics; Air Platforms; Autonomy; Armed Services Biomedical Research Evaluation and Management. Biotechnology; Command, Control, Communications, Computers, and Intelligence (C4I); Cyber; Directed Energy - Non-Lethal Weapons; Electronic Warfare; Energy and Power; Ground and Sea Platforms; Human Systems; Kinetic Weapons; Materials and Manufacturing Processes; Sensors and Processing; and Space. | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2025 Office of the Secretary Of Defense | | Date: March 2024 |
|---|---|---|
| **Appropriation/Budget Activity**<br>0400 / 2 | **R-1 Program Element (Number/Name)**<br>PE 0602251D8Z / *Applied Research for the Advancement of S&T Priorities* | **Project (Number/Name)**<br>*227 / Applied Research for the Advancement of S&T Priorities* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2023 | FY 2024 | FY 2025 |
|---|---|---|---|
| ***FY 2024 Plans:***<br>Continue to provide support to the CoIs , in developing integrated technology roadmaps, conducting technology trade studies and technology gap analysis, and coordinating and building relationships with OSD Critical Technology Area leads.<br>***FY 2025 Plans:***<br>Provide reduced support to the Communities of Interest (CoIs), allowing them to refresh existing integrated technology roadmaps, conduct limited technology trade studies and coordinate with OSD Critical Technology Area leads.<br>***FY 2024 to FY 2025 Increase/Decrease Statement:***<br>The decrease of $1.500 million between FY 2024 and FY 2025 reflects a realignment to Program Element 0603288D8Z, Science and Technology Analytic Assessments to support net technical assessments and analyses of global emerging threats and collaborative analysis with international partners and to Program Element 0606300D8Z to support Defense Science Board (DSB) directed study requirements. This will result in reduced support as indicated in the FY 2025 plans. | | | |
| ***Title:*** ARAP Seedlings<br>***Description:*** The program focuses on identifying a single technology gap or problem and establishing multi-service laboratory teams to solve the problem in 12–24-months. Solutions have the potential to laying the foundation for future Applied Research for Advancement of S&T Priority (ARAP) proposals.<br>***FY 2024 Plans:***<br>Support Seedlings initiated in FY 2023. Identify and select new Seedling projects in FY 2024.<br>***FY 2024 to FY 2025 Increase/Decrease Statement:***<br>The decrease of $5.000 million between FY 2024 and FY 2025 reflects a realignment to Program Element 0603288D8Z, Science and Technology Analytic Assessments to support net technical assessments and analyses of global emerging threats and collaborative analysis with international partners and to Program Element 0606300D8Z to support Defense Science Board (DSB) directed study requirements. | 5.000 | 5.000 | - |
| **Accomplishments/Planned Programs Subtotals** | 60.877 | 66.866 | 51.555 |

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

N/A

**Remarks**

**D. Acquisition Strategy**

N/A