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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Defense Threat Reduction Agency **Date:** March 2023

| | |
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| Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 5: System Development & Demonstration (SDD)</i> | R-1 Program Element (Number/Name) PE 0605000BR / <i>COUNTER WEAPONS OF MASS DESTRUCTION SYSTEMS DEVELOPMENT</i> |
|--|---|

| 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 | 25.120 | 13.695 | 14.403 | 14.414 | - | 14.414 | 14.341 | 14.569 | 16.922 | 17.260 | Continuing | Continuing |
| RD: <i>Nuclear Technologies and Capabilities Development</i> | 25.120 | 13.695 | 14.403 | 14.414 | - | 14.414 | 14.341 | 14.569 | 16.922 | 17.260 | Continuing | Continuing |

A. Mission Description and Budget Item Justification

The Counter Weapons of Mass Destruction (CWMD) Systems Development program element supports the development and demonstration of technologies and systems for the CWMD mission, including modeling and simulation (M&S) capabilities, verification and monitoring technologies, and decision support systems.

B. Program Change Summary (\$ in Millions)

| | <u>FY 2022</u> | <u>FY 2023</u> | <u>FY 2024 Base</u> | <u>FY 2024 OCO</u> | <u>FY 2024 Total</u> |
|-------------------------------------|----------------|----------------|---------------------|--------------------|----------------------|
| Previous President's Budget | 14.063 | 14.403 | 13.414 | - | 13.414 |
| Current President's Budget | 13.695 | 14.403 | 14.414 | - | 14.414 |
| Total Adjustments | -0.368 | 0.000 | 1.000 | - | 1.000 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | -0.368 | - | | | |
| • Realignment | - | - | 1.000 | - | 1.000 |

Change Summary Explanation

The increase in FY 2024 from the previous President's Budget is due to increased investment in Project RD: Nuclear Technologies and Capabilities Development for nuclear and radiological effects funded by decreased investment in this Project (RD) within PE 0603160BR.

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| Exhibit R-2A, RDT&E Project Justification: PB 2024 Defense Threat Reduction Agency | | | | | | | | | | Date: March 2023 | | |
| Appropriation/Budget Activity 0400 / 5 | | | | | R-1 Program Element (Number/Name) PE 0605000BR / COUNTER WEAPONS OF MASS DESTRUCTION SYSTEMS DEVELOPMENT | | | | Project (Number/Name) RD / Nuclear Technologies and Capabilities 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 |
| RD: Nuclear Technologies and Capabilities Development | 25.120 | 13.695 | 14.403 | 14.414 | - | 14.414 | 14.341 | 14.569 | 16.922 | 17.260 | Continuing | Continuing |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

A. Mission Description and Budget Item Justification

This project supports the development of capabilities for the Defense Threat Reduction Agency (DTRA) to counter proliferation and weapons of mass destruction (WMD) and to model the consequences of the use of nuclear weapons and integrate these capabilities for Combatant Command use.

DTRA's Enhanced Consequence Analysis (ECA) program performs research and development to improve the reliability and effectiveness of capabilities related to the consequence of execution of a nuclear weapon. This program delivers nuclear weapon effects (NWE) decision support tools for use during strategic and operational planning. The ECA program directly supports U.S. and allied warfighter planning requirements, including the Integrated Strategic Planning and Analysis Network Increment 5 (ISPAN Inc 5), an acquisition category (ACAT) 1A Major Automated Information System (MAIS) that supports developing nuclear and conventional force application plans.

DTRA's Nuclear Arms Control Technologies (NACT) program performs research and development to improve the sustainability, reliability, and effectiveness of capabilities related to its operational mission to install, operate, maintain, and sustain the waveform and radionuclide nuclear detonation detection stations and a radionuclide analysis laboratory comprising the majority of the U.S. portion of the International Monitoring System (IMS). This system delivers data continuously to the U.S. monitoring and verification community supporting warfighter and interagency nuclear-event response in support of the U.S. and Department of Defense (DoD). The NACT program directly supports U.S. and allied warfighter and national technical monitoring requirements and provides vital data used by the treaty monitoring community, warfighter planners, DoD, other U.S. Government agencies, and international agencies.

