Exhibit R-2, RDT&E Budget Item Justification						February 2003	

Appropriation/Budget Activity RDT&E, DW BA 3				R-1 Item Nomenclature: * **High Performance Computing 0603755D8Z**			
Cost ($ in millions)	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008	FY2009
Total PE Cost	183.524	202.933	0	0	0	00	0	0

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

* Beginning in FY 2004, High Performance Computing program management and execution responsibilities will be transferred to the Air Force under PE-0603755F (3600) and will result in a more appropriate policy-level role for OSD.

The Department of Defense (DoD) High Performance Computing (HPC) Program (HPCP) supports the needs of the warfighter for technological superiority and military dominance on the battlefield by providing advanced computational services to U.S. weapons system scientists and engineers. By exploiting continuous advances in high performance computing technology, the defense research, development, test and evaluation (RDT&E) community is able to resolve critical scientific and engineering problems more quickly and with more precision. The results of these efforts feed directly into the acquisition process by improving weapons system designs through an increased fundamental understanding of materials, aerodynamics, chemistry, fuels, acoustics, signal image recognition, electromagnetics, and other areas of basic and applied research as well as enabling advanced test and evaluation environments that allow synthetic scene generation, automatic control systems and virtual test environments. As such, HPC has been identified as a key enabling technology essential to achieving the objectives of the DoD's science and technology (S&T) and test and evaluation (T&E) programs.

The HPCP has established and supports four major shared resource supercomputing centers (MSRCs) as well as several smaller, special-purpose distributed supercomputing centers (DCs). These centers directly support the DoD S&T and T&E laboratories and test centers and are accessible to local and remote scientists and engineers via high-speed network access. Providing for the adaptation of broadband, widely used applications and algorithms to address S&T and T&E requirements, along with continued training of users as new system designs and concepts evolve, is an integral part of the program. The program pursues continuous interaction with the national HPC infrastructure, including academia, industry, and other government agencies to facilitate the sharing of knowledge, tools, and expertise.

The HPCP user base includes 4,320 Scientists and Engineers at over 100 sites (Department of Defense Laboratories and Test Centers, Academic Institutions and Commercial Businesses). The integrated HPC program consists of Shared Resource Centers; the Defense Research and Engineering Network; and Software Application Support. The MSRCs are responsible for as large a fraction of DoD`s S&T and T&E computational workload as feasible. These MSRCs provide extensive capabilities to address user requirements for hardware, software, and programming environments. A limited set of smaller shared resource centers, Distributed Centers (DCs), augment the MSRCs to form the total HPCP computational capability. Distributed Centers address critical HPC requirements that cannot be met at MSRCs, such as real-time, and near real-time computing requirements, and leverage significant HPC and mission expertise located at these remote sites. The MSRCs and DCs are currently interconnected with all S&T and T&E user sites via the Defense Research and Engineering Network (DREN). Additionally, the Software Application Support Initiative develops critical common DoD applications programs that run efficiently on advanced HPC systems technology, transitions activities with academic and commercial institutions, trains users, builds collaborative programming environment, and develops mechanisms to protect high value HPC application codes.

 True modernization of DoD`s HPC capability and fulfillment of the program's vision and goals requires an on-going program strategy that addresses all aspects of HPC. While advancing the level of hardware performance is critical to success, the higher objective is to enable better scientific research, test and evaluation environments, and technology development for superior weapons, warfighting, and related support systems. The goals of the HPCP are to:

- Provide the best commercially available high-end HPC capability.

- Acquire and develop joint-need HPC applications, software tools and programming environments.

- Educate and train DoD's scientists and engineers to effectively use advanced computational environments.

- Link users and computer sites via high-capacity networks, facilitating user access and distributed computing environments.

- Promote collaborative relationships among the DoD HPC community, the National HPC community and MSIs in network, computer and

computational science.

There are currently 8 distributed centers. In FY 2002 five existing centers were upgraded, and funding exists in the 2003 budget to upgrade or establish approximately four distributed centers. Currently supported distributed centers and their locations are as follows:

• Air Force Research Laboratory/ Information Directorate (AFRL/IF), Rome, NY
• Army High Performance Computing Research Center (AHPCRC), Minneapolis, MN
• Arnold Engineering Development Center (AEDC), Arnold AFB, TN
• Arctic Region Supercomputing Center (ARSC), Fairbanks, AK
• Maui High Performance Computing Center (MHPCC), Maui, HI
• Naval Air Warfare Center - Aircraft Division (NAWC-AD), Patuxent River NAS, MD
• Naval Research Laboratory (NRL-DC), Washington, DC
• Space and Missile Defense Command (SMDC), Huntsville, AL

The Defense Research and Engineering Network (DREN) provides wide area network (WAN) connectivity among the Department's S&T and T&E communities. The DREN is implemented through an Intersite Services Contract (DISC) originally awarded to American Telephone and Telegraph (AT&T) in FY 1996. This contract will transition to a follow-on provider (WORLDCOM) during the last quarter of FY 2002 and during FY2003. DREN currently provides services to sites throughout the continental United States, Alaska, Hawaii, and can be extended overseas where necessary. Minimal access is DS-3 (45 Mbps) with potential high-end access of OC-768 (40 Gbps) over the next 10 years. Current site connectivity ranges from DS-3 to OC-12 (622 Mbps. A Secret DREN using common Secret systems high key with NSA certified Type-1 encryptors that can transport classified traffic at OC-3 (155 Mbps) has also been deployed. DREN employs well-designed WAN security as well as strong server and user security to deploy leading-edge, Defense-In-Depth protection of DoD resources.

B. **Program Change Summary:**

	FY 2002	FY 2003	FY 2004	FY 2005
Previous President's Budget	183.524	188.642	189.073	190.266
Current FY2004 President's Budget	183.524	202.933	000.000	000.000
Total Adjustments		14.291	-189.073	-190.266
Congressional program reductions		-6.709		
Congressional rescissions				
Congressional increases		21.000		
Reprogrammings				
SBIR/STTR Transfer				
Other			-189.073	-190.266