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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)									DATE June 2001	
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3						R-1 ITEM NOMENCLATURE High Energy Laser Advanced Development PE 0603924D8Z				
COST (<i>In Millions</i>)	FY2000	FY2001	FY2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	0.000	0.000	16.005						Continuing	Continuing
	0.000	0.000	16.005							

(U) **A. Mission Description and Budget Item Justification**

(U) **BRIEF DESCRIPTION OF ELEMENT**

U) This program element funds High Energy Laser (HEL) advanced technology development aimed at translating technology solutions for broadly defined military problems into demonstrated performance pay-offs, increased capabilities, increased supportability, or increased affordability. HEL weapons systems have many potential advantages, including speed-of-light time-to-target, high precision, nearly unlimited magazine depth, low cost per kill, and reduced logistics requirements because of no need for stocks of munitions or warheads. As a result, HELs have the potential to perform a wide variety of military missions, including some that are impossible, or nearly so, for conventional weapons. These include interception of ballistic missiles in boost phase, defeat of high-speed, maneuvering anti-ship and anti-aircraft missiles, and the ultra-precision negation of targets in urban environments with no collateral damage. Research conducted under this program element develops and demonstrates the technology necessary to enable these and other HEL missions.

(U) This program element is part of an overall DOD initiative in HEL science and technology being conducted by the recently formed HEL Joint Technology Office (JTO). The goals of this HEL JTO funded research are to provide the technology to make HEL systems more effective and also to make them lighter, smaller, cheaper, and more easily supportable on the battlefield. In general, efforts funded under this program element are chosen for their potential to have major impact on multiple HEL systems and on multiple Service missions. As a result of this focus and of close coordination with the military departments and defense agencies, this program element complements other DOD HEL programs that are directed at more specific Service and agency needs.

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(U) A broad range of technology is addressed in key areas such as chemical lasers, solid-state lasers, beam control, optics, propagation, and free-electron lasers. Under this program element these technologies are integrated and tested in sub-scale demonstration systems or sub-systems. Research is conducted by Government laboratories and industry, often teamed together. The program element funds integrated theoretical, computational, and experimental investigations. These integrated investigations are structured to convincingly demonstrate the piercing of technology barriers that currently prevent HELs from being fielded as viable weapon systems. In addition, they are structured to permit rapid technology transition. As results become available, DOD will transmit them to appropriate military-department, defense-agency, and industry programs for technology transition, where appropriate.

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COST(In Millions)	FY 2000	FY 2001	FY 2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	0.000	0.000	16.005						Continuing	Continuing
blank project/1	0.000	0.000	16.005							

(U) **Project Number and Title:**

(U) **PROGRAM ACCOMPLISHMENTS AND PLANS**

(U) **FY 2001 Accomplishments:**

(U) None, this initiative is new as of FY 2002.

(U) **FY 2002 Plans:**

(U) Pursuant to Congressional direction the DOD is developing a comprehensive, prioritized investment plan for HEL science and technology. This investment plan is being developed by the HEL JTO, in coordination with the military departments and the defense agencies. The plan, which will be completed by the end of FY01, will form the basis for the work to be conducted under this program element in FY02 and beyond, as well as the work to be conducted under companion basic-research and applied-research elements. Although the plan is not yet completed, the broad outlines of plan are becoming clear. Efforts to be included in the HEL advanced technology development funded by this program element will largely involve the extension or combination of particularly successful efforts funded under the HEL applied research program in FY01. It is anticipated that efforts under this program element will include one or more of the following:

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- Solid-state-laser demonstration. Assemble successful pieces from individual applied-research projects (e.g., reliable pump diode lasers, diode-laser drivers, thin-disk amplifiers, phase-conjugate mirrors, mist cooling) into a demonstration sub-system scalable to weapons power levels.
- Free-electron-laser (FEL) demonstration. Begin to develop a scalable FEL that can be operated on a military platform (e.g., a ship).
- Tactical beam-control demonstration. Using successful pieces from individual applied-research projects (e.g., deformable mirrors, wavefront sensors, advanced tracking and compensation algorithms) begin to develop a fieldable, sub-scale tactical beam-control system.

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<u>(U) B. Program Change Summary</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>						<u>Total Cost</u>
Previous President's Budget Submit	0.000	0.000	0.000						
Appropriated Value	0.000	0.000	0.000						Continuing
Adjustments to Appropriated Value									
a. Congressionally Directed Undistributed Reduction	0.000	0.000	0.000						
b. Rescission/Below-threshold Reprogramming, Inflation Adjustment	0.000	0.000	0.000						
c. Other	0.000	0.000	16.005						
Current President's Budget	0.000	0.000	16.005						Continuing

Change Summary Explanation

- (U) **Funding:**
- (U) **Schedule:**
- (U) **Technical:**
- (U) **C. Other Program Funding Summary Cost**
- (U) **D. Acquisition Strategy:**
- (U) **E. Schedule Profile:**

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