The Nuclear Capabilities Services (NuCS) program performs RDT&E to improve capabilities to model nuclear weapon effects (NWE) environments and simulate the response of systems and networks to these effects. Starting with NWE modeling & simulation (M&S) capabilities rooted in the DoD nuclear testing program, NuCS augments these legacy codes through integration of higher-fidelity reduced-order models built by DTRA applied research efforts that combine first-principle science & technology M&S and experimental research. Through technology updates to legacy codes and integration of new models, NuCS provide a standard source of NWE M&S capabilities for all DoD users. The ECA program integrates NuCS capabilities and these M&S capabilities with operational databases and systems and works with end-users to provide a user experience specifically designed for nuclear planning. Together, these programs support United States and allied planning and decision making in the event of nuclear weapon use.

B. Accomplishments/Planned Programs (\$ in Millions)

| | FY 2022 | FY 2023 | FY 2024 |
|--|----------------|----------------|----------------|
| Title: RD - Nuclear Technologies and Capabilities Development | 13.695 | 14.403 | 14.414 |

PE 0605000BR: COUNTER WEAPONS OF MASS DESTRUCTION SYST..

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| Exhibit R-2A, RDT&E Project Justification: PB 2024 Defense Threat Reduction Agency | | Date: March 2023 |
| Appropriation/Budget Activity 0400 / 5 | R-1 Program Element (Number/Name) PE 0605000BR / COUNTER WEAPONS OF MASS DESTRUCTION SYSTEMS DEVELOPMENT | Project (Number/Name) RD / Nuclear Technologies and Capabilities Development |

B. Accomplishments/Planned Programs (\$ in Millions)

Description: Project RD supports the NuCS, NACT, and ECA programs, conducting RDT&E to support U.S. and allied nuclear planning and decision-making requirements.

FY 2023 Plans:

Nuclear Signature Monitoring – Signature Evaluation:

- Develop geographically expanded monitoring capability and algorithms for detection of new threats, Conventional-Nuclear Integration (CNI), and verification of covert nuclear signatures.
- Integrate nuclear and radionuclide data into Chemical, Biological, Radiological, Nuclear, and High-yield Explosives (CBRNE) Consequence Management Response Force (CCMRF) Exercises to provide realistic scenarios for emergency response to nuclear events.
- Characterize waveform signals from Cooperative Threat Reduction leveraged large-scale high-explosive tests at Soviet test sites to reduce uncertainty in nuclear effects models.

International Monitoring System (IMS) - Signature Exploitation / Dual Use:

- Expand digitization of nuclear testing data to other test sites and integrate into Waveforms From Nuclear Explosions (WFNE) to reduce uncertainty in nuclear effect models.
- Improve and reduce uncertainty of infrasound propagation models for both IMS and other strategic DoD missions.
- Expand characterization of waveform signals application to military mission and reduce uncertainty in nuclear effects models through detailed analysis of high-explosive coupling experiments.

Nuclear Signature Monitoring - Signature Availability/System Performance:

- Design the 32nd of 32 U.S. IMS stations to demonstrate U.S. commitment and keep pace with other State Signatories' installation of 300 out of 321 (93%) stations.
- Design the next-generation particulate monitoring station for dual-use to support both IMS and other strategic DoD missions.
- Increase nuclear and radionuclide data provided from existing networks and sensors through the DTRA Joint Operations Center (JOC) to support Combatant Commands (CCMDs).

FY 2024 Plans:

- Integrate nuclear weapon effects software capabilities prioritized by ECA users in a cloud-ready architecture that has been tested and evaluated to function under expected operational conditions.
- Integrate new and requested capabilities into cloud-ready USSTRATCOM, UK/MoD and NATO/SHAPE nuclear planning tools.
- Develop algorithms to enable transition of infrasound propagation models to DoD systems and develop prototype of next generation International Monitoring System (IMS) radionuclide lab analysis capability.

| FY 2022 | FY 2023 | FY 2024 |
|---------|---------|---------|
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| Exhibit R-2A, RDT&E Project Justification: PB 2024 Defense Threat Reduction Agency | | Date: March 2023 |
| Appropriation/Budget Activity 0400 / 5 | R-1 Program Element (Number/Name) PE 0605000BR / COUNTER WEAPONS OF MASS DESTRUCTION SYSTEMS DEVELOPMENT | Project (Number/Name) RD / Nuclear Technologies and Capabilities Development |

