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**Exhibit R-2, RDT&E Budget Item Justification:** PB 2022 Army **Date:** May 2021

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| <b>Appropriation/Budget Activity</b><br>2040: <i>Research, Development, Test &amp; Evaluation, Army / BA 5: System Development &amp; Demonstration (SDD)</i> | <b>R-1 Program Element (Number/Name)</b><br>PE 0605232A / <i>Hypersonics EMD</i> |
|--|--|

| COST (\$ in Millions)                | Prior Years | FY 2020 | FY 2021 | FY 2022 Base | FY 2022 OCO | FY 2022 Total | FY 2023 | FY 2024 | FY 2025 | FY 2026 | Cost To Complete | Total Cost |
|--------------------------------------|-------------|---------|---------|--------------|-------------|---------------|---------|---------|---------|---------|------------------|------------|
| Total Program Element                | -           | -       | -       | 111.473      | -           | 111.473       | -       | -       | -       | -       | -                | -          |
| HX2: <i>Hypersonic Weapon (LRHW)</i> | -           | -       | -       | 111.473      | -           | 111.473       | -       | -       | -       | -       | -                | -          |

**Note**

Funds BA5 activities managed by the Program Executive Office Missiles and Space (PEO MS) under Program Element (PE) 0605232A, in preparation for the FY24 transition of the BA4 activities from the Rapid Capabilities and Critical Technologies Office (RCCTO) under PE 0604182A, and establishes a Long Range Hypersonic Weapon (LRHW) program of record.

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

PE 0605232A / Hypersonics EMD funds the PEO MS hypersonic effort. Project HX2 Long Range Hypersonic Weapon (LRHW) funds analyses and assessments that may inform future design maturation of the LRHW prototype. The LRHW system will provide the Army a strategic attack weapon system to defeat Anti Access/Area Denial (A2/AD) capabilities, suppress adversary Long Range Fires, and engage other high payoff/time critical targets. LRHW is common with other Department of Defense (DoD) hypersonic programs using the Common Hypersonic Glide Body (CHGB) and the Navy 34.5 inch booster. The LRHW system consists of the CHGB with the Navy 34.5 inch booster, a Battery Operations Center (BOC) for Communications and Control (C2), and the Transporter Erector Launcher (TEL). Each TEL holds 2 canisterized rounds per launcher. Each LRHW Battery contains eight (8) All Up Rounds (AUR) with canister (AUR+C), one (1) BOC and four (4) TELs. Additionally, the LRHW will use an existing C2 network, the Advanced Field Artillery Tactical Data System (AFATDS).

FY 2022 Base dollars in the amount of \$111.473 million will support analysis for investment determination required to produce data required for program of record (POR) documentation for fielded equipment. Supports initial Non-Recurring Engineering (NRE) associated with these capability upgrades required to field additional LRHW batteries and, if required, retrofit of the first battery to the POR configuration. Purchases two live rounds (i.e., CHGBs, thermal protection systems (TPS), and canisters) and two training canisters to support training, evaluation, and certification; and initiates establishment of a LRHW Project Office under PEO MS.

Prior development effort was funded in PE 0604182A.

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| <b>Exhibit R-2, RDT&amp;E Budget Item Justification:</b> PB 2022 Army | <b>Date:</b> May 2021 |
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| <b>Appropriation/Budget Activity</b><br>2040: <i>Research, Development, Test &amp; Evaluation, Army / BA 5: System Development &amp; Demonstration (SDD)</i> | <b>R-1 Program Element (Number/Name)</b><br>PE 0605232A / <i>Hypersonics EMD</i> |
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| <b>B. Program Change Summary (\$ in Millions)</b> | <b>FY 2020</b> | <b>FY 2021</b> | <b>FY 2022 Base</b> | <b>FY 2022 OCO</b> | <b>FY 2022 Total</b> |
|---|----------------|----------------|---------------------|--------------------|----------------------|
| Previous President's Budget                       | 0.000          | 0.000          | 0.000               | -                  | 0.000                |
| Current President's Budget                        | 0.000          | 0.000          | 111.473             | -                  | 111.473              |
| Total Adjustments                                 | 0.000          | 0.000          | 111.473             | -                  | 111.473              |
| • Congressional General Reductions                | -              | -              |                     |                    |                      |
| • Congressional Directed Reductions               | -              | -              |                     |                    |                      |
| • Congressional Rescissions                       | -              | -              |                     |                    |                      |
| • Congressional Adds                              | -              | -              |                     |                    |                      |
| • Congressional Directed Transfers                | -              | -              |                     |                    |                      |
| • Reprogrammings                                  | -              | -              |                     |                    |                      |
| • SBIR/STTR Transfer                              | -              | -              |                     |                    |                      |
| • Adjustments to Budget Years                     | -              | -              | 111.473             | -                  | 111.473              |

