

# UNCLASSIFIED

| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force  |             |         |         |              |   |               |         |         |         | Date: February 2018 |                  |            |
|--|-------------|---------|---------|--------------|---|---------------|---------|---------|---------|---------------------|------------------|------------|
| Appropriation/Budget Activity<br>3600: Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development |             |         |         |              | R-1 Program Element (Number/Name)<br>PE 0101122F I Air-Launched Cruise Missile (ALCM) |               |         |         |         |                     |                  |            |
| COST (\$ in Millions)  | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO   | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023             | Cost To Complete | Total Cost |
| Total Program Element  | -           | 0.437   | 0.463   | 5.955        | 0.000   | 5.955         | 10.421  | 8.436   | 5.460   | 1.002               | Continuing       | Continuing |
| 674797: ALCM Upgrades  | -           | 0.437   | 0.463   | 5.955        | 0.000   | 5.955         | 10.421  | 8.436   | 5.460   | 1.002               | Continuing       | Continuing |
| Quantity of RDT&E Articles   | -           | -       | -       | -            | -   | -             | -       | -       | -       | -                   |                  |            |

## Note

This program, BA 7, PE 0101122F, project 674797, Inertial Navigation Element (INE), is a new start.

## A. Mission Description and Budget Item Justification

The AGM-86B, Air Launched Cruise Missile (ALCM), is a subsonic, air-to-surface strategic nuclear missile, operational since 1982. Armed with a W-80 warhead, it is designed to evade air and ground-based defenses in order to strike targets at any location within any enemy's territory. The ALCM is designed for B-52H internal and external carriage.

RDT&E funds support development of new tests and evaluation procedures, software, and equipment. RDT&E funds also provide sustainment solutions for Line Replaceable Units (LRU) and technology insertion to ensure ALCM sustainability supports Air Force strategic nuclear deterrence and Global Strike mission requirements through 2030.

The ALCM Test Plan Development and Evaluation program develops plans and procedures for testing nuclear systems, and implements those procedures as directed by the Chairman, Joint Chiefs of Staff (CJCS) and to satisfy the recurring requirements to test Chemical, Biological, Radiological, and Nuclear (CBRN) susceptibility.

An extensive Service Life Extension Program (SLEP) is in place to address age related issues and to ensure reliability and sustainability through 2030. Technology insertion is anticipated to address serviceability of components at or near end of life.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver ALCM 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.

BA7- This program is in Budget Activity 7, Operational System Development, because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

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| Appropriation/Budget Activity<br>3600: Research, Development, Test & Evaluation, Air Force I BA 7:<br>Operational Systems Development   |         | R-1 Program Element (Number/Name)<br>PE 0101122F I Air-Launched Cruise Missile (ALCM) |              |                     |               |         |
| B. Program Change Summary (\$ in Millions)  | FY 2017 | FY 2018   | FY 2019 Base | FY 2019 OCO         | FY 2019 Total |         |
| Previous President's Budget   | 0.453   | 0.463   | 0.472        | 0.000               | 0.472         |         |
| Current President's Budget  | 0.437   | 0.463   | 5.955        | 0.000               | 5.955         |         |
| Total Adjustments   | -0.016  | 0.000   | 5.483        | 0.000               | 5.483         |         |
| • Congressional General Reductions  | 0.000   | 0.000   |              |                     |               |         |
| • Congressional Directed Reductions   | 0.000   | 0.000   |              |                     |               |         |
| • Congressional Rescissions   | 0.000   | 0.000   |              |                     |               |         |
| • Congressional Adds  | 0.000   | 0.000   |              |                     |               |         |
| • Congressional Directed Transfers  | 0.000   | 0.000   |              |                     |               |         |
| • Reprogrammings  | 0.000   | 0.000   |              |                     |               |         |
| • SBIR/STTR Transfer  | -0.016  | 0.000   |              |                     |               |         |
| • Other Adjustments   | 0.000   | 0.000   | 5.483        | 0.000               | 5.483         |         |
| Change Summary Explanation  |         |   |              |                     |               |         |
| FY19: \$5.483M increase for start of Inertial Navigation Element (INE) Service Life Extension Program (SLEP) and additional CBRN test planning.   |         |   |              |                     |               |         |
| C. Accomplishments/Planned Programs (\$ in Millions)  |         |   |              | FY 2017             | FY 2018       | FY 2019 |
| Title: Inertial Navigation Element (INE)  |         |   |              | -                   | 0.000         | 4.955   |
| Description: This is a three phase approach to ensure short and long term supportability of the ALCM Inertial Navigation Element (INE).   |         |   |              |                     |               |         |
| FY 2018 Plans:<br>N/A   |         |   |              |                     |               |         |
| FY 2019 Plans:<br>The program plans to assess the engineering feasibility of recreating the INE memory modules technology of the circuit cards for technology insertion into the ALCM to offset memory module serviceability end of life. |         |   |              |                     |               |         |
| FY 2018 to FY 2019 Increase/Decrease Statement:<br>Funding increase due to FY19 new start.  |         |   |              |                     |               |         |
| Title: ALCM Test Plan Development and Evaluation  |         |   |              | 0.437               | 0.463         | 1.000   |
| Description: Develop test procedures to implement CJCS-directed requirement for Electromagnetic (EM) testing for nuclear systems.   |         |   |              |                     |               |         |
| FY 2018 Plans:  |         |   |              |                     |               |         |