| B. Accomplishments/Planned Programs (\$ in Millions) | FY 2022 | FY 2023 | FY 2024 |
|---|----------------|----------------|----------------|
| - Deliver improved "state of health" IMS performance and predictive algorithms and monitoring arrays using AI/ML techniques from legacy U.S. IMS data. - Demonstrate an emerging-threat monitoring capability that leverages current systems and complete comprehensive analyses of sensor data from DTRA/DOS/NNSA high-explosive experiments. | | | |
| FY 2023 to FY 2024 Increase/Decrease Statement: There is no significant change from FY 2023 to FY 2024. | | | |
| Accomplishments/Planned Programs Subtotals | 13.695 | 14.403 | 14.414 |

| C. Other Program Funding Summary (\$ in Millions) | | | | | | | | | | | |
|--|----------------|----------------|---------------------|--------------------|----------------------|----------------|----------------|----------------|----------------|-------------------------|-------------------|
| Line Item | 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 |
| • 23/0602718BR/RD: COUNTER WEAPONS OF MASS DESTRUCTION APPLIED RESEARCH | 97.766 | 106.095 | 119.670 | - | 119.670 | 120.980 | 122.543 | 119.240 | 121.625 | Continuing | Continuing |
| • 33/0603160BR/RD: COUNTER WEAPONS OF MASS DESTRUCTION ADVANCED TECHNOLOGY DEVELOPMENT | 53.969 | 60.249 | 51.697 | - | 51.697 | 52.341 | 54.236 | 53.596 | 54.667 | Continuing | Continuing |

Remarks

D. Acquisition Strategy

Assess government, academic, and industrial performers and make selections based upon a "best fit for task" criteria. Common government awardees include DoD Service Laboratories and the Department of Energy National Laboratories.

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| Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Defense Threat Reduction Agency | | | | | | | | | | | | Date: March 2023 | | |
| Appropriation/Budget Activity 0400 / 5 | | | | R-1 Program Element (Number/Name) PE 0605000BR / COUNTER WEAPONS OF MASS DESTRUCTION SYSTEMS DEVELOPMENT | | | | Project (Number/Name) RD / Nuclear Technologies and Capabilities Development | | | | | | |

| Product Development (\$ in Millions) | | | | FY 2022 | | FY 2023 | | FY 2024 Base | | FY 2024 OCO | | FY 2024 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 | | | |
| Enhanced Consequence Analysis (ECA) capability development | C/CPFF | Booz Allen Hamilton : McLean, VA | 2.555 | 2.100 | Nov 2021 | 1.970 | Mar 2023 | 1.861 | Nov 2023 | - | | 1.861 | Continuing | Continuing | - |
| Nuclear Capabilities Service (NuCS) nuclear weapon effects models and integration development | C/CPFF | Applied Research Associates : Raleigh, NC | 0.000 | 1.400 | Nov 2021 | 1.535 | Mar 2023 | 2.403 | Dec 2023 | - | | 2.403 | Continuing | Continuing | - |
| Subtotal | | | 2.555 | 3.500 | | 3.505 | | 4.264 | | - | | 4.264 | Continuing | Continuing | N/A |

| Support (\$ in Millions) | | | | FY 2022 | | FY 2023 | | FY 2024 Base | | FY 2024 OCO | | FY 2024 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 | | | |
| Radionuclide sensor, station, laboratory and network improvements | FFRDC | Pacific Northwest National Laboratory : Richland, WA | 2.762 | 1.236 | Jan 2022 | 1.785 | Jan 2023 | 1.084 | Dec 2023 | - | | 1.084 | Continuing | Continuing | - |
| Seismic and Infrasound sensor, station, and network Improvements; validation and verification testing | FFRDC | Sandia National Laboratory : Albuquerque, NM | 3.094 | 1.377 | Jan 2022 | 1.589 | Jan 2023 | 0.900 | Dec 2023 | - | | 0.900 | Continuing | Continuing | - |
| Radionuclide sensor, station, and network Improvements | MIPR | Air Force Technical Application Center : Patrick AFB, FL | 0.890 | 0.398 | Feb 2022 | 0.350 | Jan 2023 | - | | - | | - | Continuing | Continuing | - |
| Radionuclide sensor, station, laboratory and network improvements | C/CPFF | General Dynamics Mission Systems, Inc. : Fairfax, VA | 0.881 | 0.455 | Nov 2021 | 0.750 | Nov 2022 | 0.788 | Nov 2023 | - | | 0.788 | Continuing | Continuing | - |
| Station, and network Improvements | C/CPFF | Leidos Innovations Corp : Alexandria, VA | 0.440 | 0.245 | Nov 2021 | 0.250 | Mar 2023 | 0.750 | Mar 2024 | - | | 0.750 | Continuing | Continuing | - |