**Change Summary Explanation**

FY 2022 Base increase of \$111.473 million funds BA5 activities managed by the PEO MS under Program Element (PE) 0605232A, in preparation for the FY24 transition of the BA4 activities from the RCCTO under PE 0604182A, and establishes a LRHW program of record.

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**Exhibit R-2A, RDT&E Project Justification:** PB 2022 Army **Date:** May 2021

| Appropriation/Budget Activity<br>2040 / 5 |             |         |         |              | R-1 Program Element (Number/Name)<br>PE 0605232A / Hypersonics EMD |               |         |         | Project (Number/Name)<br>HX2 / Hypersonic Weapon (LRHW) |         |                  |            |
|---|-------------|---------|---------|--------------|--|---------------|---------|---------|---|---------|------------------|------------|
| COST (\$ in Millions)                     | Prior Years | FY 2020 | FY 2021 | FY 2022 Base | FY 2022 OCO  | FY 2022 Total | FY 2023 | FY 2024 | FY 2025   | FY 2026 | Cost To Complete | Total Cost |
| HX2: Hypersonic Weapon (LRHW)             | -           | -       | -       | 111.473      | -  | 111.473       | -       | -       | -   | -       | -                | -          |
| Quantity of RDT&E Articles                | -           | -       | -       | -            | -  | -             | -       | -       | -   | -       |                  |            |

**Note**

Funds BA5 activities managed by the Program Executive Office Missiles and Space (PEO MS) under Program Element (PE) 0605232A, in preparation for the FY24 transition of the BA4 activities from the Rapid Capabilities and Critical Technologies Office (RCCTO) under PE 0604182A, and establishes a Long Range Hypersonic Weapon (LRHW) program of record.

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

PE 0605232A / Hypersonics EMD funds the PEO MS hypersonic effort. Project HX2 Long Range Hypersonic Weapon (LRHW) funds analyses and assessments that may inform future design maturation of the LRHW prototype. The LRHW system will provide the Army a strategic attack weapon system to defeat Anti Access/Area Denial (A2/AD) capabilities, suppress adversary Long Range Fires, and engage other high payoff/time critical targets. LRHW is common with other Department of Defense (DoD) hypersonic programs using the Common Hypersonic Glide Body (CHGB) and the Navy 34.5 inch booster. The LRHW system consists of the CHGB with the Navy 34.5 inch booster, a Battery Operations Center (BOC) for Communications and Control (C2), and the Transporter Erector Launcher (TEL). Each TEL holds 2 canisterized rounds per launcher. Each LRHW Battery contains eight (8) All Up Rounds (AUR) with canister (AUR+C), one (1) BOC and four (4) TELs. Additionally, the LRHW will use an existing C2 network, the Advanced Field Artillery Tactical Data System (AFATDS).

FY 2022 Base dollars in the amount of \$111.473 million will support analysis for investment determination required to produce data required for program of record (POR) documentation for fielded equipment. Supports initial Non-Recurring Engineering (NRE) associated with these capability upgrades required to field additional LRHW batteries and, if required, retrofit of the first battery to the POR configuration. Purchases two live rounds (i.e., CHGBs, thermal protection systems (TPS), and canisters) and two training canisters to support training, evaluation, and certification; and initiates establishment of a LRHW Project Office under PEO MS.

Prior development effort was funded in PE 0604182A.

