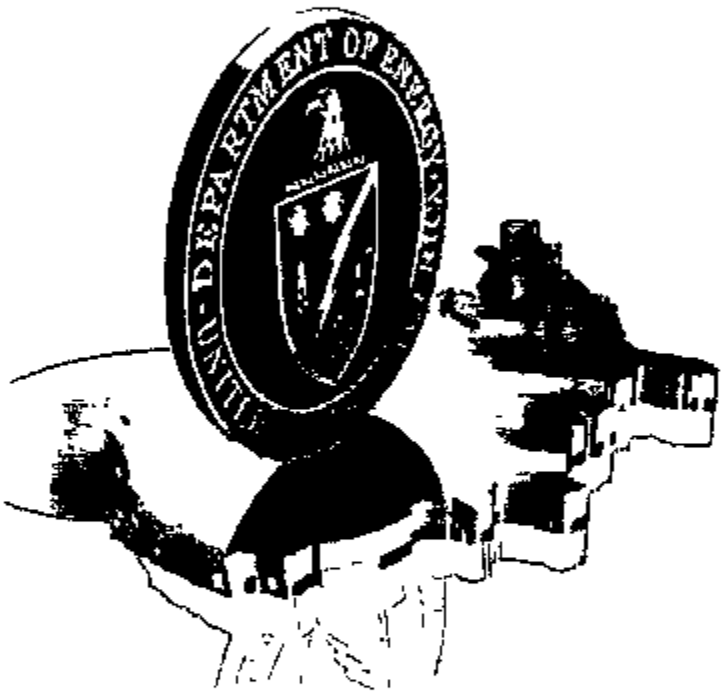
DOE/CR-0067

U.S. Department of Energy



Fiscal Year 1998
Accountability Report

U.S. Department of Energy

Fiscal Year 1998
Accountability Report

DOE is interested in the comments and suggestions of those who read this document. The Reader Response Sheet at the end of this document is designed to provide information on ways to improve this report and make it more useful to you, our valued customer. Please take a few minutes to complete the response sheet and forward it as indicated.

More information relating to the Department of Energy is available on our home page at **www.doe.gov**

February 1999

Contents

Message from the Secretary

The Clinton Administration is committed to increasing government accountability to the American taxpayer. This report, the Department of Energy's first Accountability Report, is part of our effort to better measure how we at the Department of Energy are serving the American taxpayers; the results we've achieved; and the cost-effectiveness of our work. By integrating the Department's FY 1998 performance results, financial status, and management controls, this report is a useful tool and provides a status report on the Department's performance in FY 1998. It presents a clearer picture of the return on the investment of the resources entrusted to this agency.

After thorough review by the Office of the Inspector General, with one exception, our financial statements have been found to present fairly the financial position of the Department in conformity with Federal accounting standards. Overall, the Department has reasonable assurance that we have management controls in place to ensure that our operational activities are efficient and effective and comply with the law. We have identified ten challenges where management controls can be strengthened.

The exception identified by the Inspector General is in the estimate of our environmental liabilities. The Department's work to address the environmental consequences of the nuclear weapons mission is recognized as the largest remediation program of its kind ever undertaken. With regard to our efforts to provide detailed estimates and schedules for each of our 353 cleanup projects, the Office of Inspector General said "the Department deserves much credit for its efforts; however, additional improvements are needed." I take this finding seriously and have directed the Acting Assistant Secretary for Environmental Management to put a system in place by June 30, 1999, to ensure our environmental liability estimates are adequately supported, completed and updated. I have also asked the Office of Inspector General to conduct a second review in July of representative environmental projects to ensure the accuracy and completeness of the environmental remediation liability estimates to ensure that this problem gets corrected. This will be conducted in addition to the audit of the Department's FY 1999 financial statement.

The Clinton Administration continues to work to make a Federal government that works better and costs less. This report will help guide our efforts to increase accountability and performance in the coming year.

Bill Richardson

Bill Richardson

Overview

Introduction

The Department of Energy (DOE) serves the Nation by providing innovative science and technology solutions to some of the foremost energy, national security, environmental, and scientific challenges facing America.

A successful comprehensive energy strategy ensures that clean, secure, affordable energy supplies are available to all Americans. Our Nation's economic prosperity depends on the abundance of energy resources, and a clean environment is dependent upon energy efficiency and clean production technologies. The Department's role in the U.S. energy outlook is to facilitate the efficient transition to a long-term pattern of energy supply and use that is consistent with the Nation's goals of national security, environmental responsibility, and economic prosperity.

The Department of Energy and its predecessor agencies have long played a critical role in the United States national security mission. From the cutting-edge atomic energy research and developments of the earliest days of the Manhattan Project to the stockpile stewardship and international nonproliferation efforts, DOE's activities in coordination with the Department of Defense and other agencies with a national security mission have ensured we live in a safe and secure world.

We have witnessed profound change in the United States national security policies in the post-Cold War era, but our commitment to a secure national defense remains as strong as ever. The Department of Energy and its predecessor agencies have played a key role over the past 50 years in supporting our national security through emphasis on a strong nuclear deterrent. Our focus has shifted dramatically in the last decade, however, as new and evolving geopolitical factors continue to change and redefine the world in which we live. We no longer face the threats we did during the Cold War. Instead, new threats to our national security exist; threats that pose an equal, and in some instances greater, level of danger to global security as those before.

Perhaps the greatest challenge that has faced the Department of Energy this decade is the monumental task of cleaning sites across the Nation that supported the research, production, and testing of nuclear weapons. Our nuclear deterrent has proved successful, but at a significant price to the environment. While it is a daunting challenge, minimizing the environmental risks posed by more than 50 years of operating weapons-related facilities is also one of our greatest commitments.

Science and technology have evolved as the core of virtually every mission-related activity the Department of Energy undertakes, from the study of global climate change to advancing nuclear nonproliferation worldwide. Although the Cold War has left a legacy of environmental risks and continued threats to our national security, it has also produced a legacy of world-class scientific and technological accomplishments.

The Department's science and technology-related endeavors have fostered much of our Nation's economic prosperity over the past half century. We anticipate our role in promoting economic growth will continue as science and technology continue to be an integral component of the global economy.

Our History

The Department of Energy was created as a cabinet-level agency in 1977; yet, its history can be traced back to the days of the Manhattan Project in 1942, when security requirements led to the establishment of the Manhattan Engineering District, under the U.S. Army Corps of Engineers, to manage the development of the first atomic bomb. After World War II, with atomic weapons a new reality, Congress created the Atomic Energy Commission (AEC) in 1946 to direct the design, development, and production of nuclear weapons. The AEC's mission also encompassed the development of nuclear reactors, initiation of the commercialization of nuclear power, and regulation of the growing industry.

In 1975, Congress replaced the AEC with two separate agencies: the Nuclear Regulatory Commission, which was assigned the licensing and regulatory functions of the abolished AEC, and the Energy Research and Development Administration, created to manage the nuclear weapons, naval reactors, and energy development programs, as well as to research the environmental and safety aspects of energy technologies. During this period, the United States found itself faced with an energy crisis, emphasizing the need for one cabinet-level department to

coordinate all Federal energy policy and programs. Congress passed legislation to create the Department of Energy in October 1977, bringing together many important functions under one agency. Today, the Department manages a vast array of energy programs and a nationwide complex including headquarters organizations, operations offices, field offices, national laboratories, power marketing administrations, special purpose offices, and sites now dedicated to environmental cleanup.

Our Mission and Vision

The Department of Energy mission is:

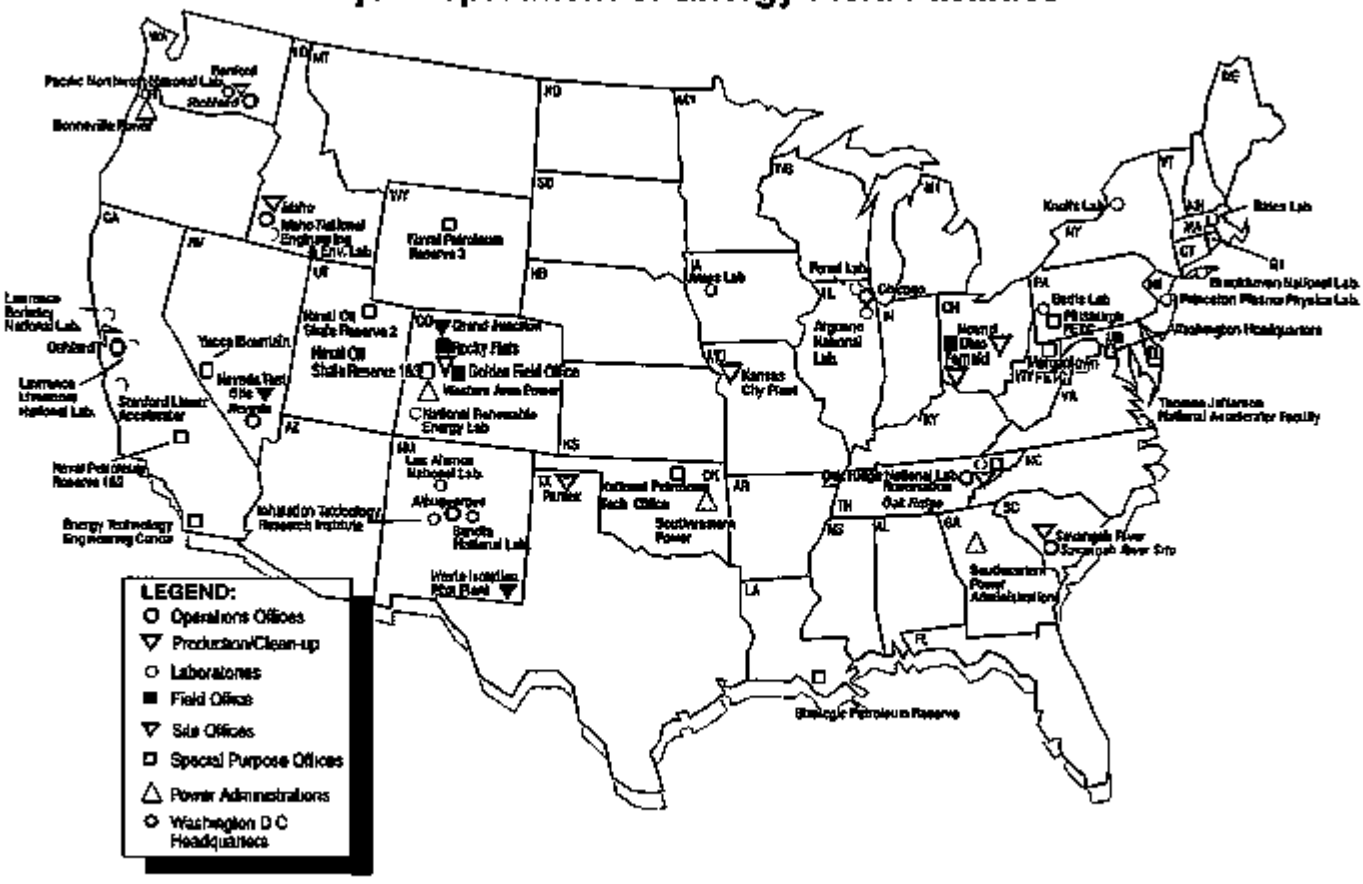
To foster a secure and reliable energy system that is environmentally and economically sustainable, to be a responsible steward of the Nation's nuclear weapons, to clean up our own facilities and to support continued United States leadership in science and technology.

We aspire to achieve the following vision:

The Department of Energy, through its leadership in science and technology, will continue to advance U.S. energy, environmental, economic, and national security by being:

- *A key contributor to ensure that the United States has a flexible, clean, efficient, and equitable system of energy supply and end-use with minimal vulnerability to disruption;*
- *A vital contributor to reducing the global nuclear danger through its national security, nuclear safety, and nonproliferation activities;*
- *A world leader in environmental restoration, nuclear materials stabilization, waste management, facilities decommissioning, and pollution prevention;*
- *A major partner in world class science and technology through its National Laboratories, research centers, university research, and its educational and information dissemination programs; and*
- *A safe and rewarding workplace that is recognized for business excellence, nurtures creativity, is trusted, and delivers results.*

Major Department of Energy Field Facilities



Since the publication of the Department of Energy's first Strategic Plan in April 1994, our activities have been conducted within a framework and vision for accomplishing our overall agency mission. In FY 1997, the Department undertook a planning effort to produce a new Strategic Plan to take us into the 21st century. This plan also meets the requirements of the Government Performance and Results Act. The updated plan, released on September 30, 1997, was significantly improved through a very close consultation process with Congress, our customers, and our stakeholders. Based on the plan, the Department began conducting its activities in 1998 within a new framework of four business lines and a corporate management function, each with a strategic goal:

Energy Resources: Encourage efficiency and advance alternative and renewable energy technologies; increase energy choices for all consumers; ensure adequate supplies of clean, conventional energy; and reduce U.S. vulnerability to external events.

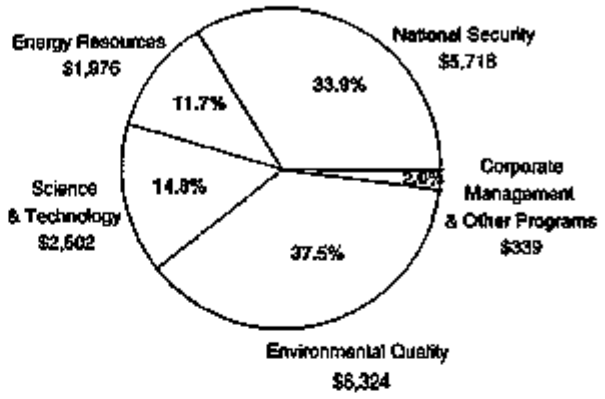
National Security: Support and maintain the safety and reliability of the enduring nuclear stockpile without nuclear testing; safely dismantle and dispose of excess weapons; and provide the technical leadership for national and global nonproliferation activities.

Environmental Quality: Reduce the environmental, safety, and health risks and threats from DOE facilities and develop the technologies and institutions required for solving domestic and global environmental problems.

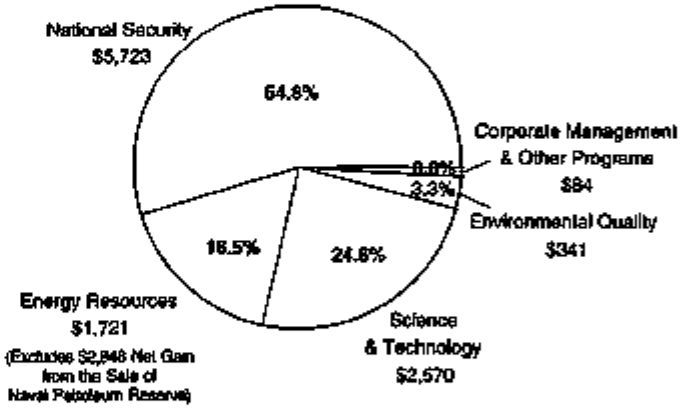
Science and Technology: Use the unique resources of the laboratories and the country's universities to maintain U.S. leadership in basic research; increasingly focus applied research to support the Department's other business lines; and maintain world technical leadership through long-term, systemic reform of science and mathematics education.

Our Resources

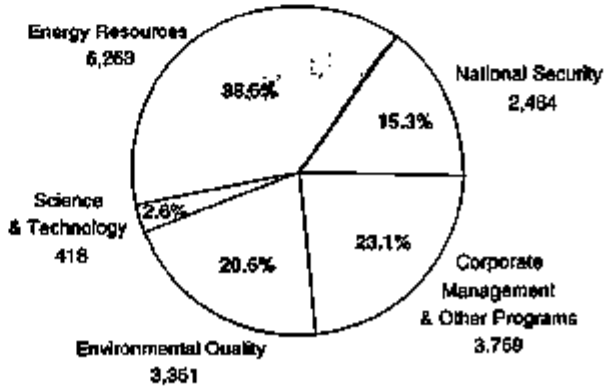
FY 1998 Budget by Business Line
(Dollars in Millions)
Total: $16,859



FY 1998 Operational Net Costs by Business Line
(Dollars in Millions)
Total: $10,439



FY 1998 Number of Federal Employees
(As Represented by Full-Time Equivalents - FTEs)
Total: 16,275



Note: The costs shown in this report differ from budgeted amounts due to items such as: environmental cleanup costs that are not included in current year because they were accrued in prior years with the environmental liabilities; expenditures for large acquisitions that are recorded as assets, not costs; depreciation and other costs that do not require funds; and the allocation of overhead to business lines.

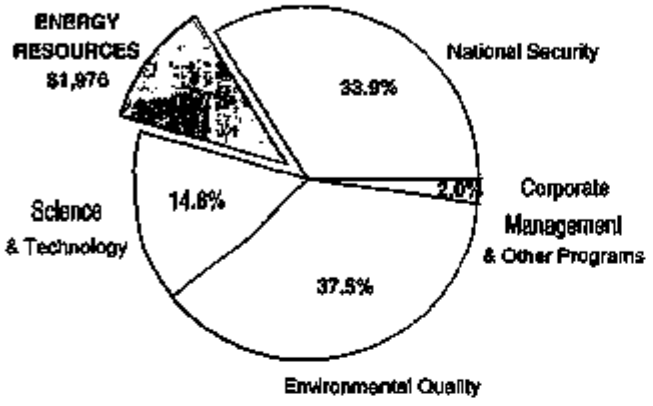
Corporate Management: We recognized, through our strategic planning process, that a streamlined Department required the key elements of successful business practices. Determining how we conduct our business is as essential to our success as determining the missions themselves. These elements are critical to our success and support every business line: environment, safety and health; communication and trust; and good management practices.

Report Background

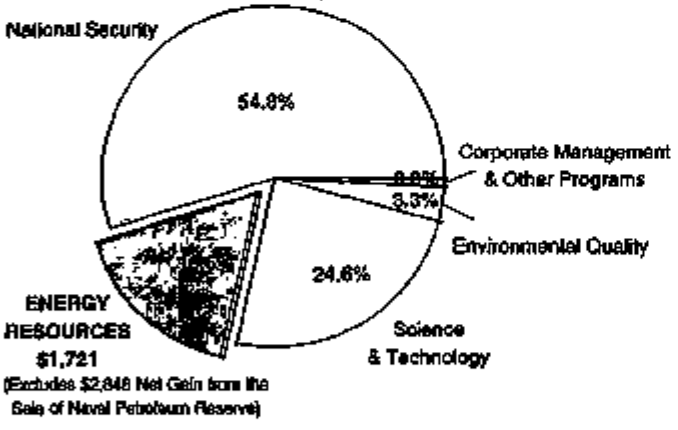
In the past few years, the President and the Congress have enacted laws and policies to reform management throughout the government. Paramount among these is the Government Performance and Results Act of 1993, which requires agencies to consider program outcomes, establish measurable annual performance goals that link to long-term goals, develop budgets based on planned performance, and report results. Other laws, such as the Chief Financial Officers Act of 1990, Government Management Reform Act of 1994, and the Clinger-Cohen Act of 1996, call for additional management activities and reports. This document meets these new reporting requirements as well as the previous reporting requirements of the Department of Energy Organization Act of 1977 and the Federal Managers' Financial Integrity Act of 1982.

Energy Resources

FY 1998 Budget by Business Line
(Dollars in Millions)
Total: $16,659



FY 1998 Energy Resources Operational Net Costs
(Dollars in Millions)
Total: $10,439



FY 1998 Energy Resources Number of Federal Employees
(As Represented by Full Time Equivalents - FTEs)
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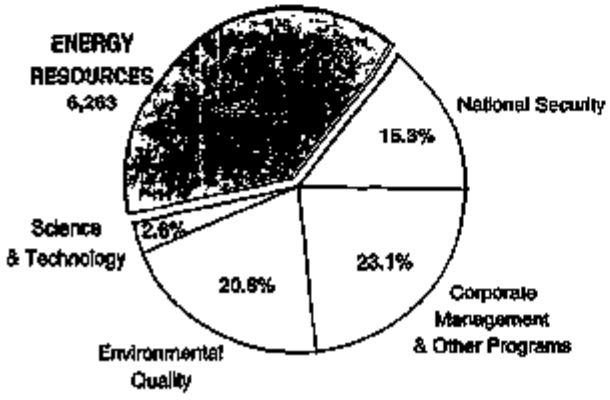


A successful comprehensive energy strategy ensures that clean, secure, affordable energy supplies are available to all Americans. Our Nation's economic prosperity depends on the abundance of energy resources, and a clean environment is dependent upon energy efficiency and clean production technologies. The Department's role in the U.S. energy strategy is to facilitate the efficient transition to a long-term pattern of energy supply and use that is consistent with the Nation's goals of national security, environmental responsibility, and economic prosperity.

In 1997, the Department of Energy developed the following strategic goal for its energy resources business line as part of the Strategic Plan:

ER GOAL: The Department of Energy and its partners promote secure, competitive, and environmentally responsible energy systems that serve the needs of the public.

The Strategic Plan also outlined the following five objectives to support the achievement of our strategic goal described above:

ER1:	Reduce the vulnerability of the U.S. economy to disruptions in energy supplies.
ER2:	Ensure that a competitive electricity generation industry is in place that can deliver adequate and affordable supplies with reduced environmental impact.
ER3:	Increase the efficiency and productivity of energy use, while limiting environmental impacts.
ER4:	Support U.S. energy, environmental, and economic interests in global markets.
ER5:	Carry out information collection, analysis, and research that will facilitate development of informed positions on long-term energy supply and use alternatives.

To meet the five objectives described above and to accomplish the energy resources strategic goal, the Department developed and executed a Performance Agreement between the Secretary and the President for FY 1998.

The Performance Agreement included 19 commitments in support of the Energy Resources objectives of the Strategic Plan and 46 measures associated with them. The Department was fully successful in meeting nine of these commitments and successful in 10 commitments. Our performance in meeting each objective, based on the results against the Performance Agreement, follows. More detailed data is contained in the supplemental information at the back of this report.

ER 1: Reduce the vulnerability of the U.S. economy to disruptions in energy supplies.

The Department is pursuing several strategies to reduce U.S. vulnerability to energy supply disruptions. One is to support research and development policies and improved regulatory practices that can lead to improved utilization of our domestic petroleum resources, and minimize our reliance on foreign supplies and potential disruptions due to economic and political factors. The Department took many actions in FY 1998 to boost the Nation's production of domestic oil, which has been on the decline. The goal is to end the decline in domestic oil production before 2005 through research and development, policy changes, and favorable regulatory practices.

In the technology area, DOE developed and transferred six new characterization technologies, as planned, and demonstrated five advanced production enhancement technologies to the oil industry, adding 17 million barrels of reserves in FY 1998 and we expected to reach the planned goal of 27 million barrels by FY 2002.

In the regulatory area, the Department completed work in four States to provide the capability to establish variances for oil and gas injection wells in areas of low environmental risk. In addition, risk-based data management systems for improved regulatory decision-making were implemented in 12 States. These data management systems will help reduce cumulative industry compliance costs by $16 billion by 2010.

The Strategic Petroleum Reserve continued to serve as a key component of our energy security strategy. In FY 1998, facing a gas-in-oil impediment to the rated drawdown capability, the Department degassed 13 million barrels of oil that had higher-than-normal gas content, two million more than originally planned. This action completed the year's oil degassification effort ahead of schedule, bringing the total amount degassed to 172 million barrels. In addition, in FY 1998, the planned work on the life extension program baseline was completed, bringing total execution of the $320 million program to 92 percent.

Declining Oil Import Protection

Emerging Issue

The United States is bound by treaty to maintain strategic inventories of petroleum, either Government or privately held, equivalent to 90 days of net imports. In direct response to the OPEC oil embargo of 1973-74, we built the Strategic Petroleum Reserve and acquired as much as 592 million barrels of oil. It is the only contingency program, outside of military response, that the United States has to respond to international energy supply disruptions. However, in recent years, the import protection provided by the Reserve has dropped. Imports have risen, oil purchases for the Reserve were discontinued, and as part of budget- balancing efforts, Congress directed us to sell oil in each of fiscal years 1996 and 1997. At the end of 1997, the oil in the Reserve equated to 63 days of imports, and that is projected to keep falling as imports increase and oil sales from the Reserve occur. Moreover, the protection afforded by private industry inventories, while substantial, is declining significantly.

The continuing decline in the number of days of net imports held in the Reserve could jeopardize our national energy security and the U.S. ability to meet its treaty obligations. While the U.S. can rely on privately held stocks to satisfy its treaty obligation, the Reserve is the only direct deterrent to politically motivated disruptions. U.S. international leadership in this area and the deterrent effect of the Reserve depend upon our maintaining the Reserve of Government-held stocks at the 90-day net import level.

In light of the current market conditions of cheap, plentiful oil, it appears that the U.S. economy is in good position to continue to grow. However, the nation is still quite vulnerable to energy supply disruptions. The Department made great strides in mitigating the potential impacts of such disruptions. Management considers that our efforts in meeting objective ER 1 were successful.

ER 2: Ensure that a competitive electricity generation industry is in place that can deliver adequate and affordable supplies with reduced environmental impact.

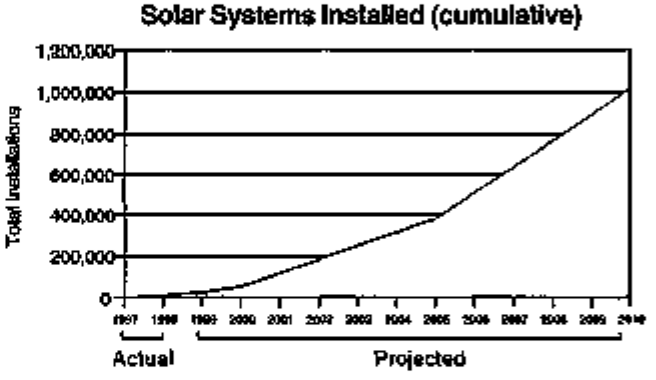
The U.S. is entering a time of tremendous change in the area of electricity generation. During the next decade, our citizens will begin to experience a competitive electricity generation market, in parallel with increased awareness of environmental impacts of electricity generation, and increased choice of alternative energy supplies such as natural gas. With all of these factors altering the business environment for the electricity generation market, industry will mobilize many resources to educate consumers on all parts of this complex infrastructure. These efforts will result in increased awareness by consumers, and market forces will dictate the energy options of choice. In this environment, "clean" energy generation such as natural gas, nuclear power, and renewables may assume a higher profile role. The Department is working to ensure that the options that benefit the nation, as a whole, are available for consumer choice.

The Department believes promoting energy security requires increased investments in a wide range of energy technology developments, including renewable technologies. One of the Department's strategies is to develop renewable technologies and support policies capable of doubling non-hydroelectric renewable energy generating capacity by 2010.

The Federal government is leading the way in the use of renewable energy technologies through the Federal Energy Management Program (FEMP). DOE has increased the use of these technologies through the completion of government-wide solar technology Super-Energy Savings Performance Contracts. In addition, FEMP completed assessments of renewable energy potential at 13 sites and has in progress six model delivery orders integrating cost-effective solar technology and energy efficiency.

DOE is also promoting the use of renewable domestic energy through the U.S. retail market. In FY 1998, two U.S. manufacturing facilities, Solar Cells Inc. of Toledo, Ohio, and BP Solar of Fairfield, California, began the process of introducing commercial cadmium telluride large area photovoltaic modules. The modules are installed in several demonstration projects, which is a very important milestone in the use of photovoltaic technology.

In FY 1998, the Department continued implementation, in coordination with industry and other partners, of the President's Million Solar Roofs Initiative. The Federal government alone has already committed to installing 20,000 solar energy systems on Federal buildings by 2010. In addition, DOE established nine State and Community Partnerships as part of the initiative in FY 1998, which have developed preliminary plans to install over 500,000 solar energy systems.



To promote the development of clean power plants to supplement the Nation's electrical capacity and reduce costs, DOE continued several successful elements of the Clean Coal Technology Demonstration Program. The Department initiated the construction of a coal-fired diesel engine project for small utility and industrial applications. In addition, the operations of a processing facility producing a coal product fuel with a sulfur content as low as 0.3 percent and heating value up to 12,000 Btu/lb was completed. The goal is to significantly reduce emissions from current and new fossil fuel plants by 2010.