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| <b>Exhibit R-2, RDT&amp;E Budget Item Justification:</b> PB 2019 Air Force   |                |                |                         |                        |  |                |                |                |                | <b>Date:</b> February 2018  |                   |                |
| <b>Appropriation/Budget Activity</b><br>3600: Research, Development, Test & Evaluation, Air Force I BA 7:<br>Operational Systems Development   |                |                |                         |                        | <b>R-1 Program Element (Number/Name)</b><br>PE 0101122F I Air-Launched Cruise Missile (ALCM) |                |                |                |                |                             |                   |                |
| <b>C. Accomplishments/Planned Programs (\$ in Millions)</b>  |                |                |                         |                        |  |                |                |                |                | <b>FY 2017</b>              | <b>FY 2018</b>    | <b>FY 2019</b> |
| Continue development of test plans and procedures for implementation of Chemical Biological Radiological Neutron (CBRN) testing requirements and Line Replaceable Units (LRU) test plan development and execution.   |                |                |                         |                        |  |                |                |                |                |                             |                   |                |
| <b>FY 2019 Plans:</b><br>Develop a test plan for an active system test of the ALCM to be exposed to a neutron/gamma environment. Intent of the test is to assess survivability of a legacy mission critical system in a CBRN environment per DoDI 3150.09 and AFI 10-2607.     |                |                |                         |                        |  |                |                |                |                |                             |                   |                |
| <b>FY 2018 to FY 2019 Increase/Decrease Statement:</b><br>Funding increase due to increase in effort/scope.  |                |                |                         |                        |  |                |                |                |                |                             |                   |                |
| <b>Accomplishments/Planned Programs Subtotals</b>  |                |                |                         |                        |  |                |                |                |                | 0.437                       | 0.463             | 5.955          |
| <b>D. Other Program Funding Summary (\$ in Millions)</b>   |                |                |                         |                        |  |                |                |                |                |                             |                   |                |
| <b>Line Item</b>   | <b>FY 2017</b> | <b>FY 2018</b> | <b>FY 2019<br/>Base</b> | <b>FY 2019<br/>OCO</b> | <b>FY 2019<br/>Total</b>   | <b>FY 2020</b> | <b>FY 2021</b> | <b>FY 2022</b> | <b>FY 2023</b> | <b>Cost To<br/>Complete</b> | <b>Total Cost</b> |                |
| • MPAF 03 Line Item MALCBG:<br>ALCM, Missile Modifications   | 21.762         | 36.425         | 47.632                  | -                      | 47.632   | 63.958         | 74.957         | 75.279         | 74.323         | Continuing                  | Continuing        |                |
| • MPAF 04 Line Item MALCBG:<br>ALCM, Replenishment Spares  | 2.796          | 2.942          | 2.280                   | -                      | 2.280  | 2.321          | 2.359          | 2.407          | 2.451          | Continuing                  | Continuing        |                |
| • OPAF 03 Line Item<br>MALCBG: ALCM, Electronics<br>& Telecommunications<br>Equipment (BP83)   | 1.710          | 1.757          | 1.775                   | -                      | 1.775  | 1.806          | 1.840          | 1.873          | 1.906          | Continuing                  | Continuing        |                |
| • MPAF 04 Line Item 999/Replen<br>Spa...: ALCM, Initial Spares   | 0.254          | 0.304          | 0.308                   | -                      | 0.308  | 0.319          | 0.328          | 0.335          | 0.341          | Continuing                  | Continuing        |                |
| <b>Remarks</b>   |                |                |                         |                        |  |                |                |                |                |                             |                   |                |
| <b>E. Acquisition Strategy</b>   |                |                |                         |                        |  |                |                |                |                |                             |                   |                |
| Previously, the Air Launched Cruise Missile (ALCM) was assessed in the nuclear environment for Chemical, Biological, Radiological and Nuclear (CBRN) Survivability for High Altitude Electromagnetic Pulse (HEMP) and Total Ionizing Dose at White Sands Missile Range (WSMR). |                |                |                         |                        |  |                |                |                |                |                             |                   |                |
| Follow-on test development will assess the neutron and gamma component in the nuclear environment for CBRN survivability. Test development and execution will utilize organic and contractor agencies.   |                |                |                         |                        |  |                |                |                |                |                             |                   |                |
| INE SLEP plans for a three phase reliability assessment with comprehensive plan to address short and long term supportability.   |                |                |                         |                        |  |                |                |                |                |                             |                   |                |