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

|   | FY 2020 | FY 2021 | FY 2022 |
|---|---------|---------|---------|
| <b>Title:</b> Development Engineering/Studies   | -       | -       | 5.484   |
| <b>Description:</b> Continues analysis for investment determination required to produce data required for program of record (POR) documentation for fielded equipment.  |         |         |         |
| <b>FY 2022 Plans:</b>   |         |         |         |
| FY22 Base funds initiate transition efforts for the LRHW prototype battery from RCCTO to PEO MS as a POR. Initiates project office planning efforts, supports further development and demonstration of LRHW training, and performs logistics analysis and |         |         |         |

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| <b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2022 Army |  | <b>Date:</b> May 2021   |
| <b>Appropriation/Budget Activity</b><br>2040 / 5                   | <b>R-1 Program Element (Number/Name)</b><br>PE 0605232A / <i>Hypersonics EMD</i> | <b>Project (Number/Name)</b><br>HX2 / <i>Hypersonic Weapon (LRHW)</i> |

| <b>B. Accomplishments/Planned Programs (\$ in Millions)</b>  | <b>FY 2020</b> | <b>FY 2021</b> | <b>FY 2022</b> |
|--|----------------|----------------|----------------|
| assessments on delivered equipment to further mature the LRHW prototype design. Includes development engineering for LRHW hardware components and systems engineering support to modify the battery configuration delivered by RCCTO.<br><b>FY 2021 to FY 2022 Increase/Decrease Statement:</b><br>Initial year of funding under the PEO MS PE 0605232A.   |                |                |                |
| <b>Title:</b> Training/Evaluation/Certification Hardware - Live AUR+C and Training Canisters<br><b>Description:</b> Purchase live AUR+C components and training canisters to support LRHW training, evaluation, and certification efforts.<br><b>FY 2022 Plans:</b><br>FY22 Base funds support the purchase of two live AUR+C rounds (includes purchase of glide bodies and thermal protection systems, as well as U.S. Navy integration of this equipment with the booster and canister) and two training canisters.<br><b>FY 2021 to FY 2022 Increase/Decrease Statement:</b><br>Initial year of funding under the PEO MS PE 0605232A. | -              | -              | 105.989        |
| <b>Accomplishments/Planned Programs Subtotals</b>  | -              | -              | 111.473        |

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

| <u>Line Item</u>               | <u>FY 2020</u> | <u>FY 2021</u> | <u>FY 2022</u><br><u>Base</u> | <u>FY 2022</u><br><u>OCO</u> | <u>FY 2022</u><br><u>Total</u> | <u>FY 2023</u> | <u>FY 2024</u> | <u>FY 2025</u> | <u>FY 2026</u> | <u>Cost To</u><br><u>Complete</u> | <u>Total Cost</u> |
|--------------------------------|----------------|----------------|-------------------------------|------------------------------|--------------------------------|----------------|----------------|----------------|----------------|-----------------------------------|-------------------|
| • 0604182A: <i>Hypersonics</i> | 394.619        | 832.166        | 300.928                       | -                            | 300.928                        | -              | -              | -              | -              | -                                 | -                 |

**Remarks**

**D. Acquisition Strategy**

The acquisition strategy for LRHW will complete design maturation of the LRHW prototype in support of future program of record (POR) battery fielding as part of the Strategic Fires Battalion in support of Multi-Domain Operations (MDO). Fielding is projected for no later than FY27. A combination of Other Transaction Authority (OTA), the Navy CPS contract with Lockheed Martin, and future FAR-based contracts will be utilized.

The Army designated PEO MS as the Office of Primary Responsibility for LRHW as a program of record. PEO MS will establish a LRHW project office in FY22. To support continuous production of the AUR+C and the Army's fielding schedule, training/certification rounds are funded in FY22 to support JFC-5 in FY24. JFC-5 will be a Soldier-operated event and will validate the configuration of the AUR+C for fielding the Army's second LRHW battery in FY25. PEO MS will begin contracting efforts to support the production efforts for batteries 2 (fielding NLT 4QFY25) and 3 (fielding NLT 4QFY27), with reloads (fielding FY28-FY29), as part of the Strategic Fires Battalion in support of Multi-domain Operations. Additionally, PEO MS will begin planning follow-on contracting efforts for contractor logistics support (CLS) beginning FY25 for all fielded Batteries. The purchase of two live rounds and two training canisters is required two years prior to delivery, resulting in funding in FY22 to meet the

