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<b>Exhibit R-2, PB 2010 Office of Secretary Of Defense RDT&amp;E Budget Item Justification</b>								<b>DATE:</b> May 2009		
<b>APPROPRIATION/BUDGET ACTIVITY</b> 0400 - Research, Development, Test & Evaluation, Defense-Wide/BA 1 - Basic Research					<b>R-1 ITEM NOMENCLATURE</b> PE 0601120D8Z National Defense Education Program (NDEP)					
<b>COST (\$ in Millions)</b>	<b>FY 2008 Actual</b>	<b>FY 2009 Estimate</b>	<b>FY 2010 Estimate</b>	<b>FY 2011 Estimate</b>	<b>FY 2012 Estimate</b>	<b>FY 2013 Estimate</b>	<b>FY 2014 Estimate</b>	<b>FY 2015 Estimate</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
Total Program Element	42.447	69.093	89.980						Continuing	Continuing
P120: National Defense Education Program (NDEP)	42.447	69.093	89.980						Continuing	Continuing

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

The National Defense Education Program (NDEP) pre-engineering and higher education initiatives are ensuring the engagement and development of high-quality talent that possess superior science, technology, engineering and mathematics (STEM) skills and abilities for the greatest impact. NDEP supports the building of STEM talent and investment in world-leading basic research. Pre-engineering middle and high school STEM teachers receive inquiry-based training and are partnered with DoD laboratory scientists and engineers. Undergraduate and graduate students are supported in STEM disciplines, trained in the DoD laboratories, and transitioned into the DoD workforce. Under NDEP, approximately ten distinguished university faculty are selected annually to be supported in their world-class research and establish strategic partnerships among the researchers and DoD personnel and organizations.

Since the program's inception in 2006, the NDEP pre-engineering initiatives resulted in 425 teachers trained, the development of several summer teacher skill-building institutes, and the establishment of partnerships between laboratory scientists and engineers with middle and high school classroom teachers in 12 states. Additionally, 16 "LabTV" webisodes that feature laboratory personnel and DoD technology were developed for the public.

NDEP higher education initiatives also supported and trained over 350 undergraduate and graduate students earning bachelor's, master's and Ph.D degrees in STEM disciplines at very high and high research universities. Nearly 150 students will have transitioned into the DoD laboratory and components workforce by year's end. To date, eighteen highly distinguished university researchers have been selected from over 800 eligible applicants. Among these researchers are members of the National Academy of Science, the National Academy of Engineering, and recipients of prestigious science awards.

Current research and education awards will be sustained and increased in FY 2010. Final selection of FY 2010 NDEP new start projects will be determined in September 2009.

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<b>APPROPRIATION/BUDGET ACTIVITY</b>	<b>R-1 ITEM NOMENCLATURE</b>
0400 - Research, Development, Test & Evaluation, Defense-Wide/BA 1 - Basic Research	PE 0601120D8Z National Defense Education Program (NDEP)

**B. Program Change Summary (\$ in Millions)**

	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>	<u>FY 2011</u>
Previous President's Budget	43.988	68.972	91.484	
Current BES/President's Budget	42.447	69.093	89.980	
Total Adjustments	-1.541	0.121	-1.504	
Congressional Program Reductions				
Congressional Rescissions		-0.379		
Total Congressional Increases				
Total Reprogrammings	-0.250	0.500		
SBIR/STTR Transfer	-1.195			
Undistributed Reductions	-0.096			
Program Adjustment			-0.457	
Other			-1.047	

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<b>COST (\$ in Millions)</b>	<b>FY 2008 Actual</b>	<b>FY 2009 Estimate</b>	<b>FY 2010 Estimate</b>	<b>FY 2011 Estimate</b>	<b>FY 2012 Estimate</b>	<b>FY 2013 Estimate</b>	<b>FY 2014 Estimate</b>	<b>FY 2015 Estimate</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
P120: National Defense Education Program (NDEP)	42.447	69.093	89.980						Continuing	Continuing

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

The National Defense Education Program (NDEP) pre-engineering and higher education initiatives are ensuring the engagement and development of high-quality talent that possess superior science, technology, engineering and mathematics (STEM) skills and abilities for the the greatest impact. NDEP supports the building of STEM talent and investment in world-leading basic research. Pre-engineering middle and high school STEM teachers receive inquiry-based training and are partnered with DoD laboratory scientists and engineers. Undergraduate and graduate students are supported in STEM disciplines, trained in the DoD laboratories, and transitioned into the DoD workforce. Under NDEP, approximately ten distinguished university faculty are selected annually to be supported in their world-leading research and establish strategic partnerships among the researchers and DoD personnel and organizations.

