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**Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force** **Date:** February 2019

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| <b>Appropriation/Budget Activity</b><br>3600: <i>Research, Development, Test &amp; Evaluation, Air Force I BA 5: System Development &amp; Demonstration (SDD)</i> | <b>R-1 Program Element (Number/Name)</b><br>PE 0604602F / <i>Armament/Ordnance Development</i> |
|---|--|

| COST (\$ in Millions)                    | Prior Years | FY 2018 | FY 2019 | FY 2020 Base | FY 2020 OCO | FY 2020 Total | FY 2021 | FY 2022 | FY 2023 | FY 2024 | Cost To Complete | Total Cost |
|--|-------------|---------|---------|--------------|-------------|---------------|---------|---------|---------|---------|------------------|------------|
| Total Program Element                    | -           | 16.765  | 49.590  | 28.043       | 0.000       | 28.043        | 6.197   | 6.597   | 6.717   | 6.838   | Continuing       | Continuing |
| 653133: <i>Bombs &amp; Fuzes</i>         | -           | 11.276  | 44.692  | 19.054       | 0.000       | 19.054        | 1.122   | 1.416   | 1.442   | 1.468   | Continuing       | Continuing |
| 655361: <i>Stores-Aircraft Interface</i> | -           | 5.489   | 4.898   | 8.989        | 0.000       | 8.989         | 5.075   | 5.181   | 5.275   | 5.370   | Continuing       | Continuing |

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

The Armament Ordnance Development program provides for the initial and continuing development of weapons, munitions, and munitions equipment for aircraft integration, support, and operational use. This program also provides for the development and integration of advanced position, navigation, and timing (PNT) capabilities (i.e. GPS, non-GPS, optical, passive, active, etc.). This program develops, characterizes, and improves current, future, and legacy munitions, ammunitions, and subsystems.

653133: The Bombs & Fuzes project improves conventional weapons/munitions (kinetic and non-kinetic), fuzes, and height-of-burst sensors (HOBS), and develops and integrates complementary position, navigation, and timing (PNT) capabilities (i.e. GPS, non-GPS, optical, passive, active, etc.). This project also provides an opportunity to quickly insert emerging technologies into existing and developing aircraft munitions and fuzes. Bombs & Fuzes provides research, development, and testing of conventional warheads, fuzing, HOBS modifications, and anti-personnel anti-materiel (APAM) weapons to improve lethality against area, mobile, hard and deeply buried, and fixed targets. This project provides for the development and testing necessary to provide a suitable manufacturing base of conventional warheads, fuzes, HOBS, and munitions materiel handling equipment (MMHE).

In FY2019, Joint Air-to-Ground Missile for Fixed Wing (JAGM-F) was a new start.

655361: The Stores-Aircraft Interface project conducts stores-aircraft interface upgrades and standards development to include the Universal Armament Interface (UAI). UAI is an Air Force initiative to develop standardized software interfaces in aircraft weapons and mission planning. The savings realized from this effort is on average 6 years of schedule and \$22M per aircraft/weapon combination. This is accomplished by enabling integration of weapons independent of aircraft Operational Flight Programs (OFF) cycles. UAI is currently implemented on the F-15E, F-16 Block 40/50 and European Participating Air Forces (EPAF) F-16 aircraft, Small Diameter Bomb (SDB) I and II, Joint Direct Attack Munition (JDAM), Laser JDAM, Joint Air-to-Surface Stand-off Missile (JASSM), and Precision Guided Munitions Planning Software (PGMPS). Planned implementation include Joint Strike Fighter (JSF/F-35), B-21, MQ-9, JASSM-Extended Range (JASSM-ER), F/A-18, Advanced Anti-Radiation Guided Missile - Extended Range (AARGM-ER), Combat Weapons Delivery Software (CWDS), SPEAR3, Joint Strike Missile (JSM), and the Turkish Stand Off Missile - Joint (SOM-J). The UAI program office is responsible for development and enhancement of the standard, support to coalition/allied/joint interoperability efforts for weapons-platform interface, provision of certification tools, and implementation support to aircraft and weapons.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver Armament/Ordnance Development weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, 0605898F, and 0605833F.

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As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is \$14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 5, System Development and Demonstration (SDD) because it has passed Milestone B approval and is conducting engineering and manufacturing development tasks aimed at meeting validated requirements prior to full rate production.

| <b>B. Program Change Summary (\$ in Millions)</b> | <b>FY 2018</b> | <b>FY 2019</b> | <b>FY 2020 Base</b> | <b>FY 2020 OCO</b> | <b>FY 2020 Total</b> |
|---|----------------|----------------|---------------------|--------------------|----------------------|
| Previous President's Budget                       | 46.540         | 58.590         | 13.043              | 0.000              | 13.043               |
| Current President's Budget                        | 16.765         | 49.590         | 28.043              | 0.000              | 28.043               |
| Total Adjustments                                 | -29.775        | -9.000         | 15.000              | 0.000              | 15.000               |
| • Congressional General Reductions                | 0.000          | 0.000          |                     |                    |                      |
| • Congressional Directed Reductions               | -32.092        | -9.000         |                     |                    |                      |
| • Congressional Rescissions                       | 0.000          | 0.000          |                     |                    |                      |
| • Congressional Adds                              | 0.000          | 0.000          |                     |                    |                      |
| • Congressional Directed Transfers                | 0.000          | 0.000          |                     |                    |                      |
| • Reprogrammings                                  | 2.793          | 0.000          |                     |                    |                      |
| • SBIR/STTR Transfer                              | -0.476         | 0.000          |                     |                    |                      |
| • Other Adjustments                               | 0.000          | 0.000          | 15.000              | 0.000              | 15.000               |

**Change Summary Explanation**

FY 2018, decrease of \$32.092M for Sensor Fuzed Weapon-ER, BPAC 651033.

FY 2018, reprogrammed \$2.000M to BLU-134/B and \$0.794M to Universal Armament Interface (UAI).

FY 2019, decrease of \$9.000M for JAGM-F.

FY 2020, increase of \$11.000M for JAGM-F.

FY 2020, increase of \$4.000M for UAI.