In the nuclear area, the goal is to improve the operation and extend the useful life of existing nuclear power plants and maintain nuclear power as a viable option for the future. Through the use of advanced electronics, the nuclear industry should see continued improvement in the availability of existing plants from the 1996 average of 76 percent to 85 percent over the next decade. In FY 1998, the Department worked with industry to

facilitate Nuclear Regulatory Commission final approval of the Westinghouse AP600 design for a passively safe nuclear reactor.

Management considers the Department successfully on track toward meeting this strategic objective.

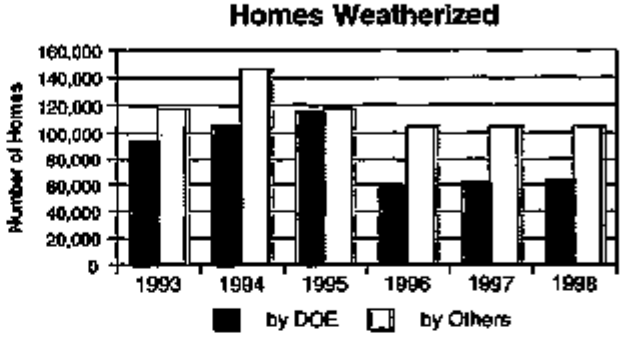
ER 3: Increase the efficiency and productivity of energy use, while limiting environmental impacts.

The Department's activities to increase the efficiency and productivity of energy use, with minimal impact to the environment, span a wide range of energy consumption, including transportation, buildings, and manufacturing.

The "vehicles of the future" campaign is on track to develop and deploy vehicles, fuels, and systems to improve energy efficiency in the transportation sector. This program contributes to the Administration's Partnership for a New Generation of Vehicles to develop, by 2004, prototype mid-sized cars capable of 80 miles per gallon of gasoline. These cars will reduce NOx and CO_2 emissions by two-thirds compared to today's new car average without compromising safety, comfort or cost. Other clean transportation technologies include fuel-cell powered vehicles. In FY 1998, the Department achieved 50 percent fuel efficiency at full power in laboratory validation tests on hydrogen-fueled full-scale proton exchange membrane fuel cell propulsion systems.

In the most energy intensive industries, the goal is to reduce industrial energy use per unit of output by 25 percent by 2010. These energy intensive industries include aluminum, chemical, forest products, glass, metal- casting, and steel production. The Department's efforts involve industry/ government/academia partnerships in research and development. In FY 1998, DOE supported 30 Industrial Assessment Centers' work at 30 participating universities. These Centers conducted more than 725 combined energy, waste, and productivity assessments. The Department also developed roadmaps that will drive our research and development portfolio for five of the most energy intensive industries.

In the buildings sector, the goal is to improve the energy efficiency of the existing U.S. building stock and increase the efficiency of new homes by 30 percent and other new buildings by 20 percent, compared to 1996 averages. In FY 1998, DOE with its industrial partners completed construction of 300 energy efficient homes. The homes were designed to save 50 percent of energy use for heating, cooling, and hot water at no incremental costs.



The Department added 55 new community partnerships to our Rebuild America program, which now has community partnerships in 47 States and three U.S. territories. The ENERGY STAR program was expanded to include windows in the portfolio of energy efficient products. DOE signed three appliance manufacturers and 20 window and glass manufacturers to label and promote Energy Star products. The number of stores labeling Energy Star appliances doubled in FY 1998, when DOE signed a major retailer buyers group representing over 1,200 stores nationwide.

Based on the Department's focused approach and the increased public awareness of energy efficiency, the Nation is moving forward to becoming an efficient energy user. The Department's commitments in meeting Objective ER 3 were successfully fulfilled in FY 1998.

ER 4: Support U.S. energy, environmental, and economic interests in global markets.

The Department's efforts in FY 1998 to support U.S. interests in global markets have proven successful. To plan for energy-related greenhouse gas reductions, the Department developed and assessed options for implementing the new international agreement proposed at the Kyoto Conference of the Parties to the U.N. Framework Convention on Climate Change. The Department maintained partnerships with more than 650 electric utilities through the Climate Challenge program. These utilities are now on target to deliver a total pledged amount of 47 million metric tons of voluntary greenhouse gas reductions in the year 2000.

In the international arena in FY 1998, the Department led the efforts to cooperate with foreign governments to remove policy, regulatory, and fiscal barriers to U.S. companies in energy efficiency, renewables, oil and gas, clean coal, and nuclear energy markets. The Department also continued coordination of the Russian-American Fuel Cell Consortium to open the Russian markets to U.S. manufactured fuel cells.

Management considers agency efforts to support energy, environmental, and economic interests abroad were successful in FY 1998.

ER 5: Carry out information collection, analysis, and research that will facilitate development of informed positions on long-term energy supply and use alternatives.

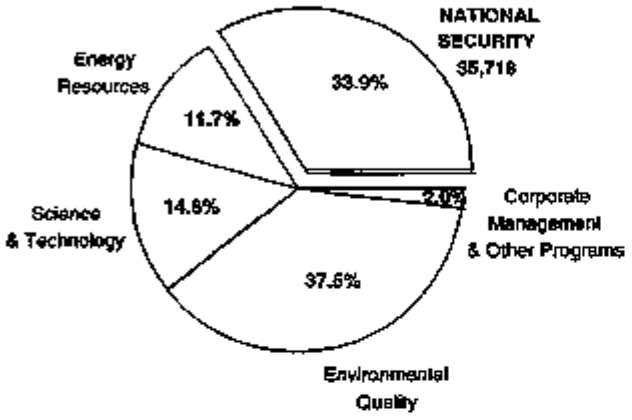
The most effective decision-making on long-term energy supply and use alternatives can only be performed with appropriate information. The Department's expertise in energy information must be shared with our stakeholders to assist in making decisions. As part of its continuing effort to expand public access to energy data, forecasts, analysis, and education material, the Department promised to achieve an average of 85,200 unique monthly users to its Energy Resources Board Web Sites. FY 1998 results indicated this goal was exceeded by nearly threefold. In addition, the Department committed to continue to publish its "Annual Energy Outlook" in December 1997, which presents midterm forecasts of energy supply, demand, and prices through 2020 based on results from our National Energy Modeling System.

In addition, the Department completed several activities for the production of the Comprehensive National Energy Strategy (CNES). A Departmental group was formed under the leadership of the Energy Resources Board to create the CNES. This group was staffed by representatives from the participating programs. Comments were sought and received from the involved programs and other Federal agencies to produce an Administration-approved document for submission to Congress. The team held public hearings in three major cities to collect comments which were used to shape the Strategy. The final document was published in April 1998.

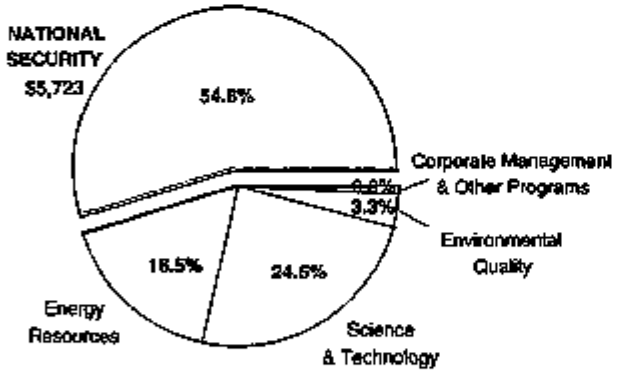
Given the changing landscape in energy production and usage, the collection, storage, and distribution of information has become even more critical than before. In this environment, the Department must lead in the efforts to cooperate, educate, and disseminate. Every area from power production to market deregulation to international climate protection will rise and fall based on the quality and availability of information. In this arena, the Department has been successful at leading the national and international community.

National Security

FY 1998 Budget by Business Line
(Dollars in Millions)
Total: $16,859



FY 1998 National Security Operational Net Costs
(Dollars in Millions)
Total: $10,439



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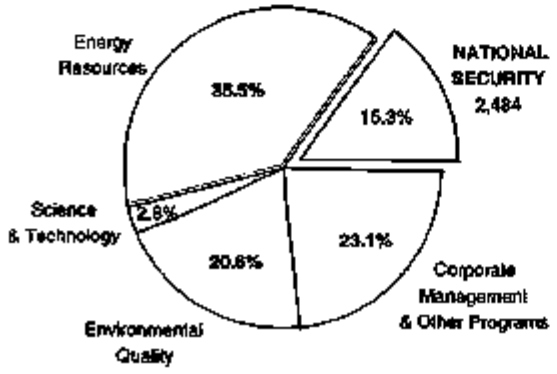


The Department of Energy and its predecessor agencies have long played a critical role in the United States national security mission. From the cutting-edge atomic energy research and developments of the earliest days of the Manhattan Project to the stewardship of the Nation's nuclear weapons stockpile and international nonproliferation efforts, DOE's activities in coordination with the Department of Defense and other agencies with a national security mission have helped to ensure that we live in a safe and secure world.

We have witnessed profound changes in the United States national security policies in the post-Cold War era, but our commitment to a secure national defense remains as strong as ever. The nuclear deterrent remains a cornerstone of our national security policy. However, the nuclear deterrent is represented by a smaller, aging weapons stockpile maintained without underground testing. Our stockpile stewardship programs are utilizing advances in science and technology to ensure the safety and reliability of the stockpile. International cooperative efforts improve the safety and minimize the risks of aging nuclear power plants in the nations of the former Soviet Union.

In 1997, the Department of Energy developed the following strategic goal for its National Security business line as part of the Strategic Plan:

> ***NS GOAL: Support national security, promote international nuclear safety, and reduce the global danger from weapons of mass destruction.***

The Strategic Plan also outlined the following seven objectives to support the achievement of our strategic goal described above:

NS1:	Maintain confidence in the safety, reliability, and performance of the nuclear weapons stockpile without nuclear testing.
NS2:	Replace nuclear testing with a science-based Stockpile Stewardship and Management Program.
NS3:	Ensure the vitality of DOE's national security enterprise.
NS4:	Reduce nuclear weapons stockpiles and the proliferation threat caused by the possible diversion of nuclear materials.
NS5:	Continue leadership in policy support and technology development for international arms control and nonproliferation efforts.
NS6:	Meet national security requirements for naval nuclear propulsion and for other advanced nuclear power systems.
NS7:	Improve international nuclear safety.

The Performance Agreement included 16 commitments in support of the seven National Security objectives of the Strategic Plan and 44 measures associated with them. The Department's performance was fully successful in meeting six of these commitments, successful in meeting seven commitments and partially successful in meeting only three commitments. Our performance in meeting each objective, based on the results against the Performance Agreement, follows. More detailed data is contained in the supplemental information at the back of this report.

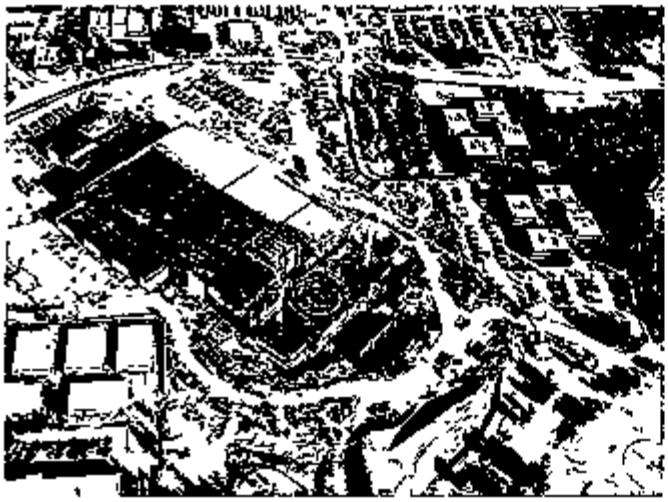
NS 1: Maintain Confidence in the Safety, Reliability, and Performance of the Nuclear Weapons Stockpile Without Nuclear Testing

In pursuit of the Comprehensive Test Ban Treaty, President Clinton directed the establishment of an annual review and certification process of the safety, reliability, and performance of the nuclear weapons stockpile. In FY 1998, the third annual certification process was initiated. The nine active and inactive weapons systems were reviewed by DOE's national weapons laboratories and joint Project Officers Groups led by the Department of Defense. Pre-decisional draft Annual Certification Technical Reports on each system were completed and final reports provided to the Secretaries of Energy and Defense in August 1998.

DOE's efforts in maintaining the nuclear stockpile include the alteration, modification, and surveillance of stockpile weapons. Surveillance is essential to assess the safety and reliability of the Nation's stockpile and includes tests on weapon components and flight tests of unarmed weapons to examine performance of the delivery systems. Alterations and modifications are conducted when surveillance activities indicate the need for updating weapons to meet higher safety standards, replace faulty components, or to meet changed military requirements. In FY 1998, DOE conducted weapons alterations of eight weapons systems and a modification of one system. We also conducted 40 flight tests; however, we are behind schedule on laboratory tests, conducting only 82 of the 100 scheduled. As of the end of the fiscal year, DOE was aggressively pursuing the completion of these tests.

In order to maintain confidence in the nuclear weapons stockpile, the Department of Energy has to address the issue of a reliable source of tritium, a radioactive isotope of hydrogen necessary for the proper function of all U.S. nuclear weapons. Since tritium decays at about five percent per year, it must be replaced in weapons to ensure their reliability. The U.S. has not produced new tritium for the past ten years and has used recycled tritium from dismantled weapons to meet stockpile requirements. Three years ago, DOE announced it would explore a dual track strategy to meet new tritium production requirements. This strategy included the possible purchase of an existing or partially complete commercial reactor or irradiation services therefrom or the construction of an accelerator. DOE completed a number of significant milestone activities on both tracks of the strategy and in December 1998 made a decision selecting irradiation services from an existing light water reactor as the primary source of tritium. Consistent with our dual strategy, the accelerator option has been designated a "backup" technology.

Management considers that this objective was met successfully.



National Ignition Facility

NS 2: Replace Nuclear Testing with a Science-Based Stockpile Stewardship and Management Program

Since the United States stopped nuclear testing in 1992, the Department of Energy has been working on replacing underground testing with a science-based program of stockpile stewardship. The Accelerated Strategic Computing Initiative is a program being developed to help maintain our existing aging stockpile through advanced simulation and modeling. In FY 1997, a major milestone was achieved with the installation of a one-trillion operations per second computer system. In 1998, DOE developed a three-trillion operations per second computer system which will provide weapons simulations that are larger and more complex than ever before. DOE's objective is to have a 100 trillion operations per second capability in place by 2004.

The National Ignition Facility, an experimental physics facility, is now under construction at the Lawrence Livermore National Laboratory in California. This facility will enable scientists to achieve the highest possible temperatures and densities attainable in a laboratory, simulating those that occur in the detonation of a nuclear weapon. Completion of the new facility, which was on schedule and on cost at the end of FY 1998, is planned for October 2003 although the first experiments are expected to be conducted in the facility by 2001. Project activities in FY 1998 included final site preparation, the award of two building construction contracts, and the establishment of manufacturing capacity at optic vendors.

Subcritical experiments are providing an improved understanding of certain dynamic material properties of plutonium, the fissile material in most nuclear weapons primaries, and are considered essential for assessing nuclear warhead reliability and safety in the absence of nuclear testing. These experiments also make a significant contribution to maintaining nuclear testing readiness. Only two experiments were conducted in FY 1998 although extensive preparatory work was completed for additional experiments expected to be executed early in FY 1999.

Management considers the Department successfully on track toward meeting this strategic objective.

NS 3: Ensure the Vitality of DOE's National Security Enterprise

Meeting national security requirements in this post Cold-War era has required the Department to reevaluate its nuclear weapons complex. Downsizing and modernization activities at several DOE sites will ensure that the U.S. maintains an appropriately-sized, cost-effective, safe, secure, and environmentally sound national security enterprise. Two key activities were underway in FY 1998. The first, the reestablishment of the Pit Production Program at the Los Alamos National Laboratory, is on schedule, and in February 1998, the first early development unit pit was successfully produced. A certified war reserve W88 pit is scheduled to be available in FY 2000 to meet DoD requirements. The second activity, the resumption of Enriched Uranium Operations at the Y-12 Plant in Oak Ridge, began in FY 1997. Scheduled activities in FY 1998 were partially delayed until FY 1999 when the final phase of the resumption is expected to be completed.

Counterintelligence

Emerging Issue

In 1998, President Clinton mandated immediate and significant changes to the Department's Counterintelligence Program. This mandate was the result of over half a dozen substantive studies critical of the Department's policies and procedures for handling foreign national presence at the national laboratories and our measures to counter the threats posed by these visitors. In response to the President's mandate, the Department created an independent Office of Counterintelligence and launched a major initiative to enhance the protection of sensitive technologies against foreign intelligence

and terrorist attempts to acquire nuclear secrets and other sensitive information from DOE laboratories. A 90-Day study conducted in FY 1998 resulted in a classified report with major findings and recommendations focused on:

1) *accountability of laboratory directors for counterintelligence activities at their locations;*
2) *organization and management of the counterintelligence program;*
3) *security programs that support the counterintelligence mission;*
4) *weaknesses related to foreign visits and assignments;*
5) *the counterintelligence-cyber threat; and*
6) *FBI and intelligence community relationships.*

The Department has delivered an action plan to the Assistant to the President for National Security Affairs that commits to achieving significant improvements in its counterintelligence program by adopting virtually all of the report recommendations.

Maintaining the capability to resume nuclear testing, consistent with Presidential direction, requires DOE to maintain test facilities and equipment at the Nevada Test Site and the nuclear testing skills of personnel at both the test site and the nuclear weapons laboratories. Subcritical experiments, two of which were conducted this year at the Nevada Test Site, and specially designed test readiness exercises maintain test readiness skills. In September 1998, a major exercise, that simulated a mass venting of an underground nuclear test at the site, exercised emergency response systems that could be needed during a nuclear test. Hundreds of experiments were conducted at weapons laboratory facilities during the year which exercised testing related skills and technologies.

The Department's Emergency Response program provides a national capability to respond to any radiological emergency or nuclear accident within the United States and abroad. During FY 1998, DOE radiological emergency response assets participated in 32 U.S. and Overseas exercises and 17 real-world events. Radiation accident management training was provided to 399 health professionals, and there was response to 224 calls for medical assistance.

Management considers our efforts in meeting objective NS3 to be on track.

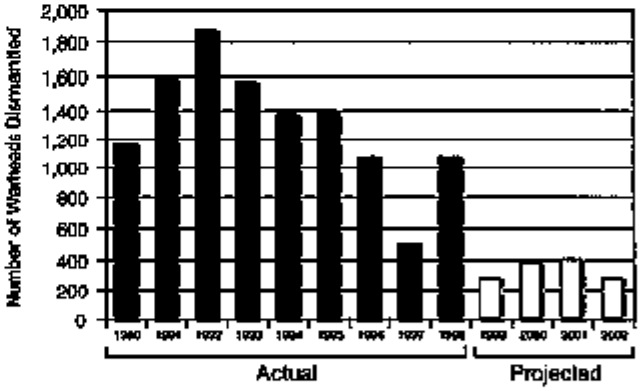
NS 4: Reduce Nuclear Weapons Stockpiles and the Proliferation Threat Caused by the Possible Diversion of Nuclear Materials

The Department takes an active role in reducing the global danger from weapons of mass destruction by reducing inventories of surplus weapons-usable fissile materials worldwide. Such efforts entail reducing our own weapons stockpile as well as international cooperation to dispose of surplus fissile materials, place excess materials under safeguards of the International Atomic Energy Agency, and reduce the demand for highly enriched uranium in civilian programs.

Since 1993, the U.S. has dismantled a total of 6,942 nuclear warheads that have been removed from the U.S. nuclear weapons stockpile. During FY 1998, 1,062 nuclear warheads were dismantled, meeting our detailed dismantlement schedules in a safe and secure manner.

On the international front, DOE has been working closely with Russia to dispose of surplus Russian plutonium that is a potential threat to global security. In

Dismantlement of Nuclear Warheads



FY 1998, 24 metric tons of Russian highly enriched uranium were converted to low enriched uranium under DOE monitoring. Monitoring trips to Russian facilities, where U.S. officials observed facility operations subject to our agreement with Russia, have been successful.

Surplus Fissile Materials

Departmental Challenge

The United States and Russia have extensive inventories of fissile nuclear materials that are no longer needed for defense purposes due to the end of the Cold War. A danger exists in the potential global proliferation of nuclear weapons and in the potential for environmental, safety and health consequences if surplus fissile nuclear materials are not properly managed. The Department could save storage, security, maintenance, and handling costs associated with these assets.

We are reducing our surplus fissile nuclear materials through various priority actions. In 1998, we made available to the United States Enrichment Corporation the first installment on 50 metric tons of surplus highly enriched uranium for down blending and subsequent sale. With regard to surplus plutonium, we are continuing to pursue a hybrid strategy that calls for immobilization of some plutonium in ceramic form and burning of some as mixed oxide fuel in existing, domestic commercial reactors. We will decide on the site(s) for disposition of our surplus plutonium in 1999. We are working with Russia to attain reciprocal actions for the disposition of Russian plutonium and will not construct new facilities for the disposition of United States plutonium unless there is significant progress with Russia on plans for plutonium disposition.

DOE successfully completed irradiation of the advanced low enriched uranium fuel test assembly at the Advanced Test Reactor. The development of alternative low enriched uranium fuels for research reactors and targets for medical isotope production will reduce the need for highly enriched uranium and the potential for it to pose a threat to national security.

Management is concerned with the danger that these nuclear materials may fall into the hands of terrorists or non-nuclear nations, but believes adequate plans are in place to address the issue.

NS 5: Continue Leadership in Policy Support and Technology Development for International Arms Control and Nonproliferation Efforts

Ensuring our national security requires much more than maintaining a strong nuclear deterrent. It also requires that we work on an international scope to minimize the threat of nuclear weapon technology and materials falling into the wrong hands. Our objective is to strengthen the nuclear nonproliferation regime and advance arms control through support of treaties and international agreements. Since the end of the Cold War, an important component of our nonproliferation programs has been our work with states of the former Soviet Union to minimize the risks of proliferation. We have completed many security upgrades at Russian reactor sites and in the Russian infrastructure that support the manufacture, transportation, and storage of weapons-usable nuclear materials. For example, in FY 1998, our nonproliferation and technical experts successfully tested the operation of a prototype railcar during a five-day trip over Russian railroads. Upon completion of the test, the program moved forward to upgrade 31 of the 35 railcars used to transport the nuclear materials.

In Russia, Ukraine, and Kazakhstan, core technical experts at technical institutes were named to lead their nations in support of nonproliferation activities. In FY 1998, the experts conducted workshops in their countries for government officials, technical experts, and exporters to educate them on the importance of export controls, including national and international export control procedures. In Russia, these experts implemented a computer system to facilitate the reviews of nuclear export applications and employed the Russian customs personnel to assist them in preventing leakage of nuclear materials and other sensitive commodities.

The Department also supported the International Atomic Energy Agency and the United Nations Special Commission in performing monitoring and intrusive inspections in North Korea and Iraq.

The Department is meeting its objective to continue leadership in this area.

NS 6: Meet National Security Requirements for Naval Nuclear Propulsion and for Other Advanced Nuclear Power Systems

Due to its nuclear expertise and state-of-the-art nuclear facilities, the Department of Energy is charged with providing the U.S. Navy with safe, militarily-effective nuclear propulsion plants and ensuring their continued safe and reliable operation in Navy warships. In FY 1998, development of the next generation plant for the Navy's New Attack Submarine proceeded with the testing and development of components and systems, such as the mechanical test cell and control drive

mechanism units, to demonstrate design acceptability. Reactor assessments continued as well to support the Navy's Analysis of Alternatives for a new nuclear powered aircraft carrier.

During this fiscal year, the Department's Naval Reactors Program celebrated its 50th anniversary, and management is confident this strategic objective is being met successfully.

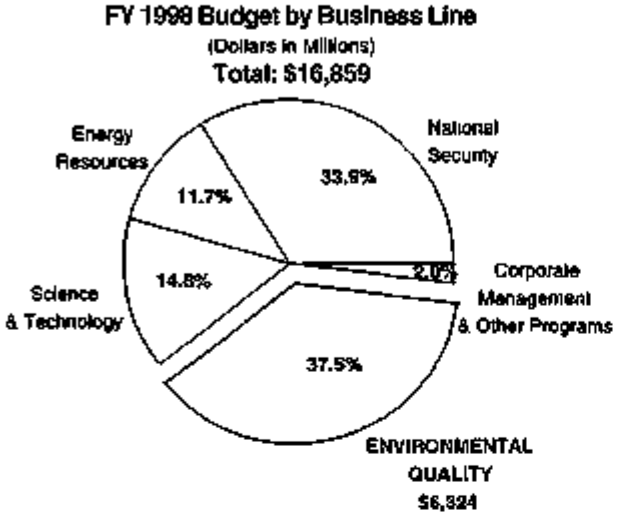
NS 7: Improve International Nuclear Safety

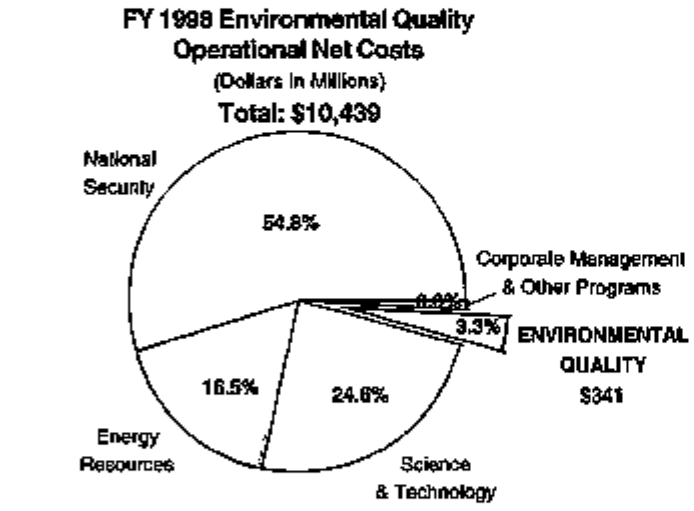
In our endeavor to advance nonproliferation cooperation worldwide, DOE assisted countries of the former Soviet Union in reducing the safety risks from Soviet-designed nuclear power plants and implementing safety programs to meet international safety practices in the nuclear industry. In FY 1998, new safety systems, providing plant operators a tool to safely control the plant in the event of an abnormal situation, were installed at the Zaporizhzhya plant in Ukraine and the Novovorenezh plant in Russia.

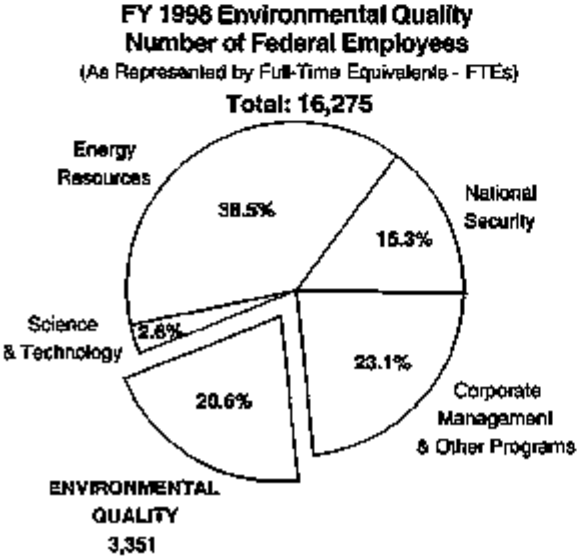
The Department of Energy and the U.S. Agency for International Development have been working over the past several years on a multi-national effort to shutdown the Chornobyl nuclear power plant in Ukraine to reduce further safety and environmental risks. In FY 1998, DOE reached an agreement with Ukraine on the defueling of Unit 1 and an overall decommissioning strategy for the three reactors was established.

This objective is being met.