Since the program's inception in 2006, the NDEP pre-engineering initiatives resulted in 425 teachers trained, the development of several summer teacher skill-building institutes, and the establishment of partnerships between laboratory scientists and engineers with middle and high school classroom teachers in 12 states. Additionally, 16 "LabTV" webisodes that feature laboratory personnel and DoD technology were developed for the public.

NDEP higher education initiatives also supported and trained over 350 undergraduate and graduate students earning bachelor's, master's and Ph.D degrees in STEM disciplines at very high and high research universities. Nearly 150 students will have transitioned into the DoD laboratory and components workforce by year's end. To date, eighteen highly distinguished university researchers have been selected from over 800 eligible applicants. Among these researchers are members of the National Academy of Science, the National Academy of Engineering, and recipients of prestigious science awards.

Current research and education awards will be sustained and increased in FY 2010. Final selection of FY 2010 NDEP new start projects will be determined in September 2009.

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

	<b>FY 2008</b>	<b>FY 2009</b>	<b>FY 2010</b>	<b>FY 2011</b>
Science, Mathematics and Research for Transformation (SMART) Defense Education Program The Science, Mathematics and Research for Transformation (SMART) Defense Education Program awards undergraduate scholarships and graduate fellowships to current and future scientists and	25.047	27.693	37.000	

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<b>B. Accomplishments/Planned Program (\$ in Millions)</b>	<b>FY 2008</b>	<b>FY 2009</b>	<b>FY 2010</b>	<b>FY 2011</b>
<p>engineers in areas of importance to DoD. Participants are required to obtain security clearances and agree to a year of DoD employment in return for each year of academic support received. Through research experiences at DoD labs, SMART scholars gain additional skills and expertise that are directly applicable to mission needs. NDEP higher education initiatives also supported and trained over 350 undergraduate and graduate students earning bachelor's, master's and Ph.D degrees in STEM disciplines at very high and high research universities. Nearly 150 students will have transitioned into the DoD laboratory and components workforce by year's end.</p> <p><i>FY 2008 Accomplishments:</i> To date, the total SMART awards (Title 10, USC 2192a) are ~350 and ~50 have transitioned into the DoD workforce.</p> <p>Reviewed 1,500 SMART applications using 100 DoD S&amp;Es and university faculty reviewers. Over 800 students were eligible for award. Approximately 200 new awards were made. As one example, Air Force selected nearly 80 SMART applicants. More students were supported at the bachelor's degree level and nearly 60 new Ph.D. and over 40 master's students were also supported. Slightly more than 100 engineers were selected. Overall GPA of new awards increased to 3.71. Increased the number of DoD sites participating in SMART to 50. Revised service agreements based on feedback. Annual program review was conducted.</p> <p><i>FY 2009 Plans:</i> Make 200 new undergraduate and graduate awards. Increase the number of DoD sites participating in SMART. Conduct an annual program review to include external reviewers. Develop management information system. Develop annual plan and report. Conduct site visits. Obtain feedback from transitioned SMART participants. Develop schedule for a third-party program evaluation. Transition approximately 100 SMART participants to the DoD workforce.</p> <p><i>FY 2010 Plans:</i> Make 200 new undergraduate and graduate awards. Increase the number of eligible applications received from students from under-represented groups. Increase the number of reviewers from under-</p>				

