

Program: Basic Research

Rating: Effective

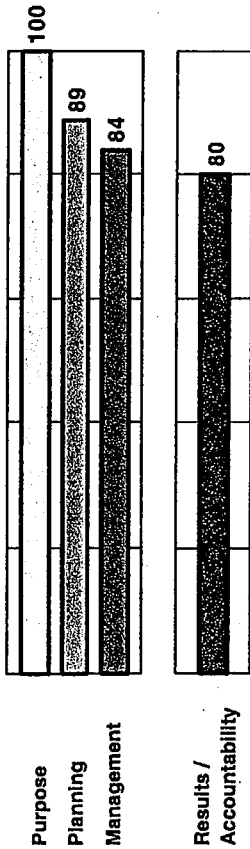
Program Type: Research and Development

Agency: Department of Defense--Military

Bureau: Research, Development, Test, and Evaluation

Program Summary:

The Basic Research program includes scientific study and experimentation to increase fundamental knowledge in the physical, engineering, environmental and life sciences and consists of a wide portfolio of projects. The program is carried out primarily through grants to universities and non-profits. The results of this research are expected to improve the country's defense capabilities, although the actual results of any specific project are unpredictable. Notable successes in the past have led to advances in satellite communications and imagery, precision navigation, stealth, night vision and technologies allowing greatly expanded battlefield awareness. Due to the long-term nature of research results, the R&D PART emphasizes assessment of the process of choosing funded projects and independent assessments of how well the research portfolio is managed.



- 0 100
- Results Achieved
 - Results Not Demonstrated
 - Measures Adequate
 - New Measures Needed

The assessment indicates that the basic research program has clear purposes of providing options for new weapons systems, helping prevent technological surprise by adversaries, and developing new scientists who will contribute to the DoD mission in the future. DoD can document--through its contracts and grants management regulations, public announcements of award competitions and results from independent review panels--the methodical management of its program. Additional findings include:

Key Performance Measures

Key Performance Measures	Year	Target	Actual
Certification in biennial reviews by technically competent independent reviewers that the supported work, as a portfolio, is of high quality, serves to advance the national security and is efficiently managed and carried out.	2003 and later	100%	
	2005	-50%	
Long-term Measure: Portion of funded research that is chosen on the basis of merit review Reduce non-merit-reviewed and -determined projects by one half in two years (from 6.0% to 3.0%)			

1. The grants/contract solicitation, review and award processes are competitive.
2. The program is reviewed regularly by technically capable outside reviewers, which recommend improvements they would like to be implemented. They indicate that the work is of overall high quality.
3. The program has competent planning and management.
4. Ear-marking of projects in the program has increased in the past decade and contribute less than the typical research project to meeting the agency's mission.

In response to these findings, the Administration will:

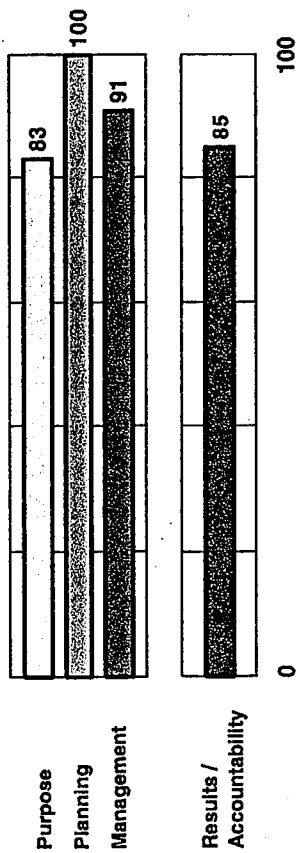
1. Continue to emphasize the use of independent review panels in assessing the performance of the program.
2. Work with the research community and Congress to explain the need to limit claims on research grant funds to proposals that independently can meet the standards of a strict merit-review process.

Program Funding Level (in millions of dollars)

2002 Actual	2003 Estimate	2004 Estimate
1,334	1,417	1,309

Program: Advanced Simulation and Computing (ASCI)

Agency: Department of Energy
 Bureau: National Nuclear Security Administration



- Results Achieved
- Results Not Demonstrated
- Measures Adequate
- New Measures Needed

Key Performance Measures

Year	Target	Actual
2009	2009	
2000	10	10
2003	30	
2005	100	
2007	200	
2002	4	4
2004	10	
2006	17	
2008	28	

Rating: Effective

Program Type: Research and Development

Program Summary:

The Advanced Simulation and Computing program (ASCI) assesses whether our nuclear weapons stockpile is safe and ready, if necessary, for use. This must be done without detonating any of the weapons to see what happens to them as they age and as they are modified. Therefore, ASCI uses computer models and existing experimental data to understand the effect that aging and other changes to weapons will have on the warheads. Approximately one quarter of the program's funding is for hardware while the remaining three quarters of funding develops tools that support scientific experiments at the three NNSA weapons laboratories.