Environmental Quality







The Environmental Management Program, charged with the weapons complex cleanup effort, began the implementation of its cleanup plan, "Accelerating Cleanup - Paths to Closure." This plan has become known as the "2006 Plan," and it was a path to complete the cleanup of many of the contaminated sites within the next eight years. The "2006 Plan" provides the basis for much of the environmental quality strategic vision and planning.

The Department of Energy has the following strategic goal for its environmental quality business line:

EQ GOAL: Aggressively clean up the environmental legacy of nuclear weapons and civilian nuclear research and development programs, minimize future waste generation, safely manage nuclear materials, and permanently dispose of the Nation's radioactive wastes.

The Strategic Plan also outlined the following seven objectives to support the achievement of our strategic goal described above:

EQ1: Reduce the most serious risks from the environmental legacy of the U.S. nuclear weapons complex first.

EQ2: Clean up as many as possible of the Department's 53 remaining contaminated geographic sites by 2006.

EQ3: Safely and expeditiously dispose of waste generated by nuclear weapons and civilian nuclear research and development programs and make defense high-level radioactive wastes disposal-ready.

EQ4: Prevent future pollution.

EQ5: Dispose of high-level radioactive waste and spent nuclear fuel in accordance with the Nuclear Waste Policy Act as amended.

EQ6: Reduce the life-cycle costs of environmental cleanup.

EQ7: Maximize the beneficial reuse of land and effectively control risks from residual contamination.

The Performance Agreement included 11 commitments in support of the Environmental Quality objectives of the Strategic Plan and 26 measures associated with them. The Department's performance was fully successful in meeting six of these commitments, successful in meeting three commitments, and partially successful in meeting only two commitments. Our performance in meeting each objective, based on the results against the Performance Agreement, follows. More detailed data is contained in the supplemental information at the back of this report.

EQ 1: Reduce the most serious risks from the environmental legacy of the U.S. nuclear weapons complex first.

Environmental Compliance

Departmental Challenge

The Department faces significant long-term environmental compliance and waste management problems at its facilities due to past operations that left a legacy of unacceptable risk to the environment. These circumstances dictate that continued high priority be given to evaluating and correcting the impacts of past practices and characterizing and minimizing the possible adverse impacts of present and future activities. We are acting aggressively in the cleanup of our sites; however, the final completion is a long-term, costly effort. Through FY 1998, we have completed cleanup actions at 65 sites. Substantial actions to correct the overall environmental compliance challenge will be completed in 2006 with the execution of our approach to bring 103 of the 113 waste sites and facilities into regulatory compliance.

In FY 1998, the Department committed to cleaning up as many of the contaminated sites in the nuclear weapons complex as possible by 2006. We prioritized our cleanup actions to identify and complete the projects representing the most serious risks to workers, the public, and the environment first. Preventing further increases in risk to the environment at all sites is also a top priority.

Among our clean up efforts, stabilizing and safely storing spent nuclear fuel was identified as a serious risk. The Department's target for the amount of spent nuclear fuel to be stabilized and placed in interim storage was approximately 3.7 metric tons for FY 1998. The stabilization at the Idaho National Engineering Laboratory was stalled, due to delays in equipment delivery. Once the equipment arrived, functional testing found several deficiencies, impacting the schedule even further. The Idaho National Engineering Laboratory has been working to correct the deficiencies identified in the system.

The project to stabilize and store plutonium waste was designed to eliminate the serious risk posed by U.S. inventories of this radioactive material. The Department stabilized only 3,000 of the 7,000 liters of plutonium solution identified for this project in FY 1998. The lower number results from termination of a draining operation at one of the Rocky Flats facilities in FY 1998 due to unexpected safety issues. At the Savannah River Site, we successfully met our target of closing one high-level waste storage tank in FY 1998.

Although cleaning our sites and protecting the environment is one of the Department of Energy's highest priorities, our progress in FY 1998 indicated that we only partially met Objective EQ 1, raising the issue that the serious environmental risks posed by our sites must be addressed more effectively in the future if we are to meet environmental compliance requirements.

EQ 2: Clean up as many as possible of the Department's 53 remaining contaminated geographic sites by 2006.

As of the end of FY 1997, there were 53 remaining contaminated sites requiring cleanup. In order to meet the ambitious plan for completing many of these projects by 2006, the Department accelerated cleanup efforts by allocating additional funding. Remediation progress is measured by the completion of release sites, where there are discrete areas of contamination, and contaminated facilities that will ultimately lead to the completion of the entire geographic site. In FY 1998, the Department completed remediation at five geographic sites rather than six as planned. This brings the total number of completed geographic sites to 65 of a total of 113 contaminated geographic sites. We also completed 89 facility decommissioning assessments and 82 facility decommissionings, bringing the number of completed facility decommissionings to 532 out of a total inventory of 2,950 facilities.

While performing the cleanup activities critical to this program's success, management must take great measures to ensure that all stakeholders are included in the negotiation and site cleanup process; moreover, all sides share the goal of placing public safety, worker

safety, and environmental protection before all cleanup activities. Therefore, management must strike a balance between how much to cleanup and on what schedule. Given the resources expended during FY 1998, management believes that we are on track in meeting this objective.

EQ 3: Safely and expeditiously dispose of waste generated by nuclear weapons and civilian nuclear research and development programs and make defense high-level radioactive wastes disposal-ready.

Waste Isolation Pilot Plant

Departmental Challenge

The Department is not able to permanently dispose of the transuranic radioactive waste generated by its weapons complex. The schedule for opening the Waste Isolation Pilot Plant (WIPP), the Nation's first research and development facility to demonstrate the safe geological disposal of transuranic waste, has continued to experience delays due to litigation. In 1998, the Environmental Protection Agency certified that WIPP complies with its radioactive disposal regulations and the Department informed Congress of its intent to begin disposal operations. However, the State of New Mexico has not issued the final Resource Conservation and Recovery Act permit required for disposal of mixed transuranic waste. The opening of WIPP is now scheduled for 1999 as the Department continues to work with the State of New Mexico to resolve the remaining legal challenges. Until WIPP is open, transuranic radioactive waste is being stored temporarily at numerous Departmental facilities across the country.

In FY 1998, DOE planned to ship between 388 and 592 cubic meters of transuranic waste from Los Alamos National Laboratory, Rocky Flats Environmental Technology Site, and the Idaho National Engineering and Environmental Laboratory. However, since the opening of WIPP was delayed until FY 1999, these targets were missed.

Despite the delays in the WIPP facility, the Department did make progress in other areas related to its commitment of safely and expeditiously making waste disposal-ready and disposing of waste generated during past and current DOE activities. In FY 1998, the West Valley Demonstration Project in New York prepared 75 canisters of existing high-level waste for disposal. The Department also disposed of nearly 30,000 cubic meters of low-level waste and 4,000 cubic meters of mixed low-level waste. The Defense Waste Processing Facility at the Savannah River Site in South Carolina made ready 228 canisters of high-level waste, 28 more canisters than the FY 1998 target.

Although the delays in opening the WIPP were due to circumstances beyond control of the agency, thereby causing the Department to fall short of its objectives, we cannot consider our efforts to meet this objective a success. Delays must be taken into account during planning phases. We must overcome the obstacles in order to carry out the Department's mission. Our efforts in meeting this objective were only partially successful in FY 1998, and the Department considers this objective a management challenge and concern.

EQ 4: Prevent future pollution.

The Department of Energy's commitment to preventing future pollution was intended to ensure that we do not compound our future cleanup work from ongoing agency activities. In fact, pollution prevention, including waste minimization, recycling, and reuse of materials, was incorporated into all DOE activities.

Our efforts to prevent pollution in FY 1998 resulted in the reduction of radioactive, mixed, and hazardous waste generation by 14,000 cubic meters. Overall, as of the end of FY 1998, we were on track to reduce routine waste generation by 54 percent, compared with 1993 waste generation rates.

Management recognizes that pollution prevention, recycling, and waste minimization are the key to meeting our future national objectives while preserving our natural resources. Based on current successes in these areas, management considered that this objective was successfully met.

EQ 5: Dispose of high-level radioactive waste and spent nuclear fuel in accordance with the Nuclear Waste Policy Act as amended.

The DOE Civilian Radioactive Waste Management Program is charged with disposing of the Nation's spent nuclear fuel and high-level radioactive waste as outlined in the Nuclear Waste Policy Act as amended. In FY 1998, viability assessment analyses for licensing and constructing a geologic repository at the Yucca Mountain Site were completed. The four key components of the

analyses were: design and operational concept; performance of that concept in the geologic setting; a cost plan and estimate to construct and operate the repository; and an estimate and plan of the costs to complete a license application.

Anticipating potential statutory direction that may include transportation of spent nuclear fuel and high-level waste to a designated interim storage facility, the Civilian Radioactive Waste Management Program completed safety analyses for the Centralized Interim Storage Facility. The Department also revised and submitted the Topical Safety Analysis Report to the Nuclear Regulatory Commission. In addition, the policy and procedure for implementation of Section 180 of the Nuclear Waste Policy Act was revised.

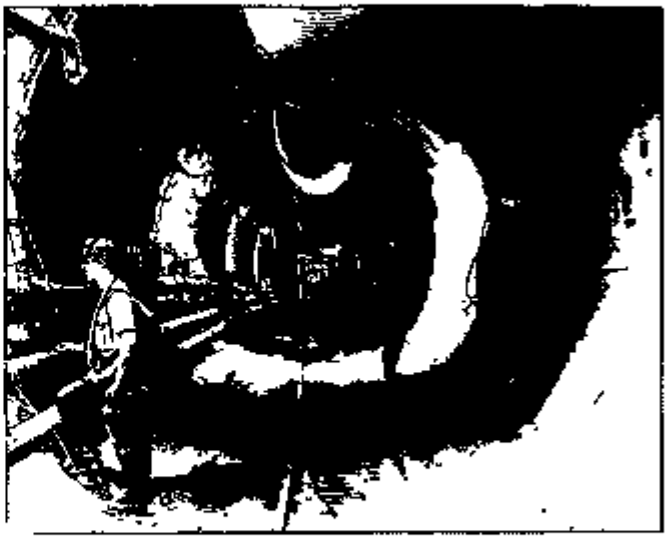
Yucca Mountain

Departmental Challenge

In accordance with the Nuclear Waste Policy Act (NWPA), as amended, the Department has been studying Yucca Mountain, Nevada, to determine its suitability for a permanent repository. Litigation, funding shortfalls, and the need for scientific characterization well beyond the levels envisioned when the NWPA was initially passed in 1982, necessitated a change to the schedule and in 1989 the Department fixed the schedule for start of repository operations as 2010. Until a permanent repository is open, high-level radioactive waste and spent nuclear fuel are being stored temporarily at numerous Departmental facilities and individual utilities around the country.

Progress is being made. A viability assessment of the Yucca Mountain site was completed in 1998. Future actions are to complete an environmental impact statement in 2000, and, if the site is suitable, recommend it to the President in 2001, submit a license application to the Nuclear Regulatory Commission in 2002, and begin repository operations in 2010.

In the meantime, a U.S. Court of Appeals recently ruled that the Department had an unconditional obligation to initiate waste acceptance by January 31, 1998. Because a Federal receipt facility constructed under the NWPA is not yet available, the Department is unable to initiate waste acceptance. As a result, several utilities have brought suit against the Department and in the first three cases, the Court of Federal Claims found that the Department has breached its contracts with three utilities with shutdown reactors. There is an ongoing process to determine the damages the Government must pay these utilities. Other cases involving utilities, most with operating reactors, are currently pending in the Court of Federal Claims. The Government has argued that these utilities must first exhaust administrative remedies at the Department before filing suit in court. We expect a decision in the first of these cases in 1999. While it is too early to evaluate the ultimate impact of claims based on these cases, the Department has estimated possible damages to be between $500 million and $1 billion if all utilities filed claims. Some utilities' representatives have estimated damages totaling $45 billion.



Yucca Mountain Tunnel

EQ 6: Reduce the life-cycle costs of environmental cleanup.

Because the scope of the Department's cleanup effort is so large, we have taken steps to ensure that the costs are minimized through enhanced performance and increased efficiency. We have used many methods to control our costs, including the use of fixed-price competitive contracting, optimized project sequencing, privatization, systems engineering, and bench marking. Recycling and waste minimization efforts have also helped the Department control operating costs, resulting in a two-fold benefit as they also keep risks to the environment at a minimum.

FY 1998 accomplishments include vendor selections and awards for the Oak Ridge TRY (transuranic) Waste

Treatment Privatization contract, the Hanford Tank Waste Remediation System contract, and the Carls bad Area Office Contact-Handled TRY Waste Transportation Privatization contract.

Developing and deploying innovative environmental cleanup, nuclear waste, and spent fuel technologies have contributed significantly to reducing our costs as we provide greater protection to our workers and the environment. In FY 1998, DOE developed and actually deployed 119 innovative technologies across its complex. The Department conducted 35 full scale demonstrations of alternative technology systems that meet the performance specification needs at lower costs as identified by the Site Technology Coordinating Group.

In addition, the Environmental Management program made 40 alternative technology systems available for implementation with full cost and engineering performance data.

When performing life cycle analysis, management must consider which interventions are appropriate and when. A decision to clean one site completely before beginning another site may not be popular. However, if specific "maintenance" activities can be halted based on that cleanup, the unpopular decision may be the best decision.

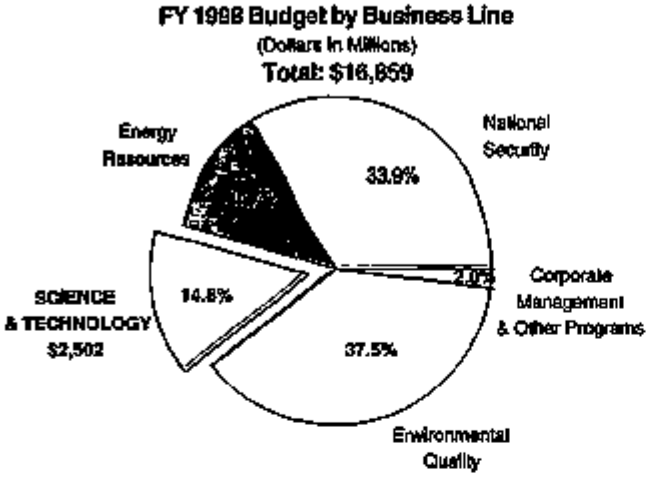
Management has considered numerous proposals to reduce life-cycle costs. Some have been chosen and others rejected. Based on these decisions, management considered this objective successfully on track to lead to greater reductions in the overall life-cycle cost of the Department's environmental cleanup.

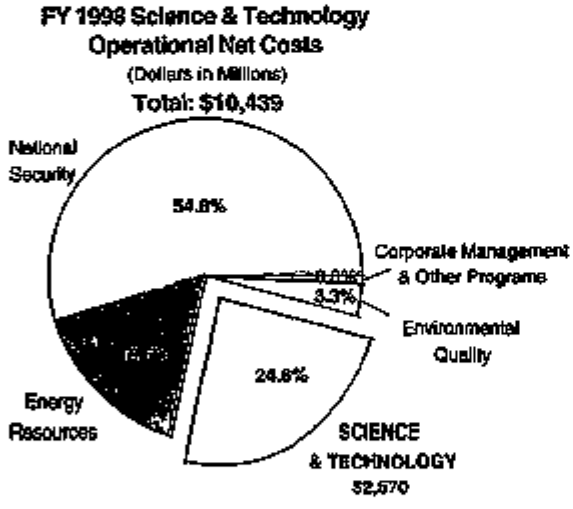
EQ 7: Maximize the beneficial reuse of land and effectively control risks from residual contamination.

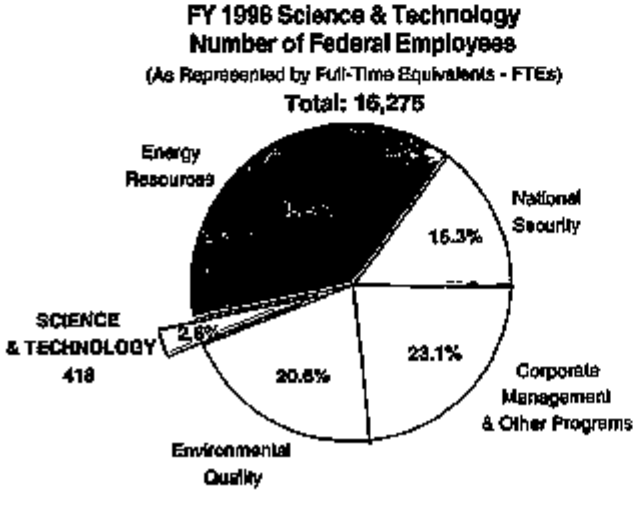
The Department is working very closely with stakeholders to develop comprehensive land use plans for many DOE sites following their cleanup. These land use plans address future alternative uses, environmental requirements, and implementation schedules for land use. The Department had committed to providing Congress, by March 1998, as outlined in the 1997 National Defense Authorization Act, a "future use" plan for many DOE sites, including the specific plans for Hanford Site, the Savannah River Site, the Rocky Flats Environmental Technology Site, and the Idaho National Engineering and Environmental Laboratory. The Department was subsequently granted an extension and plans for all sites, except Hanford, were submitted in October 1998. The plan for the Hanford site will be submitted to Congress when it is published.

Management is concerned with the agency's initial delays, but believes it is successfully on track with this objective.

Science and Technology







The successful performance of virtually every mission activity at the Department of Energy is based on the scientific leadership of our national laboratories and industrial research partners. From the study of global climate change to advancing nuclear nonproliferation worldwide, science is at the heart of the Department's work. Although the Cold War has left a legacy of environmental risks and threats to our national security, it has also left a legacy of world-class scientific and technological accomplishments.

In addition to the scientific nature of our mission, the Department is also responsible for sustaining the Nation's science leadership in the basic research areas, such as chemistry, physics, and materials science. The Department's science and technology-related endeavors have fostered much of our Nation's economic prosperity over the past half century, and we anticipate our role in promoting economic growth will continue to be an integral component of the global economic community in the future.

Year after year, the Department of Energy's contributions to cutting-edge technological developments earn worldwide recognition. In FY 1998, R&D Magazine awarded 33 R&D 100 Awards to the Department's laboratories, bringing the total number won by our national laboratories since the program began 25 years ago to 486. This is a remarkable achievement considering that this is the most awarded by far to any single organization, private or government, and amounts to twice as many awards as those received by all other government agencies combined.

In 1997, the Department of Energy developed the following strategic goal for its science and technology business line as part of the Strategic Plan:

ST GOAL: Deliver the scientific understanding and technological innovations that are critical to the success of DOE's mission and the Nation's science base.

The Strategic Plan also outlined the following four objectives to support the achievement of our strategic goal described above:

ST1:	Develop the science that underlies DOE's long-term mission.
ST2:	Deliver leading-edge technologies that are critical to the DOE mission and the Nation.
ST3:	Improve the management of DOE's research enterprise to enhance the delivery of leading-edge science and technology at reduced costs.
ST4:	Assist in the government-wide effort to advance the Nation's science education and literacy.

The Performance Agreement included 12 commitments in support of the Science and Technology objectives of the Strategic Plan and 32 measures associated with them. The Department's performance was successful in meeting 11 of these commitments, and partially successful in meeting one commitment. Our performance in meeting each objective, based on the results against the Performance Agreement, follows. More detailed data is contained in the supplemental information at the back of this report.

ST 1: Develop the science that underlies DOE's long-term mission.

The Department's efforts to develop the science that supports our long-term mission produces the knowledge and understanding that will allow scientists to make breakthroughs in other fields.

DOE-sponsored researchers have applied technological advances from other research areas, such as the semi-conductor field, to develop very small data processing components used to process medical imaging data in record time. A major accomplishment in FY 1998 was the use of high performance computing to better understand and model the molecular mechanisms of scintillator fluorescence. This scientific advancement resulted in new technologies for breast cancer detection. In the Department's effort to continually support the development of new highly-specific radio tracer probes to detect and treat disease, a joint workshop was held with the National Institutes of Health. The workshop laid the groundwork for developing an advanced research program that will capitalize on the recent advances in molecular and structural biology. These researchers will produce the next generation of molecular imaging probes for nuclear medicine.

In FY 1998, the Department's Brookhaven National Laboratory in New York, in coordinated efforts with the Beth Israel Deaconess Medical Center, completed early clinical trials of Boron Neutron Capture Therapy, a potential method of treating cancer, including brain cancer and melanoma, that resist conventional methods of treatment. During FY 1998, a total of 53 patients have been treated at the two cooperating facilities. Ultimately, the results of this research will be made available via the World Wide Web.

The Department of Energy Joint Genome Institute's human genome project continued to make progress in FY 1998. The three organizations who have combined their unique capabilities to form the Joint Genome Institute for work on this ground-breaking endeavor, Los Alamos, Lawrence Livermore, and Lawrence Berkeley National Laboratories, reduced their costs and increased the speed and quality of DNA sequencing. They established ambitious DNA sequencing goals and were five percent over target for unique DNA sequence completed in FY 1998. These goals were based on international standards for DNA sequence quality agreed upon by the international scientific community. The Joint Genome Institute submitted 20 million bases of high quality, unique DNA sequence to public data bases in FY 1998.

To further the knowledge of energy and matter, the Department began fully operating all three experimental halls at the Thomas Jefferson National Accelerator Facility in Newport News, Virginia. The laboratory can deliver simultaneous beams of widely differing energies and currents to each hall and is also able to deliver a polarized beam to any of them.

International collaboration on science projects allows scientists from other parts of the world to leverage their research opportunities to reach a synergistic relationship that has the potential to break new ground in their fields. Under the Russian-American Fuel Cell Consortium, scientists designed and developed advanced catalysts, electrodes, and membranes in support of the development of fuel cell technology as an efficient and reliable energy resource. In FY 1998, we funded nine research and development projects covering the full array

of key fuel cell technologies. The overall goal of these projects was to reduce the cost of fuel cell technology by testing less expensive materials to make up the component parts of fuel cells. An additional benefit of the collaborative projects was the useful employment of former Russian nuclear weapons scientists in commercial research and development activities, rather than in military applications, thus promoting global nonproliferation efforts.

The U.S. began cooperative research efforts with Russia on fundamental properties of matter, fusion energy science, nuclear reactor safety, environmental restoration, and nuclear waste management under the umbrella Peaceful Uses of Atomic Energy Agreement 25 years ago. The agreement covered hundreds of activities under four major memoranda of cooperation. In FY 1998, major progress continued in high energy and nuclear physics, fusion science, nuclear safety upgrades at Russian reactors built in the Soviet era, and research on environmental restoration and waste management of materials associated with nuclear fission.

In the area of science, the U.S. has a broad responsibility to expand the knowledge of our planet for constructive purposes. The Department's role is to advance the scientific domain within our mission areas. At the same time, the Department must remain vigilant to ensure that the expenditures in the area of general science are controlled and efficient. Based on the numerous accomplishments during FY 1998, management considers that our efforts in FY 1998 toward meeting this objective were successful.

ST 2: Deliver leading-edge technologies that are critical to the DOE mission and the Nation.

As our mission has evolved during the past half century, so have our scientific and technical capabilities. As we approach the 21st century, we must ensure that our mission critical capabilities continue to support emerging energy, national security, and environmental quality goals.

The Department continued to pursue international collaborations in FY 1998 on large-scale science projects to explore the frontiers of high-energy physics. Over the course of FY 1998, we established cost and schedule baselines for the three components of the U.S. contribution to the Large Hadron Collider.

On the domestic front, DOE executed a multi-year contract for development of highly efficient radioisotope power systems in support of the National Aeronautics and Space Administration's (NASA) future mission requirements. Lockheed Martin Astronautics was selected as the system integration contractor to develop an advanced radioisotope power system for potential use on the Europa Orbiter, Pluto-Kuiper Express and other future NASA missions. Work began in FY 1998 on the new conversion technology and system design to meet requirements.

Although DOE's own research and development capabilities are world-renowned, we recognized that the pursuit of new technologies can be accomplished more effectively and efficiently through partnerships with industry, academia, and other government agencies. In FY 1998, the Department selected 17 multi-year laboratory technology research projects in the areas of advanced materials, biotechnology, intelligent processes and controls, applied mathematics, and catalysis. These areas represented our top priorities for science and technology, and the projects were 50 percent cost-shared with industry partners. Research began on eight of the 17 projects during FY 1998.

Considering the successful deployment of so many mission-critical technologies in FY 1998, management believes the Department is successfully on track toward meeting this strategic objective.

ST 3: Improve the management of DOE's research enterprise to enhance the delivery of leading-edge science and technology at reduced costs.

The Department of Energy operates one of the largest scientific research and development enterprises in the world, supporting a network of national laboratories and user facilities employing more than 30,000 scientists and engineers who conduct world-class basic and applied research.

Given the immensity of the laboratory complex, it is the Department's role to ensure that the laboratories, user facilities, and other DOE research providers are managed in an integrated, responsive, and cost-effective manner, building on unique core strengths and corresponding roles and minimizing duplicative activities.

As planned, the Department completed a draft facilities roadmap which will determine the needs for and provide direction to the scientific facilities through the year 2020.

The Department also made progress on the development of new facilities. DOE initiated the assembly and installation of the National Spherical Tokomak Experiment at the Princeton Plasma Physics Laboratory.

DOE's user facilities provided access to our cutting-edge scientific and technological resources. During FY 1998, however, the Department determined it must improve the management, dissemination, sharing, and use of scientific and technical information. In FY 1998, the DOE Office of Scientific and Technical Information and the U.S. Government Printing Office unveiled a new information tool that made DOE research and development report literature available on the world wide web. Named the "DOE Information Bridge," the tool became available with a world wide web address and required no passwords or other entry requirements. The system can be used to access, locate, search, and download full-text and bibliographic information electronically. At the end of FY 1998, the site included the full-text of more than 27,000 DOE-sponsored research and development reports and their bibliographic records and abstracts.

On another front, the longstanding issue of the evaluation process for DOE's research programs showed signs of improvement in FY 1998. The Fusion Energy Sciences Advisory Committee was charged to review the advanced fusion materials program and a panel of specialists was appointed to conduct the review. The High Energy Physics Advisory Panel's Subpanel completed its study, and the resulting report, entitled "Planning for the Future of U.S. High-Energy Physics," was published in February 1998.

In balancing the competing needs of the Department's various stakeholder groups, a successful scientific program was established that addressed those needs within the constraint of our budget environment. By relying on peer review and national professional societies, the Department has been able to identify the top scientific objectives and organized the resources to meet those objectives. The efforts to date will keep the Department on track to achieve our strategic objective of improving the management of our research enterprise.

ST 4: Assist in the government-wide effort to advance the Nation's science education and literacy.

Just as science education and literacy was essential to our Nation's past successes, it will play an even larger role in our Nation's future successes. If the United States is to retain its global leadership in science and technology, we must give our youth the best possible tools in math and science. The Department of Energy is committed to developing and promoting the technologies and programs that provide information and contribute to learning in science, math, and engineering. In addition, DOE committed to expand access to DOE's vast quantity of technical information. Our extensive network of human and physical resources has been leveraged, in conjunction with the National Science Foundation and other Federal agencies, to promote science awareness and interest. Recognizing the power of diversity, we also committed to improving educational opportunities for minorities who have traditionally been under represented in math and science-related fields.

In FY 1998, the Department supported the Hollaender post-doctoral fellowship program through 10 awards involving collaborations between minority students, their faculty advisors, and scientists in DOE laboratories. The Department also supported the multi-agency Significant Opportunities in Atmospheric Research and Science Program through sponsorship of five of the 19 program proteges, who are predominantly minority students. Our efforts enhanced diversity while recruiting well-qualified students for careers in the atmospheric sciences and global climate change.