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<b>B. Accomplishments/Planned Program (\$ in Millions)</b>	<b>FY 2008</b>	<b>FY 2009</b>	<b>FY 2010</b>	<b>FY 2011</b>
represented groups. Conduct a program evaluation. Transition 100 SMART graduates to the DoD workforce. Conduct a program review to include external reviewers.				
<p>Pre-Engineering Program (PEP)</p> <p>Since the program's inception in 2006, the NDEP pre-engineering initiatives resulted in 425 teachers trained, the development of several summer teacher skill-building institutes, and the establishment of partnerships between laboratory scientists and engineers with middle and high school classroom teachers in 12 states. Additionally, 16 "LabTV" webisodes that feature laboratory personnel and DoD technology were developed for the public. PEP partnerships were developed in 12 states in FY 2008, 16 states in FY 2009, and 20 states in FY 2010.</p> <p><i>FY 2008 Accomplishments:</i></p> <p>Classroom-based activities spanned 12 states and reached 425 teachers in 208 schools across 68 school districts. At least 85 defense S&amp;E's have participated and 21,258 students have been reached. There were at least 69 individual NDEP-supported K-12 events.</p> <p>Conducted an assessment of DoD S&amp;E and teacher classroom-based STEM collaboration conducted in the Harford County school system.</p> <p>Conducted 3 one-week Summer Institute professional development training sessions on inquiry-based learning for 72 teachers and 12 defense S&amp;E's.</p> <p>Increased partnerships with internal DoD and external partners to improve educational program efficiencies and effectiveness. Three formal partnerships were initiated within DoD: the DoD Education Activity (DoDEA), OSD (Advanced Systems and Concepts) and OSD (Reserve Affairs).</p> <p>10 top tier U.S. high school students supported to conduct research experiences through the Research Science Institute (RSI) at MIT.</p> <p>Developed and launched an informal learning educational website to stimulate student and teacher interest in DoD science and technology challenges and DoD laboratory careers in science and engineering (<a href="http://www.ndep.us">www.ndep.us</a>). Created weekly LabTV episodes for middle and high school audiences that brings DoD technology and scientists and engineers into the classroom.</p>	10.000	15.000	16.000	

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<b>B. Accomplishments/Planned Program (\$ in Millions)</b>	<b>FY 2008</b>	<b>FY 2009</b>	<b>FY 2010</b>	<b>FY 2011</b>
<p>Distributed 7,500 MATHCOUNTS "Club Kits" to participating U.S. middle schools to build math interest and skills.</p> <p>Sponsored 700 middle and high school students and their teacher sponsors participating in Team America Rocketry Challenge (TARC) national competition. Selected 6 teacher sponsors to participate in inquiry-based professional development Summer Institute with DoD S&amp;Es.</p> <p>An electronic newsletter, STARLink, was initiated to bring topics of mutual interest to pre-college teachers and administrators and DoD laboratory scientists and engineers. Three issues were circulated to more than 2,500 DoD S&amp;E employees and pre-college teachers and administrators .</p> <p>Increased partnerships with DoD laboratory S&amp;Es and science and math pre-college educators in four States: Alabama, Hawaii, New York and South Carolina.</p> <p>Developed a computer-based mathematics learning module curriculum (Tabula Digita) to increase middle school math skills. A training program was developed and a series of teacher-S&amp;E training workshops were conducted in Pennsylvania, Florida, New Jersey and California.</p> <p>Received two program awards: (1) "Programs That Work" presented to the Navy for it's pilot demonstration implementation in Dahlgren, VA sponsored by the Virginia Mathematics &amp; Science Coalition; and (2) "Outstanding Contributions in Science Education" presented by the San Diego Science Educators Association for hosting a series of local teacher and DoD S&amp;E workshops.</p> <p><i>FY 2009 Plans:</i></p> <p>Increase number of PEP partnerships between DoD S&amp;E laboratory personnel and pre-college local schools in defense laboratory communities in Ohio, Massachusetts, Mississippi, and Rhode Island.</p> <p>Support 10 top-tier U.S. high school students' RSI summer research experience at MIT in areas of importance to DoD.</p> <p>Increase MATHCOUNTS teams in local schools in defense laboratory communities and provide MATHCOUNTS "Club Kits" to middle schools.</p> <p>Assess PEP learning modules and implementation approach.</p> <p>Support 700 middle and high school students and their teacher sponsors participating in Team America Rocketry Challenge (TARC) national competition. Select 4 teachers to participate in inquiry-based professional development Summer Institute with DoD S&amp;Es.</p>				

