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| <b>Exhibit R-2, RDT&amp;E Budget Item Justification:</b> PB 2014 Office of Secretary Of Defense | <b>DATE:</b> April 2013 |
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| APPROPRIATION/BUDGET ACTIVITY                                                                            |                 |         |                      |              | R-1 ITEM NOMENCLATURE                                                            |               |         |         |         |         |                  |            |
|----------------------------------------------------------------------------------------------------------|-----------------|---------|----------------------|--------------|----------------------------------------------------------------------------------|---------------|---------|---------|---------|---------|------------------|------------|
| 0400: <i>Research, Development, Test &amp; Evaluation, Defense-Wide</i><br>BA 2: <i>Applied Research</i> |                 |         |                      |              | PE 0602251D8Z: <i>Applied Research for the Advancement of S&amp;T Priorities</i> |               |         |         |         |         |                  |            |
| COST (\$ in Millions)                                                                                    | All Prior Years | FY 2012 | FY 2013 <sup>#</sup> | FY 2014 Base | FY 2014 OCO <sup>##</sup>                                                        | FY 2014 Total | FY 2015 | FY 2016 | FY 2017 | FY 2018 | Cost To Complete | Total Cost |
| Total Program Element                                                                                    | -               | 0.000   | 0.000                | 45.000       | -                                                                                | 45.000        | 38.800  | 45.654  | 49.698  | 51.538  | Continuing       | Continuing |
| P227: <i>Applied Research for the Advancement of S&amp;T Priorities</i>                                  | -               | 0.000   | 0.000                | 45.000       | -                                                                                | 45.000        | 38.800  | 45.654  | 49.698  | 51.538  | Continuing       | Continuing |

<sup>#</sup> FY 2013 Program is from the FY 2013 President's Budget, submitted February 2012

<sup>##</sup> The FY 2014 OCO Request will be submitted at a later date

**Note**

This program element (PE) is a FY 2014 new start.

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

The Applied Research for the Advancement of Science and Technology (S&T) Priorities PE will enable the early launch of S&T applied research projects to shape Components' investments. The PE is oriented toward the design, development, and improvement of prototypes and new processes to meet general mission area requirements, and to translate promising research into solutions for military needs. Efforts are situated within the seven DoD S&T priorities and focus areas and will include studies, feasibility evaluations, and non-system specific technology efforts. Investigations conducted in this PE will facilitate concept exploration efforts and studies of alternative concepts. Efforts are formulated and managed by teams of subject matter experts drawn from the Office of the Secretary of Defense, the Military Services, and Defense Agencies. The PE will also provide necessary administrative support to the Priority Steering Councils and S&T Focus Areas.

| <b><u>B. Program Change Summary (\$ in Millions)</u></b> | <b><u>FY 2012</u></b> | <b><u>FY 2013</u></b> | <b><u>FY 2014 Base</u></b> | <b><u>FY 2014 OCO</u></b> | <b><u>FY 2014 Total</u></b> |
|----------------------------------------------------------|-----------------------|-----------------------|----------------------------|---------------------------|-----------------------------|
| Previous President's Budget                              | 0.000                 | 0.000                 | 0.000                      | -                         | 0.000                       |
| Current President's Budget                               | 0.000                 | 0.000                 | 45.000                     | -                         | 45.000                      |
| Total Adjustments                                        | 0.000                 | 0.000                 | 45.000                     | -                         | 45.000                      |
| • Congressional General Reductions                       | -                     | -                     |                            |                           |                             |
| • Congressional Directed Reductions                      | -                     | -                     |                            |                           |                             |
| • Congressional Rescissions                              | -                     | -                     |                            |                           |                             |
| • Congressional Adds                                     | -                     | -                     |                            |                           |                             |
| • Congressional Directed Transfers                       | -                     | -                     |                            |                           |                             |
| • Reprogrammings                                         | -                     | -                     |                            |                           |                             |
| • SBIR/STTR Transfer                                     | -                     | -                     |                            |                           |                             |
| • Baseline Adjustments                                   | -                     | -                     | 45.000                     | -                         | 45.000                      |

**Change Summary Explanation**

FY 2014 baseline adjustments are in compliance with DoD S&T priorities and Advanced Manufacturing.