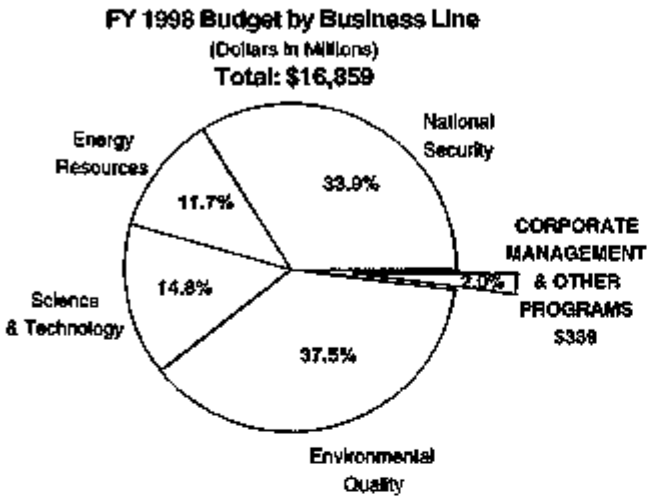
The Department of Energy considers science awareness events an effective means to attract the most promising and qualified individuals to mathematical and scientific career fields. In FY 1998, more than 8,000 students from 1,600 high schools participated in 48 regional science bowl competitions across the country and in the Virgin Islands. These figures represent a growing interest in the science bowl events and the support of both the DOE and non-DOE sites for this effort. More than 5,000 volunteers from DOE sites, other Federal agencies, local colleges and universities, technology companies and sponsors served as officials for the competitions. For the first time in the history of the competition, the winning

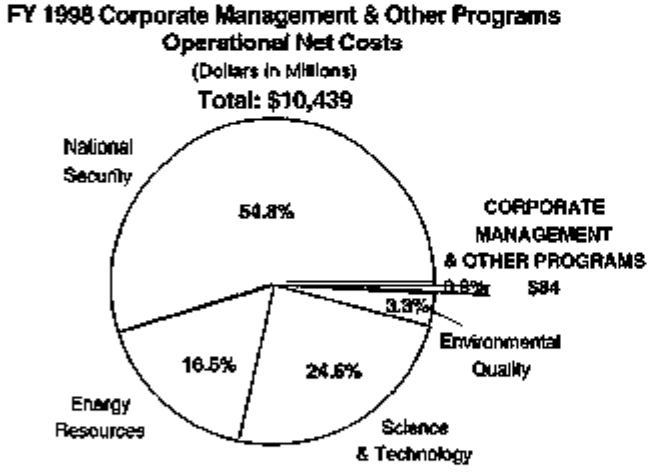
team from the 1998 National Science Bowl event in Washington, D.C. was invited to attend the 48th Meeting of Nobel Laureates in Chemistry held in Lindau, Germany.

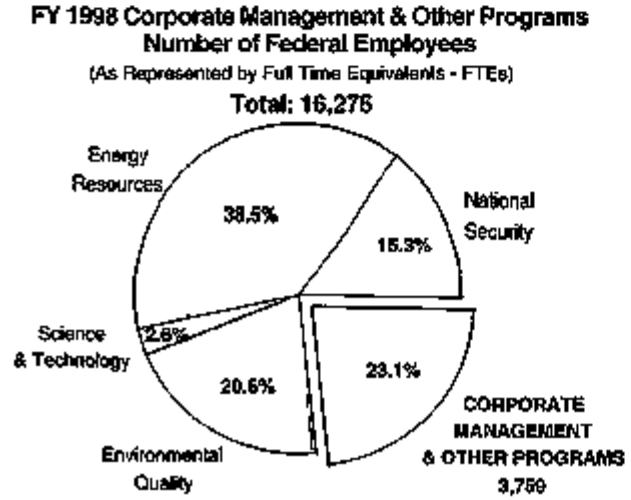
Our activities in FY 1998 in promoting science and math education and science awareness helped the Department successfully fulfill its commitments from the Performance Agreement. Management believed our accomplishments indicated we were on track to successfully meet our strategic objective.

1998 National Science Bowl Winning Team

Corporate Management







Corporate Management encompasses functions that apply to all business lines within the Department. Recognizing that sound management is the key to the agency's success in achieving the strategic objectives for its diverse portfolio of programs, it is identified separately. It not only includes the administrative, staff, and operational functions traditionally associated with a large organization, but also encompasses the crosscutting activities related to the environment, safety and health of our workers and the public ongoing in all our program activities; effective communication and trust with our stakeholders; and highly efficient managerial practices.

In FY 1997, the Department of Energy developed the following strategic goal for its Corporate Management as part of the Strategic Plan:

CM GOAL: The Department of Energy will strive to demonstrate organizational excellence in its environment, safety and health practices, in its communication and trust efforts, and in its corporate management systems and approaches.

The Strategic Plan outlined the following three objectives to support the achievement of our strategic goal described above:

CM1: Ensure the safety and health of the DOE workforce and members of the public, and the protection of the environment in all Departmental activities.

CM2: As a good neighbor and public partner, continually work with customers and stakeholders in an open, frank, and constructive manner.

CM3: Use efficient and effective corporate management systems and approaches to guide decision making, streamline and improve operations, align resources and reduce costs, improve the delivery of products and services, and evaluate performance.

The Performance Agreement included 15 commitments in support of the Corporate Management objective of the Strategic Plan and 44 measures associated with them. We were fully successful in meeting eight commitments, successful in meeting four commitments, and only partially successful in three commitments.

CM 1: Ensure the safety and health of the DOE workforce and members of the public, and the protection of the environment in all Departmental activities.

The Department has maintained stewardship of some of the most hazardous materials known to mankind. As a result, environment, safety and health concerns are some of our highest priorities. The commitment in FY 1998 was to reinforce a culture of sound environment, safety and health practices into our day-to-day operations.

Using independent oversight, the Department collected information and analysis on the Department's environment, safety, health, and safeguards and security policies and programs. This information was provided to the Secretary and senior line managers. During FY 1998, we successfully completed one Integrated Safety Management Evaluation of the Lawrence Livermore National Laboratory and three special reviews at Albuquerque.

As part of the effort to emphasize safety, the Secretary ordered a complex-wide review of emergency management. As a result, the Department completed reviews of the Nevada Test Site, the Savannah River Site, and the Los Alamos and Sandia National Laboratories. At Brookhaven National Laboratory, the Department implemented a comprehensive follow-up program of Groundwater Tritium Plume Recovery Activities to address public health concerns.

In FY 1998, the Department developed and completed the fourth update of 20 environment, safety and health profiles describing and monitoring the most significant environment, safety and health issues at DOE sites. The Department developed oversight analyses for 17 programmatic and technical areas and 20 sites which have been integrated into an assessment of complex-wide safety performance.

DOE believes that environment, safety and health issues can only be successfully addressed with appropriately trained and technically competent employees. In FY 1998, our Office of Human Resources worked with senior technical managers from every program throughout the agency to produce the Implementation Plan for the Technical Qualification Program (TQP). The TQP is the Department's method of ensuring that workers whose jobs affect the safety and health of other workers, the public, and the environment are fully qualified to perform their work. This program was first developed in FY 1993 in response to a recommendation from the Defense Nuclear Facilities Board. The Department met its goal of increasing the percentage of employees certified through this program from 65 percent in FY 1997 to 75 percent in FY 1998. By the year 2000, our goal is to have 90 percent certification of the more than 1,700 employees covered by the program.

Safety and Health

Departmental Challenge

The Department of Energy is tasked with simultaneously addressing the consequences of past activities, managing current operations, and preventing future human and environmental problems. The Department is attempting to meet these challenges through implementing a variety of initiatives, including Integrated Safety Management (ISM). The Department has demonstrated its commitment to the principles of ISM and has evidenced this commitment by establishing safety and health programs that protect its workers, the public, and the environment. The challenge remains that improvements in worker safety are being offset by adverse trends in safety records related to construction and industrial service. Also, while the principles of work planning and hazard analysis have been established at some sites, at many others these principles are limited in their implementation, especially where subcontractor personnel are involved. A need to improve accountability for safety management performance is apparent in the Department's self-assessment and corrective action processes and in the under-utilization of "lessons learned" information.

Through 1998, 64 of the 106 vulnerabilities identified with our storage of spent nuclear fuel had been corrected. In addition, four independent oversight evaluations were conducted in FY 1998 which support the Department's ability to monitor the implementation of current safety standards and provide feedback critical in completing the nuclear safety standards upgrade project.

The Department's long-term plan for correcting these deficiencies includes the ongoing evaluation of internal operations; the final publication of remaining Nuclear Safety Management Rules during FY 2000; and the completion of actions to correct deficiencies in the storage of spent fuel in 2005. In addition, the Department will address these challenges by ensuring the implementation of ISM at all sites by September 2000; by inserting a clause into contracts that puts the contractor's entire performance-based fee at risk for poor safety performance; and by establishing a "Safety Council" that will ensure ISM targets are met.

In addition, the primary challenge to the Department in the area of worker and public health is the lack of a consistent, complex-wide approach to performing health studies. The Department is working closely with public health agencies such as the Centers for Disease Control and Prevention on a new effort to establish clear, site-specific public health agendas that are responsive to worker and public concerns. Stakeholder input is key to this initiative.

Meeting the challenge of maintaining adequate worker and public protection in an environment with aging facilities and uncertain future requirements is a great challenge. In addition, the resource constraints make the job even more difficult.

Management considers that although we achieved several accomplishments in this area, our ongoing deficiencies indicate that our efforts in FY 1998 toward meeting Objective CM 1 were only partially successful.

CM 2: As a good neighbor and public partner, continually work with customers and stakeholders in an open, frank, and constructive manner.

Since the end of the Cold War, the Department has undergone a transformation from a secretive, weapons-producing agency to a results-driven, customer-focused leader in science, technology, and environmental management. This has been accomplished by emphasizing openness, enhancing communications, and fostering trust among stakeholders. In addition, the Department demonstrated its concern for public participation in FY 1998 by conducting a needs assessment at 11 Operations/Field Offices, and initiated a public participation training program for Headquarters and field managers, from Deputy Assistant Secretaries to project managers to public affairs staff.

In FY 1998, the Department successfully involved stakeholders in the policy-making process through the Environmental Management Program's public involvement activities. National meetings for soliciting public involvement in the program were conducted for Site-Specific Advisory Board Chairs, the State and Tribal Government Working Group, the National Association of Attorneys General, and the National Governors' Association. These meetings provided a unique opportunity for stakeholders to discuss upcoming DOE decisions on nuclear materials and waste management from a national perspective.

The DOE World Wide Web site has been a successful tool in increasing customer and public awareness of DOE's mission areas. In FY 1998, an increase of over 30 percent in the number of DOE Home Page visits occurred. The Department's efforts to improve the information disseminated through the Home Page contributed to the increase in usage.

Although not all parties agreed with all DOE decisions, most groups feel that they were included in the process. This represents a significant improvement from only a few years ago. In this environment, management must continue to work to improve.

Management considers the Department to be successfully on track toward meeting this strategic objective.

CM 3: Use efficient and effective corporate management systems and approaches to guide decision making, streamline and improve operations, align resources and reduce costs, improve the delivery of products and services, and evaluate performance.

Improving business practices throughout the Department encompasses a variety of management issues, including contracting, infrastructure, property control, information management, financial management systems, managerial performance and accountability, and human resources. There are a number of Departmental challenges in these areas.

Contract Management

Departmental Challenge

The Department is reforming its contracting practices, which were largely unchanged for more than 50 years. The weaknesses in our contracting practices were substantial and required major changes in such areas as contractor performance and accountability. While this reform effort is applicable to all our contracts, it is especially pertinent to the large contracts we have with companies managing and operating our major facilities to which we fund approximately $13 billion a year. To correct these problems we instituted an extensive, multi-year contract reform initiative. The key component of this initiative has been the implementation of performance-based contracts which emphasize results and performance incentives. In FY 1998 we continued to refine this contracting mechanism and strengthen it by improving our use of performance-based incentives. We will assess the effectiveness of these actions in FY 1999 through a follow-up assessment.

Project Management

Departmental Challenge

Credibility in the Department's ability to build new facilities or upgrade existing systems has been adversely affected by reports of cost overruns, schedule slippages, and other project management problems. These issues have led to Congressional concerns about the Department's construction project management structure and practices. To correct this problem, we assessed Department-wide policy and procedures in FY 1998 and examined specific aspects of our defense-funded construction projects including overall project performance, organizational management structure, and personnel resources. We have initiated corrective actions as a result of these studies.

In FY 1999, in accordance with Congressional direction, we will procure services for independent assessments of ongoing and planned projects Department- wide and an independent evaluation of Departmental construction planning and management practices. Although it is expected that completion of these actions in FY 1999 will bring correction of major project management deficiencies to near closure, potential follow-on actions may extend final closure until FY 2000.

Inadequate Audit Coverage

Departmental Challenge

There are deficiencies in the audit coverage of the our major contractors that perform many of the functions integral to the Department's mission. As a result, the Department lacks full assurance that its contractors are only being reimbursed for costs that are reasonable and allowable. The Inspector General has taken steps towards the correction of this problem by implementing a revised audit strategy. While the strategy places greater reliance on major contractor internal audit staffs using a risk-based approach, contractor internal audit activities are assessed to ensure that professional auditing standards are followed, effectively expanding audit coverage of the Department.

While there have been improvements in audit coverage, an Inspector General evaluation of the Department's audit needs concluded that staffing and resource limitations will continue to hinder audit efforts into the foreseeable future. The Department is working to resolve these staffing issues in order to accomplish an acceptable level of audits of our major contractors.

Unclassified Computer Security

Departmental Challenge

Internal and external reviews have made it apparent that there is an increase in system and network vulnerabilities at the Department. These vulnerabilities, which have come under Congressional scrutiny, increase the likelihood of unauthorized intrusions into our publicly available systems. One of the primary causes is the lack of a meaningful policy and program framework, while another root cause is a lack of awareness of system vulnerabilities by employees, line managers, and upper management. Planned actions for addressing this challenge include the issuance of technical security advisories, development of guidelines and policies, and the commencement of awareness training and pilot programs for network intrusion detection.

Financial Management Systems

Departmental Challenge

The Department's financial management systems do not report financial information in a manner needed to facilitate effective management of our programs and contractors. Departmental financial management systems also need to be upgraded to produce financial information required to measure program and financial

management performance. In order to address identified deficiencies, the Office of the Chief Financial Officer has strengthened its planning and support for current and future financial system requirements. In FY 1998, the Department implemented a new Financial Data Warehouse prototype to address managers' needs for obligation and cost data. We also deployed the new Executive Information System to all Departmental managers. In addition, to address future system needs, a project to address the design, development, and implementation of a new Business Management Information System was initiated. During FY 1999, the Department will identify functional and technical system requirements, such as additional infrastructure and maintenance data needs, for evaluation during the development of the Business Management Information System. Full implementation of the Business Management Information System in 2002 will bring the correction of financial system deficiencies to closure.

To emphasize results and accountability in our business management approaches, the Department sought to submit Department-wide audited financial statements, including performance against the FY 1997 Performance Agreement with the President, with an unqualified audit opinion to the Office of Management and Budget (OMB) in FY 1998. This commitment was met in March 1998. DOE was actually one of only two Federal agencies to receive an "A" grade from OMB for its financial statements.

In addition to our success in our financial statements in FY 1998, we also completed the correction of two prior departmental challenges.

Infrastructure

Prior Departmental Challenge

The Department lacked processes to ensure its infrastructure was adequately maintained. As a result, due to decades of deferred maintenance and upgrades, much of the Department's infrastructure was in poor condition. This infrastructure consists of buildings, roads, utilities, and other facilities that are vital to the operations of the Department. Unsafe conditions, lost-time delays, and more frequent and costly maintenance resulted from deferring maintenance at our aging facilities.

To improve the condition of its infrastructure, the Department implemented a long-range strategy that strengthened the capital asset management process for the acquisition, maintenance, modernization, and/or eventual disposal of infrastructure. In addition, a Functional Cost Reporting System, which includes maintenance data has been deployed and is providing information on infrastructure upgrade requirements. Potential enhancements to the available financial information will be addressed in the Department's new Business Management Information System now under development. Due to the substantial nature of the processes now in place to adequately maintain our infrastructure, this reportable problem is closed.

Property Controls

Prior Departmental Challenge

In the past, inadequate control over Government personal property by the Department's management and operating contractors had been identified as a deficiency at some of the Department's facilities. This property included nuclear-related technology equipment, vehicles, construction equipment, computers, tools, and other items. The deficiencies identified included missing property, risk of unauthorized use, and improper disposal. These problems resulted from inadequate policies and procedures as well as lack of adequate attention to contractor personal property management systems. To remedy this situation, Departmental policies were strengthened to provide increased emphasis on property management by contractors, include extensive coverage of high risk property and address critical problems identified by audits and investigations. A final rule formally revising the Department's policies was issued in FY 1998, completing the correction of this problem.

In FY 1998, we reduced the Headquarters buildings inventory from eight to six locations and saved $3.83 million in rent. Savings from reengineered information management business processes were $69 million. Technical and support services contracts were reduced to $200 million, well below the goal of $610 million. Concerning asset sales, the sale of the Naval Petroleum Reserve alone yielded over $3 billion and exceeded the original goal. The Deputy Secretary, refocused and modified the original goals for this effort and has closed this out as of the end of FY 1998. Also in FY 1998, on-board staffing, excluding the Power Marketing Administrations and Federal Energy Regulatory

Commission, was reduced to 10,355, 519 below the end-of-year goal of 10,874.

Workforce Planning

Departmental Challenge

Workforce planning remains a significant challenge at the Department. In recent years, DOE lost a large number of staff through reductions-in-force, buyouts, and attrition during a hiring moratorium to meet lowered budget levels. Collectively, these have created a need to redeploy staff, realign functions, retrain employees, and take other actions to maintain a viable, highly skilled workforce in critical program areas. While we are hopeful that we can operate within available resource limitations, the Department's long period of downsizing has created skill gaps, an aging workforce, and other workforce management challenges. In response, the Department has begun a Workforce for the 21st Century Initiative that establishes a DOE-wide workforce planning process which will become the basis for addressing critical staffing and employee development needs as well as utilizing other human resource management tools and authorities. This process coupled with existing management systems to support staffing decisions will help DOE rebuild a talented and diverse workforce that is aligned with our critical mission needs. This process complements the Department's ongoing initiative in technical training, implemented to address the recommendations of the Defense Nuclear Facilities Safety Board, and our newly-begun efforts to strengthen the Department's research and development management workforce.

The Department has performed organizational and managerial assessments using the Malcolm Baldrige criteria for Performance Excellence. These criteria are used to recognize the finest organizations in the private sector, those organizations achieving the highest levels of customer satisfaction and greatest value for their stakeholders. The Department of Energy has developed the Energy Performance Excellence Award, based upon the Baldrige model. Participant organizations within the Department have shown significant improvement over the four years the Award program has been in existence. The Department will continue to strive for improved performance by applying the principles of good leadership and good management practices.

There are several Departmental challenges related to this objective. Our progress in FY 1998 indicates that we have only been partially successful in meeting this objective, raising the issue that the reengineering of our business and management systems must be addressed more effectively in the future if we are to achieve the Department's strategic vision.

Status of Year 2000 Actions

The Year 2000 (Y2K) issue is of critical importance Government-wide. At the Department of Energy, we have established critical milestones reflecting Government-wide requirements that encompass the 420 mission-critical systems being tracked. As of January 31, 1999, the Department has completed Year 2000 compliance implementation for 85 percent of these systems and we project that a 98 percent compliance rate will be achieved by March 31, 1999. All but eight systems are scheduled to complete Y2K compliance prior to the Government-wide milestone of March 31, 1999. All of these systems are scheduled to be compliant by October 1999. The worst case scenario involves four of the seven systems that are behind schedule. These systems are used in our waste processing activities. If they are shut down due to Y2K problems, waste processing would be halted at one of our major waste processing sites. This shutdown would cost the taxpayers an estimated $1 million for each day of the shutdown. However, the public is not at risk should any of these systems fail because of Y2K related issues. As summarized in **Chart A**, historical costs to address Year 2000 within the Department have amounted to $106.7 million and future costs are estimated to be $99.9 million.

YEAR 2000 Remediation Costs and Future Estimates

(Dollars in Millions)

1996	1997	1998	1999	2000	Total
$1.0	$20.0	$85.7	$80.0	$19.9	$206.6

Chart A

Previous to our recent achievements, we received Congressional criticism for not progressing rapidly enough to solve the Y2K problem, and OMB stated that Energy, as well as some other Federal agencies, "are not making adequate progress." In addition, the Inspector General has issued several advisory memoranda expressing concerns in areas such as the need for: formal procedures to ensure identification of all data exchanges and embedded systems that may have Y2K consequences; formal procedures to ensure adequate management control and evaluation of system test plans; improved techniques to ensure accuracy and completeness of the Department's inventory of mission critical systems; a better methodology for prioritization of high-risk Y2K efforts and enhanced contingency plans which will recognize that even systems converted to avert Y2K problems may ultimately fail in spite of improvements. The Department is taking action to address these criticisms.

In December 1998, the Secretary established Year 2000 Stretch Goals for the Department to achieve Year 2000 implementation. In addition to his stretch goal initiative, the Secretary issued guidance requiring that continuity business plans be developed for each DOE mission area and contingency plans for individual mission-critical systems. Direction and guidance for external independent verification and validation have been placed on the Department's Year 2000 website. The Department's Y2K Council, composed of senior DOE managers, continues to closely monitor this issue, as does the Departmental Internal Control and Audit Review Council, which includes selected senior managers, including the Inspector General. Although the Department has experienced rapid turnover in top management within our information management organization, current management has placed a great deal of emphasis on meeting the Y2K goals. The Department requested and received additional funding which will be used to provide support in completing independent verification and validation and contingency/ continuity planning activities. We continue to exceed the baseline plan for remediation of mission-critical systems established a year ago, and we expect successful completion.

Management's Response to Inspector General Audit Reports

The Department responds to audit reports by evaluating the recommendations they contain, formally responding to the Inspector General (IG), and implementing agreed upon corrective actions. In some instances, we are able to take corrective actions immediately and in others, action plans with long-term milestones are developed and implemented. This audit resolution and follow-up process is an integral part of the Department's efforts to deliver its priorities more effectively and at the least cost. Actions taken by management on audit recommendations increase both the efficiency and effectiveness of our operations and strengthen our standards of accountability. The Inspector General Act, as amended, requires that we report on the status of our progress in implementing these corrective actions semiannually. A report was issued in May 1998 for the semiannual period ended March 31, 1998. This section provides similar information for the second half of FY1998.

During the semiannual period ended September 30, 1998, the Department took final action on 31 IG operational, financial, and preaward audit reports. At the end of the period, 72 reports awaited final action. Some of these reports contain recommendations to make changes to our operations in order to save funds that could be reapplied elsewhere in the future. The table below provides more detail on the audit reports with open actions and the dollar value of recommendations that funds "be put to better use" that were agreed to by management.

STATUS OF FINAL ACTION ON IG AUDIT REPORTS
(For the Period April 1 - September 30, 1998)

Audit Reports	Number of Reports	Agreed Upon Funds Put To Better Use
Pending final action at the beginning of the period	80	$ 359,882,695
With actions agreed upon during the period	23	7,161,683
Total pending final action	103	367,044,378
Achieving final action during the period	31	237,439,084
Requiring final action at the end of the period	72	129,605,294

Summary of Departmental Challenges and Emerging Issues

Departmental challenges and issues, emerging as potential problems, are identified in this report in accordance with the Federal Managers' Financial Integrity Act (FMFIA). The objective of the FMFIA is to identify areas of vulnerability in the operations of the Government and, as a consequence, ensure that appropriate attention is given to ameliorating problems that may affect the wise expenditure of the taxpayers' money. As required by the FMFIA, the Department has evaluated its management controls to provide reasonable assurance that they were working effectively, that program and administrative functions were performed in an economical and efficient manner consistent with applicable laws, and that assets were safeguarded against the potential for waste, fraud, abuse, or mismanagement. The results of the evaluations indicate our system of management controls provides reasonable assurance that those objectives were achieved except for the problems identified as Departmental challenges in this report.

Current Departmental Challenges	Scheduled Correction
Surplus Fissile Materials	2000
Environmental Compliance	2006
Waste Isolation Pilot Plant	1999
Yucca Mountain	2002
Safety and Health	2005
Contract Management	1999
Project Management	2000
Inadequate Audit Coverage	TBD
Unclassified Computer Security	1999
Financial Management System Improvements	2002
Prior Departmental Challenges Resolved in FY 1998	
Infrastructure	
Property Controls	

Statistical Status of Departmental Challenges	
Beginning of FY 1998	10
New	2*
Closed	2
End of FY 1998	10

FY 1998 Emerging Issues
Declining Oil Import Protection
Counterintelligence
Workforce Planning

* In 1998, one previous Departmental challenge, "Nuclear Waste Storage and Disposal," was split into two: Waste Isolation Pilot Plant and Yucca Mountain.

Message from the Chief Financial Officer

Michael L. Telson

I am pleased to present the Department of Energy's consolidated financial statements and disclose our financial condition and results of operations for FY 1998 within the Department of Energy's first Accountability Report. As we strive to streamline and improve Government financial management in a new era of accountability, the Office of the Chief Financial Officer has prepared the following comprehensive Departmental statements for FY 1998. These are in accordance with standards developed by the Federal Accounting Standards Advisory Board, the requirements of the Office of Management and Budget, the Chief Financial Officers Act of 1990, and the Government Management Reform Act of 1994.

In addition, the Department has conducted an evaluation of its financial management system using guidance issued by the Office of Management and Budget. This evaluation indicates that the Department's financial management system is in general conformance with governmental financial system requirements except for one area. That area is identified as a Departmental challenge under the Federal Managers' Financial Integrity Act and described within Corporate Management.

The Department of Energy is committed to professional excellence, accountability, and responsibility in the administration of our programs and financial operations. Our financial management initiatives stress the need for improvements if we are to be able to meet increasing requirements and expectations during a period of stable or declining resources. In response to this need, an Executive Information System has been implemented to support Departmental managers by providing financial information useful for making informed management decisions. Other initiatives include: producing performance based budgets in accordance with the Government Performance and Results Act; consolidating accounting centers; the monitoring of uncosted balances, construction project balances, and functional support costs; and modernizing our financial systems. Another challenge that continues to significantly impact our financial statements is the effect on unfunded liabilities of the Department moving toward an accelerated cleanup approach for the Environmental Management program.

The Department, and the Federal government as a whole, continue to implement financial management changes requiring us to become more efficient, effective, and accountable. These changes require our increasing diligence, dedication, and the productive use of all our resources to ensure that the Department effectively supports our program goals, while also maintaining our financial responsibilities to the American taxpayer, the Congress, and the President. Our current financial initiatives are critical to the achievement of our Departmental missions and goals in an effective and efficient manner. We appreciate the support of the President and the Congress in these efforts.

Michael L. Telson

Financial Overview

The financial overview section is intended to provide a concise description of the Department of Energy's financial position and the results of financial performance measures.