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| <b>Appropriation/Budget Activity</b><br>3600 / 5 | <b>R-1 Program Element (Number/Name)</b><br>PE 0604602F / <i>Armament/Ordnance Development</i> | <b>Project (Number/Name)</b><br>653133 / <i>Bombs &amp; Fuzes</i> |
|--|--|---|

| COST (\$ in Millions)            | Prior Years | FY 2018 | FY 2019 | FY 2020 Base | FY 2020 OCO | FY 2020 Total | FY 2021 | FY 2022 | FY 2023 | FY 2024 | Cost To Complete | Total Cost |
|----------------------------------|-------------|---------|---------|--------------|-------------|---------------|---------|---------|---------|---------|------------------|------------|
| 653133: <i>Bombs &amp; Fuzes</i> | -           | 11.276  | 44.692  | 19.054       | 0.000       | 19.054        | 1.122   | 1.416   | 1.442   | 1.468   | Continuing       | Continuing |
| Quantity of RDT&E Articles       | -           | -       | -       | -            | -           | -             | -       | -       | -       | -       |                  |            |

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

The Bombs & Fuzes project improves conventional weapons/munitions (kinetic and non-kinetic), fuzes, and height-of-burst sensors (HOBS), and develops and integrates complementary position, navigation, and timing (PNT) capabilities (i.e. GPS, non-GPS, optical, passive, active, etc.). This project also provides an opportunity to quickly insert emerging technologies into existing and developing aircraft munitions and fuzes. Bombs & Fuzes provides research, development, and testing of conventional warheads, fuzing, HOBS modifications, and anti-personnel anti-materiel (APAM) weapons to improve lethality against area, mobile, hard and deeply buried, and fixed targets. This project provides for the development and testing necessary to provide a suitable manufacturing base of conventional warheads, fuzes, HOBS, and munitions materiel handling equipment (MMHE).

- Munitions Materiel Handling Equipment (MMHE): MMHE is a continuing project to develop and improve the standardization and commonality of munitions handling and armament equipment to preclude duplication. Efforts are primarily the study, design, and development of MMHE and armament control systems; however, support may be provided to other functional areas as requested. Procurement will be performed and funded by the applicable weapons system project.

- Medium Caliber Ammunition project assesses, refines, and develops medium caliber ammunition, to include, but not limited to, conducting 25mm (F-35) qualification testing, comparative testing, and mitigating ammunition inventory health issues.

- Insensitive Munitions (IM) project supports AF IM strategic planning to achieve IM compliance IAW U.S. Code, Title 10, Subtitle A, Part N, Chapter 141, Section 2389, ensuring safety regarding insensitive munitions. Models and validates munition performance, integrates less sensitive explosive fills, addresses IM explosive fill deficiencies, and develops bomb case modifications to improve the response of conventional weapons to unplanned stimuli. This project explores and develops IM solutions.

- Next Generation Area Attack Weapons (NGAAWs) are a family of unitary area attack weapon capabilities to meet the DoD policy regarding cluster munitions and unintended harm to civilians. They consist of BLU-134/B and BLU-136/B warheads with a height of burst sensor. BLU-134/B Improved Lethality Warhead (ILW), NGAAW Increment I, is a near-term solution for area attack as an anti-personnel anti-materiel (APAM) weapon that improves lethality using a 500 lb warhead design and any variants. The BLU-136/B NGAAW Increment II continues development to provide significantly increased capability and lethality against area targets as an APAM weapon. This effort is being executed using an accelerated acquisition strategy to study, design, develop, and test a 2,000 lb unitary warhead design and any variants based on target sets.

- Cockpit-selectable Height-Of-Burst Sensor (C-HOBS): The C-HOBS sensor will be a replacement for the current DSU-33D/B proximity sensor. C-HOBS will replace the single factory height-of-burst setting with the addition of multiple height-of-burst options selectable via both manual switches and a cockpit interface. These selection

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| <b>Appropriation/Budget Activity</b><br>3600 / 5 | <b>R-1 Program Element (Number/Name)</b><br>PE 0604602F / <i>Armament/Ordnance Development</i> | <b>Project (Number/Name)</b><br>653133 / <i>Bombs &amp; Fuzes</i> |
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options allow flexibility during flight to address a wide array of targets. The C-HOBS is intended to interface with and provide a cockpit-selectable proximity function to general and special purpose weapons.

- Joint Air-to-Ground Missile for Fixed Wing Aircraft (JAGM-F) is an improvement to the Army-led JAGM which will allow the missile to be released from fixed wing aircraft in order to eliminate time sensitive moving targets and high value covered/sheltered targets. JAGM-F will be able to combat adverse weather/low visibility battlefield and countermeasure environments as well as austere communication environments. JAGM-F will have the ability to engage multiple target types near-simultaneously in multiple engagement modes. Efforts include but are not limited to testing, qualification, and design/build demo components to production standards. Intent is to investigate meeting all BRU-55, BRU-57, and BRU-61 environments.

In FY2019, Joint Air-to-Ground Missile for Fixed Wing (JAGM-F) was a new start.

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

|  | FY 2018 | FY 2019 | FY 2020 Base | FY 2020 OCO | FY 2020 Total |
|--|---------|---------|--------------|-------------|---------------|
| <p><b>Title:</b> Munitions Materiel Handling Equipment (MMHE)</p> <p><b>Description:</b> Armament Standardization/Control/Munitions Materiel Handling Equipment (MMHE) is a continuing project to develop and improve the standardization and commonality of munitions handling and armament equipment to preclude duplication. Efforts are primarily the study, design, and development of MMHE and armament control systems; however, support may be provided to other functional areas as requested. Procurement will be performed and funded by the applicable weapons system project.</p> <p><b>FY 2019 Plans:</b><br/>Complete 20 MMHE support equipment projects to include engineering, drafting, proof load, technical data, and safety authorizations. Fabricate 15 prototypes for test and evaluation purposes. Complete 15 first article equipment fabrications for drafting verification and delivery to Air Force units for additional test and evaluation. Provide support to all system program offices with new weapons and aircraft configurations, as needed. Continue support to the F-35 program with equipment to aid safe munitions loading and handling of various pylons and adapters. Continue to support the B-21 program office with evaluations and recommendations for equipment to aid safe munitions loading and handling of various pylons and adapters. Continue support to DARPA with designs and manufacturing of equipment to aid safe munitions loading and handling of Hypersonic weapons. Continue support and sustainment of all previously existing items developed by the MMHE program office. Continue to provide MMHE Sustainment office at Robins AFB with engineering support.</p> <p><b>FY 2020 Base Plans:</b><br/>Complete MMHE support projects to include engineering, drafting, proof load, technical data, and safety authorizations. Fabricate prototypes for test and evaluation purposes. Complete first article equipment fabrications for drafting verification and delivery to Air Force units for additional test and evaluation. Provide</p> | 0.932   | 0.696   | 0.714        | -           | 0.714         |