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Defense Threat Reduction Agency **Date:** March 2023

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| Appropriation/Budget Activity 0400 / 5 | R-1 Program Element (Number/Name) PE 0605000BR / COUNTER WEAPONS OF MASS DESTRUCTION SYSTEMS DEVELOPMENT | Project (Number/Name) RD / Nuclear Technologies and Capabilities Development |
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| Support (\$ in Millions) | | | | FY 2022 | | FY 2023 | | FY 2024 Base | | FY 2024 OCO | | FY 2024 Total | | | |
|---|------------------------|---|-------------|---------|------------|---------|------------|--------------|------------|-------------|------------|---------------|------------------|------------|--------------------------|
| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | Cost | Award Date | Cost | Award Date | Cost | Award Date | Cost | Award Date | Cost | Cost To Complete | Total Cost | Target Value of Contract |
| Seismic and Infrasound sensor, station, and network Improvements | C/CPFF | Pennsylvania State University : State College, PA | 0.850 | 0.459 | Jan 2022 | 0.275 | Feb 2023 | 0.300 | Feb 2024 | - | | 0.300 | Continuing | Continuing | - |
| Seismic and Infrasound sensor, station, and network Improvements; validation and verification testing | C/CPFF | University of Alaska Fairbanks : Fairbanks, AK | 0.143 | 0.000 | | 0.395 | Mar 2023 | 0.411 | Mar 2024 | - | | 0.411 | Continuing | Continuing | - |
| Integrated Munitions Effects Assessment Software Development | C/CPFF | Applied Research Associates, Inc : Alexandria, VA | 0.400 | 0.204 | Feb 2022 | 0.000 | | - | | - | | - | 0.000 | 0.604 | - |
| Radionuclide sensor, station, laboratory and network improvements | FFRDC | Argonne National Laboratory : Argonne, IL | 0.200 | 0.000 | | 0.602 | Mar 2023 | 0.400 | Mar 2024 | - | | 0.400 | Continuing | Continuing | - |
| Seismic and Infrasound sensor, station, and network Improvements; validation and verification testing | MIPR | University Affiliated Research Center, University of Alaska : Fairbanks, AK | 0.660 | 0.510 | Mar 2022 | 0.695 | Feb 2023 | 0.650 | Jan 2024 | - | | 0.650 | Continuing | Continuing | - |
| Seismic and Infrasound sensor, station, and network Improvements | MIPR | U.S. Army Corps of Engineers : Vicksburg, MS | 0.400 | 0.306 | Jan 2022 | 0.000 | | - | | - | | - | Continuing | Continuing | - |
| Seismic and Infrasound sensor, station, and network Improvements | MIPR | Missile Defense Agency : Fort Belvoir, VA | 0.650 | 0.000 | | 0.000 | | - | | - | | - | Continuing | Continuing | - |
| Seismic and Infrasound sensor, station, and network Improvements | MIPR | Geophysical Detection for Non-Proliferation University Affiliated Research Center, University of Alaska : Fairbanks, AK | 0.706 | 0.510 | Feb 2022 | 0.000 | | - | | - | | - | Continuing | Continuing | - |

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Defense Threat Reduction Agency **Date:** March 2023