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| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force   |  | Date: February 2018  |
| <b>Appropriation/Budget Activity</b><br>3600: Research, Development, Test & Evaluation, Air Force / BA 7:<br>Operational Systems Development  |  | <b>R-1 Program Element (Number/Name)</b><br>PE 0101122F / Air-Launched Cruise Missile (ALCM) |
| Phase 1 - Short-term parts shortage mitigation analyses with Tomahawk Reference Measuring Unit and Computer<br>Phase 2 - Definition of scope of efforts and establishing the manufacturing methodology<br>Phase 3 - Delivery of working engineering samples, certification of production, and production of INE's equal to the function and reliability of 'like new' devices |  |  |
| <b>F. Performance Metrics</b><br>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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|--|--|--|--|--|--|--|--|--|--|--|--|----------------------------|--|--|--|
| <b>Exhibit R-3, RDT&amp;E Project Cost Analysis:</b> PB 2019 Air Force |  |  |  |  |  |  |  |  |  |  |  | <b>Date:</b> February 2018 |  |  |  |
| <b>Appropriation/Budget Activity</b><br>3600 / 7                       |  |  |  |  |  | <b>R-1 Program Element (Number/Name)</b><br>PE 0101122F / Air-Launched Cruise Missile (ALCM) |  |  |  | <b>Project (Number/Name)</b><br>674797 / ALCM Upgrades |  |                            |  |  |  |

  

| <b>Test and Evaluation (\$ in Millions)</b> |                                   |   |                    | <b>FY 2017</b> |                   | <b>FY 2018</b> |                   | <b>FY 2019 Base</b> |                   | <b>FY 2019 OCO</b> |                   | <b>FY 2019 Total</b> |                         |                   |                                 |
|---|-----------------------------------|---|--------------------|----------------|-------------------|----------------|-------------------|---------------------|-------------------|--------------------|-------------------|----------------------|-------------------------|-------------------|---------------------------------|
| <b>Cost Category Item</b>                   | <b>Contract Method &amp; Type</b> | <b>Performing Activity &amp; Location</b> | <b>Prior Years</b> | <b>Cost</b>    | <b>Award Date</b> | <b>Cost</b>    | <b>Award Date</b> | <b>Cost</b>         | <b>Award Date</b> | <b>Cost</b>        | <b>Award Date</b> | <b>Cost</b>          | <b>Cost To Complete</b> | <b>Total Cost</b> | <b>Target Value of Contract</b> |
| INE LRU Sustainment Assessment              | TBD                               | NG : UT                                   | -                  | -              |                   | 0.000          |                   | 4.955               | Oct 2018          | -                  |                   | 4.955                | Continuing              | Continuing        | -                               |
| CBRN Test Plan Development & Evaluation     | Various                           | WSMR, Boeing : NV                         | -                  | 0.417          | Jul 2017          | 0.443          | May 2018          | 1.000               |                   | -                  |                   | 1.000                | Continuing              | Continuing        | -                               |
| <b>Subtotal</b>                             |                                   |   | -                  | 0.417          |                   | 0.443          |                   | 5.955               |                   | -                  |                   | 5.955                | Continuing              | Continuing        | N/A                             |