Balance Sheet

The Department prepares consolidated financial statements that include a Balance Sheet, a Statement of Net Cost, a Statement of Changes in Net Position, a Statement of Budgetary Resources, a Statement of Financing, and a Statement of Custodial Activity. Overall, these statements summarize the financial activity and financial position of the Department. The following table highly summarizes these statements and provides a quick overview of significant balances:

ASSETS	(Dollars in Billions) September 30, 1998
Fund Balances with Treasury Primarily appropriated funds to pay current liabilities and finance authorized purchase commitments.	$ 11.2
Investments Primarily monies managed for the Nuclear Waste Fund and the Uranium Enrichment Decontamination and Decommissioning Fund. Fees paid by owners and generators of spent nuclear fuel and high-level radioactive waste, and fees collected from domestic utilities are deposited in the respective funds to pay current program costs, with any excess funds invested in Treasury securities.	10.5
Accounts Receivable Intragovernmental - Primarily for reimbursable work performed for other Federal agencies. Governmental - Primarily for Nuclear Waste Fund and Uranium Enrichment Decontamination and Decommissioning Fund fees.	5.1
Inventory Materials Crude oil at the Strategic Petroleum Reserve, Nuclear Materials and Other Inventory	37.3
General Property, Plant and Equipment Includes over 126 million square feet of buildings located on over 2.6 million acres of land.	19.8
Regulatory Assets Associated with the Department's power generation and management responsibilities. These assets represent the Bonneville Power Administration's (BPA) right to future revenues generated from non-Federal power generator projects in return for BPA's payment of debt issued to complete these projects.	13.2
Other Assets	.8
TOTAL ASSETS	**$ 97.9**

LIABILITIES		(Dollars in Billions) September 30, 1998
Environmental Liabilities		$ 186.4
Represents the Department's obligation to correct the environmental damage incurred throughout the DOE complex while researching, producing, and testing nuclear weapons.		
Debt and Appropriated Capital Owed To Treasury		17.9
Represent amounts which the Department has obligations to pay for borrowing from Treasury, refinanced appropriations, and non-federal projects.		
Accounts Payable		3.4
Intragovernmental - Includes liability for allocation transfers, accrued expenses and interest		
Governmental - Includes contract holdbacks and accrued expenses.		
Pensions and Other Actuarial Liabilities		6.5
Represent amounts which the Department has obligations to pay for specified benefits to contractor employees having approved defined benefit pension plans and postretirement benefits other than pensions.		
Other Liabilities, Including Other Unfunded Liabilities		16.0
Primarily, represents the amount of Nuclear Waste Fund revenues that exceed the Nuclear Waste Fund expenses and DOE's unfunded environment, safety and health liability. Nuclear Waste Fund revenues are accrued based on fees assessed against owners and generators of high-level radioactive waste and spent nuclear fuel and are recognized as costs are incurred for Nuclear Waste Fund activities. The environment, safety and health liability represents those activities necessary to bring facilities and operations into compliance with existing laws and regulations.		
TOTAL LIABILITIES		**$ 230.2**
BEGINNING NET POSITION		**($ 125.0)**
Net Costs of Programs		(20.9)
Energy Resources (Includes $2.8 net gain on sale of NPR-1)	($ 1.1)	
National Security	5.7	
Environmental Quality	.3	
Science & Technology	2.6	
Corporate Management & Other Programs	.1	
Total Business Line Costs	7.6	
Costs Not Assigned to Programs (Includes $10.1 environmental liability adjustment)	13.3	
Financing Sources		13.3
Represents appropriations used, taxes, imputed financing, and transfers.		
Other Adjustments/Changes to Results of Operations		.3
Represents prior period adjustments, change in Nuclear Waste Fund deferred revenues, and decreases in unexpended appropriations.		
ENDING NET POSITION		**($ 132.3)**
TOTAL LIABILITIES AND NET POSITION		**$ 97.9**

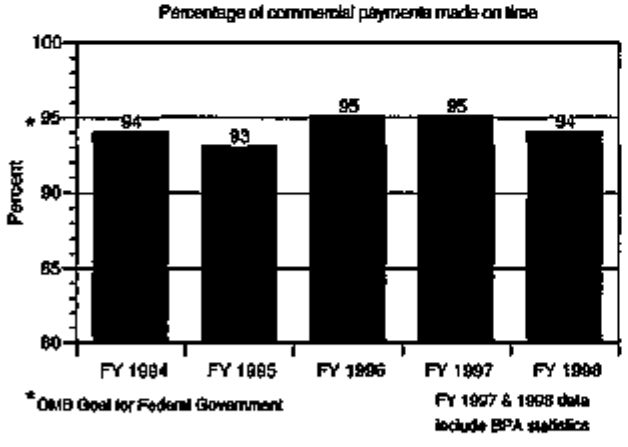
More detailed explanations of these and other balances on the consolidated financial statements are included in the Notes to the Financial Statements.

Financial Performance Measures

Payment Performance

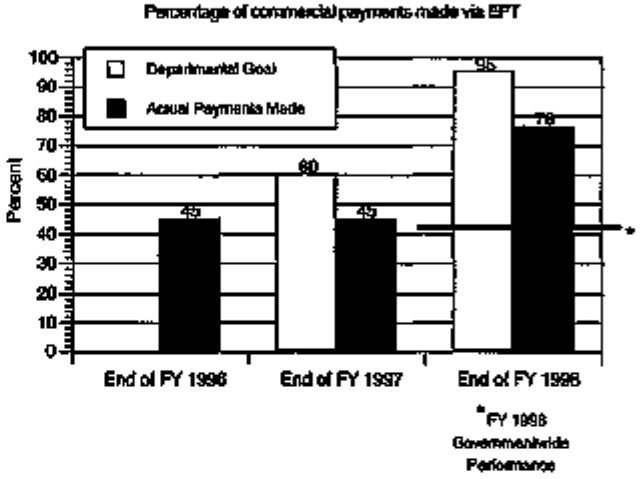
Prompt Payment. The Department is committed to meeting Federal government goals established by the Office of Management and Budget and enacted legislation related to payments made by Federal agencies. **Chart 1** displays the Federal government's prompt payment goal and the Department's performance for FY 1994-FY 1998. The Department's FY 1998 on-time payment performance percentage rate was 94 percent, indicating a small decrease from the FY 1997 performance. This decrease resulted primarily from temporary staffing problems and process interruptions at one of the Power Marketing Administrations and from final process changes associated with payment consolidation efforts. The Department is committed to meeting Federal government goals established by the Office of Management and Budget and enacted legislation related to payments made by Federal agencies and will ensure that appropriate actions are taken to improve future payment performance.

Chart 1. Prompt Payment Percentage



Electronic Funds Transfer. The Debt Collection Improvement Act of 1996 requires the use of Electronic Funds Transfer (EFT) for all Federal payments made after January 1, 1999, with limited exceptions. The results portrayed in **Chart 2** demonstrate the Department's continued efforts to implement the Government-wide mandate to fully utilize EFT for payments. The Department's percentage of commercial payments made by EFT as of September 30, 1998, is 76 percent, which falls short of the established performance goal of 95 percent, but compares very favorably to the Government-wide average of only 42 percent. As a result of this EFT performance being so far ahead of most Federal agencies, the Department has been held out as a model by the Department of the Treasury.

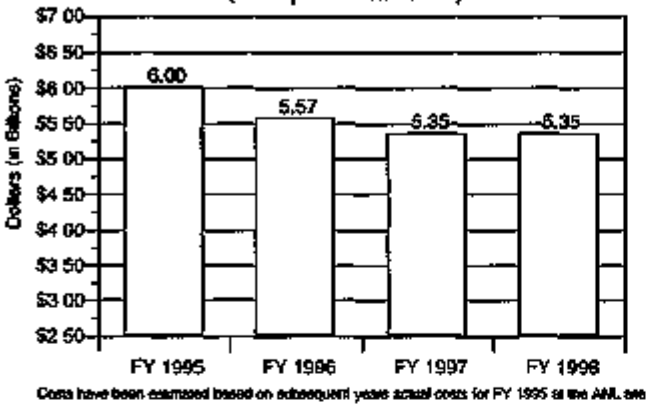
Chart 2. Electronic Funds Transfer (EFT)



Reducing Functional Support Costs

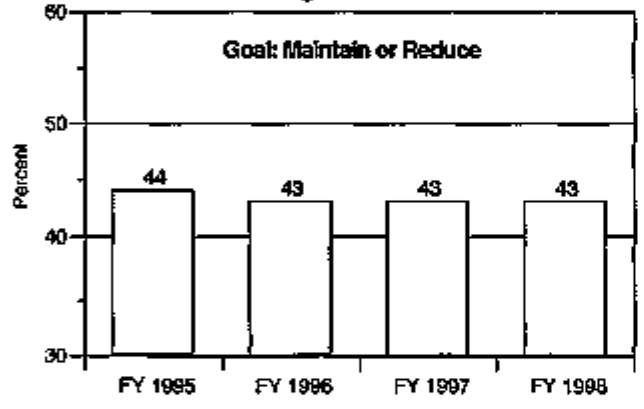
Over the past several years the Department has made significant progress in controlling functional support costs across the complex. Functional support activities are required to be performed, but are not directly tied to mission activities and do not include the costs of capital equipment and construction. Examples of functional support activities include: maintenance, procurement, information/outreach services, safeguards and security, financial services, and safety and health. The Department has implemented a reporting system to compile, analyze and monitor functional support costs provided by the Department's major contractors at 23 Departmental sites. This reporting system accumulates data on functional support costs for FY 1995 through FY 1998. System enhancements implemented during FY 1998 have automated data input and improved the reporting format. **Charts 3 and 4** display the downward trend as the Department focuses to control and monitor these costs.

Chart 3. Managing Functional Support Costs
(23 Departmental Sites)



Costs have been estimated based on subsequent years actual costs for FY 1995 at the AML site

Chart 4. Functional Support Costs as a Percentage of Total Costs



Balances of Uncosted Obligations and Unobligated Appropriations

The Department's total uncosted obligation balance is the lowest it has been in over 15 years. Over the past several years, the Department has made significant progress in analyzing and reducing the level of uncosted balances. Significant balances of uncosted obligations occur when a Federal agency contracts out much of its appropriated funds, as does the Department. These uncosted balances represent the portion of contract obligations related to goods and services which have not yet been received. While balances of uncosted obligations are natural and acceptable, it is incumbent upon Federal agencies to evaluate these balances to ensure that the levels maintained are appropriate and consistent with good financial management.

As reflected in **Charts 5 and 6**, the Department has taken aggressive actions to understand what drives uncosted obligation balances, control and reduce these balances, and more actively consider these resources when determining budget estimates. Most notably, in FY 1996, the Department developed and has continued to refine a comprehensive methodology for analyzing uncosted balances. This methodology established dollar level thresholds which are consistent with sound financial management for specific types of financial/contractual arrangements allowing the Department to evaluate its overall performance based on the variance between the calculated thresholds and actual balances. Additionally, the Department has charted progress in reducing unobligated appropriations balances to ensure that excess uncosted balances are being eliminated rather than recategorized. The results of these internal evaluations indicate that the Department is operating at or near optimum uncosted levels. (NOTE: Charts 5 and 6 exclude data for the Bonneville Power Administration, which is treated as a Government Corporation.)

Chart 5. Uncosted Obligations by Fiscal Year
(Excludes Bonneville Power Administration)

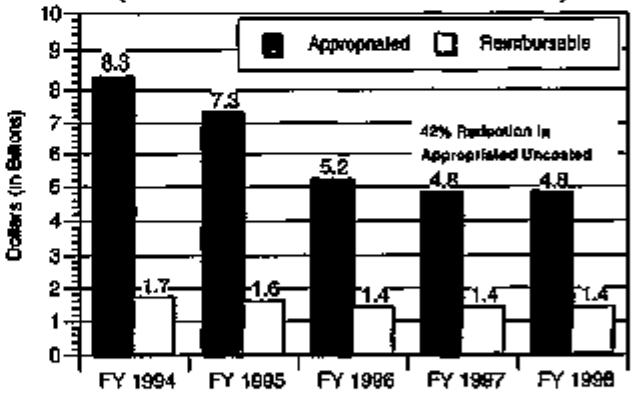
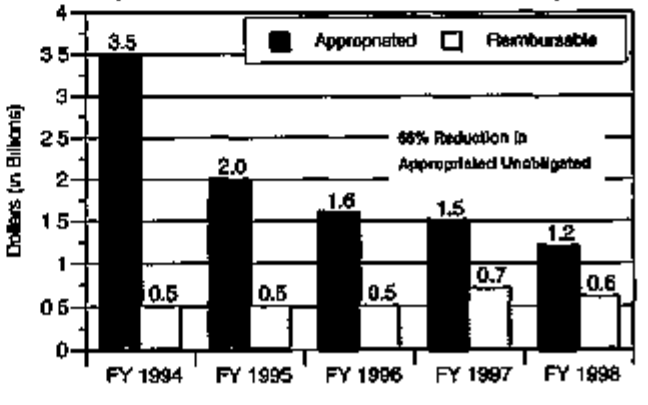


Chart 6. Unobligated Appropriations by Fiscal Year
(Excludes Bonneville Power Administration)



Effective Audit Resolution

The Department receives an average of 100 Inspector General and 80 General Accounting Office reports each year. The CFO is responsible for liaison with both of these audit organizations, for facilitating the preparation of management responses to their reports and resolving audit issues, and for tracking corrective actions through completion. A senior management oversight council, the Departmental Internal Control and Audit Review Council, has the authority to challenge any office not aggressively pursuing completion of audit related corrective actions.

As illustrated in **Charts 7 and 8**, the Department has a number of corrective actions that are incomplete after one year or more. Our goal is to complete these actions as rapidly as possible. However, the amount of time it takes to properly correct a problem identified in an audit report varies according to the nature of the problem. For example, some corrective actions could require the completion of a construction project or the performance of an audit by an outside organization. Others could be delayed by litigation or funding shortfalls. Nevertheless, we have decreased the number of reports open over one year from 72 at the end of FY 1995 to 43 at the end of FY 1998, a reduction of 40 percent.

Chart 7. IG Audit Reports With Agreed-Upon Actions Open Over One Year (By Fiscal Year)

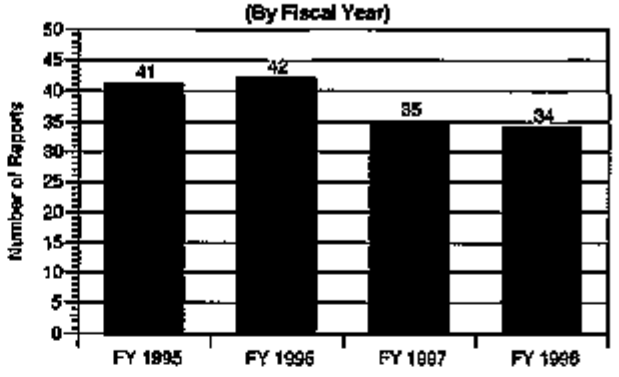
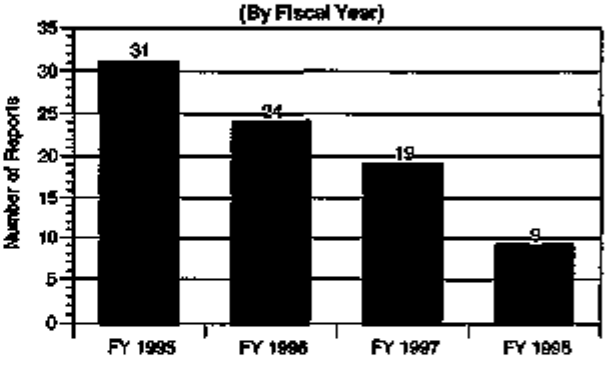


Chart 8. GAO Audit Reports With Agreed-Upon Actions Open Over One Year (By Fiscal Year)



Appendices

Department of Energy
Washington, DC 20585
February 25, 1999

MEMORANDUM FOR THE SECRETARY

FROM: Gregory H. Friedman
Inspector General

SUBJECT: INFORMATION: Report on "Audit of the U.S. Department of Energy's Consolidated Financial Statements for Fiscal Years 1998 and 1997"

BACKGROUND:

The Department prepared the Fiscal Year 1998 Accountability Report to combine critical financial and program performance information in a single report. The Department's consolidated financial statements and our related audit reports are included as major components of the Accountability Report.

DISCUSSION:

The Office of Inspector General audited the Department's consolidated financial statements as of and for the years ended September 30, 1998 and 1997. In the opinion of the Office of Inspector General, except for the environmental liabilities line items in Fiscal Year 1998, these financial statements present fairly, in all material respects, the financial position of the Department as of September 30, 1998 and 1997, and its consolidated net cost, changes in net position, budgetary resources, financing activities, and custodial activities for the years then ended in conformity with Federal accounting standards.

In accordance with *Government Auditing Standards*, the Office of Inspector General issued a separate report on the Department's internal controls. This report discusses needed improvements to the environmental liabilities estimating process and the reporting of performance measure information.

Environmental Liabilities Estimating Process

The Department's effort to address the environmental consequences of its nuclear weapons mission has been recognized as the largest remediation program of its kind ever undertaken. Over the past few years, the Office of Environmental Management has reoriented the tasks of estimating costs and planning work to focus on individual projects. In this manner, the Department expects to achieve greater detail in its environmental liabilities estimate. In June 1998, the Department published a site-by-site estimate of the technical scope, cost, and schedule required to complete all 353 projects at its remaining cleanup sites. Creating such an estimate

involved significant programmatic complexities and technical uncertainties. The Department deserves much credit for its efforts; however, additional improvements are needed. Weaknesses in controls over the Department's estimating process precluded the Office of Inspector General from forming an opinion on the reasonableness of environmental liabilities account balances reported on the Fiscal Year 1998 financial statements.

During the course of the audit, the Office of Inspector General worked closely with the Offices of Environmental Management and Chief Financial Officer to develop a common understanding of cost-effective enhancements to the process for estimating environmental liabilities. The Department plans to incorporate these enhancements to the process, and if these enhancements are executed properly, the internal control weaknesses should be resolved.

Other Issues

We also reported that controls over performance measure information presented in the Overview to the financial statements need to be strengthened. While we considered this matter to be a reportable condition, it did not materially affect the Department's financial statements for Fiscal Years 1998 and 1997.

In addition, the audit disclosed a number of other conditions relating to the Department's internal controls that were not considered to be reportable conditions and did not materially affect the Department's financial statements. These matters will be communicated to the Chief Financial Officer and to the heads of field elements in separate reports. The recommendations made in these reports are designed to strengthen internal controls or improve operating efficiencies.

We also issued a report on the Department's compliance with applicable laws and regulations. The results of our tests in this area disclosed no compliance matters reportable under applicable audit standards.

MANAGEMENT REACTION:

The Department concurred with our recommendations and indicated that it is actively working to improve the quality of the environmental liabilities estimating process and its performance measure reporting.

Attachment

cc: Acting Deputy Secretary
Under Secretary
Chief Financial Officer
Acting Assistant Secretary for Environmental Management

U.S. Department of Energy
Office of Inspector General
Office of Audit Services

REPORT OF THE OFFICE OF INSPECTOR GENERAL

The Secretary
U.S. Department of Energy

We have audited the accompanying consolidated balance sheets of the U.S. Department of Energy (Department) as of September 30, 1998 and 1997, and the related consolidated statements of net cost, changes in net position, budgetary resources, financing, and custodial activity for the years then ended. These financial statements are the responsibility of the Department's management. Our responsibility is to express an opinion on these financial statements based on our audits.

Except as discussed in the following paragraph, we conducted our audits in accordance with generally accepted auditing standards; *Government Auditing Standards* issued by the Comptroller General of the United States; and Office of Management and Budget (OMB) Bulletin No. 98-08, *Audit Requirements for Federal Financial Statements*, as amended. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, the evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that our audit provides a reasonable basis for our opinion.

We were unable to satisfy ourselves as to the recorded balance for the Department's environmental liabilities (described in Note 13) on the balance sheet as of September 30, 1998, and related effects on the accompanying statements for the year then ended based on the Department's records. Nor were we able to satisfy ourselves as to the balances by other auditing procedures. The uncertainty over the balances resulted from a material weakness in the Department's internal controls over estimating environmental liabilities. This weakness is addressed in our audit report on the Department's internal controls.

In our opinion, except for the qualification discussed above, the consolidated financial statements present fairly, in all material respects, the financial position of the U.S. Department of Energy as of September 30, 1998 and 1997, and its consolidated net cost, changes in net position, budgetary resources, financing activities, and custodial activities for the fiscal years then ended in conformity with Federal accounting standards.

Our audit was made for the purpose of forming an opinion on the Department's consolidated financial statements. The information presented in management's Overview, the Supplemental Financial Information, and the Performance Measure Information are not required parts of the principal statements, but are supplementary information required by OMB Bulletin No. 97-01, *Form and Content of Agency Financial Statements*, as amended. We have considered whether this information is materially inconsistent with the consolidated financial statements. Such information has been subjected to limited procedures. However, we did not audit the information, and accordingly, we do not express an opinion on it. The performance information included in management's Overview is addressed in our audit report on the Department's internal controls.

Management has chosen for purposes of additional analysis to incorporate information on the Department's compliance with the Federal Managers' Financial Integrity Act of 1982 (FMFIA) and the Inspector General Act within the Overview to the consolidated financial statements. This information is not a required part of the Department's consolidated financial statements. While the FMFIA information has been reviewed separately by the Office of Inspector General, neither it nor the Inspector General Act information relating to audit followup has been subjected to auditing procedures applied in the audit of the consolidated financial statements, and accordingly, we do not express an opinion on it.

MATTERS OF EMPHASIS

The Department is a party to various administrative proceedings, legal actions, and tort claims that may ultimately result in settlements or decisions adverse to the Government, as discussed in Note 16 of the financial statements. The Office of General Counsel, in responding to our inquiries about these matters, was generally not able to form a conclusion as to the likely outcome or potential loss resulting from many of the claims and assessments against the Department. Readers of the Department's consolidated financial statements should, therefore, be aware that the statements may be affected by uncertainties concerning the outcome of claims described in Note 16, which are not currently susceptible to reasonable estimation.

In addition, the Year 2000 (Y2K) issue represents a significant challenge to the Federal Government. The Department has developed a plan to address and remediate these challenges. If the plan is successfully implemented, management believes that its mission critical systems will not experience adverse effects of the Y2K issue. However, due to the complexities of the Y2K issue, there can be no assurance that the Department is or will be Y2K compliant on a timely basis. Failure of the Department, or other entities with which the Department does business, to successfully address the Y2K issue may result in changes in the Department's structure, operations, and mission; affect its ability to provide goods and services or perform its mission in a timely manner; and cause other operating disruptions.

REFERENCE TO OTHER REPORTS

In accordance with *Government Auditing Standards,* we have also issued a report on our consideration of the Department's internal controls and a separate report on its compliance with laws and regulations. Both reports are dated January 5, 1999.

Office of Inspector General

January 5, 1999

Principal Financial Statements

DOE's financial statements have been prepared to report the financial position and results of operations of the Department of Energy, pursuant to the requirements of the Chief Financial Officers Act of 1990 and the Government Management Reform Act of 1994.

While the statements have been prepared from the books and records of DOE in accordance with the formats prescribed by the Office of Management and Budget, the statements are different from the financial reports used to monitor and control budgetary resources which are prepared from the same books and records.

The statements should be read with the understanding that they are for a component of a sovereign entity, that liabilities not covered by budgetary resources cannot be liquidated without the enactment of an appropriation, and that payment of all liabilities other than for contracts can be abrogated by the sovereign entity.

Consolidated Balance Sheet
As of September 30, 1998 and 1997

		(in millions)
	1998	1997
ASSETS		
Intragovernmental		
Fund balance with Treasury (Note 2)	$11,169	$10,546
Investments (Note 3)	10,200	8,147
Accounts Receivable, Net (Note 4)	482	556
Regulatory Assets (Note 5	5,228	5,228
Other Assets	5	7
Investments (Note 3)	283	245
Accounts Receivable, Net (Note 4)	4,583	4,649
Inventory, Net (Note 6)		
Strategic Petroleum Reserve	15,087	15,087
Nuclear Materials	21,728	22,531
Other Inventory	504	521
General Property, Plant, and Equipment, Net (Note 7)	19,840	20,766
Regulatory Assets (Note 5)	8,031	7,936
Other Assets	827	592
Total Assets	$97,947	$96,801
LIABILITIES		
Liabilities Covered by Budgetary Resources		
Intragovernmental Liabilities		
Accounts Payable (Note 8)	$119	$140
Debt (Note 9)	8,906	9,083
Appropriated Capital Owed to Treasury (Note 10)	1,986	2,309
Deferred Revenues (Note 11)	217	244
Other Liabilities (Note 12)	280	250
Accounts Payable (Note 8)	3,276	3,564
Debt (Note 9)	7,056	7,166
Deferred Revenues (Note 11)	11,065	9,351
Other Liabilities (Note 12)	2,030	1,423
Funded Environmental Liabilities (Note 13)	918	1,148
Total Liabilities Covered By Budgetary Resources	$35,833	$34,698
Liabilities Not Covered By Budgetary Resources		
Environmental Liabilities (Note 13)	185,495	179,466
Pension and Other Actuarial Liabilities (Note 14)	6,508	6,282
Other Unfunded Liabilities (Note 15)	1,934	1,332
Contingencies (Note 16)	506	11
Total Liabilities Not Covered By Budgetary Resources	$194,443	$187,091
Total Liabilities	$230,276	$221,789
NET POSITION		
Unexpended Appropriations (Note 17)	4,939	5,368
Cumulative Results of Operations	(137,268)	(130,356)
Total Net Position	($132,329)	($124,988)
Total Liabilities and Net Position	$97,947	$96,801

The accompanying notes are an integral part of these statements.

Consolidated Statements of Net Cost
For the Years Ended September 30, 1998 and 1997

	(in millions)	
	1998	1997
Costs		
Energy Resources (Note 18)		
Program Costs	$4,848	$4,834
Net Gain on Sale of Naval Petroleum Reserves	($2,848)	
Earned Revenues	(3,127)	(3,727)
Net Cost of Energy Resources Programs	($1,127)	$1,107
National Security (Note 19)		
Program Costs	$5,726	$5,876
Earned Revenues	(3)	(41)
Net Cost of National Security Programs	$5,723	$5,835
Environmental Quality (Note 20)		
Program Costs	$637	$1,246
Earned Revenues	(296)	(248)
Net Cost of Environmental Quality Programs	$341	$998
Science & Technology (Note 21)		
Program Costs	$2,583	$2,562
Earned Revenues	(13)	(11)
Net Cost of Science & Technology Programs	$2,570	$2,551
Other Programs (Note 22)		
Program Costs	$2,255	$2,422
Earned Revenues	(2,171)	(2,251)
Net Cost of Other Programs	$84	$171
Costs Not Assigned to Programs (Note 23)	13,379	(45,886)
Less Earned Revenues Not Attributable to Programs	(14)	(23)
Net Cost of Operations	$20,956	($35,249)

The accompanying notes are an integral part of these statements.

Consolidated Statements of Changes in Net Position
For the Years Ended September 30, 1998 and 1997

		(In millions)
	1998	1997
Net Cost of Operations	($20,956)	$35,249
Financing Sources (Other Than Exchange Revenues)		
Appropriations Used	16,861	17,550
Taxes (and Other Non-Exchange Revenues)	2	(11)
Imputed Financing	79	97
Transfers-in	0	(100)
Transfers-out	(3,612)	(928)
Net Results of Operations	($7,626)	$51,857
Prior Period Adjustments (Note 24)	37	(6,076)
Net Change in Cumulative Results of Operations	($7,589)	$45,781
Change in Nuclear Waste Fund Deferred Revenues	945	211
Increase (Decrease) in Unexpended Appropriations	(697)	(533)
Change in Net Position	($7,341)	$45,459
Net Position - Beginning of Period	(124,988)	(170,447)
Net Position - End of Period	($132,329)	($124,988)

Consolidated Statements of Budgetary Resources
For the Years Ended September 30, 1998 and 1997

		(In millions)
	1998	1997
BUDGETARY RESOURCES		
Budgetary Authority	$17,103	$16,990
Unobligated Balances - Beginning of Period	2,464	2,651
Spending Authority from Offsetting Collections	4,696	4,640
Adjustments	(167)	(32)
Total Budgetary Resources	$24,096	$24,249
STATUS OF BUDGETARY RESOURCES		
Obligations Incurred	21,921	21,429
Unobligated Balances Available	2,690	3,358
Unobligated Balances - Not Available	(515)	(538)
Total, Status of Budgetary Resources	$24,096	$24,249
OUTLAYS		
Obligations Incurred	21,921	21,429
Less Spending Authority from Offsetting Collections and Adjustments	(4,725)	(4,671)
Obligated Balance, Net - Beginning of Period	7,903	8,487
Obligated balance Transferred, Net	2	2
Less Obligated balance, Net - End of Period	(8,072)	(7,903)
Total Outlays	$17,029	$17,344

The accompanying notes are an integral part of these statements.