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| <b>Appropriation/Budget Activity</b><br>3600 / 5                        | <b>R-1 Program Element (Number/Name)</b><br>PE 0604602F / <i>Armament/Ordnance Development</i> | <b>Project (Number/Name)</b><br>653133 / <i>Bombs &amp; Fuzes</i> |

| <b>B. Accomplishments/Planned Programs (\$ in Millions)</b>   | <b>FY 2018</b> | <b>FY 2019</b> | <b>FY 2020 Base</b> | <b>FY 2020 OCO</b> | <b>FY 2020 Total</b> |
|---|----------------|----------------|---------------------|--------------------|----------------------|
| <p>support to all system program offices with new weapons and aircraft configurations, as needed. Continue support to the F-35 program with equipment to aid safe munitions loading and handling of various pylons and adapters. Continue to support the B-21 program office with evaluations and recommendations for equipment to aid safe munitions loading and handling of various pylons and adapters. Continue support to DARPA with designs and manufacturing of equipment to aid safe munitions loading and handling of hypersonic weapons. Continue support for Air Force Research Laboratory on future munition concept demonstrators. Continue support and sustainment of all previously existing items developed by the MMHE program office. Continue to provide MMHE Sustainment office at Robins AFB with engineering support.</p> <p><b>FY 2019 to FY 2020 Increase/Decrease Statement:</b><br/>Funding increased due to increase in MMHE projects.</p>   |                |                |                     |                    |                      |
| <p><b>Title:</b> Medium Caliber Ammunition</p> <p><b>Description:</b> The Medium Caliber Ammunition efforts support the warfighter's medium caliber ammunition research, development, test, and evaluation (RDT&amp;E) requirements, DoN/USAF collaboration for the medium caliber family of ammunition, foreign comparative testing, inventory health challenges, procurement of ammunition, and other emerging technologies.</p> <p><b>FY 2019 Plans:</b><br/>Provide engineering and technical support for PGU-48/B rounds as well as further comparative testing and engineering &amp; manufacturing development (EMD) of alternative products/sources. Assess and mitigate Medium Caliber ammunition inventory health challenges.</p> <p><b>FY 2020 Base Plans:</b><br/>Continue to provide engineering and technical support for PGU-48/B rounds as well as further comparative testing/EMD of alternative products/sources. Initiate development of the 30mm replacement round. Assess and mitigate Medium Caliber ammunition inventory health challenges.</p> <p><b>FY 2019 to FY 2020 Increase/Decrease Statement:</b><br/>N/A</p> | 0.200          | 0.100          | 0.100               | -                  | 0.100                |
| <p><b>Title:</b> Insensitive Munitions (IM)</p> <p><b>Description:</b> Model and validate munition performance; assess and correct IM deficiencies; explore and develop new IM technology; conduct strategic IM planning for the AF; support Joint Service IM efforts; provide technical guidance and test expertise to AF IM programs.</p>   | 0.300          | 0.300          | 0.300               | -                  | 0.300                |

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| <b>Appropriation/Budget Activity</b><br>3600 / 5                        | <b>R-1 Program Element (Number/Name)</b><br>PE 0604602F / <i>Armament/Ordnance Development</i> | <b>Project (Number/Name)</b><br>653133 / <i>Bombs &amp; Fuzes</i> |

| <b>B. Accomplishments/Planned Programs (\$ in Millions)</b>   | <b>FY 2018</b> | <b>FY 2019</b> | <b>FY 2020 Base</b> | <b>FY 2020 OCO</b> | <b>FY 2020 Total</b> |
|---|----------------|----------------|---------------------|--------------------|----------------------|
| <p><b>FY 2019 Plans:</b><br/>Execute the Insensitive Munitions Strategic Plan (IMSP) and Plan of Action and Milestones (POAM). Model and validate munition performance; support DoD and Joint Service IM planning; provide IM planning expertise to individual AF programs and continue to improve, characterize, and integrate less sensitive explosive fills; assess and correct identified IM explosive fill deficiencies; and develop bomb case modifications to improve the response of conventional weapons to unplanned stimuli.</p> <p><b>FY 2020 Base Plans:</b><br/>Execute the Insensitive Munitions Strategic Plan (IMSP) and Plan of Action and Milestones (POAM). Begin Phase II of the Liner project for the BLU-117 which includes engineering passive venting using IM features. Once features are implemented, qualification testing will take place.</p> <p><b>FY 2019 to FY 2020 Increase/Decrease Statement:</b><br/>N/A</p> |                |                |                     |                    |                      |
| <p><b>Title:</b> BLU-136/B Next Generation Area Attack Weapon Increment II</p> <p><b>Description:</b> The Next Generation Area Attack Weapon Increment II (NGAAW II) continues development of anti-personnel anti-materiel (APAM) weapons to improve lethality against area targets via an accelerated acquisition strategy. This effort studies, designs, develops, and tests a warhead design and any variants which significantly improve lethality against APAM while meeting current DoD policy on cluster munitions and unintended harm to civilians.</p> <p><b>FY 2019 Plans:</b><br/>N/A</p> <p><b>FY 2020 Base Plans:</b><br/>N/A</p>  | 8.718          | 0.000          | 0.000               | -                  | 0.000                |
| <p><b>Title:</b> BLU-134/B Improved Lethality Warhead (ILW), Next Generation Area Attack Weapon Inc I</p> <p><b>Description:</b> This Next Generation Area Attack Weapon (NGAAW Inc I), formerly known as Improved Lethality (IL), continues and expands development planning and legacy warhead efforts in designing anti-personnel anti-materiel (APAM) weapons to improve lethality against area targets. This effort studies, designs, develops, and tests warhead and fuzing modifications which improve lethality against area targets while meeting current</p>  | 0.331          | 0.000          | 0.000               | -                  | 0.000                |

