

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY
RDTE, Defense Wide BA 01

PE NUMBER AND TITLE
0601120D8Z - National Defense Education Program (NDEP)

COST (\$ in Millions)	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
P120 National Defense Education Program (NDEP)	18.425	43.988	68.972	91.484	114.122	127.771	130.136

A. Mission Description and Budget Item Justification: (U) Section 1101 of the National Defense Authorization Act (NDAA) for Fiscal Year 2005 and Section 1104 of the National Defense Authorization Act of 2006 established and modified the National Defense Education Program (NDEP).

(U) DoD employs almost half of the Federal Governments scientists and engineers. NDEP attacks a continuing DoD challenge: educating, training, recruiting, and retaining workers in the science, technology, engineering, and mathematics (STEM) disciplines that are critical to our national security. In the US, there is a long-term, downward trend in defense-relevant science and engineering degrees at all levels awarded to clearable persons, whether native-born or naturalized. This trend is exacerbated by a general erosion of US competency in math and science at the middle and high school levels. Basic science and mathematics competence, gained in grades K-12, form the foundation of an educated, capable, technical future workforce for DoD. NDEP is a bridge from DoD STEM education efforts in mid and late term education to future defense community employment. One of NDEPs major programs is the Science, Mathematics and Research for Transformation (SMART) Defense Education Program.

(U) SMART awards physical science and engineering scholarships to current and future scientists, mathematicians, and engineers. Scholarships are awarded at undergraduate and graduate levels and recipients are required to obtain security clearances and to enter government civilian service for a period of time commensurate with the duration of educational support they receive. SMART scholars gain additional education, develop skills, talents, and expertise that are directly applicable to specific DoD needs through interaction at DoD laboratories.

(U) The NDAA of 2006 amendment to SMART further enables the development of DoDs future workforce. The amendment establishes a permanent program (the initial FY 2005 program was a pilot) with four features: 1) increased development, recruitment, and retention of individuals with acumen in physical science disciplines critical to the Department of Defense; 2) expanded the kinds of academic degrees covered by the program, including the associate's degree; 3) authorized DoD to employ SMART scholars in over-strength positions while pursuing their studies and for up to two years after completion; and 4) increased the recipients types of allowable expenses.

<u>B. Program Change Summary</u>	FY 2007	FY 2008	FY 2009
Previous President's Budget (FY 2008)	19.420	44.372	58.972
Current BES/President's Budget (FY 2009)	18.425	43.988	68.972
Total Adjustments	-0.995	-0.384	10.000
Congressional Program Reductions		-0.384	
Congressional Rescissions			
Congressional Increases			
Reprogrammings	-0.477		
SBIR/STTR Transfer	-0.543		

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Other	0.025		10.000
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C. Other Program Funding Summary Not applicable for this item.

D. Acquisition Strategy Not applicable for this item.

E. Performance Metrics:

FY	Strategic Goals Supported	Existing Baseline	Planned Performance Improvement / Requirement Goal	Actual Performance Improvement	Planned Performance Metric / Methods of Measurement	Actual Performance Metric / Methods of Measurement
07	AT&L 3.3.3; 3.3.4; 3.3.5					
08	AT&L 3.3.3; 3.3.4; 3.3.5					

Comment: Performance Metrics within the National Defense Education Program:

- 1) Award 1000 SMART scholarships by 2013
- 2) Demonstrate DoD involvement in 20 states K-12 education programs by 2010
- 3) Award 50 National Security Science and Engineering Faculty Fellowships by 2013

AT&L 3.3.3 - 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 Partnership and Material World Modules initiatives address this outreach requirement.

AT&L 3.3.4 - Support National Defense Education Program: Funding has been increased over FY06 levels to expand the scope of NDEP to include National Security Science and Engineering Faculty Fellowships and an increase in the scope and magnitude of the Science, Mathematics and Research for Transformation scholarship initiatives.

AT&L 3.3.5 - Ensure grant and fellowship programs are providing maximum benefit to DoD and the taxpayer: Reviews of the NDEP scholarship and fellowship programs continue. Modifications to grants, scholarships and fellowships are being made as appropriate.

Data will be gathered and analyzed annually to assess program execution including level of application to the program, and level of satisfaction and ability of graduates to meet the expectations of sponsoring services and agencies. Placement and performance of scholars and fellows will be tracked. Services and agencies will be queried to identify any need for programmatic adjustments to maximize program benefits.

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P120 National Defense Education Program (NDEP)	18.425	43.988	68.972	91.484	114.122	127.771	130.136	

A. Mission Description and Budget Item Justification: (U) DoD laboratories expect to lose 13,000 scientists and engineers over the next ten years. At the same time, the overall US demand for scientists is projected to increase by 17 percent, and for engineers by 22 percent. NDEP attacks this continuing DoD challenge: educating, training, recruiting, and retaining workers in the science, technology, engineering, and mathematics (STEM) disciplines that are critical to the national security. NDEP is a bridge from DoD STEM education efforts in mid and late term K-12 education to future defense community employment. The program provides support for the study of physical sciences and engineering in pre-college, undergraduate, graduate, and postgraduate projects.

(U) Pre-college: There are two initiatives in this area: the Material World Modules project and the Pre-Engineering Partnership Program. These two initiatives improve teacher skills and techniques, stimulate student interest, and promote competence in physical sciences and math. They are evidence based, multidisciplinary, hands-on activities for middle through high school students. Additionally, they connect working DoD laboratory scientists and engineers with local teachers to provide assistance in teaching scientific concepts through real-world applications.