  

| <b>Management Services (\$ in Millions)</b> |                                   |   |                    | <b>FY 2017</b> |                   | <b>FY 2018</b> |                   | <b>FY 2019 Base</b> |                   | <b>FY 2019 OCO</b> |                   | <b>FY 2019 Total</b> |                         |                   |                                 |
|---|-----------------------------------|---|--------------------|----------------|-------------------|----------------|-------------------|---------------------|-------------------|--------------------|-------------------|----------------------|-------------------------|-------------------|---------------------------------|
| <b>Cost Category Item</b>                   | <b>Contract Method &amp; Type</b> | <b>Performing Activity &amp; Location</b> | <b>Prior Years</b> | <b>Cost</b>    | <b>Award Date</b> | <b>Cost</b>    | <b>Award Date</b> | <b>Cost</b>         | <b>Award Date</b> | <b>Cost</b>        | <b>Award Date</b> | <b>Cost</b>          | <b>Cost To Complete</b> | <b>Total Cost</b> | <b>Target Value of Contract</b> |
| PMA - Government Costs                      | Various                           | Various : Various                         | -                  | 0.020          | Aug 2017          | 0.020          | Aug 2018          | -                   |                   | -                  |                   | -                    | Continuing              | Continuing        | -                               |
| <b>Subtotal</b>                             |                                   |   | -                  | 0.020          |                   | 0.020          |                   | -                   |                   | -                  |                   | -                    | Continuing              | Continuing        | N/A                             |

  

**Remarks**  
 Test Development and Evaluation PMA is for Supplies and Travel in support of project number 674797

  

|                            | <b>Prior Years</b> | <b>FY 2017</b> | <b>FY 2018</b> | <b>FY 2019 Base</b> | <b>FY 2019 OCO</b> | <b>FY 2019 Total</b> | <b>Cost To Complete</b> | <b>Total Cost</b> | <b>Target Value of Contract</b> |
|----------------------------|--------------------|----------------|----------------|---------------------|--------------------|----------------------|-------------------------|-------------------|---------------------------------|
| <b>Project Cost Totals</b> | -                  | 0.437          | 0.463          | 5.955               | -                  | 5.955                | Continuing              | Continuing        | N/A                             |

  

**Remarks**

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|   |  |   |                            |  |   |
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| <b>Exhibit R-4, RDT&amp;E Schedule Profile:</b> PB 2019 Air Force |  |   | <b>Date:</b> February 2018 |  |   |
| <b>Appropriation/Budget Activity</b><br>3600 / 7                  |  | <b>R-1 Program Element (Number/Name)</b><br>PE 0101122F / <i>Air-Launched Cruise Missile (ALCM)</i> |                            |  | <b>Project (Number/Name)</b><br>674797 / <i>ALCM Upgrades</i> |

|                                      | FY 2017 |   |   |   | FY 2018 |   |   |   | FY 2019 |   |   |   | FY 2020 |   |   |   | FY 2021 |   |   |   | FY 2022 |   |   |   | FY 2023 |   |   |   |
|--------------------------------------|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|
|                                      | 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>INE Sustainment</b>               |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |
| INE Line Replaceable Unit Assessment |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |
| <b>CBRN Test</b>                     |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |
| CBRN Test Plan Development           |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |
| CBRN Test Execution                  |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |

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| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force |   |   | Date: February 2018 |
| Appropriation/Budget Activity<br>3600 / 7               | R-1 Program Element (Number/Name)<br>PE 0101122F / Air-Launched Cruise Missile (ALCM) | Project (Number/Name)<br>674797 / ALCM Upgrades |                     |

## Schedule Details

| Events by Sub Project                | Start   |      | End     |      |
|--------------------------------------|---------|------|---------|------|
|                                      | Quarter | Year | Quarter | Year |
| <b>INE Sustainment</b>               |         |      |         |      |
| INE Line Replaceable Unit Assessment | 2       | 2019 | 4       | 2022 |
| <b>CBRN Test</b>                     |         |      |         |      |
| CBRN Test Plan Development           | 1       | 2017 | 4       | 2019 |
| CBRN Test Execution                  | 1       | 2020 | 4       | 2020 |