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| <b>Appropriation/Budget Activity</b><br>3600 / 5  |         | <b>R-1 Program Element (Number/Name)</b><br>PE 0604602F / <i>Armament/Ordnance Development</i> |              | <b>Project (Number/Name)</b><br>653133 / <i>Bombs &amp; Fuzes</i> |               |
| <b>B. Accomplishments/Planned Programs (\$ in Millions)</b>   |         |  |              |   |               |
|   |         |  |              |   |               |
| DoD policy on cluster munitions and unintended harm to civilians. These improvements may be synergistic with maintaining a suitable manufacturing base.   |         |  |              |   |               |
| <b>FY 2019 Plans:</b><br>N/A  |         |  |              |   |               |
| <b>FY 2020 Base Plans:</b><br>N/A   |         |  |              |   |               |
| <b>FY 2019 to FY 2020 Increase/Decrease Statement:</b><br>N/A   |         |  |              |   |               |
| <b>Title:</b> Cockpit-Selectable Height-Of-Burst Sensor (C-HOBS)  |         |  |              |   |               |
| <b>Description:</b> Cockpit-selectable Height-Of-Burst Sensor (C-HOBS). The C-HOBS sensor will be a replacement for the legacy DSU-33D/B proximity sensor. C-HOBS will replace the single factory height-of-burst setting with the addition of multiple height-of-burst options selectable via both manual switches and a cockpit interface. These selection options allow flexibility during flight to address a wide array of targets. The C-HOBS is intended to interface with the weapon via the cockpit and provide a cockpit-selectable proximity function for general and special purpose weapons. |         |  |              |   |               |
| <b>FY 2019 Plans:</b><br>Continue design and development effort; design and initial qualification tests; and integration work. Conduct government/industry reviews working towards completion of Milestone B efforts. Evaluate production representative articles and prepare Initial Product Baseline and Product Support Plan. Initiate a CDR Assessment based on test results for the Milestone Decision Authority (MDA) in preparation of a LRIP Production Decision in FY20 with a Full Rate Production Decision in FY21.  |         |  |              |   |               |
| <b>FY 2020 Base Plans:</b><br>Continue to mature development; design and qualification tests; and integration work. Conduct government/industry reviews working towards completion of Milestone B efforts. Evaluate production representative articles and complete Initial Product Baseline and Product Support Plan. Complete a CDR Assessment based on test results for the Milestone Decision Authority (MDA) in preparation of a LRIP Production Decision with a Full Rate Production Decision in FY21.  |         |  |              |   |               |
| <b>FY 2019 to FY 2020 Increase/Decrease Statement:</b>  |         |  |              |   |               |
|   | FY 2018 | FY 2019  | FY 2020 Base | FY 2020 OCO   | FY 2020 Total |
|   | 0.795   | 21.000   | 6.940        | -   | 6.940         |

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| <b>Appropriation/Budget Activity</b><br>3600 / 5                        | <b>R-1 Program Element (Number/Name)</b><br>PE 0604602F / <i>Armament/Ordnance Development</i> | <b>Project (Number/Name)</b><br>653133 / <i>Bombs &amp; Fuzes</i> |

| <b>B. Accomplishments/Planned Programs (\$ in Millions)</b>   | <b>FY 2018</b> | <b>FY 2019</b> | <b>FY 2020 Base</b> | <b>FY 2020 OCO</b> | <b>FY 2020 Total</b> |
|---|----------------|----------------|---------------------|--------------------|----------------------|
| Funding decreased due to ramp down in development efforts.  |                |                |                     |                    |                      |
| <b>Title:</b> Joint Air-to-Ground Missile for Fixed Wing (JAGM-F)   | 0.000          | 22.596         | 11.000              | 0.000              | 11.000               |
| <b>Description:</b> Joint Air-to-Ground Missile for Fixed Wing Aircraft (JAGM-F) is an improvement to the Army-led JAGM which will allow the missile to be released from fixed wing aircraft in order to eliminate time sensitive moving targets and high value covered/sheltered targets. JAGM-F will be able to combat adverse weather/low visibility battlefield and countermeasure environments as well as austere communication environments. JAGM-F will have the ability to engage multiple targets types near-simultaneously in multiple engagement modes. Efforts include but are not limited to testing, qualification, and design/build demo components to production standards. Intent is to investigate meeting all BRU-55, BRU-57, and BRU-61 environments. |                |                |                     |                    |                      |
| <b>FY 2019 Plans:</b><br>Model the design and build, Jettison and Capture Analysis, Mechanical Design, Electronic Design and Testing, Electrical Packaging, software design and code development, weapons system integration, aircraft systems integration, test vehicle design and build, and test vehicle flight planning.  |                |                |                     |                    |                      |
| <b>FY 2020 Base Plans:</b><br>Continue to model the design and build, Jettison and Capture Analysis, Mechanical Design, Electronic Design and Testing, Electrical Packaging, software design and code development, weapons system integration, aircraft systems integration, test vehicle design and build, and test vehicle flight planning. Purchase additional government furnished equipment (GFE) and flight test support.   |                |                |                     |                    |                      |
| <b>FY 2020 OCO Plans:</b><br>N/A  |                |                |                     |                    |                      |
| <b>FY 2019 to FY 2020 Increase/Decrease Statement:</b><br>Funding decreased due to ramp down in development efforts.  |                |                |                     |                    |                      |
| <b>Accomplishments/Planned Programs Subtotals</b>   | 11.276         | 44.692         | 19.054              | 0.000              | 19.054               |

| <b>C. Other Program Funding Summary (\$ in Millions)</b>    | <b>FY 2018</b> | <b>FY 2019</b> | <b>FY 2020 Base</b> | <b>FY 2020 OCO</b> | <b>FY 2020 Total</b> | <b>FY 2021</b> | <b>FY 2022</b> | <b>FY 2023</b> | <b>FY 2024</b> | <b>Cost To Complete</b> | <b>Total Cost</b> |
|---|----------------|----------------|---------------------|--------------------|----------------------|----------------|----------------|----------------|----------------|-------------------------|-------------------|
| • PAAF 01 Line Item 353020:<br><i>General Purpose Bombs</i> | 341.501        | 811.170        | 0.000               | 631.194            | 631.194              | 1,106.037      | 896.535        | 905.658        | 484.254        | Continuing              | Continuing        |
| • PAAF 01 Line Item 356120: <i>Fuzes</i>                    | 60.369         | 180.691        | 0.000               | 158.889            | 158.889              | 226.259        | 163.565        | 168.021        | 140.557        | Continuing              | Continuing        |

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| <b>Appropriation/Budget Activity</b><br>3600 / 5                        | <b>R-1 Program Element (Number/Name)</b><br>PE 0604602F / <i>Armament/Ordnance Development</i> | <b>Project (Number/Name)</b><br>653133 / <i>Bombs &amp; Fuzes</i> |