(U) Undergraduate, Graduate, Post-Graduate: There are two projects in this area: Science, Mathematics, and Research for Transformation (SMART) scholarships and the National Security Science and Engineering Faculty Fellowships (NSSEFF). These two projects educate, recruit, and retain clearable scientists and engineers by awarding scholarships and fellowships, some of which require civil service payback employment. Assistance is for clearable and employable candidates. They receive comprehensive academic education and training as well as mentorship, internship, and employment. These programs generate competent STEM professionals in critical DoD physical science disciplines and engage the nations top university researchers in critical, long-term DoD research.

B. Accomplishments/Planned Program:

<u>Accomplishments/Planned Program Title:</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
Material World Modules	4.600	6.500	13.000

FY 2007 Accomplishments:
 Expanded DoD laboratory involvement by three additional states and partnered with private sector STEM stakeholders in a coordinated effort on STEM education in middle and high schools.
 Organized and conducted next teacher training sessions. A total of 254 teachers from 13 states had completed training in MWM at the conclusion of FY07 activities.

FY 2008 Planned program
 Expand DoD laboratory involvement and partner with private sector STEM stakeholders in a coordinated effort on STEM education at the middle and high school level.

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Organize and conduct final teacher training sessions.

FY 2009 Planned program

Expand and balance DoD laboratory involvement and partner with private sector STEM stakeholders in a coordinated effort on STEM education at the middle and high school level in school systems across the USA.

Development of new learning modules.

Continue and expand the organization and execution of DoD S&E and school system teacher training sessions.

<u>Accomplishments/Planned Program Title:</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
Pre-Engineering Partnerships (new start)		3.500	10.000

FY 2008 Planned program

Provide hands-on, inquiry-based learning of real-world math, engineering, and science principles that tie physical science and mathematics learning to real-world applications for middle school students.

Fund development of additional computer-based curriculum modules that encourage, stimulate, and engage middle school students

Evaluate and select proposals for broad module implementation.

Award contracts

FY 2009 Planned program

Provide hands-on, inquiry-based learning of real-world math, engineering, and science principles that tie physical science and mathematics learning to real-world applications for middle school students.

Fund development of additional computer-based curriculum modules

Initiate assessment of module effectiveness for purpose intended

Exercise first contract option for implementation or re-compete

<u>Accomplishments/Planned Program Title:</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
Science, Mathematics and Research for Transformation (SMART)	13.825	26.588	34.572

FY 2007 Accomplishments

106 SMART awards made. Applications were invited from the public for science and engineering educational support at the associate, undergraduate, and graduate degree levels. The application window for FY08 awards closed on 14 Dec 2007.

Modified program based upon input from the previous year lessons learned.

Continued assessment of SMART program.

Developed metrics to assess utility of SMART program.

FY 2008 Planned program

Invite applications from the public for science and engineering educational support at the associate, undergraduate, and graduate degree levels.

Modify program as indicated based upon input from the previous year lessons learned.

Report assessment of SMART program.

Review metrics with field activity directors to assess utility of SMART program

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FY 2009 Planned program
 Invite applications from the public for science and engineering educational support at the associate, undergraduate, and graduate degree levels.
 Modify program as indicated based upon input from the previous year lessons learned.
 Report assessment of SMART program.
 Review metrics with field activity directors to assess utility of SMART program

<u>Accomplishments/Planned Program Title:</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
National Security Science and Engineering Faculty Fellowships (NSSEFF) (new start)		7.400	11.400

FY 2008 Planned program
 Creates a competitive award program with substantial financial support for outstanding scientists and engineers that is large enough to be attractive and long enough to produce quantifiable research results. Fellowships awards are \$600K annually for five consecutive years. Funds 50 top-flight researchers over the FYDP and adds 10 more each year thereafter, all working on critical DoD research issues. Engages, without additional funding, at least double that number of graduate students and post-docs, each receiving substantial DoD funding at a critical juncture in their careers. Engages for the long-term, the absolute best available university research talent to pursue DoD research.
 Issue competitive fellowship announcement for research in areas of DoD long-term interest. Public announcement for the competitive fellowships will be advertised in national professional journals in January 2008.
 Evaluate proposals and select first fellowship recipients. Biased toward early-career faculty members.

FY 2009 Planned program
 Conduct Fellows S&T conclave with COCOM leaders and assess results
 Re-direct and revise research areas as needed for FY 2008 and FY 2009
 Issue competitive fellowship announcement for research in areas of COCOM long-term interest
 Evaluate proposals and select next fellowship recipients.

C. Other Program Funding Summary Not applicable for this item.

D. Acquisition Strategy Not applicable for this item.

E. Major Performers

Category	Name	Location	Type of Work and Description	Award Date
<u>Labs/Centers</u>				
	Naval Postgraduate School	Monterey, CA	These funds are provided for the execution of the Science, Mathematics and Research for Transformation (SMART) Defense Education Program and for execution of NSSEFF grants.	Jul 07

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<u>FFRDCs</u>				
	Institute for Defense Analysis	Arlington, VA	These funds are provided for the technical, programmatic, and administrative support of the National Security Science and Engineering Faculty Fellowship (NSSEFF) Program.	Dec 07