Consolidated Statements of Financing
For the Years Ended September 30, 1998 and 1997

		(In millions)
	1998	1997
OBLIGATIONS AND NONBUDGETARY RESOURCES		
Obligations Incurred		
Category A, Direct	$19,897	$19,391
Reimbursable	2,024	2,038
Less Spending Authority from Offsetting Collections and Adjustments		
Earned Reimbursements		
Collected	(4,982)	(4,875)
Receivable from Federal Sources	54	6
Change in Unfilled Orders (Decreases) Increases	(65)	163
Recoveries of Prior-Year Obligations	(28)	(34)
Financing Imputed for Cost Subsidies	78	82
Transfers Out (Note 25)	(3,612)	(1,026)
Exchange Revenues Not In the Budget	1,549	1,260
Other	(212)	(248)
Total Obligations as Adjusted, and Nonbudgetary Resources	$14,703	$16,757
RESOURCES THAT DO NOT FUND NET COST OF OPERATIONS		
Change in Amount of Goods, Services, and Benefits Ordered but Not Yet Received or Provided	102	374
Costs Capitalized on the Balance Sheet		
General Property, Plant, and Equipment	(1,274)	(1,595)
Purchases of Inventory	(463)	(523)
Financing Sources That Fund Costs of Prior Periods	(6,301)	(6,037)
Other	(1,410)	(1,565)
Total Resources that Do Not Fund Net Cost of Operations	($9,346)	($9,346)
COSTS THAT DO NOT REQUIRE RESOURCES		
Depreciation and Amortization	1,875	1,902
Revaluation of Assets and Liabilities	(161)	626
Loss on Disposition of Assets	484	23
Other	630	2,876
Total Costs That Do Not Require Resources	$2,828	$5,427
FINANCING SOURCES YET TO BE PROVIDED (Note 26)	12,771	(48,087)
NET COST OF OPERATIONS	$20,956	($35,249)

The accompanying notes are an integral part of these statements.

Consolidated Statements of Custodial Activities
For the Years Ended September 30, 1998 and 1997

		(in millions)
	1998	1997
SOURCES OF COLLECTIONS (Note 27)		
Cash Collections		
Power marketing administrations	$428	$438
Petroleum Pricing Violation Escrow Fund	74	80
Other	3	3
Net Collections	$505	$521
Accrual Adjustment		
Power marketing administrations	12	4
Petroleum Pricing Violation Escrow Fund	(50)	(53)
Total Revenue	$467	$472
DISPOSITION OF REVENUE		
Transferred to Others		
Treasury	(440)	(537)
Other	(57)	(51)
Increase (Decrease) in Amounts to be Transferred	53	148
Collections Used for Refunds and Other Payments	(2)	(2)
Retained by DOE	(21)	(30)
Net Custodial Activity	$0	$0

The accompanying notes are an integral part of these statements.

Notes to the Financial Statements

1. Significant Accounting Policies

A. Basis of Presentation

These consolidated financial statements have been prepared to report the financial position and results of operations of the U.S. Department of Energy (DOE). They have been prepared from the books and records of DOE in accordance with the form and content for agency financial statements, specified by the Office of Management and Budget (OMB) in OMB Bulletin No. 97-01. Generally accepted accounting principles for the Federal government consist of the following hierarchy:

- Individual standards agreed to by the Director of OMB, the Comptroller General, and the Secretary of the Treasury and published by OMB and the General Accounting Office;
- Interpretations related to the Statements of Federal Financial Accounting Standards issued by OMB;
- Requirements contained in OMB Bulletin No. 97-01, Form and Content of Agency Financial Statements; and
- Accounting principles published by other authoritative standard-setting bodies and other authoritative sources.

B. Description of Reporting Entity

DOE is a cabinet level agency of the Executive Branch of the U.S. Government. DOE's headquarters organizations are located in Washington, D.C. and Germantown, MD and consist of an executive management structure that includes: the Secretary, the Deputy Secretary, and the Under Secretary; Secretarial staff organizations; and program organizations that provide technical direction and support for DOE's principal programmatic missions. DOE also includes the Federal Energy Regulatory Commission, which is an independent regulatory organization responsible for setting rates and charges for the transportation and sale of natural gas and for the transmission and sale of electricity and the licensing of hydroelectric power projects.

DOE has a complex field structure comprised of operations offices, field offices, power marketing administrations, laboratories, and other facilities. The majority of DOE's environmental cleanup, energy research and development, and testing and production activities are carried out by major contractors. These contractors operate, maintain, or support DOE's government-owned facilities on a day-to-day basis and provide other special work under the direction of field organizations.

These contractors have unique contractual relationships with DOE. In most cases, their charts of accounts and accounting systems are integrated with DOE's accounting system through a home office-branch office type of arrangement. Additionally, DOE is ultimately responsible for funding certain defined benefit pension plans, as well as postretirement benefits such as medical care and life insurance, for the employees of these contractors. As a result, these statements reflect not only the costs incurred by these contractors, but also include certain assets (i.e., employee advances and prepaid pension costs) and liabilities (i.e., accounts payable, accrued expenses including payroll and benefits, and pension and other actuarial liabilities) that would not be reflected in the financial statements of other Federal agencies that do not have these unique contractual relationships.

C. Basis of Accounting

Transactions are recorded on an accrual accounting basis and a budgetary basis. Under the accrual method, revenues are recognized when earned and expenses are recognized when liabilities are incurred, without regard to receipt or payment of cash. Budgetary accounting facilitates compliance with legal constraints and controls over the use of Federal funds. All material intra-agency balances and transactions have been eliminated in consolidation.

D. Revenues and Other Financing Sources

DOE receives the majority of the funding needed to perform its mission through Congressional appropriations. These appropriations may be used, within statutory limits, for operating and capital expenditures. Revenues are recognized when earned (i.e., goods have been delivered or services rendered.)

E. Funds with Treasury and Cash

Funds with Treasury represent appropriated funds, trust funds, and revolving funds that are available to pay current liabilities and finance authorized purchase commitments. Cash balances held outside Treasury primarily represent trust fund balances held in minority financial institutions. (See Note 2)

F. Investments

Investments in Treasury securities for the Nuclear Waste Fund are classified as available for sale and are reported at fair value in accordance with Statement of Financial Accounting Standards (SFAS) No. 115, *Accounting for Certain Investments in Debt and Equity Securities*. All other DOE investments are reported at cost net of amortized premiums or discounts, as it is DOE's intent to hold the investments to maturity. Premiums or discounts are amortized using the effective interest method. (See Note 3)

G. Accounts Receivable, Net of Allowance

The amounts due for governmental (non-Federal) receivables are stated net of an allowance for uncollectible accounts. The estimate of the allowance is based on past experience in the collection of receivables and an analysis of the outstanding balances. (See Note 4)

H. Property, Plant, and Equipment

Property, plant, and equipment that are purchased, constructed, or fabricated in-house, including major modifications or improvements, are capitalized at cost. Costs of construction are capitalized as construction work in process. Upon completion or beneficial occupancy, the cost is transferred to the appropriate property account. Property, plant and equipment related to environmental management facilities storing and processing DOE's environmental legacy wastes are not capitalized. (See Notes 7 and 24)

Depreciation expense is generally computed using the straight line method throughout DOE. The units of production method may be used only in special cases where applicable, such as depreciating automotive equipment on a mileage basis and construction equipment on an hourly use basis. The ranges of service lives are generally as follows:

Structures	25 - 40 years
ADP Software	5 - 20 years
Equipment	5 - 45 years

I. Liabilities

Liabilities represent amounts of monies or other resources likely to be paid by DOE as a result of a transaction or event that has already occurred. However, no liability can be paid by DOE absent an authorized appropriation. Liabilities for which an appropriation has not been enacted are, therefore, classified as unfunded liabilities, and there is no certainty that the appropriations will be enacted. Also, liabilities of DOE arising from other than contracts can be abrogated by the Government, acting in its sovereign capacity.

J. Accrued Annual, Sick and Other Leave

Federal employees' annual leave is accrued as it is earned, and the accrual is reduced annually for actual leave taken and increased for leave earned. Each year, the accrued annual leave balance is adjusted to reflect the latest pay rates. To the extent that current or prior year appropriations are not available to fund annual leave earned but not taken, funding will be obtained from future financing sources.

Sick leave and other types of nonvested leave are expensed as taken.

K. Retirement Plans

Federal Employees

There are two primary retirement systems for Federal employees. DOE employees hired prior to January 1, 1984 may participate in the Civil Service Retirement System (CSRS)and contribute 7% of pay to which DOE makes contributions equal to 8.51 percent of pay. On January 1, 1984, the Federal Employees Retirement System (FERS) went into effect pursuant to Public Law 99-335. Most employees hired after December 31, 1983, are automatically covered by FERS and Social Security. Employees hired prior to January 1, 1984, elected to either join FERS and Social Security or remain in CSRS. A primary feature of FERS is that it offers a savings plan to which DOE automatically contributes 1 percent of pay and matches any employee contribution up to an additional 4 percent of pay. For most employees hired since December 31, 1983, DOE also contributes the employer's matching share for Social Security. DOE does not report CSRS or FERS assets, accumulated plan benefits, or unfunded liabilities, if any, applicable to its employees. Reporting such amounts is the responsibility of the Office of Personnel Management and the Federal Employees Retirement System. DOE does report, as an imputed financing source and a program expense, the difference between its contributions to Federal employee pension and other retirement benefits and the estimated actuarial costs as computed by the Office of Personnel Management.

Contractor Employees

Most DOE contractors have a defined benefit pension plan under which they promise to pay specified benefits, such as a percentage of the final average pay for each year of service. DOE costs under the contracts include reimbursement of annual employer contributions to the pension plans. Each year an amount is calculated for employers to contribute to the pension plan to ensure the plan assets are sufficient to provide for the full accrued benefits of contractor employees in the event that the plan is terminated. The level of contributions is

dependent on actuarial assumptions about the future, such as the interest rate, employee turnover and deaths, age of retirement, and salary progression. (See Note 13)

L. Comparative Data

Certain FY 1997 amounts have been reclassified to conform to the FY 1998 presentation.

M. Program Expenses

Program expenses are summarized in the Consolidated Statement of Net Costs by business line, which represents the four major elements of the Department's mission. The program expenses reported in the Consolidated Statement of Net Costs represent the full cost of the Department's programs in accordance with the Department's implementation of OMB's Statement of Federal Financial Accounting Standards Number 4, *Managerial Cost Accounting Concepts and Standards for the Federal Government*. A detailed breakdown of the expenses for each business line is presented in the Notes.

N. Use of Estimates

DOE has made certain estimates and assumptions relating to the reporting of assets and liabilities and the disclosure of contingent assets and liabilities to prepare these consolidated financial statements. Actual results could differ from these estimates.

2. Fund Balance with Treasury *(in millions)*

	FY 1998			FY 1997		
	Agency Funds	Custodial Funds	Total Fund Balance	Agency Funds	Custodial Funds	Total Fund Balance
Trust Funds						
Advances for Co-sponsored Projects		$8	$8		$10	$10
Revolving Funds						
Bonneville Power Administration Fund	$526		526	$399		399
Colorado River Basins Power Marketing Fund	38		38	39		39
U. S. Enrichment Corporation		484	484			
Other	37	1	38	34	1	35
Total Revolving Funds	$601	$485	$1,086	$472	$1	$473
Appropriated Funds						
Fossil Energy Research and Development	318		318	310		310
Energy Conservation	537		537	574		574
Naval Petroleum & Oil Shale Reserves	99		99	512		512
Science	1,060		1,060	425		425
Energy Supply	782		782	1,863		1,863
Clean Coal Technology	860		860	1,038		1,038
Weapons Activities	1,807		1,807	1,613		1,613
Defense Environmental Restoration & Waste Management	2,063		2,063	2,145		2,145
Other Defense Programs	773		773	768		768
Other	946	6	952	560	7	567
Total Appropriated Funds	$9,245	$6	$9,251	$9,808	$7	$9,815
Special Funds						
Elk Hills School Land Funds		298	298			
Construction, Rehabilitation, Operation, & Maintenance, Western Area Power Administration	166		166	189		189
Other	17		17	30		30
Total Special Funds	$183	$298	$481	$219	$0	$219
Deposit Funds						
Naval Petroleum Reserve Fund		323	323			
Other	3	17	20	8	21	29
Total Deposit Funds	$3	$340	$343	$8	$21	$29
Total Funds in Treasury	$10,032	$1,137	$11,169	$10,502	$39	$10,546

FY 1997 fund balances have been restated to include transfer appropriations received from other agencies.

3. Investments *(in millions)*

	Face	Unamortized Premium (Discount)	Investments Net	Market Value
Fiscal Year 1998				
Agency Assets				
Intragovernmental Non-Marketable				
Nuclear Waste Fund	$11,169	($3,453)	$7,716	$8,610
Net unrealized holding gains			894	
Uranium Enrichment D&D Fund	1,280	10	$1,290	1,314
Great Plains Gasification Plant Trust Fund	13	0	$13	13
Subtotal	$12,462	($3,443)	$9,913	$9,937
Governmental Marketable Securities				
Du Pont pension receipts	50		50	50
Total agency investments	$12,512	($3,443)	$9,963	$9,987
Custodial Assets				
Intragovernmental Non-Marketable				
Petroleum Pricing Violation Escrow Fund	290	(3)	287	287
Governmental Marketable Securities				
Petroleum Pricing Violation Escrow Fund	213		213	213
Total custodial investments	$503	($3)	$500	$500
Total FY 1998 investments	$13,015	($3,446)	$10,463	$10,487
Fiscal Year 1997				
Agency Assets				
Intragovernmental Non-Marketable				
Nuclear Waste Fund	$6,248	$579	$6,827	$6,947
Net unrealized holding gains			120	
Uranium Enrichment D&D Fund	880	4	884	886
Great Plains Gasification Plant Trust Fund	14		14	14
Subtotal	$7,142	$583	$7,845	$7,847
Governmental Marketable Securities				
Du Pont pension receipts	45		45	72
Total agency investments	$7,187	$583	$7,890	$7,919
Custodial Assets				
Intragovernmental Non-Marketable				
Petroleum Pricing Violation Escrow Fund	303	(3)	300	300
Low Level Radioactive Waste Fund	2		2	2
Subtotal	$305	($3)	$302	$302
Governmental Marketable Securities				
Petroleum Pricing Violation Escrow Fund	200		200	200
Total custodial investments	$505	($3)	$502	$502
Total FY 1997 Investments	$7,692	$580	$8,392	$8,421

Pursuant to statutory authorizations, DOE invests monies in Treasury notes and commercial certificates of deposit which are secured by the Federal Deposit Insurance Corporation. DOE's investments primarily involve the Nuclear Waste Fund and the Uranium Enrichment Decontamination and Decommissioning Fund. Fees paid by owners and generators of spent nuclear fuel and high-level radioactive waste and fees collected from domestic utilities are deposited into the respective funds. Funds in excess of those needed to pay current program costs are invested in Treasury securities. DOE also has non-Federal

securities resulting from an over funded pension plan of a former contractor and the 1988 sale of the Great Plains Coal Gasification Project to a private concern.

DOE custodial investments are primarily Petroleum Pricing Violation Escrow Fund receipts collected as a result of consent agreements reached with individuals or firms that violated petroleum pricing regulations during the 1970s. These receipts are invested in Treasury securities and certificates of deposit at minority financial institutions pending determination by DOE as to how to distribute the fund balance.

Except for the Nuclear Waste Fund, DOE's investments are valued at the amortized acquisition cost. The Nuclear Waste Fund investments are reported at fair value in accordance with SFAS No. 115, which requires the valuation of investments at fair value when there is an intent to sell the securities prior to maturity. Based on past investment practices, the Nuclear Waste Fund's Treasury notes are routinely redeemed prior to maturity in order to maximize the return on the Fund's investments and minimize uninvested cash balances. As a result, the Nuclear Waste Fund's investment balance includes net unrealized holding gains of $894 million and $120 million as of September 30, 1998, and 1997 respectively.

4. Accounts Receivable

(in millions)

	FY 1998			FY 1997		
	Receivable	Allowance	Net	Receivable	Allowance	Net
Agency Receivables						
Intragovernmental						
Accounts receivable	$374		$374	$442		$442
Interest receivable	$108		108	114		$114
Subtotal	$482		$482	$556		$556
Governmental						
Nuclear Waste Fund receivables	2,440		2,440	2,316		$2,316
Uranium Enrichment D&D Fund receivables	1,526		1,526	1,662		$1,662
Power Marketing Administrations' receivables	343		343	371		$371
Credit program receivables	62	($26)	36	66	($26)	$40
Other	196	(68)	128	253	(123)	$130
Subtotal	$4,567	($94)	$4,473	$4,668	($149)	$4,519
Total agency receivables	$5,049	($94)	$4,955	$5,224	($149)	$5,075
Custodial Receivables						
Petroleum Pricing Violation Escrow Fund	2,404	(2,294)	110	2,449	(2,319)	$130
Total Receivables	$7,453	($2,388)	$5,065	$7,673	($2,468)	$5,205

Intragovernmental accounts receivable primarily represent amounts due from other Federal agencies for reimbursable work performed pursuant to the Economy Act, Atomic Energy Act, and other statutory authority. Interest receivable represents earned revenues on investments held in Treasury securities.

Governmental receivables represent amounts due primarily for Nuclear Waste Fund (NWF) and Uranium Enrichment Decontamination and Decommissioning (D&D) Fund fees. NWF receivables are supported by contracts and agreements with public utilities that contribute resources to the fund. D&D Fund receivables from public utilities are supported by public law. Other receivables due from the public include reimbursable work billings and other amounts related to trade receivables, overpayments, and other miscellaneous receivables.

Custodial receivables represent amounts owed as a result of consent agreements reached with individuals or firms that violated petroleum pricing regulations during the 1970s. The majority of these receivables are with individuals or firms that are in bankruptcy, or collection action is being taken by the Department of Justice. Many cases handled by the Department of Justice will result in complete write-offs or settlement agreements for amounts significantly less than the original consent agreement. Allowance accounts have been established to reflect the realistic potential for recovery of amounts owed. The methodology used to calculate the allowance accounts was derived through an intensive analysis of each case. The receivables were categorized based on the status of the case, the financial condition of the debtor, the collections received to date, and any pertinent information from the Office of General Counsel related to each case. Based on this analysis and categorization, percentages for the probability of collection were determined. Percentages ranging from 7 to 100 were used to calculate the allowance account.

5. Regulatory Assets

(in millions)

	FY 1998	FY 1997
Intragovernmental		
Appropriation refinancing asset	$5,228	$5,228
Governmental		
Operating regulatory assets	2,930	2,775
Non-operating regulatory assets	4,319	4,350
Conservation and fish & wildlife projects	762	800
Other	20	11
Total governmental regulatory assets	$8,031	$7,936
Total	$13,259	$13,164

DOE's power marketing administrations record certain assets in accordance with SFAS No. 71. The provisions of SFAS No. 71 require that regulated enterprises reflect rate actions of the regulator in their financial statements, when appropriate. These rate actions can provide reasonable assurance of the existence of an asset, reduce or eliminate the value of an asset, or impose a liability on a regulated enterprise. The Bonneville Power Administration reclassified its FY 1997 regulatory assets among the operating, nonoperating and other categories.

Appropriation refinancing asset

The BPA Appropriations Refinancing Act of 1994 required that the unpaid balance, as of September 30, 1996, of the Federal Columbia River Power System (FCRPS) capital appropriations, which BPA is obligated to set rates to recover, be reset and assigned prevailing market rates. As a result, BPA assumed the liability to repay the unpaid balance of capital appropriations of the power generating assets of the Corps of Engineers and the Bureau of Reclamation associated with the FCRPS. In accordance with SFAS No. 71, offsetting regulatory assets are recognized which represent the ability of BPA to repay this appropriated capital from the proceeds of power sales generated from the Corps and Bureau of Reclamation assets.

Operating regulatory assets

The Bonneville Power Administration (BPA) has acquired the generating capability of one operating nuclear power plant, as well as several hydroelectric projects. BPA pays the annual operating costs including debt service. These project costs are recovered through BPA's electric rates. Because these projects' current and future costs can be recovered through BPA's electricity rates, the Balance Sheet includes a regulatory asset and an offsetting related debt.

Non-Operating Regulatory Assets

BPA has acquired all or part of the generating capability of four terminated nuclear power plants. The government's contracts require BPA to pay all or part of the annual projects' budgets, including debt service of the terminated plants. Because these projects' current and future costs can be recovered through BPA's electricity rates, the Balance Sheet includes a regulatory asset and an offsetting related debt.

Conservation and fish and wildlife projects

The conservation and fish and wildlife projects consist of facilities constructed by BPA for the protection, enhancement, and mitigation of fish and wildlife losses attributed to the development and operation of hydroelectric projects on the Columbia River and its tributaries pursuant to Section 4(h) of the Northwest Power Act. BPA pays for the construction of the facilities and recovers the costs in rates but does not retain ownership of the facilities. These facilities are amortized and recovered in rates over a 15 year period.

6. Inventory, Net

Inventory includes stockpile materials, consisting of crude oil held in the Strategic Petroleum Reserve and nuclear materials, and other inventory consisting primarily of operating materials and supplies

The Strategic Petroleum Reserve consists of crude oil stored in salt domes, terminals, and pipelines The Reserve contained 563 million barrels of oil as of September 30, 1998 The reserve provides a deterrent to the use of oil as a political instrument and provides an effective response mechanism should a disruption occur Oil from the reserve may be sold only with the approval of Congress and the President of the United States During FY 1997, DOE sold 10 2 million barrels of crude oil inventory from the reserve No oil was sold from the Reserve in FY 1998

The FY 1993 Defense Appropriations Act authorized DOE to acquire, transport, store and prepare for ultimate drawdown of crude oil for the Department of Defense (DOD) The crude oil purchased with DOD funding is commingled with DOE stock and is held for DOD's future use The historical cost of the crude oil held for DOD is $106 million

Nuclear materials include weapons and related components, including those in the custody of the Department of Defense under Presidential Directive, and materials used for research and development purposes

Stockpile materials are recorded at historical costs in accordance with Statement of Federal Financial Accounting Standards No 3, *Accounting for Inventory and Related Property,* except for certain nuclear materials which have been identified as surplus or excess to DOE's needs These nuclear materials are recorded at their net realizable value

7. Property, Plant and Equipment, Net

(in millions)

	FY 1998			FY 1997		
	Acquisition Costs	Accumulated Depreciation	Net Book Value	Acquisition Costs	Accumulated Depreciation	Net Book Value
Land and land rights	$460	($4)	$456	$497	($4)	$493
Structures and facilities	29,245	(18 154)	11,091	$29 138	(17 664)	11,474
ADP software	33	(7)	26	$14	(13)	1
Equipment	14 065	(9,080)	4 985	$13,725	(8,493)	5,232
Natural resources	66	(8)	58	$11	(2)	9
Construction work in process	3,224	0	3,224	$3,547	0	3,547
Total	$47 093	($27 253)	$19 840	$46,932	($26 176)	$20,756

In FY 1997, DOE raised its capitalization threshold from $5,000 to $25,000 for all field elements except the power marketing administrations. This change in accounting policy resulted in a charge to expense during FY 1997 of $694 million Another $34 million was charged to expense in FY 1998 as additional capitalized items under the new threshold were identified and written off (See Note 23)

8. Accounts Payable

(in millions)

	FY 1998	FY 1997
Intragovernmental		
Accounts payable	$39	$76
Accrued expenses	45	24
Accrued interest	35	40
	$119	$140
Governmental		
Accounts payable	$1,140	$1,021
Uranium inventories to be transferred to USEC (see Note 23)		426
Contract holdbacks	43	61
Accrued expenses	2,093	2,086
	$3,276	$3,584
Total accounts payable	$3,395	$3,724

Certain FY 1997 amounts have been reclassified to conform to the FY 1998 presentation.

9. Debt

(in millions)

	FY 1998	FY 1997
Intragovernmental Debt		
Borrowing from Treasury	$2,499	$2,499
Refinanced appropriations	6,407	6,584
Subtotal	$8,906	$9,083
Governmental Debt		
Non-Federal projects	7,056	7,166
Total debt	$15,962	$16,249

Borrowing from Treasury

To finance its capital programs, the Bonneville Power Administration is authorized to issue to Treasury up to $3,750 million of interest-bearing debt with terms and conditions comparable to debt issued by U.S. government corporations. A portion ($1,250 million) is reserved for conservation and renewable resource loans and grants. The average interest rate of BPA's long-term debt exceeds the rate which could be obtained currently. As a result, the fair value of BPA's long-term debt, based on discounting future cash flows using rates offered by Treasury as of September 30, 1998 and 1997, for similar maturities, exceeds carrying value by approximately $559 million and $303 million, respectively. BPA's policy is to refinance debt that is callable when associated benefits exceed costs of refinancing.

Refinanced appropriations

The BPA Appropriations Refinancing Act of 1994 required that the unpaid balance, as of September 30, 1996, of the Federal Columbia River Power System (FCRPS) capital appropriations, which BPA is obligated to set rates to recover, be reset and assigned prevailing market rates. The majority of the refinanced appropriations represent the unpaid capital appropriations of the Corps of Engineers and the Bureau of Reclamation. (See Note 5)

Non-Federal projects

As discussed in Note 5, the non-Federal projects debt represents BPA's liability to pay all or part of the annual budgets, including debt service, of the generating capability of five nuclear power plants as well as several hydroelectric projects.

10. Appropriated Capital Owed to Treasury

Appropriated capital owed to Treasury represents the balance of appropriations provided to DOE's power marketing administrations for construction and operation of power projects which will be repaid to Treasury. The amount owed also includes accumulated interest on the net unpaid Federal investment in the power projects. The Federal investment in these facilities is to be repaid to Treasury within 50 years from the time the facilities are placed in service or are commercially operational. Replacements to Federal investments are generally to be repaid over their expected useful service lives. There is no requirement for repayment of a specific amount of Federal investment on an annual basis.

Each of the power marketing administrations, except the Bonneville Power Administration, receives an annual appropriation to fund operation and maintenance expenses. These appropriations totaled $245 million and $229 million in FY 1998 and FY 1997, respectively. These appropriated funds are repaid to Treasury from the revenues generated from the sale of power and transmission services. To the extent that funds are not available for payment, such unpaid annual net deficits become payable from the subsequent years' revenues prior to any repayment of Federal investment. DOE treats these appropriations as a borrowing from Treasury, and as such, the Statement of Changes in Net Position does not reflect these funds as appropriated capital used.

Except for the appropriation refinancing asset described in Note 5, DOE's financial statements do not reflect the Federal investment in power generating facilities owned by the U.S. Department of Defense, Army Corps of Engineers; the U.S. Department of Interior, Bureau of Reclamation; and the U.S. Department of State, International Boundary and Water Commission. DOE's power marketing administrations are responsible for collecting, and remitting to Treasury, revenues resulting from the sale of hydroelectric power generated by these facilities.

11. Deferred Revenues

(in millions)

	FY 1998	FY 1997
Intragovernmental		
Nuclear Waste Fund	$198	$123
Other	19	121
	$217	$244
Governmental		
Nuclear Waste Fund	9,795	8,891
United States Enrichment Corporation	482	
Power Marketing Administrations	437	277
Reimbursable work advances	224	106
Other	127	77
	$11,065	$9,351
Total	$11,282	$9,595

Nuclear Waste Fund

Nuclear Waste Fund revenues are accrued based on fees assessed against owners and generators of high-level radioactive waste and spent nuclear fuel and interest accrued on investments in Treasury securities. These revenues are recognized as a financing source as costs are incurred for Nuclear Waste Fund activities. Annual adjustments are made to defer revenues that exceed the Nuclear Waste Fund expenses. FY 1997 balances were restated to reflect reclassifications between intragovernmental and governmental components.

United States Enrichment Corporation

Upon privatization of the United States Enrichment Corporation (USEC) on July 28, 1998, OMB and the Department of the Treasury designated DOE as successor to USEC for purposes of disposition of balances remaining in the United States Enrichment Fund, including payment of final bills associated with privatization. As of September 30, 1998, a total of approximately $484 million resided in the USEC-Government account. Of this amount, approximately $374 million was retained for the treatment and recycling of depleted uranium hexafluoride generated by USEC between July 1, 1993 and the privatization date. A liability was established in FY

1998 for this amount. Pursuant to Public Law 105-204, the Secretary of Energy shall prepare and the President shall include in the budget request for FY 2000, a plan and proposed legislation for the use of these funds to commence construction of, not later than January 1, 2004, and to operate an onsite facility at each of the gaseous diffusion plants at Paducah, Kentucky, and Portsmouth, Ohio, to treat and recycle this material. The law further provides that no amounts shall be withdrawn from this account until one year after the date on which the President submits to Congress the budget request for FY 2000. The balance of approximately $109 million represents amounts available for DOE to pay privatization expenses on behalf of USEC.