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| Appropriation/Budget Activity 0400 / 5 | R-1 Program Element (Number/Name) PE 0605000BR / COUNTER WEAPONS OF MASS DESTRUCTION SYSTEMS DEVELOPMENT | Project (Number/Name) RD / Nuclear Technologies and Capabilities Development |
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| Support (\$ in Millions) | | | | FY 2022 | | FY 2023 | | FY 2024 Base | | FY 2024 OCO | | FY 2024 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 | | | |
| Radionuclide sensor, station, and network Improvements | FFRDC | Savannah River National Laboratory : Savannah River Site Aiken, SC | 1.154 | 0.765 | Mar 2022 | 0.300 | Mar 2023 | - | | - | | - | Continuing | Continuing | - |
| Seismic and Infrasound sensor, station, and network Improvements | MIPR | DIA/MSIC : TBD | 0.250 | 0.255 | Mar 2022 | 0.000 | | - | | - | | - | Continuing | Continuing | - |
| Seismic and Infrasound sensor, station, and network Improvements; validation and verification testing | FFRDC | Lawrence Livermore National Laboratory : Livermore, CA | 0.950 | 0.969 | Jan 2022 | 0.000 | | - | | - | | - | Continuing | Continuing | - |
| Radionuclide sensor, station, and network Improvements | C/CPFF | Draper : Cambridge, MA | 3.000 | 0.000 | | 0.300 | Jan 2023 | 0.250 | Feb 2024 | - | | 0.250 | Continuing | Continuing | - |
| Enhanced consequence analysis initial capability | C/CPFF | TBD : TBD | 5.000 | 0.000 | | 0.000 | | - | | - | | - | Continuing | Continuing | - |
| Seismic and Infrasound sensor, station, and network Improvements; validation and verification testing | C/CPFF | National Nuclear Center of Kazakhstan : Kazakhstan | 0.000 | 0.000 | | 0.550 | Dec 2022 | - | | - | | - | Continuing | Continuing | - |
| Applied Research Associates : Albuquerque, NM | C/CPFF | Applied Research Associates : Albuquerque, NM | 0.000 | 0.000 | | 0.450 | Dec 2022 | - | | - | | - | Continuing | Continuing | - |
| Seismic and Infrasound sensor, station, and network Improvements; comprehensive analysis of high explosive experiments | FFRDC | Lawrence Livermore National Laboratory : Livermore, CA | - | - | | - | | 0.450 | Dec 2023 | - | | 0.450 | Continuing | Continuing | - |
| Seismic and Infrasound sensor, station, and network Improvements; | C/CPFF | Applied Research Associates : Arlington, VA | - | - | | - | | 0.350 | Feb 2024 | - | | 0.350 | Continuing | Continuing | - |

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Defense Threat Reduction Agency **Date:** March 2023

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| Appropriation/Budget Activity 0400 / 5 | R-1 Program Element (Number/Name) PE 0605000BR / COUNTER WEAPONS OF MASS DESTRUCTION SYSTEMS DEVELOPMENT | Project (Number/Name) RD / Nuclear Technologies and Capabilities Development |
|--|--|--|

| Support (\$ in Millions) | | | | FY 2022 | | FY 2023 | | FY 2024 Base | | FY 2024 OCO | | FY 2024 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 | | | |
| comprehensive analysis of high explosive experiments | | | | | | | | | | | | | | | |
| Subtotal | | | 22.430 | 7.689 | | 8.291 | | 6.333 | | - | | 6.333 | Continuing | Continuing | N/A |

| Test and Evaluation (\$ in Millions) | | | | FY 2022 | | FY 2023 | | FY 2024 Base | | FY 2024 OCO | | FY 2024 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 | | | |
| Enhanced Consequence Analysis (ECA) T&E | C/CPFF | Booz Allen Hamilton : McLean, VA | 0.000 | 1.200 | Nov 2021 | 1.020 | Mar 2023 | 1.982 | Nov 2023 | - | | 1.982 | Continuing | Continuing | - |
| NuCS T&E | C/CPFF | Applied Research Associates : Raleigh, NC | 0.000 | 0.500 | Nov 2021 | 0.000 | | 1.754 | Dec 2023 | - | | 1.754 | Continuing | Continuing | - |
| NuCS T&E | TBD | TBD : TBD | 0.000 | 0.692 | Mar 2022 | 1.475 | Mar 2023 | - | | - | | - | Continuing | Continuing | - |
| Subtotal | | | 0.000 | 2.392 | | 2.495 | | 3.736 | | - | | 3.736 | Continuing | Continuing | N/A |

| Management Services (\$ in Millions) | | | | FY 2022 | | FY 2023 | | FY 2024 Base | | FY 2024 OCO | | FY 2024 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 | | | |
| Travel | Reqn | Various : Various | 0.135 | 0.114 | Nov 2021 | 0.112 | Nov 2022 | 0.081 | Nov 2023 | - | | 0.081 | Continuing | Continuing | - |
| Subtotal | | | 0.135 | 0.114 | | 0.112 | | 0.081 | | - | | 0.081 | Continuing | Continuing | N/A |

| | | | 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 | | | 25.120 | 13.695 | 14.403 | 14.414 | - | 14.414 | Continuing | Continuing | N/A |

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Defense Threat Reduction Agency **Date:** March 2023

