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**Exhibit R-2, RDT&E Budget Item Justification:** PB 2013 Air Force **DATE:** February 2012

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| <b>APPROPRIATION/BUDGET ACTIVITY</b><br>3600: <i>Research, Development, Test &amp; Evaluation, Air Force</i><br>BA 3: <i>Advanced Technology Development (ATD)</i> | <b>R-1 ITEM NOMENCLATURE</b><br>PE 0603199F: <i>Sustainment Science and Technology (S&amp;T)</i> |
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| COST (\$ in Millions)                 | FY 2011 | FY 2012 | FY 2013 Base | FY 2013 OCO | FY 2013 Total | FY 2014 | FY 2015 | FY 2016 | FY 2017 | Cost To Complete | Total Cost |
|---------------------------------------|---------|---------|--------------|-------------|---------------|---------|---------|---------|---------|------------------|------------|
| Total Program Element                 | 2.764   | 5.780   | 6.565        | -           | 6.565         | 9.839   | 9.371   | 9.454   | 9.620   | Continuing       | Continuing |
| 635351: <i>Technology Sustainment</i> | 2.764   | 5.780   | 6.565        | -           | 6.565         | 9.839   | 9.371   | 9.454   | 9.620   | Continuing       | Continuing |

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

This project develops and demonstrates sustainment technologies such as materials, corrosion, and structures for transition into Air Force systems to increase readiness and reduce life cycle costs. Technologies matured and demonstrated in this program impact affordability and availability of fielded and future aerospace weapon systems by extending service life, ensuring flight safety, reducing sustainment costs, and ensuring mission readiness and capability. This project develops and demonstrates technologies that can be implemented to address operational sustainment issues on existing systems as well as supports new sustainability through demonstration of technologies related to robust life cycle management, system design, fleet management decision making, and mission capability. Studies are conducted to identify and analyze design methodologies that focus on building in sustainability into future applications. Efforts in this program have been coordinated through the Reliance 21 process to harmonize efforts and eliminate duplication. This program is in Budget Activity 3, Advanced Technology Development, since it develops and demonstrates technologies for sustaining existing and future aerospace systems that have military utility and address warfighter needs.

| <b>B. Program Change Summary (\$ in Millions)</b> | <b>FY 2011</b> | <b>FY 2012</b> | <b>FY 2013 Base</b> | <b>FY 2013 OCO</b> | <b>FY 2013 Total</b> |
|---|----------------|----------------|---------------------|--------------------|----------------------|
| Previous President's Budget                       | 2.935          | 5.780          | 6.744               | -                  | 6.744                |
| Current President's Budget                        | 2.764          | 5.780          | 6.565               | -                  | 6.565                |
| Total Adjustments                                 | -0.171         | -              | -0.179              | -                  | -0.179               |
| • Congressional General Reductions                | -              | -              |                     |                    |                      |
| • Congressional Directed Reductions               | -              | -              |                     |                    |                      |
| • Congressional Rescissions                       | -              | -              |                     |                    |                      |
| • Congressional Adds                              | -              | -              |                     |                    |                      |
| • Congressional Directed Transfers                | -              | -              |                     |                    |                      |
| • Reprogrammings                                  | -0.077         | -              |                     |                    |                      |
| • SBIR/STTR Transfer                              | -0.079         | -              |                     |                    |                      |
| • Other Adjustments                               | -0.015         | -              | -0.179              | -                  | -0.179               |

**Change Summary Explanation**

FY11: Other Adjustments include -0.015 Congressional General Reductions

Decrease in FY13 is due to higher Department of Defense priorities.