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

| <u>Line Item</u>                                 | <u>FY 2018</u> | <u>FY 2019</u> | <u>FY 2020</u> | <u>FY 2020</u> | <u>FY 2020</u> | <u>FY 2021</u> | <u>FY 2022</u> | <u>FY 2023</u> | <u>FY 2024</u> | <u>Cost To</u>  |                   |
|--|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|-------------------|
|  |                |                | <u>Base</u>    | <u>OCO</u>     | <u>Total</u>   |                |                |                |                | <u>Complete</u> | <u>Total Cost</u> |
| • PAAF 01 Line Item<br>352010: <i>Cartridges</i> | 205.853        | 188.227        | 0.000          | 193.091        | 193.091        | 186.551        | 171.852        | 168.021        | 149.779        | Continuing      | Continuing        |

**Remarks**

**D. Acquisition Strategy**

- Fuzes (including C-HOBS) is a continuing effort with most activities performed through contracted services.
- Munitions Materiel Handling Equipment (MMHE) project activities are performed in-house with limited technical and analysis contract support.
- Medium Caliber Ammunition project activities are performed in-house with technical and analysis contract support, organic government test support, and possible contracted services (small contracts).
- Insensitive Munitions project activities are performed in-house with limited technical and analysis contract support.
- The BLU-136/B NGAAW Inc II warhead design program will implement an accelerated acquisition program strategy. This strategy includes rapid development and prototyping of a warhead design resulting in a final, validated Technical Data Package (TDP). The TDP will be used to compete for initial production and follow on procurement to meet the warfighter requirement. The NGAAW program will continue to evaluate product improvements.
- Joint Air-to-Ground Missile for Fixed Wing Aircraft (JAGM-F) will utilize the Defense Ordnance Technology Consortium (DOTC) contract combined with modeling and simulation contract support and government test support.

**E. Performance Metrics**

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force** **Date:** February 2019

|  |  |   |
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| <b>Appropriation/Budget Activity</b><br>3600 / 5 | <b>R-1 Program Element (Number/Name)</b><br>PE 0604602F / <i>Armament/Ordnance Development</i> | <b>Project (Number/Name)</b><br>653133 / <i>Bombs &amp; Fuzes</i> |
|--|--|---|

| <b>Product Development (\$ in Millions)</b>         |                        |  |             | FY 2018 |            | FY 2019 |            | FY 2020 Base |            | FY 2020 OCO |            | FY 2020 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          |                  |            |                          |
| IM  | Various                | Various : TBD                              | -           | 0.300   | Mar 2018   | 0.300   | Mar 2019   | 0.300        | Mar 2020   | -           |            | 0.300         | Continuing       | Continuing | -                        |
| MMHE - Prototypes                                   | Various                | Prototype Fabrication Shop : Eglin AFB, FL | -           | 0.322   | Apr 2018   | 0.086   | Apr 2019   | 0.134        | Apr 2020   | -           |            | 0.134         | Continuing       | Continuing | -                        |
| BLU-134/B / BLU-136 ILW - NGAAW Concept Development | Various                | Various : Eglin AFB, FL                    | -           | 4.703   | Aug 2018   | -       |            | -            |            | -           |            | -             | Continuing       | Continuing | -                        |
| CHOBS - HW/SW                                       | C/Various              | Various : Eglin AFB, FL                    | -           | 0.500   | Jan 2019   | 16.385  | Mar 2019   | 3.440        | Dec 2019   | -           |            | 3.440         | Continuing       | Continuing | -                        |
| JAGM-F  | C/FFP                  | DOTC : Huntsville, AL                      | -           | 0.000   |            | 20.217  | Feb 2019   | 7.396        | Oct 2019   | 0.000       |            | 7.396         | Continuing       | Continuing | -                        |
| <b>Subtotal</b>                                     |                        |  | -           | 5.825   |            | 36.988  |            | 11.270       |            | 0.000       |            | 11.270        | Continuing       | Continuing | N/A                      |

**Remarks**  
NGAAW concept development continues.

| <b>Support (\$ in Millions)</b>         |                        |                                     |             | FY 2018 |            | FY 2019 |            | FY 2020 Base |            | FY 2020 OCO |            | FY 2020 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          |                  |            |                          |
| MMHE - Shipping/Supplies                | Various                | MMHE Program Office : Eglin AFB, FL | -           | 0.130   | Mar 2018   | 0.130   | Mar 2019   | 0.130        | Mar 2020   | -           |            | 0.130         | Continuing       | Continuing | -                        |
| JAGM-F - Government Furnished Equipment | C/TBD                  | Army : Huntsville, AL               | -           | -       |            | 0.560   | Apr 2019   | 1.549        | Dec 2019   | -           |            | 1.549         | Continuing       | Continuing | -                        |
| <b>Subtotal</b>                         |                        |                                     | -           | 0.130   |            | 0.690   |            | 1.679        |            | -           |            | 1.679         | Continuing       | Continuing | N/A                      |

| <b>Test and Evaluation (\$ in Millions)</b>   |                        |                                |             | FY 2018 |            | FY 2019 |            | FY 2020 Base |            | FY 2020 OCO |            | FY 2020 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          |                  |            |                          |
| BLU-134/B / BLU-136 ILW - Test and Evaluation | PO                     | Various : Various              | -           | 3.525   | Aug 2018   | -       |            | -            |            | -           |            | -             | Continuing       | Continuing | 6.530                    |

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force** **Date:** February 2019

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| <b>Appropriation/Budget Activity</b><br>3600 / 5 | <b>R-1 Program Element (Number/Name)</b><br>PE 0604602F / <i>Armament/Ordnance Development</i> | <b>Project (Number/Name)</b><br>653133 / <i>Bombs &amp; Fuzes</i> |
|--|--|---|

| <b>Test and Evaluation (\$ in Millions)</b> |                        |                                |             | FY 2018 |            | FY 2019 |            | FY 2020 Base |            | FY 2020 OCO |            | FY 2020 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          |                  |            |                          |
| CHOBS - Test and Evaluation                 | C/Various              | Various : Various              | -           | -       |            | 2.700   | Mar 2019   | 3.000        | Jul 2020   | -           |            | 3.000         | Continuing       | Continuing | -                        |
| MMHE - Test Support                         | PO                     | 96 TW : Eglin AFB, FL          | -           | 0.040   | Apr 2018   | 0.040   | Apr 2019   | 0.050        | Nov 2019   | -           |            | 0.050         | Continuing       | Continuing | -                        |
| JAGM-F - Test Support                       | PO                     | Various : Various              | -           | -       |            | 1.489   | Mar 2019   | 1.624        | Dec 2019   | -           |            | 1.624         | Continuing       | Continuing | -                        |
| <b>Subtotal</b>                             |                        |                                | -           | 3.565   |            | 4.229   |            | 4.674        |            | -           |            | 4.674         | Continuing       | Continuing | N/A                      |