Overall, the program scores well because it has a clear purpose, is well managed, and has clear and measurable goals. Additional findings include:

1. For the most part, the program makes a unique contribution to this mission area and there does not appear to be any other viable alternative.
2. ASCI has specific goals that guide the program and inform its progress. While some of the annual goals are somewhat vague, they contribute to the long-term goal of simulating the performance of nuclear weapons.
3. A possible area of concern with the ASCI program is that the focus of the program not be diverted to other, non-weapons related work. Furthermore, the program should focus on using its resources to the maximum extent possible without developing redundancy in the three weapons laboratories.

In response to these findings, the Administration will ensure that planned growth in the program meets requirements specifically related to the weapons stockpile and does not develop unneeded redundancy.

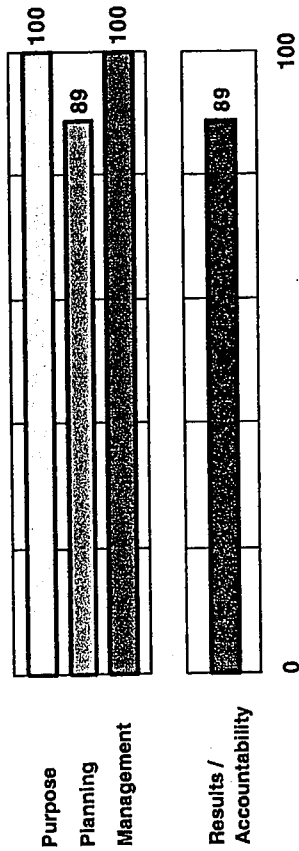
(For more information on this program, please see the Department of Energy chapter in the Budget volume.)

Program Funding Level (in millions of dollars)

2002 Actual	2003 Estimate	2004 Estimate
704	725	751

Program: Mars Exploration

Agency: National Aeronautics and Space Administration
 Bureau: National Aeronautics and Space Administration



- Results Achieved
- Results Not Demonstrated
- Measures Adequate
- New Measures Needed

Key Performance Measures

Key Performance Measure	Year	Target	Actual
Long-term Measure: Determine if life exists or has ever existed on Mars by: 1) exploring a high priority site on the Martian surface for definitive signs of organic molecules, and 2) mapping potential biosignatures from Mars orbit and the Martian surface (New measure)	2011	2 milestones	
	2002	<+10%	-1% to +14%
	2003	<+10%	
	2004	<+10%	
Annual Measure: Percentage cost overrun on spacecraft missions	2002	>75%	70%
	2003	>75%	
	2004	>75%	

Rating: Effective

Program Type: Research and Development

Program Summary:

The Mars Exploration Program (MEP) conducts scientific exploration of the planet Mars, focusing on the search for water and evidence of life. MEP develops technologies, builds, launches, and operates robotic spacecraft, and performs research to better understand Mars and its past and present potential for life.

This assessment indicates that the MEP is a very well-defined and focused program that ties directly to NASA's mission. In the late 1990s, the MEP lost two spacecraft to mission failures. This assessment indicates that the MEP has recovered well since that time and is yielding quality science results today.

Additional findings include:

- The success of the next mission to Mars, the Mars Exploration Rovers (MERs), is important to validating NASA's revamped Mars program strategy.
- Scientific and educational returns could be increased many-fold if new communications technologies, such as optical communications, were used by the MEP.

3. Advance planning for the next decade of Mars missions is important to understanding what technologies the MEP should be investing in this decade.

4. Large Mars missions must be planned carefully as they can cost two to five times as much as smaller Mars missions.

5. Although annual MEP performance measures quantify program inputs and outputs, long-term MEP performance lacks quantifiable measures of program outputs and outcomes. R&D programs like MEP have historically experienced difficulty quantifying long-term outcomes because scientific discoveries are hard to predict.

In response to these findings, the Administration will:

- Demonstrate new optical communications technology critical to future, high data rate, deep space communications. This demonstration will focus on the 2009 Mars Mobile Laboratory mission.
- Develop options for the next decade of Mars missions, including both large and small missions, to help guide MEP technology investments in future budgets.
- Develop long-term, quantitative, outcome oriented performance measures.

[For more information on this program, please see the National Aeronautics and Space Administration chapter in the Budget volume. 2004 estimate reflects NASA's change to full cost budgeting and is not directly comparable with prior years.]

Program Funding Level (in millions of dollars)

2002 Actual	2003 Estimate	2004 Estimate
457	496	570