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| <b>C. Accomplishments/Planned Programs (\$ in Millions)</b>   | FY 2011 | FY 2012 | FY 2013 Base | FY 2013 OCO | FY 2013 Total |
|---|---------|---------|--------------|-------------|---------------|
| <p><b>Title:</b> Major Thrust 1.</p> <p><b>Description:</b> Develop, demonstrate, and transition system health management technologies. Conduct studies and analyses to design in sustainability into future applications.</p> <p><b>FY 2011 Accomplishments:</b><br/>Continued efforts related to fatigue/corrosion diagnostics sensors and algorithms. Refined efforts to verify and validate real-time material state awareness capability for engine and airframe structural components. Incorporated health assessment technologies into system data environment.</p> <p><b>FY 2012 Plans:</b><br/>Verify capability of state-of-the-art reasoners to assess component health and real-time awareness for engine components. Develop and demonstrate real time diagnostic technologies. Develop life prediction model capability to support risk-based decision making and prognostics. Incorporate health assessment technologies into system data environment.</p> <p><b>FY 2013 Base Plans:</b><br/>Refine verification of capability of state-of-the-art reasoners to assess component health and real-time awareness for engine components. Complete development of real-time diagnostic technologies. Continue to develop life prediction model capability to support risk-based decision making and prognostics. Complete incorporating health assessment technologies into system data environment.</p> <p><b>FY 2013 OCO Plans:</b><br/>N/A</p> | 1.309   | 2.842   | 3.304        | -           | 3.304         |
| <p><b>Title:</b> Major Thrust 2.</p> <p><b>Description:</b> Develop, demonstrate, and transition technologies to improve component design, maintenance, replacement, and concepts for performance improvement and reduced maintenance burden.</p> <p><b>FY 2011 Accomplishments:</b><br/>Integrated structural life enhancement/replacement application concepts. Demonstrated risk-based approach to structural integrity decision making. Demonstrated capability of certification by analysis to reduce design time, implementation, and sustainment costs.</p> <p><b>FY 2012 Plans:</b></p>   | 0.480   | 0.940   | 1.146        | -           | 1.146         |

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| <b>C. Accomplishments/Planned Programs (\$ in Millions)</b>  | FY 2011 | FY 2012 | FY 2013 Base | FY 2013 OCO | FY 2013 Total |
|--|---------|---------|--------------|-------------|---------------|
| <p>Continue to evaluate concepts for integrated structural life enhancement/replacement concepts. Demonstrate risk-based approach to structural integrity decision making. Assess capability of certification by analysis to reduce design time, implementation, and sustainment costs.</p> <p><b>FY 2013 Base Plans:</b><br/>Continue efforts to evaluate concepts for integrated structural life enhancement/replacement concepts. Begin efforts to demonstrate risk-based approach to structural integrity decision making. Refine assessment of capability of certification by analysis to reduce design time, implementation, and sustainment costs.</p> <p><b>FY 2013 OCO Plans:</b><br/>N/A</p>   |         |         |              |             |               |
| <p><b>Title:</b> Major Thrust 3.</p> <p><b>Description:</b> Develop, demonstrate, and transition technologies to improve existing and new components to decrease downtime, costs, and increase reliability.</p> <p><b>FY 2011 Accomplishments:</b><br/>Evaluated technological means to adjust maintenance management and operational sustainment. Demonstrated high reliability maintenance free repair technologies. Demonstrated improved maintenance and repair data base systems.</p> <p><b>FY 2012 Plans:</b><br/>Evaluate technological means to adjust system management and operational sustainment. Demonstrate high reliability repair technologies. Demonstrate improved maintenance and repair data base systems.</p> <p><b>FY 2013 Base Plans:</b><br/>Continue to evaluate technological means to adjust system management and operational sustainment. Demonstrate high reliability repair technologies. Demonstrate improved maintenance and repair data base systems.</p> <p><b>FY 2013 OCO Plans:</b><br/>N/A</p> | 0.975   | 1.998   | 2.115        | -           | 2.115         |
| <b>Accomplishments/Planned Programs Subtotals</b>  | 2.764   | 5.780   | 6.565        | -           | 6.565         |

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

| <u>Line Item</u> | <u>FY 2011</u> | <u>FY 2012</u> | <u>FY 2013</u><br><u>Base</u> | <u>FY 2013</u><br><u>OCO</u> | <u>FY 2013</u><br><u>Total</u> | <u>FY 2014</u> | <u>FY 2015</u> | <u>FY 2016</u> | <u>FY 2017</u> | <u>Cost To</u><br><u>Complete</u> | <u>Total Cost</u> |
|------------------|----------------|----------------|-------------------------------|------------------------------|--------------------------------|----------------|----------------|----------------|----------------|-----------------------------------|-------------------|
| • N/A: N/A       | 0.000          | 0.000          | 0.000                         | 0.000                        | 0.000                          | 0.000          | 0.000          | 0.000          | 0.000          | Continuing                        | Continuing        |

**E. Acquisition Strategy**

Not Applicable.

**F. 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.