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| Appropriation/Budget Activity 0400 / 5 | R-1 Program Element (Number/Name) PE 0605000BR / COUNTER WEAPONS OF MASS DESTRUCTION SYSTEMS DEVELOPMENT | Project (Number/Name) RD / Nuclear Technologies and Capabilities Development |
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| | FY 2015 | | | | FY 2016 | | | | FY 2017 | | | | FY 2018 | | | | FY 2019 | | | | FY 2020 | | | | FY 2021 | | | | | | | |
|--|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|--|--|--|--|
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | | | | |
| Develop initial training materials for NuCS 2022 production release; release training materials | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Conduct annual user review; implement changes to NuCS products; release NuCS 2023 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Conduct annual user review; implement changes to NuCS products; release NuCS 2024 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Conduct annual user review; implement changes to NuCS products; release NuCS 2025 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Conduct annual user review; implement changes to NuCS products; release NuCS 2026 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Conduct annual user review; implement changes to NuCS products; release NuCS 2027 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Conduct annual user review; implement changes to NuCS products; release NuCS 2028 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Conduct annual training review of training materials for users, develop new training materials based on changes made to annual release as required | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nuclear Arms Control Technology | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Optimize and improve IMS seismic, infrasound, and radionuclide sensors | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Defense Threat Reduction Agency **Date:** March 2023

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| Appropriation/Budget Activity 0400 / 5 | R-1 Program Element (Number/Name) PE 0605000BR / COUNTER WEAPONS OF MASS DESTRUCTION SYSTEMS DEVELOPMENT | Project (Number/Name) RD / Nuclear Technologies and Capabilities Development |
|--|--|--|

| | FY 2022 | | | | FY 2023 | | | | FY 2024 | | | | FY 2025 | | | | FY 2026 | | | | FY 2027 | | | | FY 2028 | | | | | | |
|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|--|--|--|
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | | | |
| once mature and available to meet DoD and Allied planning requirements | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Train users on the employment, assumptions, and limitation of ECA nuclear weapon decision support tools | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nuclear Capabilities Services (NuCS) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Develop and deliver initial release of NuCS version 2022 (NuCS 2022) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Demonstrate NuCS 2022 M&S capabilities; Conduct ongoing V&V of NuCS 2022 production release; conduct early user assessment for initial release | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Develop NuCS Demonstration Environment for Model Outputs (NuCS DEMO) application and establish initial capability for early user assessment engagements on DoD networks | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Develop initial training materials for NuCS 2022 production release; release training materials | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Conduct annual user review; implement changes to NuCS products; release NuCS 2023 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Conduct annual user review; implement changes to NuCS products; release NuCS 2024 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Conduct annual user review; implement changes to NuCS products; release NuCS 2025 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Defense Threat Reduction Agency **Date:** March 2023

| | | |
|--|--|--|
| Appropriation/Budget Activity 0400 / 5 | R-1 Program Element (Number/Name) PE 0605000BR / COUNTER WEAPONS OF MASS DESTRUCTION SYSTEMS DEVELOPMENT | Project (Number/Name) RD / Nuclear Technologies and Capabilities Development |
|--|--|--|

| | FY 2022 | | | | FY 2023 | | | | FY 2024 | | | | FY 2025 | | | | FY 2026 | | | | FY 2027 | | | | FY 2028 | | | |
|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Conduct annual user review; implement changes to NuCS products; release NuCS 2026 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Conduct annual user review; implement changes to NuCS products; release NuCS 2027 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Conduct annual user review; implement changes to NuCS products; release NuCS 2028 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Conduct annual training review of training materials for users, develop new training materials based on changes made to annual release as required | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nuclear Arms Control Technology | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Optimize and improve IMS seismic, infrasound, and radionuclide sensors | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Optimize and improve IMS station performance: validation and verification testing of RDTE concepts to enable operational implementation | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Optimize and improve IMS seismic, infrasound, and radionuclide sensors: testing and evaluation of next generation systems | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Optimize and improve IMS seismic, infrasound, and radionuclide sensors: support of DoD and Interagency nuclear-event response missions to enhance nuclear-event response capabilities | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Defense Threat Reduction Agency **Date:** March 2023