| <b>Management Services (\$ in Millions)</b> |                        |                                |             | FY 2018 |            | FY 2019 |            | FY 2020 Base |            | FY 2020 OCO |            | FY 2020 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          |                  |            |                          |
| Medium Caliber - PMA                        | Various                | Various : Eglin AFB, FL        | -           | 0.200   | Jun 2018   | 0.100   | Jun 2019   | 0.100        | Jun 2020   | -           |            | 0.100         | Continuing       | Continuing | -                        |
| MMHE - PMA                                  | Various                | Various : Eglin AFB, FL        | -           | 0.440   | Jun 2018   | 0.440   | Jun 2019   | 0.400        | Jun 2020   | -           |            | 0.400         | Continuing       | Continuing | -                        |
| BLU-134/B / BLU-136/B - PMA                 | Various                | Various : NV                   | -           | 0.821   | Jul 2018   | -       |            | -            |            | -           |            | -             | Continuing       | Continuing | -                        |
| CHOBS - PMA                                 | Various                | Various : Eglin AFB, FL        | -           | 0.295   | Jul 2018   | 1.915   | Oct 2018   | 0.500        | Oct 2019   | -           |            | 0.500         | Continuing       | Continuing | -                        |
| JAGM-F - PMA                                | Various                | Various : Eglin AFB, FL        | -           | -       |            | 0.330   | Mar 2019   | 0.431        | Oct 2019   | -           |            | 0.431         | Continuing       | Continuing | -                        |
| <b>Subtotal</b>                             |                        |                                | -           | 1.756   |            | 2.785   |            | 1.431        |            | -           |            | 1.431         | Continuing       | Continuing | N/A                      |

|                            | Prior Years | FY 2018 | FY 2019 | FY 2020 Base | FY 2020 OCO | FY 2020 Total | Cost To Complete | Total Cost | Target Value of Contract |     |
|----------------------------|-------------|---------|---------|--------------|-------------|---------------|------------------|------------|--------------------------|-----|
| <b>Project Cost Totals</b> |             | -       | 11.276  | 44.692       | 19.054      | 0.000         | 19.054           | Continuing | Continuing               | N/A |

**Remarks**

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| <b>Exhibit R-4, RDT&amp;E Schedule Profile: PB 2020 Air Force</b> |  | <b>Date:</b> February 2019  |
| <b>Appropriation/Budget Activity</b><br>3600 / 5                  | <b>R-1 Program Element (Number/Name)</b><br>PE 0604602F / <i>Armament/Ordnance Development</i> | <b>Project (Number/Name)</b><br>653133 / <i>Bombs &amp; Fuzes</i> |

|  | FY 2018 |   |   |   | FY 2019 |   |   |   | FY 2020 |   |   |   | FY 2021 |   |   |   | FY 2022 |   |   |   | FY 2023 |   |   |   | FY 2024 |   |   |   |
|--|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|
|  | 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 |
| <b><i>Bombs and Fuzes</i></b>  |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |
| Munitions Materiel Handling Equipment (MMHE): design, prototype, test priority MMHE projects |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |
| Execute IMSP POAM  |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |
| BLU-134/B ILW Mold Design, Build, Test   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |
| BLU-136/B- Warhead Design / Initial Prototype  |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |
| CHOBBS - RFP/Contract Prep/Source Selection  |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |
| CHOBBS - Contract Award  |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |
| CHOBBS - Design, Build, Test, and Integration  |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |
| Medium Caliber Ammunition: Assess, refine and develop medium caliber ammunition              |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |
| JAGM-F - Contract Award  |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |
| JAGM-F - Design, Build, Test, and Integration  |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |

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| <b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2020 Air Force |  | <b>Date:</b> February 2019  |
| <b>Appropriation/Budget Activity</b><br>3600 / 5                   | <b>R-1 Program Element (Number/Name)</b><br>PE 0604602F / <i>Armament/Ordnance Development</i> | <b>Project (Number/Name)</b><br>653133 / <i>Bombs &amp; Fuzes</i> |

Schedule Details

| Events by Sub Project  | Start   |      | End     |      |
|--|---------|------|---------|------|
|  | Quarter | Year | Quarter | Year |
| <b><i>Bombs and Fuzes</i></b>  |         |      |         |      |
| Munitions Materiel Handling Equipment (MMHE): design, prototype, test priority MMHE projects | 1       | 2018 | 4       | 2024 |
| Execute IMSP POAM  | 1       | 2018 | 4       | 2024 |
| BLU-134/B ILW Mold Design, Build, Test   | 1       | 2018 | 3       | 2018 |
| BLU-136/B- Warhead Design / Initial Prototype  | 1       | 2018 | 4       | 2019 |
| CHOBS - RFP/Contract Prep/Source Selection   | 1       | 2018 | 2       | 2019 |
| CHOBS - Contract Award   | 2       | 2019 | 2       | 2019 |
| CHOBS - Design, Build, Test, and Integration   | 2       | 2019 | 2       | 2021 |
| Medium Caliber Ammunition: Assess, refine and develop medium caliber ammunition              | 1       | 2018 | 4       | 2024 |
| JAGM-F - Contract Award  | 2       | 2019 | 2       | 2019 |
| JAGM-F - Design, Build, Test, and Integration  | 2       | 2019 | 4       | 2021 |

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|---|--------------------|----------------|----------------|---------------------|--|----------------------|----------------|----------------|---|----------------------------|-------------------------|-------------------|
| <b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2020 Air Force |                    |                |                |                     |  |                      |                |                |   | <b>Date:</b> February 2019 |                         |                   |
| <b>Appropriation/Budget Activity</b><br>3600 / 5                        |                    |                |                |                     | <b>R-1 Program Element (Number/Name)</b><br>PE 0604602F / <i>Armament/Ordnance Development</i> |                      |                |                | <b>Project (Number/Name)</b><br>655361 / <i>Stores-Aircraft Interface</i> |                            |                         |                   |
| <b>COST (\$ in Millions)</b>  | <b>Prior Years</b> | <b>FY 2018</b> | <b>FY 2019</b> | <b>FY 2020 Base</b> | <b>FY 2020 OCO</b>   | <b>FY 2020 Total</b> | <b>FY 2021</b> | <b>FY 2022</b> | <b>FY 2023</b>  | <b>FY 2024</b>             | <b>Cost To Complete</b> | <b>Total Cost</b> |
| 655361: <i>Stores-Aircraft Interface</i>                                | -                  | 5.489          | 4.898          | 8.989               | 0.000  | 8.989                | 5.075          | 5.181          | 5.275   | 5.370                      | Continuing              | Continuing        |
| Quantity of RDT&E Articles  | -                  | -              | -              | -                   | -  | -                    | -              | -              | -   | -                          |                         |                   |