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| Exhibit R-2A, RDT&E Project Justification: PB 2014 Office of Secretary Of Defense                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                 |         |                      |              |                                                                                                |               |         |         | DATE: April 2013                                                        |         |                  |            |
| APPROPRIATION/BUDGET ACTIVITY<br>0400: Research, Development, Test & Evaluation, Defense-Wide<br>BA 2: Applied Research                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                 |         |                      |              | R-1 ITEM NOMENCLATURE<br>PE 0602251D8Z: Applied Research for the Advancement of S&T Priorities |               |         |         | PROJECT<br>P227: Applied Research for the Advancement of S&T Priorities |         |                  |            |
| COST (\$ in Millions)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | All Prior Years | FY 2012 | FY 2013 <sup>#</sup> | FY 2014 Base | FY 2014 OCO <sup>##</sup>                                                                      | FY 2014 Total | FY 2015 | FY 2016 | FY 2017                                                                 | FY 2018 | Cost To Complete | Total Cost |
| P227: Applied Research for the Advancement of S&T Priorities                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | -               | 0.000   | 0.000                | 45.000       | -                                                                                              | 45.000        | 38.800  | 45.654  | 49.698                                                                  | 51.538  | Continuing       | Continuing |
| # FY 2013 Program is from the FY 2013 President's Budget, submitted February 2012                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                 |         |                      |              |                                                                                                |               |         |         |                                                                         |         |                  |            |
| ## The FY 2014 OCO Request will be submitted at a later date                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                 |         |                      |              |                                                                                                |               |         |         |                                                                         |         |                  |            |
| Note<br>This program element (PE) is a FY 2014 new start.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                 |         |                      |              |                                                                                                |               |         |         |                                                                         |         |                  |            |
| A. Mission Description and Budget Item Justification<br>The Applied Research for the Advancement of Science and Technology (S&T) Priorities program element (PE) will enable the early launch of S&T applied research projects to shape the Components' investments. The PE is oriented toward the design, development, and improvement of prototypes and new processes to meet general mission area requirements, and to translate promising research into solutions for military needs. Efforts are situated within the seven DoD S&T priorities and focus areas and will include studies, feasibility evaluations, and non-system specific technology efforts. Investigations conducted in this PE will facilitate concept exploration efforts and studies of alternative concepts. Efforts are formulated and managed by teams of subject matter experts drawn from the Office of the Secretary of Defense, the Military Services, and Defense Agencies. The PE will also provide necessary administrative support to the Priority Steering Councils and S&T Focus Areas. |                 |         |                      |              |                                                                                                |               |         |         |                                                                         |         |                  |            |
| B. Accomplishments/Planned Programs (\$ in Millions)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                 |         |                      |              |                                                                                                |               |         |         | FY 2012                                                                 | FY 2013 | FY 2014          |            |
| Title: Applied Research for the Advancement of S&T Priorities                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                 |         |                      |              |                                                                                                |               |         |         | 0.000                                                                   | 0.000   | 32.667           |            |
| Description: The FY 2014 S&T priorities include: Electronic Warfare (EW), Human Systems, Counter Weapons of Mass Destruction (CWMD), Engineered Resilient Systems (ERS), Data to Decisions (D2D), Autonomy, and Cybersecurity.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                 |         |                      |              |                                                                                                |               |         |         |                                                                         |         |                  |            |
| FY 2014 Plans:<br>Conduct concept exploration efforts that focus on the seven S&T priority areas. Challenge areas within the priorities include:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                 |         |                      |              |                                                                                                |               |         |         |                                                                         |         |                  |            |
| Electronic Warfare:<br>- Spatial and spectral parameters<br>- Integrated, network-enabled EW systems<br>- Electronic protection measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                 |         |                      |              |                                                                                                |               |         |         |                                                                         |         |                  |            |
| Human Systems:<br>- System interfaces                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                 |         |                      |              |                                                                                                |               |         |         |                                                                         |         |                  |            |