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**Exhibit R-2A, RDT&E Project Justification:** PB 2022 Army **Date:** May 2021

| <b>Appropriation/Budget Activity</b> | <b>R-1 Program Element (Number/Name)</b> | <b>Project (Number/Name)</b>          |
|--------------------------------------|--|---------------------------------------|
| 2040 / 5                             | PE 0605232A / <i>Hypersonics EMD</i>     | HX2 / <i>Hypersonic Weapon (LRHW)</i> |

FY24 manufacturing and delivery requirement. A SETA contract provides support to the Government Project Office. The personnel will build the embedded PEO MS transition team, to ensure an efficient transition in FY24 as a POR.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army** **Date:** May 2021

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| <b>Appropriation/Budget Activity</b><br>2040 / 5 | <b>R-1 Program Element (Number/Name)</b><br>PE 0605232A / <i>Hypersonics EMD</i> | <b>Project (Number/Name)</b><br>HX2 / <i>Hypersonic Weapon (LRHW)</i> |
|--|--|---|

| <b>Management Services (\$ in Millions)</b> |                        |                                |             | FY 2020 |            | FY 2021 |            | FY 2022 Base |            | FY 2022 OCO |            | FY 2022 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          |                  |            |                          |
| System Engineering/<br>Program Management   | TBD                    | Various : Various              | -           | -       |            | -       |            | 5.484        | Dec 2021   | -           |            | 5.484         | 0.000            | 5.484      | -                        |
| <b>Subtotal</b>                             |                        |                                | -           | -       |            | -       |            | 5.484        |            | -           |            | 5.484         | 0.000            | 5.484      | N/A                      |

**Remarks**  
Includes the Government PM's office (civilian, SETA, and matrix personnel) to support RDT&E efforts. This encompasses overall planning, direction, and control of the definition, development, and production of the system/program, including functions of logistics engineering and integrated logistics support.

| <b>Product Development (\$ in Millions)</b> |                        |                                |             | FY 2020 |            | FY 2021 |            | FY 2022 Base |            | FY 2022 OCO |            | FY 2022 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          |                  |            |                          |
| Development Engineering/<br>Studies         | C/TBD                  | Various : Various              | -           | -       |            | -       |            | 4.881        | Jan 2022   | -           |            | 4.881         | 0.000            | 4.881      | -                        |
| Development Engineering/<br>Hardware        | TBD                    | Various : Various              | -           | -       |            | -       |            | 101.108      | Mar 2022   | -           |            | 101.108       | 0.000            | 101.108    | -                        |
| <b>Subtotal</b>                             |                        |                                | -           | -       |            | -       |            | 105.989      |            | -           |            | 105.989       | 0.000            | 105.989    | N/A                      |

|                            | Prior Years | FY 2020 | FY 2021 | FY 2022 Base | FY 2022 OCO | FY 2022 Total | Cost To Complete | Total Cost | Target Value of Contract |
|----------------------------|-------------|---------|---------|--------------|-------------|---------------|------------------|------------|--------------------------|
| <b>Project Cost Totals</b> | -           | -       | 0.000   | 111.473      | -           | 111.473       | 0.000            | 111.473    | N/A                      |

**Remarks**

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**Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army** **Date:** May 2021

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| <b>Appropriation/Budget Activity</b><br>2040 / 5 | <b>R-1 Program Element (Number/Name)</b><br>PE 0605232A / <i>Hypersonics EMD</i> | <b>Project (Number/Name)</b><br>HX2 / <i>Hypersonic Weapon (LRHW)</i> |
|--|--|---|