On May 18, 1998, DOE and USEC signed a memorandum of agreement (MOA) establishing each organization's responsibilities for the disposal of depleted uranium generated by USEC between July 1, 1993 and the privatization date (pre-privatization period). In accordance with the MOA, USEC paid DOE $16 million in FY 1998 for storage, surveillance, and maintenance of the depleted uranium generated by USEC during the pre-privatization period, and DOE established a liability to record the advance received prior to the performance of services.

A second MOA between DOE and USEC, relating to depleted uranium generated by USEC after privatization, was signed on June 30, 1998. Pursuant to the MOA, approximately 16.7 million kgU of depleted uranium will be transferred to DOE thru FY 2004. In accordance with the MOA, USEC paid DOE approximately $50 million in FY 1998 for storage, management, and disposition of the transferred depleted uranium, research and development into the beneficial use of depleted uranium, and related activities and support services for depleted uranium-related activities. A liability of $50 million was established to record the advance payment received prior to the performance of services.

A third MOA between DOE and USEC, relating to the administration of worker transition services at the two gaseous diffusion plants, was signed on June 30, 1998. Pursuant to the terms of the MOA, USEC paid DOE $20 million to administer worker transition services including enhanced benefits for workers, monies for buyouts and severance payments, other career transition assistance, as well as economic development assistance to the affected communities. A liability of $20 million was established to record the advance payment received prior to providing services.

Power Marketing Administrations

The power marketing deferred revenues represent primarily amounts paid to the Bonneville Power Administration (BPA) from participants under various AC intertie capacity agreements and load diversification fees paid to BPA by various customers. These one-time payments cover the remaining term of the customer's existing contractual agreement. FY 1997 balances were reclassified from other liabilities and advances.

12. Other Liabilities

(in millions)

	FY 1998	FY 1997
Intragovernmental		
Oil held for DOD	$106	$106
Other	154	144
	$260	$250
Governmental		
Accrued payroll and benefits	659	683
Petroleum Pricing Violation Escrow Fund	548	583
Naval Petroleum Reserve Deposit Fund	323	
Elk Hills School Land Fund	298	
Other governmental liabilities	202	157
	$2,030	$1,423
Total	$2,184	$1,567

Oil Held for DOD (See Note 6)

Accrued Payroll and Benefits

Accrued payroll and benefits represent amounts owed to DOE and contractor employees.

Petroleum Pricing Violation Escrow Fund

Pursuant to the Emergency Petroleum Allocation Act of 1973, DOE is responsible for recovering oil pricing overcharges and making restitution to injured parties. Monies received are invested in Treasury securities and minority financial institutions pending disbursement to injured parties or returned to the Treasury's general fund.

Naval Petroleum Reserve Deposit Fund

The balance in this fund represents proceeds from the sale of the Naval Petroleum Reserve at Elk Hills that are being held until final disposition in accordance with the settlement. Approximately $288 million is being held for a contingency payment to Chevron, Inc., pending the outcome of equity finalization. The remaining $35 million is reserved for anticipated adjustments to Occidental's final payment and for possible reimbursement to the investment banker for an advance of their commission (See Note 18).

Elk Hills School Land Fund

This balance represents the portion of the Naval Petroleum Reserve at Elk Hills sales proceeds being retained for future disbursements to the State of California pending authorization of Congress.

13. Environmental Liabilities

(in millions)

	FY 1998	FY 1997
EM facilities and legacy wastes	$145,108	$141,321
Active facilities	19,572	20,708
Pipeline facilities	7,828	8,758
High-level waste and spent nuclear fuel	10,678	6,745
Other	3,227	3,082
Total environmental liabilities	$186,413	$180,614
Amount funded by current appropriations	(918)	(1,148)
Total unfunded environmental liabilities	$185,495	$179,466
Changes in environmental liabilities		
Total environmental liabilities, beginning balance	$180,614	$229,114
Prior period adjustment	(106)	5,271
Adjusted beginning balance	$180,508	$234,385
Changes to environmental liability estimates		
EM facilities and legacy wastes	$9,746	($43,309)
Active facilities	(1,120)	(1,409)
Pipeline facilities	(795)	(2,662)
High-level waste and spent nuclear fuel	4,169	85
Other	181	(454)
Total changes in estimates	$12,181	($47,749)
Operating expenditures related to legacy waste activities	(5,907)	(5,552)
Capital expenditures related to legacy waste activities	(369)	(470)
Total environmental liabilities	$186,413	$180,614

During World War II and the Cold War, the United States developed a massive industrial complex to research, produce, and test nuclear weapons. The nuclear weapons complex included nuclear reactors, chemical processing buildings, metal machining plants, laboratories, and maintenance facilities that manufactured tens of thousands of nuclear warheads, and conducted more than one thousand nuclear explosion tests.

At all sites where these activities took place, some environmental contamination occurred. In this regard, the treatment and storage of radioactive and chemical waste resulted in contamination of soil, surface water, and groundwater and an enormous backlog of waste and dangerous materials. The environmental legacy derived from the process of producing nuclear weapons includes thousands of contaminated areas and buildings, and large volumes of waste and special nuclear materials requiring treatment, stabilization, and disposal. Approximately one-half million cubic meters of radioactive high-level, mixed, and low-level waste must be stabilized, safeguarded, and dispositioned, including a quantity of plutonium sufficient to fabricate thousands of nuclear weapons.

The FY 1998 environmental liability estimate is largely based on life cycle cost estimates which reflect a strategy for accelerating our efforts to clean up most of DOE's sites by 2006. This strategy was reported in the Accelerating Cleanup: Paths to Closure Report (published as a draft in February 1998 and as a final report in June 1998) and provides for a site by site project by project projection of the technical scope, costs, and schedule required to complete all 353 projects at DOE's 53 remaining cleanup sites in the United States, while complying with compliance agreements and other legal obligations. Further, the strategy consists of detailed projections on the scope, schedules, and costs at each site for the cleanup of contaminated soil, groundwater, and facilities; treating, storing, and disposing of waste; and managing nuclear materials.

Changes to FY 1997 Estimates

Changes to the FY 1997 estimates relate to: inflation adjustments to reflect FY 1998 constant dollars; cleanup activities performed during FY 1998; sale and transfers of facilities to outside entities; changes to assumptions relating to the treatment of wastes and long term surveillance and maintenance; and other scope changes relating to the refinement of estimates, including adjustments for efficiencies, resequencing of activities, and other changes in the remediation approach.

Legacy Wastes and Surplus Facilities 2006 Plan Estimate (FY 1998)

In FY 1998, the Department developed life cycle cost estimates consistent with its Paths to Closure strategic vision to cleanup most of the sites by 2006. These estimates, which were developed by the cognizant field offices, cover life cycle cost estimates to 2070. For financial statement reporting purposes, the Department deducted from the field estimates costs associated with waste generated from current and future operations and FY 1998 costs incurred to arrive at the FY 1998 year-end liability.

The Paths to Closure cost, scope and schedules were based on meeting existing compliance agreements, including milestones for as long as they were established, consistent with existing Federal, State and/or local statutes and/or regulations. For the Development of Paths to Closure estimates, sites received a total funding guideline of $5,750 million per year. In some cases, sites exceeded this funding guideline in order to meet compliance commitments. The site estimates include cost and schedule estimates for environmental restoration; nuclear material and facility stabilization; and waste treatment, storage, and disposal activities at each installation. The estimates also include costs for related activities such as landlord responsibilities, program management, and legally prescribed grants for participation and oversight by native American tribes and regulatory agencies.

Active Facilities

Environmental liabilities for active facilities represent anticipated remediation costs for those facilities that are conducting ongoing operations but will ultimately require stabilization, deactivation, and decommissioning. The FY 1998 environmental liability for active facilities is estimated at $19,600 million. This estimate is not based on costs determined by remediation/feasibility studies performed at the active sites. Rather, cost estimating models were used to estimate costs of remediating sites with matching conditions. Such models were used to extrapolate stabilization, deactivation, and decommissioning costs for contaminated active facilities and structures not included in the Paths to Closure or the FY 1996 BEMR.

BEMR (Pipeline Facilities/Activities)

Environmental liabilities for these facilities represent deactivation and decommissioning costs of surplus "pipeline" facilities not managed by the Office of Environmental Management (EM) but which are generally excess to the current mission of their programmatic owners. Although not under EM management, these facilities are assumed to be candidates for transfer to the EM work scope. The FY 1996 Baseline Environmental Management Report (BEMR), which was superseded by the Paths to Closure Report, included costs for the "pipeline facilities." In circumstances where additional cost estimating techniques were not applied to the pipeline facilities/activities during FY 1998, the BEMR (adjusted for

inflation) continues to be used as it reflects the most comprehensive analysis of life cycle costs. Where decisional changes in assumptions resulted in a material difference from the amounts in the BEMR, adjustments were made to reflect the assumptions. For example, in addition to the inflation adjustment to FY 1998 constant dollars, the most significant factor in the change in last year's estimate for pipeline facilities is a reduction related to the transfer of these facilities to the EM program, where they are covered under the Paths to Closure effort.

High-Level Waste and Spent Nuclear Fuel

The Nuclear Waste Policy Act of 1982 established DOE's responsibility to provide for permanent disposal of the Nation's high-level radioactive waste and spent nuclear fuel. The Act requires that owners and generators of nuclear waste pay the full cost of the program and, to that end, establishes a fee on civilian nuclear utilities which DOE must collect and annually assess to determine its adequacy.

The most recent total-system life cycle cost estimate was issued in December 1998 for a surrogate single repository system without interim storage and was estimated at $43,700 million in constant FY 1998 dollars. Yucca Mountain, Nevada, was assumed as the location for the repository since it is the only site that DOE is authorized by law to characterize, but this does not constitute a predecision that Yucca Mountain is an acceptable site. Cost estimates for additional scenarios including a two-repository system with interim storage were not developed since DOE did not have current cost information or designs for a second repository or interim storage facility.

To estimate the share of the total-system costs that should be allocated to the disposal of DOE's high-level waste and spent nuclear fuel, the methodology announced by DOE in the *Federal Register* in August 1987 was used. DOE's share of the total-system life cycle cost in FY 1998 dollars is estimated to be $10,960 million (DOE/RW-0510, *Analysis of the Total System Life Cycle Cost of the Civilian Radioactive Waste Management Program*). DOE funding provided through FY 1998 totaled $934 million, which is less than its share ($1,452 million) of the total system costs incurred through September 30, 1998. Interest accruing on this outstanding balance totaled $652 million. As a result, DOE's net unfunded liability for its share of costs for the disposal of high-level waste and spent nuclear fuel totaled $10,678 million as of September 30, 1998.

As of September 30, 1996, DOE accrued a liability totaling $1,421 million. This primarily represented DOE's share of unpaid costs incurred for the program plus accrued interest. During FY 1997, DOE recorded a prior period adjustment of $5,271 million to recognize its share of the total-system life cycle costs associated with the disposal of its high-level waste and spent nuclear fuel.

Since the last total-system life cycle cost estimate was prepared in FY 1995, significant changes in the program resulted in increased program costs including: additional waste quantities and types; updates to the repository design basis; a reanalysis of cost uncertainties associated with waste transportation; and an extended monitoring period. These changes, reflected in the FY 1998 life cycle cost estimate, resulted in an increase in DOE's liability for spent nuclear fuel and high-level waste disposal.

Other Unfunded Environmental Liabilities

Dispositioning of excess plutonium

Based on a Nuclear Weapons Council declaration in December 1994, the Secretary of Energy announced in February 1996 that 38.2 metric tons of weapons grade plutonium were excess to national security needs. DOE also designated a quantity of non-weapons grade plutonium as excess. DOE has considered a variety of disposition methodologies for this excess material. A formal record of decision regarding the storage and disposition methodology was announced by the Secretary of Energy in January 1997. The decision is to reduce, over time, the number of locations where the various forms of plutonium are stored, and to pursue a disposition strategy that allows for immobilization of excess plutonium in glass form and burning of the excess material as mixed oxide fuel in existing reactors. DOE has recognized a $2,266 million unfunded liability in the FY 1998 financial statements to reflect the estimated disposition cost in constant 1998 dollars of the preferred alternative. The estimated disposition cost is based on a current planning inventory of 43.2 metric tons of weapons and non-weapons grade plutonium. FY 1999 events including site selection of the facilities that will be needed to disposition the excess plutonium and the award of contracts for (1) fuel fabrication and irradiation services and (2) design services for a pit disassembly and conversion facility may result in adjustments to the liability in subsequent fiscal years.

Dispositioning of excess highly enriched uranium

The Nuclear Weapons Council declared in December 1994, leading to the Secretary of Energy's announcement in February 1996, that 174.3 metric tons of DOE's highly enriched uranium (HEU) were excess to national security needs. Most of this material will be blended for sale as low-enriched uranium (LEU) and used over time as commercial nuclear reactor fuel to recover its value. Material that could not be economically recovered was originally planned to be blended to LEU for disposal as low-level waste. DOE recorded a $592 million unfunded liability in FY 1996 for the disposition of 26.1 metric tons of surplus HEU estimated to be waste. After further

evaluation of the material in FY 1997, it has been determined part of this material will now be sold for use as reactor fuel. The remaining part, the majority of the material, is already in the form of irradiated fuel, which requires no processing prior to disposal. Therefore, the $592 million unfunded liability for blending 26.1 metric tons of surplus HEU was reduced to zero in FY 1997.

Disposition of Depleted Uranium Generated by the United States Enrichment Corporation

Pursuant to Section 3109(a)(3) of the USEC Privatization Act of 1996, DOE is responsible for disposal of depleted uranium generated by USEC between July 1, 1993 and the privatization date (pre-privatization period). On May 18, 1998, DOE and USEC signed a memorandum of agreement (MOA) establishing each organization's responsibilities for fulfilling the requirements of Section 3109(a)(3). Subsequently, on July 28, 1998, USEC was privatized. In accordance with the MOA, USEC paid DOE $16 million in FY 1998 for storage, surveillance, and maintenance of the depleted uranium generated by USEC during the pre-privatization period. In December 1997, DOE published a Draft Programmatic Environmental Impact Statement for Alternative Strategies for the Long-Term Management and Use of Depleted Uranium Hexafluoride (UF_6). While this assessment did not specifically address the USEC generated depleted uranium requiring disposal because of uncertainties regarding its future management, it did identify a preferred alternative strategy for use of 100 percent of the Department's depleted UF_6 either as uranium oxide, uranium metal, or a combination of both. Since the USEC generated material represents a relatively small portion of the total UF_6 inventory, its disposition cost is provided within the reported $1.6 billion - $3.9 billion estimate. Once uncertainties regarding future management of the USEC generated depleted uranium are resolved, the Department may include this material in future assessments. Such assessments could identify potential alternative uses for the USEC generated depleted uranium. Accordingly, no provision for the cost of disposal is included in these financial statements.

Deactivation and decommissioning of inactive naval reactors facilities

Deactivation and decommissioning liabilities for inactive naval facilities represent anticipated remediation costs for those facilities at the Pittsburgh and Schenectady Naval Reactors Offices that have ceased operations. The methodology used for estimating the environmental liabilities for these facilities was similar to the approach used in estimating the liabilities for active facilities in that experiences of similar types of facilities further along in the decommissioning process were used as a basis for determining the estimate.

Assumptions

Estimating the cost of DOE's environmental cleanup liability requires making assumptions about future activities and is inherently uncertain. The future course of DOE's environmental management program will depend on a number of fundamental technical and policy choices, many of which have not been made. Ultimately, these decisions will be made on the basis of fulfilling Congressional mandates, regulatory direction, and stakeholder input. Congressional appropriations at lower than anticipated levels would cause increases in life cycle costs.

The cost and environmental implications of alternative choices can be profound. For example, many contaminated sites and facilities could be restored to a pristine condition, suitable for any desired use; they could also be restored to a point where they pose no near-term health risks to surrounding communities but are essentially surrounded by fences and left in place. Achieving pristine conditions would have a higher cost but may or may not warrant the costs and potential ecosystem disruption or be legally required.

The following key assumptions were used in estimating the environmental liability:

- DOE has identified approximately 10,500 potential release sites from which contaminants could migrate into the environment. Although virtually all of these sites have been at least partially characterized, final remedial action and/or regulatory decisions have not been made for most sites. Site specific assumptions regarding the amount and type of contamination and the remediation technologies that will be utilized were used in estimating the environmental restoration costs.

- The first geological repository for high-level radioactive waste will open in 2010. At that time, it will accept spent nuclear fuel from commercial utilities. In 2016, the repository will begin accepting defense high-level waste and will begin accepting DOE-owned fuel shortly thereafter. An uncertainty relating to projected waste dispositioning costs is that current projections of legacy waste volume exceed storage capacity. This could result in significant cost growth in out years as additional storage capacity is acquired.

- The Waste Isolation Pilot Plant (WIPP) will open in 1998. DOE received the necessary certification from the United States Environmental Protection Agency to open WIPP for waste storage. However, due to a court injunction, the

opening of WIPP has been delayed. The Department of Justice is currently working with the plaintiffs in this action to lift the injunction. If the court refuses to lift the injunction, WIPP may not open until the State of New Mexico issues the RCRA Permit for the disposal of mixed transuranic waste, now expected in late 1999. Sites that would be most effected by the delay in the WIPP opening are taking actions to mitigate any impact by assessing temporary storage alternatives and switching priorities to shipping waste not impacted by the injunction. It is anticipated that the WIPP will be open for waste storage before the end of 1999. The delay is not expected to have a significant impact on the environmental liability cost estimate.

- Project baselines anticipate savings from enhanced productivity. However, it is possible that some projected savings may not be achieved.

- Only existing technologies, such as pumping and treating groundwater, are assumed to be available for estimating cleanup costs. Estimates were based on remedies considered technically and environmentally reasonable and achievable by local project managers and appropriate regulatory authorities.

- Environmental cleanup will be considered substantially complete when all sites have been remediated and when wastes generated from previous activities and from remediation and stabilization activities are safely disposed.

- Projects with no current feasible remediation approach are excluded from the estimate. The cost estimate would be higher if some remediation were assumed for these areas for which complete cleanup is not technically feasible with existing technologies. However, because no effective remedial technology could be identified, no basis for estimating cost was available. Significant projects excluded are:
  - nuclear explosion test areas (e.g., Nevada Test Site);
  - large surface water bodies (e.g., Clinch and Columbia rivers); and
  - most contaminated ground water (even with treatment, future use will remain restricted)

- Costs related to the disposition of depleted UF_6 are excluded from the estimate. DOE published a draft Programmatic Environmental Impact Statement (PEIS) in December 1997, which assessed several strategies for the long-term management of approximately 560,000 metric tons of depleted UF_6 owned by DOE. The draft PEIS identified a preferred strategy that would use 100 percent of the Department's depleted UF_6 either as uranium oxide, uranium metal, or a combination of both. However, the draft PEIS acknowledged that potential uses that are capable of consuming a substantial fraction or all of the depleted uranium inventory are yet to be fully developed. Recognizing this uncertainty, DOE estimated in its September 1997, Cost Analysis Report for the Long-Term Management of Depleted Uranium Hexafluoride, that the cost of depleted UF_6 disposition under the preferred alternative would range from $1,600 million to $3,900 million. The cost estimate is being updated in conjunction with the final PEIS and Record of Decision, scheduled for completion in March 1999.

In addition to the assumptions and exclusions identified above, another factor that could affect the certainty of the estimate includes the adjustment to FY 1998 dollars which is required under Federal accounting standards. Any potential increases caused by future inflation could result in costs that are substantially higher than the recorded liability.

The environmental liability estimates include some amounts for contractor pensions and postretirement benefits other than pensions (PRB). The liability for contractor pension and PRB has been recorded separately from the environmental liability and disclosed in Note 14.

14. Pension and Other Actuarial Liabilities

(in millions)

	FY 1998	FY 1997
Contractor pension plans	$314	$283
Contractor postretirement benefits other than pensions	6,187	5,987
Contractor disability and life insurance plans	20	20
Total actuarial liabilities	$6,521	$6,290
Less funded actuarial liabilities	(13)	(8)
Total unfunded actuarial liabilities	$6,508	$6,282

Most of DOE's contractors have defined benefit pension plans under which they promise to pay specified benefits to their employees, such as a percentage of the final average pay for each year of service. DOE's cost under the contracts includes reimbursement of annual contractor contributions to these pension plans. DOE's contractors also sponsor postretirement benefits other than pensions (PRB) consisting predominantly of postretirement health care benefits. In the past, these costs were recognized on a pay-as-you-go or cash basis. Since DOE approves the contractors' pension and postretirement benefit plans and is ultimately responsible for funding the plans, the responsibility for any related liabilities rests with DOE.

DOE reimburses its major contractors for employee disability insurance plans and estimates are recorded as unfunded liabilities for these plans.

Contractor Pension Plans

DOE adopted SFAS No. 87, *Employers' Accounting for Pensions*, beginning in FY 1996 for contractor employees, for whom DOE has a continuing pension obligation. As of September 30, 1998, DOE has prepaid pension costs of $554 million and accrued pension costs of $314 million. DOE has a continuing obligation for a variety of contractor-sponsored pension plans (46 qualified and 8 nonqualified). In this regard, benefit formulas consist of final average pay (36 plans), career average pay (9 plans), dollar per month of service (8 plans), and one defined contribution plan with future contributions for retired employees. Twenty-four of the plans cover nonunion employees only, 13 cover union employees only, and 17 cover both union and nonunion employees.

For qualified plans, DOE's current funding policy is for contributions made to a trust during a plan year for a separate defined benefit pension plan to not exceed the greater of: (1) the minimum contribution required by Section 302 of the Employee Retirement Income Security Act (ERISA) or (2) the amount estimated to eliminate the unfunded current liability as projected to the end of the plan year. The term "unfunded current liability" refers to the unfunded current liability as defined in Section 302(d)(8) of ERISA. For nonqualified plans, the funding policy is pay-as-you-go.

Plan assets generally include cash and equivalents, stocks, corporate bonds, government bonds, real estate, venture capital, international investments, and insurance contracts.

Assumptions and methods

In order to provide consistency among the various DOE contractors, certain standardized actuarial assumptions were used. These standardized assumptions include the discount rates, mortality assumptions, and an expected long-term rate of return on plan assets, salary scale, and any other economic assumption consistent with an expected long-term inflation rate of 3.5 percent for the entire U.S. economy with adjustments to reflect regional or industry rates as appropriate. In most cases, ERISA valuation actuarial assumptions for demographic assumptions were used.

The following specific assumptions and methods were used in determining the pension estimates:

The weighted average discount rates of 7.0 percent for FY 1998 and 7.75 percent for FY 1997 were used, the average long-term rate of return on assets was 8.3 percent in FY 1998 and 8.2 percent in FY 1997, and the average rate of compensation increase was 4.9 percent in FY 1998 and FY 1997 in determining the net periodic pension cost.

The weighted average discount rates used to determine the vested benefit obligation, accrued benefit obligation, and projected benefit obligation as of September 30, 1998 and 1997 were 6.5 percent and 7.0 percent, respectively.

Straight line amortization of unrecognized prior service cost over the average remaining years of service of the active plan participants and the minimum amortization of unrecognized gains and losses were used. The transition obligation was amortized over the greater of 15 years or the average remaining service.

Table 1 sets forth the vested benefit obligation, accrued benefit obligation, projected benefit obligation, plan assets, and a reconciliation of the funded status to the prepaid/(accrued) pension cost after minimum liability. Table 2 sets forth the components of net periodic pension cost.

Table 1	(In millions) September 30, 1998	September 30, 1997
Vested Benefit Obligation	($12,008)	($10,475)
Accrued Benefit Obligation	($12,735)	($11,354)
Projected Benefit Obligation:		
Projected Benefit Obligation	($14,908)	($13,462)
Plan Assets	20,135	17,584
Funded Status	$5,227	$4,122
Unrecognized Transition Obligation/(Asset)	(1,485)	(1,590)
Unrecognized Prior Service Cost	56	28
Unrecognized (Gain)/Loss	(3,428)	(2,438)
Prepaid/(Accrued) Pension Cost	$370	$122
Adjustment required to reflect minimum liability	(130)	(122)
Prepaid/(Accrued) pension cost after minimum liability	$240	$0
Total Prepaid Pension Cost after minimum liability	$554	$283
Total (Accrued) Pension Cost after minimum liability	($314)	($283)

In the interest of brevity, information regarding all defined benefit plans is summarized in a single table. Assets of one plan are not available to satisfy liabilities of another plan.

Table 2	(In millions) FY 1998	FY 1997
Net Periodic Pension Cost:		
Service Cost	$421	$367
Interest Cost	900	861
Actual Return on Plan Assets	(1,311)	(1,114)
Net Amortization and Deferral	(209)	(150)
Impact of Curtailment or Special Termination Benefits	8	34
Total Net Periodic Pension Cost	($191)	($2)

In 1998, expense of $.13 million was recognized at Ames Laboratories for an early retirement window. The electrician's retirement plan at Argonne National Laboratories was terminated resulting in a curtailment and settlement gain of $.02 million. The Bechtel Petroleum Operations, Inc. Pension Plan was terminated resulting in a curtailment and settlement gain of $2.97 million. Due to staff reductions, curtailment losses were recognized at Babcock & Wilcox, Hanford Environmental Health Foundation, and Sandia National Laboratories for $11.01 million, $.07 million, and $.25 million, respectively and a curtailment gain was recognized at Pantex for $.04 million. A curtailment gain of $.23 million was recognized at Ross Aviation due to a plan amendment eliminating future benefit accruals.

Contractor Postretirement Benefits Other Than Pensions (PRB)

DOE adopted SFAS No. 106, *Employers' Accounting for Postretirement Benefits Other Than Pensions*, beginning in FY 1994 for contractor employees for whom DOE has a continuing obligation. SFAS No. 106 requires that the cost of PRB be accrued during the years that the employees render service. As of September 30, 1998, DOE has an accrued PRB liability of $6,187 million. Prior to FY 1994, PRB costs, consisting of predominantly retiree health care, were recognized as expenses when claims were paid. Generally, the PRB plans are unfunded, and DOE's funding policy is to fund on a pay-as-you-go basis. There are 9 contractors, however, that are prefunding benefits in part as permitted by law.

DOE's contractors sponsor a variety of postretirement benefits other than pensions. Benefits consist of medical (35 contractors), dental (14 contractors), life insurance (21 contractors), and Medicare Part B premium reimbursement (4 contractors). Thirty-one of the contractors sponsor a traditional indemnity plan, a PPO, an HMO, or similar plan. Eighteen of these also have a point of service plan, an HMO, or similar plan. Four additional contractors have only a point of service plan, an HMO, or similar plan.

Assumptions and methods

In order to provide consistency among the various DOE contractors, certain standardized actuarial assumptions were used. These standardized assumptions include medical and dental trend rates, discount rates, and mortality assumptions.

The following specific assumptions and methods were used in determining the PRB estimates:

The medical trend rates for under age 65 and the drug trend rates for under age 65 and over age 64 for a point of service plan, an HMO, or similar plan, grade from 8.0 percent in 1997

down to 5.5 percent in 2002 and later, and the medical trend rates for over age 64 grade from 6.75 percent in 1997 down to 5.5 percent in 2002 and later. The medical trend rates for under age 65 and the drug trend rates for under age 65 and over age 64 for a PPO, a traditional indemnity plan, or similar plan, grade from 10.0 percent in 1997 down to 5.5 percent in 2002 and later, and the medical trend rates for over age 64 grade from 8.75 percent in 1997 down to 5.5 percent in 2002 and later. The dental trend rates at all ages grade down from 7.0 percent in 1997 to 5.5 percent in 2002 and later.