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| <b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2014 Office of Secretary Of Defense                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |                                                                                                                  | <b>DATE:</b> April 2013 |                                                                                           |                |
| <b>APPROPRIATION/BUDGET ACTIVITY</b><br>0400: <i>Research, Development, Test &amp; Evaluation, Defense-Wide</i><br>BA 2: <i>Applied Research</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  | <b>R-1 ITEM NOMENCLATURE</b><br>PE 0602251D8Z: <i>Applied Research for the Advancement of S&amp;T Priorities</i> |                         | <b>PROJECT</b><br>P227: <i>Applied Research for the Advancement of S&amp;T Priorities</i> |                |
| <b>B. Accomplishments/Planned Programs (\$ in Millions)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |                                                                                                                  | <b>FY 2012</b>          | <b>FY 2013</b>                                                                            | <b>FY 2014</b> |
| <ul style="list-style-type: none"> <li>- Social and cultural understanding</li> <li>- Personnel and training</li> <li>- Protection and sustainment</li> </ul> <p>Counter Weapons of Mass Destruction:</p> <ul style="list-style-type: none"> <li>- Systems integration</li> <li>- Activity recognition</li> <li>- Advanced signature detection and tracking</li> <li>- Advanced radiation detection</li> </ul> <p>Engineered Resilient Systems:</p> <ul style="list-style-type: none"> <li>- Systems analysis methods and tools</li> <li>- Early concept engineering techniques</li> <li>- Advanced architecture and design analysis techniques</li> <li>- New approaches to analysis and testing</li> <li>- Methods and tools for more robust designs</li> <li>- Advanced algorithms</li> </ul> <p>Data to Decisions:</p> <ul style="list-style-type: none"> <li>- Enhanced images</li> <li>- Temporal and text analytics</li> <li>- Better software architectures</li> <li>- Improved algorithms for data fusion</li> <li>- Improved understanding of user interactions</li> </ul> <p>Autonomy:</p> <ul style="list-style-type: none"> <li>- Machine reasoning and intelligence</li> <li>- Human/autonomous systems interaction and collaboration</li> <li>- Scalable Teaing of Autonomous systems</li> <li>- Testing and Evaluation and Verification and Validation</li> </ul> <p>Cyber:</p> <ul style="list-style-type: none"> <li>- Mission assurance and effectiveness</li> <li>- Operating securely in an insecure world</li> </ul> |  |                                                                                                                  |                         |                                                                                           |                |

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| <b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2014 Office of Secretary Of Defense                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  | <b>DATE:</b> April 2013                                                                                          |                                                                                           |
| <b>APPROPRIATION/BUDGET ACTIVITY</b><br>0400: <i>Research, Development, Test &amp; Evaluation, Defense-Wide</i><br>BA 2: <i>Applied Research</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  | <b>R-1 ITEM NOMENCLATURE</b><br>PE 0602251D8Z: <i>Applied Research for the Advancement of S&amp;T Priorities</i> | <b>PROJECT</b><br>P227: <i>Applied Research for the Advancement of S&amp;T Priorities</i> |
| <b>B. Accomplishments/Planned Programs (\$ in Millions)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  | <b>FY 2012</b>                                                                                                   | <b>FY 2013</b>                                                                            |
| - Reinventing cyber technology foundations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |                                                                                                                  |                                                                                           |
| <b>Title:</b> S&T Focus Areas<br><br><b>Description:</b> The S&T Focus Areas task facilitates cooperation and collaboration among Components and optimizes development of selected S&T efforts across the DoD enterprise. Select technology areas are examined and projects are initiated to address gaps or opportunities. FY 2014 focus areas are: Advanced Materials; Energy and Power; Weapons; Command, Control, and Communications and Networks; Intelligence, Surveillance, and Reconnaissance; Counter-Improvised Explosive Devices; and Biomedical.<br><br><b>FY 2014 Plans:</b><br>Candidate projects for S&T Focus Areas include: exceptional materials properties and processing routes through electromagnetic field - materials coupling; active informatics photonic materials; development of models and architecture for digital curation; nano-scale battery architectures; and 3-dimensional (3D) stereochemistry through multitasking polymer catalysts; garbage and waste mining – creation of material stock for mobile manufacturing. |  | 0.000                                                                                                            | 0.000                                                                                     |
| <b>Accomplishments/Planned Programs Subtotals</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  | 0.000                                                                                                            | 45.000                                                                                    |
| <b>C. Other Program Funding Summary (\$ in Millions)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |                                                                                                                  |                                                                                           |
| N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |                                                                                                                  |                                                                                           |
| <b>Remarks</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |                                                                                                                  |                                                                                           |
| <b>D. Acquisition Strategy</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |                                                                                                                  |                                                                                           |
| N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |                                                                                                                  |                                                                                           |
| <b>E. Performance Metrics</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |                                                                                                                  |                                                                                           |
| Project performance metrics specific to each effort are identified in the project plans established by the Priority Steering Councils and Focus Area leads. Individual project success will be monitored through these metrics.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |                                                                                                                  |                                                                                           |