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

The Stores-Aircraft Interface project conducts stores-aircraft interface upgrades and standards development to include the Universal Armament Interface (UAI). UAI is an Air Force initiative to develop standardized software interfaces in aircraft weapons and mission planning. The savings realized from this effort is on average 6 years of schedule and \$22M per aircraft/weapon combination. This is accomplished by enabling integration of weapons independent of aircraft Operational Flight Programs (OFP) cycles. UAI is currently implemented on the F-15E, F-16 Block 40/50 and European Participating Air Forces (EPAF) F-16 aircraft, Small Diameter Bomb (SDB) I and II, Joint Direct Attack Munition (JDAM), Laser JDAM, Joint Air-to-Surface Stand-off Missile (JASSM), and Precision Guided Munitions Planning Software (PGMPS). Planned implementation include Joint Strike Fighter (JSF/F-35), B-21, MQ-9, JASSM-Extended Range (JASSM-ER), F/A-18, Advanced Anti-Radiation Guided Missile - Extended Range (AARGM-ER), Combat Weapons Delivery Software (CWDS), SPEAR3, Joint Strike Missile (JSM), and the Turkish Stand Off Missile - Joint (SOM-J). The UAI program office is responsible for development and enhancement of the standard, support to coalition/allied/joint interoperability efforts for weapons-platform interface, provision of certification tools, and implementation support to aircraft and weapons.

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

|  | <b>FY 2018</b> | <b>FY 2019</b> | <b>FY 2020 Base</b> | <b>FY 2020 OCO</b> | <b>FY 2020 Total</b> |
|--|----------------|----------------|---------------------|--------------------|----------------------|
| <b>Title:</b> Universal Armament Interface (UAI) Development   | 5.489          | 4.898          | 8.989               | -                  | 8.989                |
| <b>Description:</b> Conduct stores-aircraft interface upgrades and standards development to the Universal Armament Interface (UAI); development and maintenance to the UAI; and facilitation of aircraft, stores, and mission planning program users in the UAI process.   |                |                |                     |                    |                      |
| <b>FY 2019 Plans:</b><br>Continue development and configuration management of UAI standards in response to new users and evolving requirements including but not limited to F-35, JASSM-ER, CWDS, F/A-18, B-21, PGMPS, MQ-9, AARGM-ER and Army & Navy UAVs and stores. Support working group management, technical meetings and workshops, risk reduction assessments, common mission planning, and support platform-specific implementation of UAI. Continue maintenance of existing certification tools to meet F-35, SDB II, F/A-18, B-21, AARGM-ER, MQ-9, JSM, SPEAR3, SOM-J and other future user system integration lab test certification needs. These tools are shared among aircraft and weapons programs to reduce time and cost for UAI integration efforts. Support multinational Memorandum of Understanding including but not limited to Joint Strike Missile (JSM), SPEAR 3, and Stand Off Missile - Joint (SOM-J). |                |                |                     |                    |                      |
| <b>FY 2020 Base Plans:</b>   |                |                |                     |                    |                      |

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| <b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2020 Air Force |  | <b>Date:</b> February 2019  |
| <b>Appropriation/Budget Activity</b><br>3600 / 5                        | <b>R-1 Program Element (Number/Name)</b><br>PE 0604602F / <i>Armament/Ordnance Development</i> | <b>Project (Number/Name)</b><br>655361 / <i>Stores-Aircraft Interface</i> |

| <b>B. Accomplishments/Planned Programs (\$ in Millions)</b>  | <b>FY 2018</b> | <b>FY 2019</b> | <b>FY 2020 Base</b> | <b>FY 2020 OCO</b> | <b>FY 2020 Total</b> |
|--|----------------|----------------|---------------------|--------------------|----------------------|
| <p>Continue development and configuration management of UAI in response to evolving requirements including but not limited to F-35, JASSM-ER, SDB II, F/A-18, B-21, AARGM-ER, PGMPs, MQ-9 and Army &amp; Navy UAVs and stores. Support working groups, technical meetings and workshops, risk reduction assessments, common mission planning, and platform-specific implementation of UAI. Maintain existing certification tools to meet current and future user system integration lab test certification needs. These tools are shared among aircraft and weapons programs to reduce time and cost for UAI integration efforts. Support multinational Memorandum of Understanding including but not limited to Joint Strike Missile (JSM), SPEAR 3, and Stand Off Missile - Joint (SOM-J).</p> <p><b><i>FY 2019 to FY 2020 Increase/Decrease Statement:</i></b><br/>                     Increase in funding for FY20 will be used for ongoing efforts to address planned/required interface capabilities. This will enable UAI to be responsive to technology changes, staving off obsolescence, and enable the UAI PO/industry team to support programs (F-35 Blk 4, B-21, MQ-9, AARGM) during critical stages of implementation, minimizing potential schedule slips and increased costs.</p> |                |                |                     |                    |                      |
| <b>Accomplishments/Planned Programs Subtotals</b>  | 5.489          | 4.898          | 8.989               | -                  | 8.989                |

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

N/A

**Remarks**

N/A

**D. Acquisition Strategy**

In December 2004, under the authority of a class Justification and Approval (J&A), the UAI program office awarded individual Cost Plus Fixed Fee (CPFF) contracts to Boeing, Lockheed Martin, Northrop Grumman, and Raytheon. Each Original Equipment Manufacturer is responsible for a different piece of the total UAI requirement based on its product-specific (platform/weapon) expertise. During FY10, these contracts expired. Under the authority of the class J&A, Cost Plus Incentive Fee (CPIF) contracts were awarded to the four UAI vendors in August 2010. Follow-on period of performance was awarded in March 2014 for 16 months to better align future contract awards with funding through the Future Years Defense Program. The period of performance was extended to 1 November 2015 to allow immediate start of the effort on F-35/JSF request for changes. A new J&A was approved in January 2015 for the follow-on sole source contracts to the original equipment manufacturers. These new sole-source contracts were awarded in November 2015 and will expire in November 2019. A new J&A was signed in December 2018 and the RFP for a follow-on sole source 5 year contract was released in February 2019.