| Event Name   | FY 2020 |   |   |   | FY 2021 |   |   |   | FY 2022 |   |   |   | FY 2023 |   |   |   | FY 2024 |   |   |   | FY 2025 |   |   |   | FY 2026 |   |   |   |  |  |  |  |
|--|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|--|--|--|--|
|  | 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 |  |  |  |  |
| AAE Approval of LRHW Funds Execution under PEO MS    |         |   |   |   |         |   |   |   | ▲<br>1  |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |  |  |  |  |
| LRHW Project Office Establishment                    |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |  |  |  |  |
| Purchase Training/Certification/Evaluation Rounds    |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |  |  |  |  |
| Purchase Training Canisters                          |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |  |  |  |  |
| Development Engineering                              |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |  |  |  |  |
| Section 804 MTA ADM Approval                         |         |   |   |   |         |   |   |   |         |   |   |   | ▲<br>2  |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |  |  |  |  |
| Transition LRHW from RCCTO to PEO MS                 |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |  |  |  |  |
| Training/Certification/Evaluation Rounds Delivery #1 |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |  |  |  |  |
| Training Canister Delivery #1                        |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |  |  |  |  |
| JFC 5  |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |  |  |  |  |
| Training/Certification/Evaluation Rounds Delivery #2 |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |  |  |  |  |
| Training Canister Delivery #2                        |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |  |  |  |  |
| JFC 6  |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |  |  |  |  |

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**Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army** **Date:** May 2021

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| <b>Appropriation/Budget Activity</b><br>2040 / 5 | <b>R-1 Program Element (Number/Name)</b><br>PE 0605232A / <i>Hypersonics EMD</i> | <b>Project (Number/Name)</b><br>HX2 / <i>Hypersonic Weapon (LRHW)</i> |
|--|--|---|

| Event Name  | FY 2020 |   |   |   | FY 2021 |   |   |   | FY 2022 |   |   |   | FY 2023 |   |   |   | FY 2024 |   |   |   | FY 2025 |   |   |   | FY 2026 |   |   |   |
|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|
|   | 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 |
| Training/Certification/Evaluation Rounds Delivery #3<br><br>JFC 7 |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   | 9       |   |   |   |
|   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   | 1       |   |   |   |

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**Exhibit R-4A, RDT&E Schedule Details:** PB 2022 Army **Date:** May 2021

|  |  |   |
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| <b>Appropriation/Budget Activity</b><br>2040 / 5 | <b>R-1 Program Element (Number/Name)</b><br>PE 0605232A / <i>Hypersonics EMD</i> | <b>Project (Number/Name)</b><br>HX2 / <i>Hypersonic Weapon (LRHW)</i> |
|--|--|---|

Schedule Details

| Events   | Start   |      | End     |      |
|--|---------|------|---------|------|
|  | Quarter | Year | Quarter | Year |
| AAE Approval of LRHW Funds Execution under PEO MS    | 1       | 2022 | 1       | 2022 |
| LRHW Project Office Establishment                    | 1       | 2022 | 4       | 2028 |
| Purchase Training/Certification/Evaluation Rounds    | 1       | 2022 | 4       | 2028 |
| Purchase Training Canisters                          | 1       | 2022 | 4       | 2028 |
| Development Engineering                              | 1       | 2022 | 4       | 2028 |
| Section 804 MTA ADM Approval                         | 1       | 2023 | 1       | 2023 |
| Transition LRHW from RCCTO to PEO MS                 | 1       | 2024 | 4       | 2024 |
| Training/Certification/Evaluation Rounds Delivery #1 | 4       | 2024 | 4       | 2024 |
| Training Canister Delivery #1                        | 4       | 2024 | 4       | 2024 |
| JFC 5  | 4       | 2024 | 4       | 2024 |
| Training/Certification/Evaluation Rounds Delivery #2 | 4       | 2025 | 4       | 2025 |
| Training Canister Delivery #2                        | 4       | 2025 | 4       | 2025 |
| JFC 6  | 4       | 2025 | 4       | 2025 |
| Training/Certification/Evaluation Rounds Delivery #3 | 4       | 2026 | 4       | 2026 |
| JFC 7  | 4       | 2026 | 4       | 2026 |
| Training/Certification/Evaluation Rounds Delivery #4 | 4       | 2027 | 4       | 2027 |
| Training Canister Delivery #3                        | 4       | 2027 | 4       | 2027 |
| JFC 8  | 4       | 2027 | 4       | 2027 |
| Training/Certification/Evaluation Rounds Delivery #5 | 4       | 2028 | 4       | 2028 |