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| Appropriation/Budget Activity 0400 / 5 | R-1 Program Element (Number/Name) PE 0605000BR / COUNTER WEAPONS OF MASS DESTRUCTION SYSTEMS DEVELOPMENT | Project (Number/Name) RD / Nuclear Technologies and Capabilities Development |
|--|--|--|

| | FY 2022 | | | | FY 2023 | | | | FY 2024 | | | | FY 2025 | | | | FY 2026 | | | | FY 2027 | | | | FY 2028 | | | |
|--|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Optimize and improve IMS seismic, infrasound, and radionuclide sensors: comprehensive analysis of high explosive experiments | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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| Exhibit R-4A, RDT&E Schedule Details: PB 2024 Defense Threat Reduction Agency | | Date: March 2023 |
| Appropriation/Budget Activity 0400 / 5 | R-1 Program Element (Number/Name) PE 0605000BR / COUNTER WEAPONS OF MASS DESTRUCTION SYSTEMS DEVELOPMENT | Project (Number/Name) RD / Nuclear Technologies and Capabilities Development |

Schedule Details

| Events by Sub Project | Start | | End | |
|---|---------|------|---------|------|
| | Quarter | Year | Quarter | Year |
| Enhanced Consequence Analysis (ECA) | | | | |
| Test and evaluation of ECA integrated nuclear weapon effects models in preparation for deployment on strategic and operational planning networks | 4 | 2020 | 4 | 2028 |
| Deployment of ECA decision support tools on DoD and Allied strategic and operational planning networks | 1 | 2021 | 1 | 2023 |
| Update ECA decision support tools and integrate new nuclear weapon effects models once mature and available to meet DoD and Allied planning requirements | 2 | 2021 | 4 | 2028 |
| Train users on the employment, assumptions, and limitation of ECA nuclear weapon decision support tools | 2 | 2021 | 4 | 2028 |
| Nuclear Capabilities Services (NuCS) | | | | |
| Develop and deliver initial release of NuCS version 2022 (NuCS 2022) | 1 | 2021 | 2 | 2022 |
| Demonstrate NuCS 2022 M&S capabilities; Conduct ongoing V&V of NuCS 2022 production release; conduct early user assessment for initial release | 1 | 2021 | 4 | 2022 |
| Develop NuCS Demonstration Environment for Model Outputs (NuCS DEMO) application and establish initial capability for early user assessment engagements on DoD networks | 1 | 2021 | 4 | 2022 |
| Develop initial training materials for NuCS 2022 production release; release training materials | 1 | 2021 | 4 | 2022 |
| Conduct annual user review; implement changes to NuCS products; release NuCS 2023 | 1 | 2022 | 2 | 2023 |
| Conduct annual user review; implement changes to NuCS products; release NuCS 2024 | 1 | 2023 | 2 | 2024 |
| Conduct annual user review; implement changes to NuCS products; release NuCS 2025 | 1 | 2024 | 2 | 2025 |

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Defense Threat Reduction Agency **Date:** March 2023

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| Appropriation/Budget Activity 0400 / 5 | R-1 Program Element (Number/Name) PE 0605000BR / COUNTER WEAPONS OF MASS DESTRUCTION SYSTEMS DEVELOPMENT | Project (Number/Name) RD / Nuclear Technologies and Capabilities Development |
|--|--|--|

| Events by Sub Project | Start | | End | |
|---|---------|------|---------|------|
| | Quarter | Year | Quarter | Year |
| Conduct annual user review; implement changes to NuCS products; release NuCS 2026 | 1 | 2025 | 2 | 2026 |
| Conduct annual user review; implement changes to NuCS products; release NuCS 2027 | 1 | 2026 | 2 | 2027 |
| Conduct annual user review; implement changes to NuCS products; release NuCS 2028 | 1 | 2027 | 2 | 2028 |
| Conduct annual training review of training materials for users, develop new training materials based on changes made to annual release as required | 2 | 2022 | 4 | 2028 |
| <i>Nuclear Arms Control Technology</i> | | | | |
| Optimize and improve IMS seismic, infrasound, and radionuclide sensors | 1 | 2022 | 4 | 2025 |
| Optimize and improve IMS station performance: validation and verification testing of RDTE concepts to enable operational implementation | 1 | 2020 | 4 | 2028 |
| Optimize and improve IMS seismic, infrasound, and radionuclide sensors: testing and evaluation of next generation systems | 1 | 2020 | 4 | 2028 |
| Optimize and improve IMS seismic, infrasound, and radionuclide sensors: support of DoD and Interagency nuclear-event response missions to enhance nuclear-event response capabilities | 1 | 2021 | 4 | 2027 |
| Optimize and improve IMS seismic, infrasound, and radionuclide sensors: comprehensive analysis of high explosive experiments | 1 | 2021 | 4 | 2026 |