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| <b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2020 Air Force |  | <b>Date:</b> February 2019  |
| <b>Appropriation/Budget Activity</b><br>3600 / 5                        | <b>R-1 Program Element (Number/Name)</b><br>PE 0604602F / <i>Armament/Ordnance Development</i> | <b>Project (Number/Name)</b><br>655361 / <i>Stores-Aircraft Interface</i> |

**E. Performance Metrics**

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force** **Date:** February 2019

|  |  |   |
|--|--|---|
| <b>Appropriation/Budget Activity</b><br>3600 / 5 | <b>R-1 Program Element (Number/Name)</b><br>PE 0604602F / <i>Armament/Ordnance Development</i> | <b>Project (Number/Name)</b><br>655361 / <i>Stores-Aircraft Interface</i> |
|--|--|---|

| <b>Product Development (\$ in Millions)</b>                      |                        |   |             | FY 2018 |            | FY 2019 |            | FY 2020 Base |            | FY 2020 OCO |            | FY 2020 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          |                  |            |                          |
| Interface Control Document (ICD) Development/Updates/Maintenance | SS/<br>Various         | Boeing Northrop Grumman Lockheed Martin Raytheon :<br>Various | -           | 4.525   | Nov 2017   | 4.698   | Nov 2018   | 8.789        | Nov 2019   | -           |            | 8.789         | Continuing       | Continuing | -                        |
| Certification Tool   | SS/CPFF                | Boeing Northrop Grumman Lockheed Martin Raytheon :<br>Various | -           | 0.764   | Sep 2018   | -       |            | -            |            | -           |            | -             | Continuing       | Continuing | -                        |
| <b>Subtotal</b>  |                        |   | -           | 5.289   |            | 4.698   |            | 8.789        |            | -           |            | 8.789         | Continuing       | Continuing | N/A                      |

**Remarks**  
New 5 year Follow-on contract will be awarded in November 2019.

| <b>Management Services (\$ in Millions)</b>       |                        |                                |             | FY 2018 |            | FY 2019 |            | FY 2020 Base |            | FY 2020 OCO |            | FY 2020 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          |                  |            |                          |
| Program Management Administration/Program Support | Various                | Various : Various              | -           | 0.200   |            | 0.200   |            | 0.200        |            | -           |            | 0.200         | Continuing       | Continuing | -                        |
| <b>Subtotal</b>                                   |                        |                                | -           | 0.200   |            | 0.200   |            | 0.200        |            | -           |            | 0.200         | Continuing       | Continuing | N/A                      |

**Remarks**  
PE Systems Contractor provides support to the Program Office for financial services.

|                            | Prior Years | FY 2018 | FY 2019 | FY 2020 Base | FY 2020 OCO | FY 2020 Total | Cost To Complete | Total Cost | Target Value of Contract |     |
|----------------------------|-------------|---------|---------|--------------|-------------|---------------|------------------|------------|--------------------------|-----|
| <b>Project Cost Totals</b> |             | -       | 5.489   | 4.898        | 8.989       | -             | 8.989            | Continuing | Continuing               | N/A |

**Remarks**

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|---|--|---|
| <b>Exhibit R-4, RDT&amp;E Schedule Profile:</b> PB 2020 Air Force |  | <b>Date:</b> February 2019  |
| <b>Appropriation/Budget Activity</b><br>3600 / 5                  | <b>R-1 Program Element (Number/Name)</b><br>PE 0604602F / <i>Armament/Ordnance Development</i> | <b>Project (Number/Name)</b><br>655361 / <i>Stores-Aircraft Interface</i> |

| FY 2018 |   |   |   | FY 2019 |   |   |   | FY 2020 |   |   |   | FY 2021 |   |   |   | FY 2022 |   |   |   | FY 2023 |   |   |   | FY 2024 |   |   |   |
|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|
| 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 |

| <b>Stores-Aircraft Interface</b>       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| ICD Development/Governance (SJICWG)    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Certification Tools (CTs) Dev / Update |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| UAI (Msn PIng) Common Component        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| F-16                                   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| JDAM, S/W Regression                   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| JASSM-ER, Development Rev 4            |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| SDB I & II, S/W Regression             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| F-35, Fielding Rev 4 (Program funded)  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| B-21, Development (Program funded)     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| MQ-9, Development                      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| GW, Development                        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| SiAW, Development                      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| AARGMER, Development                   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

**UNCLASSIFIED**

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| <b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2020 Air Force |  | <b>Date:</b> February 2019  |
| <b>Appropriation/Budget Activity</b><br>3600 / 5                   | <b>R-1 Program Element (Number/Name)</b><br>PE 0604602F / <i>Armament/Ordnance Development</i> | <b>Project (Number/Name)</b><br>655361 / <i>Stores-Aircraft Interface</i> |

Schedule Details

| Events by Sub Project                  | Start   |      | End     |      |
|--|---------|------|---------|------|
|  | Quarter | Year | Quarter | Year |
| <b>Stores-Aircraft Interface</b>       |         |      |         |      |
| ICD Development/Governance (SJICWG)    | 1       | 2018 | 4       | 2024 |
| Certification Tools (CTs) Dev / Update | 1       | 2018 | 4       | 2024 |
| UAI (Msn PIng) Common Component        | 1       | 2018 | 4       | 2024 |
| F-16                                   | 1       | 2018 | 4       | 2024 |
| JDAM, S/W Regression                   | 1       | 2018 | 4       | 2024 |
| JASSM-ER, Development Rev 4            | 1       | 2018 | 4       | 2024 |
| SDB I & II, S/W Regression             | 1       | 2018 | 4       | 2024 |
| F-35, Fielding Rev 4 (Program funded)  | 1       | 2018 | 4       | 2024 |
| B-21, Development (Program funded)     | 1       | 2018 | 4       | 2024 |
| MQ-9, Development                      | 1       | 2018 | 4       | 2024 |
| GW, Development                        | 1       | 2018 | 4       | 2024 |
| SiAW, Development                      | 1       | 2018 | 4       | 2024 |
| AARGMER, Development                   | 1       | 2018 | 4       | 2024 |