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<p>Increase LabTV webisodes that feature DoD S&amp;Es and technology to stimulate interest to middle and high school audiences. Develop supplemental learning material to accompany LabTV webisodes. Increase teacher professional development training with DoD S&amp;Es. Contribute to DoD STEM Education Strategic Plan goals and objectives.</p> <p><i>FY 2010 Plans:</i> Increase PEP partnerships between DoD S&amp;Es and local schools in defense laboratory communities in 4 additional States. Expand and balance partnerships with STEM stakeholders in a coordinated effort on STEM education at the middle and high school level in defense laboratory communities. Contribute to DoD STEM Education Strategic Plan goals and objectives.</p>				
<p>National Security Science and Engineering Faculty Fellowship (NSSEFF)</p> <p>Fellowship awards are up to \$600K annually in direct research costs for up to five consecutive years. In FY 2008, NSSEFF supported eight world-leading researchers and will add up to ten more each year. By FY 2012, NSSEFF will support a steady state of up to 50 researchers and engage, without additional funding, at least double that number of graduate students and post-docs.</p> <p><i>FY 2008 Accomplishments:</i> Nearly 100 DoD S&amp;Es reviewed 350 eligible white papers. The following eight basic research awards were funded: Exploring Dissimilar and Nano Materials Integration as a Platform for New MWIR Device Functionality; Engineering Proteins for Viral Applications; Functional 1-D Structures Based Upon On-Wire Lithography (OWL); Fusion and Inference from Multiple and Massive Disparate Data Sources; Managing Acoustic Communications in High-Stress Settings; High Strain Actuators for Miniaturized Actuators and Self-Powered Sensors; Nanostructured Materials for Low Power, Low Weight, High Performance Electronic and Optoelectronic Devices; and Development of High Power Ultrafast Lasers and Applications in Hyperspectral Imaging and Nanotechnology. Developed lessons learned document on review process.</p> <p><i>FY 2009 Plans:</i> Nearly 100 DoD S&amp;Es reviewed ~470 eligible white papers. Ten basic research awards funded to distinguished university faculty. Develop NSSEFF Fellows strategic partnership plan that includes DoD</p>	7.400	26.400	36.980	

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<p>NSSEFF Conference to introduce Fellows to DoD community and NSSEFF Fellows' visits to ARL, NRL and AFRL. Review and report on NSSEFF Fellows' annual progress. Develop MoU between DDR&amp;E and AFOSR naming AFOSR as executive administrator of NSSEFF.</p> <p><i>FY 2010 Plans:</i> Monitor and support AFOSR activities to administer NSSEFF. Review NSSEFF Fellows' annual progress. Participate in AFOSR annual NSSEFF program review.</p>						
<b>C. Other Program Funding Summary (\$ in Millions)</b>						
N/A						
<b>D. Acquisition Strategy</b>						
N/A						
<b>E. Performance Metrics</b>						
<p>Performance Metrics within the National Defense Education Program:</p> <ol style="list-style-type: none"> <li>1) Award 250 SMART scholarships</li> <li>2) Demonstrate DoD PEP education initiatives in 20 states</li> </ol> <p>Attract students at elementary, middle, and high school levels to pursue careers in science and engineering: A DoD outreach program has been established within NDEP. The Pre-Engineering Program initiative addresses this outreach requirement.</p> <p>National Defense Education Program: Funding to support National Security Science and Engineering Faculty Fellowships and Science, Mathematics and Research for Transformation scholarship initiatives.</p> <p>Ensure grant and fellowship programs are providing maximum benefit to DoD and the taxpayer: Reviews of the NDEP scholarship and fellowship programs continue. Modifications and enhancements to initiatives are being made as a result of participant feedback and program reviews.</p> <p>Conduct annual program review. Monitor placement and performance of scholars and fellows. Identify any need for programmatic adjustments to maximize program benefits.</p>						

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R-1 Line Item #5

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