The weighted average discount rates of 7.0 percent for FY 1998 and 7.75 percent for FY 1997 were used, and the average long-term rate of return on assets was 7.11 percent in FY 1998 and 7.36 percent in FY 1997 in determining the net periodic postretirement benefit cost. The rate of compensation increase was the same rate as each contractor used to determine pension contributions.

The weighted average discount rates used to determine the accumulated postretirement benefit obligation as of September 30, 1998 and 1997 were 6.5 percent and 7.0 percent, respectively.

Straight line amortization of unrecognized prior service cost over the average remaining years of service to full eligibility for benefits of the active plan participants and the minimum amortization of unrecognized gains and losses were used. DOE chose immediate recognition of the transition obligation existing at the beginning of FY 1994.

Table 3 sets forth the components of the accumulated postretirement benefit obligation, plan assets, and a reconciliation of the funded status to the accrued postretirement benefit liability. Table 4 sets forth the components of net periodic postretirement benefit cost. Table 5 sets forth the effect of a one percentage point increase in the assumed health care cost trend rates for each future year.

(in millions)

Table 3	*September 30, 1998*	*September 30, 1997*
Accumulated Postretirement Benefit Obligation (APBO):		
Fully eligible actives	($855)	($750)
Other actives	(1,950)	(1,850)
Retirees	(2,588)	(2,539)
Total APBO	($5,393)	($5,139)
Plan assets	125	126
Funded status	($5,268)	($5,013)
Unrecognized prior service cost	(138)	(98)
Unrecognized (gain)/loss	(781)	(875)
Accrued postretirement benefit liability	($6,187)	($5,986)

(in millions)

Table 4	*FY 1998*	*FY 1997*
Net Periodic Postretirement Benefit Cost:		
Service cost	$148	$136
Interest cost	323	326
Actual return on plan assets	(9)	(9)
Net amortization and deferral	(84)	(105)
Impact of curtailment	(9)	(68)
Total Net Periodic Postretirement Benefit Cost	$369	$280

In 1998, curtailment gains were recognized at Bechtel Petroleum Operations, Inc., $7.4 million; Hanford Environmental Health Foundation, $.58 million; Rust Geotech Grand Junction, $.03 million; and Lockheed Martin Corporation Sandia Laboratories, $.86 million. A curtailment loss of $.05 million was recognized at Iowa State University Ames Laboratories for an early retirement window.

(in millions)

Table 5
Trend Rate Sensitivity

	Base Valuation	1% Trend Increase
Service Cost plus Interest Cost for health care benefits	$427	$506
APBO as of Sep. 30, 1998 for health care benefits	$4,829	$5,587

15. Other Unfunded Liabilities

(in millions)

	FY 1998	FY 1997
Environment, safety and health compliance activities	$1,694	$796
United States Enrichment Corporation	0	242
Capital leases	41	103
Accrued annual leave of Federal employees	94	95
Other	105	96
Total other unfunded liabilities	$1,934	$1,332

Environment, Safety and Health Compliance Activities

DOE's unfunded environment, safety and health liability represents those activities necessary to bring facilities and operations into compliance with existing environmental, safety and health (ES&H) laws and regulations (e.g., Occupational Safety and Health Act; Clean Air Act; Safe Drinking Water Act). Types of activities included in the estimate relate to the following: upgrading site wide fire and radiological programs; nuclear safety upgrades; industrial hygiene and industrial safety; safety related maintenance; emergency preparedness programs; life safety code improvements; and transportation of radioactive and hazardous materials. The estimate covers corrective actions expected to be performed in future years for programs outside the purview of DOE's Environmental Management (EM) Program. ES&H activities within the purview of the EM program are included in the environmental liability estimate. The increase in the ES&H liability is largely attributable to (1) additional corrective actions, activities, or programs, that are required to improve the facilities' state of compliance and move them toward full compliance or conformance with all applicable ES&H laws, regulations, agreements, and DOE Orders and (2) revised costs estimates for existing ES&H activities.

United States Enrichment Corporation

In December 1994, DOE and USEC signed a memorandum of agreement (MOA) relating to the transfer of functions and activities from DOE to USEC. The MOA provides for DOE to reimburse USEC for costs associated with bringing two Gaseous Diffusion Plants (GDPs) into compliance with Nuclear Regulatory Commission standards (i.e., nuclear safety upgrades). DOE also agreed to assume the costs for closing out the Determination Order transferring DOE's uranium enrichment function to USEC. Accordingly, a $242 million liability was established in FY 1997. On May 18, 1998, DOE signed an amendment to the December 1994, MOA whereby DOE would transfer 3.8 million KgU of natural uranium and 45 metric tons of low enriched uranium to USEC in full satisfaction of DOE's liabilities with respect to the nuclear safety upgrades and the Determination Order. A second amendment to the December 1994, MOA was also signed on May 18, 1998. This amendment provided for DOE to transfer an additional 0.8 metric tons of highly enriched uranium, valued at approximately $35 million, to USEC. DOE in turn received an offsetting credit against amounts owed USEC for services they provided at the two GDPs. Both transfers were effected in May 1998.

Capital Leases

DOE's contractors lease facilities, machinery, equipment and other assets. The assets under capital leases are recorded at the lesser of the present value of minimal lease payments or the fair value of the assets. Unfunded capital lease liabilities generally reflect lease agreements in effect prior to FY 1993. Subsequent capital leases, except for telecommunications and certain computer leases, are required to be funded by existing appropriations.

16. Contingencies

DOE is a party in various administrative proceedings, legal actions and tort claims which may ultimately result in settlements or decisions adverse to the Federal government. DOE has accrued contingent liabilities where losses are determined to be probable and the amounts can be estimated. Other significant contingencies exist where a loss is reasonably possible, or where a loss is probable and an estimate cannot be determined. In some cases, a portion of any loss that may occur may be paid from Treasury's Judgment Fund. The following are other significant contingencies:

- *Toxic Releases from DOE's Facilities* - DOE's contractors are defendants in a number of class action suits arising from alleged environmental contamination of air, water, and soil affecting communities surrounding various DOE facilities. Collectively, in the most significant cases involving facilities at Rocky Flats, Colorado; Hanford, Washington; Brookhaven, New York; Paducah, Kentucky; and Mound and Piketon, Ohio, the claimants seek in excess of $2,100 million in damages. DOE's contractors are vigorously contesting all of these cases, and an evaluation of the likely outcome of these claims cannot be estimated at this time.

- *Human Radiation Experiments* - DOE and its contractors are the defendants in a number of individual and class action suits, as well as administrative claims, arising from past human radiation experiments allegedly sponsored or carried out by the Federal government. In the aggregate, the remaining claims seek more than $400 million in damages. Due to the preliminary nature of many of these matters, an evaluation of the likely outcomes of these claims cannot be estimated at this time. While the cases will be vigorously contested, possibilities of settlement will also be pursued.

- *DOE's Waste Acceptance Obligation*

  The Office of Civilian Radioactive Waste Management (OCRWM) is involved with various matters of litigation relating to its obligation in a standard contract (Standard Contract) with utilities to initiate waste acceptance by January 31, 1998, the date specified in Nuclear Waste Policy Act of 1982 (NWPA), as amended. A summary of those actions is included below.

  Indiana Michigan and Northern States Cases

  The Court of Appeals for the District of Columbia Circuit has ruled that the Standard Contract (1) imposes an unconditional obligation on DOE to initiate waste acceptance by January 31, 1998, and (2) offers a potentially adequate remedy for the failure of DOE to meet this obligation. Indiana Michigan Power Co. v. U.S. Department of Energy, 88 F.3d 1272 (D.C. Cir. 1996). In addition, the Northern States decision precludes DOE from invoking the unavoidable delays clause of the Standard Contract; and from asserting traditional sovereign acts defenses in any suits for damages in the Court of Federal Claims. DOE did not appeal the decision in the Indiana Michigan case. DOE and the State of Michigan filed petitions for certiorari in the Northern States case, which the Supreme Court denied on November 30, 1998.

  The Indiana Michigan and Northern States cases do not have a direct impact on the Nuclear Waste Fund (NWF) because no contractual damages were sought and the court denied equitable relief, such as an escrow of funds. All other cases discussed in this section, however, are based on the holdings in these two cases. It is too early to evaluate the ultimate impact on OCRWM of claims based on the decisions in the Indiana Michigan and Northern States cases. Resolution of any such claims will involve highly fact-specific and individualized decisions about the costs incurred by each contract holder as a result of the delay of the Department in meeting its obligation under the Standard Contract. The potential impact, however, is significant. The Department has estimated possible damages to be between $500 million and $1 billion if all utilities filed claims. Some utilities' representatives have estimated damages totaling $45 billion.

  Claims based on the decisions in the Indiana Michigan and Northern States cases could impact the NWF in one of two ways. First, if a court determines a contract holder can and must pursue its contractual remedies and proceed under the delays clause of the Standard Contract, the contract holder may be found eligible to receive equitable adjustments of its on-going nuclear waste fees. This "equitable adjustment" of fees would reduce revenues to the NWF. Alternatively, if a court determines a contract holder can pursue a damage suit for breach of contract, the contract holder may obtain a judgment against the Department for money damages. It is unclear whether such a judgment would be paid out of the Judgment Fund, the NWF, or some other source of funds. If a judgment were paid out of the Judgment Fund, there is a possibility the Judgment Fund would ultimately be reimbursed by the NWF or other funds appropriated to the Department. If the size of the NWF were to be substantially affected by either equitable adjustments or payments of judgments, the Department might then be obligated to propose fee adjustments pursuant to the NWPA's "full cost recovery" provision, 42 U.S.C. 10222(a)(4). Any such fee

adjustments would be "across the board" and applicable to all utilities with currently operating reactors.

Pending Cases: U.S. Court of Appeals for the District of Columbia Circuit

As discussed in detail below, several utilities have brought cases in the U.S. Court of Appeals for the District of Columbia that contain claims based on the decisions in the Indiana Michigan and Northern States cases. The Department believes that, after the exhaustion of any administrative remedies under the Standard Contract, the U.S. Court of Federal Claims is the proper venue for claims based on the decisions in the Indiana Michigan and Northern States cases and anticipates that the Court of Appeals will agree with this view. If, however, the Court of Appeals permits these claims to proceed, it is too early to evaluate their likely outcome. As discussed previously, a judgment against the Department could affect the NWF.

Consolidated Edison Company of New York v. U.S. Department of Energy, case no. 98-1358.

Several utilities filed a petition for review of the Department's fee adequacy determination. In addition, they sought leave to file a complaint in the D.C. Circuit seeking damages and specific relief for the Department's failure to commence disposal of their spent nuclear fuel. These cases were held in abeyance pending disposition by the U.S. Supreme Court of petitions for certiorari filed in Northern States, as discussed above. The denial of certiorari on November 30, 1998, has revived the cases. The utilities have filed a motion for appointment of a special master to hear the case which the Department opposed. Briefing of jurisdictional issues will begin in January 1999.

General Electric Company v. U.S. Department of Energy, case no. 98-1356; Arizona Public Service Commission v. U.S. Department of Energy, consol. cases no. 98-1346 and 98-1348.

These cases involve petitions filed in the Court of Appeals for review of the Department's failure to commence disposal of spent nuclear fuel in an attempt to ensure that the decision in the Northern States case applies to utilities that were not parties to that case. On January 5, 1999, the Court of Appeals ordered the petitioners to show cause why their petitions should not be dismissed in light of the decision in the Northern States case that the Standard Contract provides a potentially adequate remedy. While the Department believes it is likely the petitions will be dismissed, it is possible the utilities then will file suit in the United States Court of Federal Claims or pursue an administrative claim with the contracting Officer for the Standard Contract.

Pending Cases: U.S. Court of Federal Claims

As discussed in more detail below, several utilities have brought cases in the U.S. Court of Federal Claims that contain claims based on the decisions in the Indiana Michigan and Northern States cases. In the first three cases, the Court of Federal Claims has found that the Department has breached its contracts with the three utilities, each of which has only one shutdown reactor, and that no contractual remedy exists because these utilities are not paying ongoing fees. The Department currently is engaged in discovery to determine the amount of damages to be paid. It is too early to evaluate the ultimate amounts of the judgments against the Department in these cases. As discussed previously, these judgments could affect the NWF.

In the other seven cases, the Court of Federal Claims has not issued any final decisions. The Department is taking the position in these cases that the utilities, which have operating reactors and are subject to the payment of ongoing fees, must exhaust the administrative process at the Department before filing suit in the Court of Federal Claims. It is unclear whether there ultimately will be a contractual remedy or a court judgment in any of these cases. As discussed previously, an equitable adjustment of fees or a judgment against the Department could affect the NWF.

Yankee Atomic Electric Co. v. United States, case no. 98-126C, Connecticut Yankee Atomic Power Company v. United States, case no. 98-154C, and Main Yankee Atomic Power Company v. United States, case no. 98-474C.

On February 18, 1998, the Yankee Atomic Electric Company filed suit for damages in the amount of $70 million associated with the extended storage of 127 metric tons of spent nuclear fuel onsite at its shutdown nuclear plant in Massachusetts. Yankee asserted that, while it had paid the contractual fees in full, the Department did not commence disposal by January 31, 1998, and had thus breached the Standard Contract. The Department argued that any delay in performance was redressable under the avoidable delays clause of the Standard Contract and that Yankee's sole remedy is a claim for equitable adjustment through administrative procedures described in the contract, as opposed to a suit for damages based on a breach of contract claim.

On October 29, 1998, the U.S. Court of Federal Claims found that the utility need not exhaust its contractual remedies and that the Department was in breach of contract.

It therefore granted summary judgment for Yankee on the issue of the government's liability. The Court also stated that, where complete relief is not available under a contract, the controversy is not limited to administrative remedies in the contract ("Disputes" clause) and may be tried in court. The Court found that statutory restrictions on the adjustment of the one-time fee precluded the Department from retroactively adjusting Yankee's charges to reflect its onsite storage costs and that the Department's authority to make expenditures from the NWF was restricted to specifically listed activities which do not include paying the costs of onsite storage.

Similar suits had been filed by Connecticut Yankee and Main Yankee seeking $90 million and $128 million respectively for the Department's failure to remove spent nuclear fuel from their shutdown reactor sites. On October 30, 1998, and November 3, 1998, the U.S. Court of Federal Claims issued orders finding that, for the same reasons stated in the Yankee Atomic decision, the Department is contractually liable to the utilities.

The next phase of the "Yankee" cases will determine the damages payable. While it is not expected that the utilities will receive all of the damages that they seek, potential government liability from these three cases could be in the tens of millions of dollars. As discussed previously, these judgments could affect the NWF.

Northern States Power Company v. United States, case no. 98-484C; Commonwealth Edison Company v. United States, case no. 98-621C; Southern Nuclear Operating Company, including Alabama Power Company and Georgia Power Company v. United States, case no. 98-614C; Duke Power, a Division of Duke Energy Corporation v. United States, case no. 98-485C; Florida Power and Light Company v. United States, case no. 98-483C; Indiana Michigan Power Company v. United States, case no. 98-486C; Sacramento Municipal Utility District v. United States, case no. 98-488C.

In addition to the "Yankee" cases, seven other utilities, most with currently operating reactors, have filed suits in the U.S. Court of Federal Claims seeking damages totaling over $4 billion. In several of these cases, the utilities have motions for summary judgment on contract liability pending that are similar to those filed in the "Yankee" cases. In opposition, the Department has filed motions to dismiss the cases on the ground that the utilities have not exhausted their contractual remedies by applying for equitable adjustment of their ongoing fees. Depending on how the Court decides these cases, damages could be paid out of the Judgment Fund or the NWF, or there could be an equitable adjustment of fees that would affect revenues currently being deposited into the NWF. While it is too early to evaluate the ultimate outcome of these cases, the potential government liability from these cases could be substantial but most likely considerably less than the $4 billion claimed in the complaints. As discussed previously, an equitable adjustment of fees or a judgment against the Department could affect the NWF.

Should the Department not prevail on its motion to dismiss for the utilities' failure to exhaust their administrative remedies, it is likely that many more utilities will file similar suits for damages. If the Department does prevail, it is likely that the seven utilities, as well as many other utilities, would file administrative claims with the Department's Contracting Officer.

- *Natural Resource Damage Claims* - DOE is disclosing a contingency for potential natural resource damage (NRD) claims filed under the Comprehensive Environmental Response, Compensation, and Liability Act. Such liabilities could result from potential claims filed against DOE for natural resource injuries, primarily those remaining at DOE facilities after cleanup. Although any estimate of such liability is by necessity extremely speculative, the estimated range of DOE's NRD liability is $1,400 million to $2,500 million.

  Notwithstanding the potential for such claims, there neither are currently pending claims against DOE nor have there been any successful NRD claims against DOE. DOE's practice of addressing natural resource injuries during the remedy selection process should limit the exposure to potential NRD claims. DOE has initiated other efforts as well that are intended to minimize the potential for NRD claims. These efforts include: creating site-specific advisory boards at its facilities; ensuring participation of interested parties in the remedial planning process; and forming natural resource trustee councils at facilities where there is sufficient interest. In view of the foregoing, DOE currently considers estimating its potential NRD liability speculative and any potential payment less than probable but reasonably possible. Therefore, DOE has not recognized such a liability in its financial statements to date.

- *Tenaska Claim* - In FY 1995, the Tenaska Washington Partners (Tenaska) and Chase Manhattan Bank (Chase) filed suit against the Bonneville Power Administration (BPA) for breach of contract and lost revenues. In June 1996, BPA reached a settlement which resulted in a payment of $115 million by BPA to Chase. BPA settled with several subcontractors of Tenaska for $38 million in FY 1997. In FY 1998, BPA settled with Tenaska for $158.6 million. BPA has now settled with all litigants of the Tenaska suit and no further exposure exists.

17. Unexpended Appropriations

(in millions)

	FY 1998	FY 1997
Unobligated		
Available	$2,690	$3,358
Unavailable		
Bonneville Power Administration	(890)	(1,012)
Reimbursable work orders accepted in excess of apportionment authority	365	38
Naval Petroleum Reserves	2	426
Other	17	11
Total unavailable unobligated	($506)	($537)
Total unobligated	$2,184	$2,821
Undelivered orders	6,264	6,231
Unfilled customer orders	(1,706)	(1,664)
Advances	(252)	(227)
Revolving funds	(27)	(13)
Apportioned not available	85	88
Power Marketing Administrations	(691)	(720)
Funded environmental liabilities	(918)	(1,148)
Total unexpended appropriations	$4,939	$5,368

FY 1997 unobligated, unfilled and undelivered orders were restated as a result of corrections to a prior period misclassification of non-Federal reimbursable work orders accepted without advances as budgetary resources.

18. Supporting Schedule of Net Cost for Energy Resources

(in millions)

	FY 1998		FY 1997	
Utility Technology				
Program Cost	$329		$326	
Less Earned Revenues	—		(1)	
		$329		$325
Building Technology		310		144
Federal Energy Management Program		23		25
Industrial Technology		163		148
Transportation Technology		256		244
Coal Research and Development		116		164
Petroleum Research and Development		66		86
Gas Research and Development		128		147
Clean Coal Technology		93		115
Strategic Petroleum Reserve				
Operating Costs	$209		$216	
Cost of Oil Sold	--		241	
Less Earned Revenues	--		(220)	
Net Cost of Strategic Petroleum Reserve		209		237
Naval Petroleum Reserves				
Operating Costs	$47		$187	
Less Earned Revenues	(11)		(491)	
Net Operating Revenue of Naval Petroleum Reserves	536		($304)	
Less Net Gain from Sale of NPR-1	(2,848)			
Net Revenue of Naval Petroleum Reserves		(2,812)		(304)
Power Marketing Administrations				
Cost of Sales	$3,063		$2,718	
Less Earned Revenues	(3,114)		(3,015)	
Net Revenue of Power Marketing Administrations		(51)		($297)
Other Energy Resources Activities		45		73
Less Other Earned Revenues		(2)		0
Total Energy Resources Net Costs (Revenues)		($1,127)		$1,107

ENERGY RESOURCES ACTIVITIES - encourage energy efficiency; advance alternative and renewable energy technologies; increase energy choices for all consumers; assure adequate supplies of clean, conventional energy; and reduce U.S. vulnerability to external energy supply disruptions.

Utility Technology - research and development programs that contribute to strengthening the Nation's energy security, providing a cleaner environment, enhancing global sales of U.S. energy products, and increasing industrial competitiveness and Federal technology transfer. Activities range from basic cost-shared research in universities and national laboratories to applied research, development, and field validations in full partnership with private sector manufacturers.

Building Technology - research and development to improve the energy efficiency of appliances, building equipment, and the building envelope complemented by programs designed to move advanced technologies into the marketplace and produce near-term energy savings with associated economic and environmental benefits.

Federal Energy Management Program - Reduction in the cost of government by advancing energy efficiency and water conservation, and the use of solar and other renewable energy as a means to reduce energy costs. Major emphasis is placed on using private sector investments to retrofit Federal facilities using energy savings performance contracting, thus stretching Federal leveraging to the maximum.

Industrial Technology - cost shared research in critical technology areas identified by industry, with focus on high-risk but promising technologies that decrease industry's use of raw materials and depletable energy and reduce their generation of wastes and pollutants.

Transportation Technology - development and commercialization of transportation technologies which can radically alter current projections of U.S. and world demand for energy, particularly oil, and reduce the associated environmental impacts such as greenhouse gas emissions.

Coal Research and Development - research and development of coal technologies to meet future national energy and environmental demands and to position the U.S. coal industry to respond to growing export market opportunities while maintaining our national energy security.

Petroleum Research and Development - research and development of increased domestic oil production technology, enhanced processing and utilization technologies, and reservoir life extension.

Gas Research and Development - research and development of natural gas exploration, production, processing, and storage technologies.

Clean Coal Technology - joint Federal and private industry development of promising advances in coal-based technologies and demonstration of commercial marketplace potential.

Strategic Petroleum Reserve - operation and maintenance of the U.S.'s emergency stored oil supply at five sites in Texas and Louisiana. During FY 1997, DOE sold 10.2 million barrels of oil from the Strategic Petroleum Reserve. The $220 million proceeds from this sale were returned to Treasury.

Naval Petroleum Reserves - The Naval Petroleum and Oil Shale Reserves consist of three government-owned oil fields and three oil shale reserves in the western United States. Naval Petroleum Reserve No. 1, Elk Hills, is jointly owned by the United States Government and Chevron USA Inc. (Chevron). It is located about 35 miles west of Bakersfield in Kern County, CA, ranks among the 11 largest domestic producing oil fields in the lower 48 States, and is one of the Nation's top 10 producing gas fields.

Crude oil, natural gas, and natural gas liquids produced from the Naval Petroleum Reserves are sold to public customers at bid prices. Proceeds from these sales and royalties from leased acreage are returned to Treasury.

The Naval Petroleum Reserves' lands were set aside in the early 1900's by the U.S. Government. Therefore, no value has been recorded for the crude oil and gas reserves underlying these lands and no costs are reflected for the depletion of the reserves.

Net Gain from the Sale of (NPR-1)

As required by the FY 1996 National Defense Authorization Act, DOE sold its interest in NPR-1. It was originally set aside to ensure a future source of crude oil for the U.S. Navy. The field no longer served a national security purpose and was in commercial production since Congress authorized its development in 1976.

The sale of NPR-1 to Occidental Petroleum Corporation was completed in February 1998. The sale agreement provides that Occidental receive the net economic benefit of DOE's continued operation of NPR-1 from October 1, 1998 until the closing date of the transaction. As such, the $151 million of revenue and $31 million of expenses related to DOE's operation of NPR-1 during FY 1998 are reflected as a component of the net gain on the sale. In addition, pursuant to Congressional directive, 9 percent of the net sale proceeds was set aside in a special Treasury account (Elk Hills School Land Fund) and will be paid out to the State of California over a seven-year period. DOE will adjust the amount in this fund once all divestment related expenses have been paid. Also, as part of DOE's termination agreement with Chevron, $323 million of the sales proceeds were placed in an escrow fund. Likewise, Chevron has provided DOE with a $215 million letter of credit. These two reserves will assure each party that funds will be available when a final determination is made on the settlement of NPR-1 partnership equities. The following schedule reflects the computation of the net gain on this sale.

	FY 1998
Sales price	53,650
Cost of sales	
Commissions and divestiture expenses	20
Elk Hills School Land Fund	298
Net book value of assets sold	484
Total cost of sales	$802
Gain on Sale of Elk Hills	52,848

Power Marketing Administrations

DOE's power marketing administrations market electricity generated primarily by Federal hydropower projects. Preference for the sale of power is given to public bodies and cooperatives. Revenues from selling power and transmission services are used to repay Treasury annual appropriations and maintenance costs, repay the capital investments with interest, and assist capital repayment of other features and certain projects.

19. Supporting Schedule of Net Cost for National Security

(in millions)

	FY 1998	FY 1997
Stockpile Stewardship	$1,686	$1,514
Stockpile Management	2,390	2,678
Verification and Control Technology	547	494
Uranium Programs - Downblend HEU at Portsmouth	33	19
International Nuclear Safety	82	104
Naval Reactors	680	728
Nuclear Safeguards and Security	96	87
Emergency Management/Preparedness	31	27
Worker and Community Transition	69	92
Fissile Materials Disposition	109	95
Russian Origin Uranium Sales		
Cost of Sales	$3	$38
Less Earned Revenues	(3)	(41)
	0	(3)
Total National Security Net Costs	$5,723	$5,835

NATIONAL SECURITY ACTIVITIES - effectively support and maintain a safe and reliable enduring nuclear weapons stockpile without underground nuclear testing; safely dismantle and dispose of excess weapons; and provide technical leadership for national and global nonproliferation activities.

Stockpile Stewardship - research, development, and engineering support necessary to maintain a safe and reliable U.S. nuclear weapons stockpile, which requires sustaining core competencies, nuclear weapons laboratories, and the Nevada Test Site, and enhancing computational and simulation capabilities.

Stockpile Management - physical maintenance of the U.S. nuclear weapons stockpile, including: continual surveillance and retirement and disposal of weapons: pursuing a dual-track new tritium source: maintaining a worldwide nuclear/radiological accident response capability; and maintaining the infrastructure at the production plants.

Verification and Control Technology - conduct research and development to provide the science and technology required for treaty monitoring, material control, and early detection and characterization of the proliferation of weapons of mass destruction and special nuclear materials, including arms control treaty verification; intelligence collecting and processing supporting Presidential arms control and nonproliferation initiatives; and provide intelligence support in assessing nuclear threats.

Uranium Programs - Downblend HEU at Portsmouth - downblend HEU hexafluoride to low enriched uranium (LEU) hexafluoride for use in filling the United States Enrichment Corporation (USEC) commercial orders for enrichment services and safeguarding of all HEU material at the Portsmouth site.

International Nuclear Safety - enhance the safety of Soviet-designed nuclear power plants, help host countries upgrade their nuclear safety cultures and supporting infrastructures, reduce the proliferation threats posed by plutonium and highly enriched uranium (HEU) materials available in Russia and other states of the Former Soviet Union and cooperate and coordinate with other Departmental Offices and Government Agencies in the implementation of U.S. Non-Proliferation Policy by increasing confidence that Russian Low Enriched Uranium (LEU) sold to the United States Enrichment Corporation (USEC) is derived from HEU removed from dismantled Russian nuclear weapons.

Naval Reactors - design, development, testing, and production of safe, long-lived, militarily-effective nuclear power plants for U.S. Navy ships and submarines, including over 120 operating reactors in nine different operational classes.

Nuclear Safeguards and Security - provide direction and training for protection of nuclear weapons, nuclear materials, classified information, and facilities, including related technology development, and directing classification and declassification activities.

Emergency Management/Preparedness - control and direction to ensure comprehensive and integrated planning, preparedness, and response capability for emergencies involving DOE operations or facilities.

Worker and Community Transition - mitigate adverse impact on workers and communities resulting from restructuring, including local economic assistance for job-base conversion.

Fissile Materials Disposition - provide safe, secure, environmentally sound, and inspectable long-term storage of weapons-usable fissile materials; disposal of surplus HEU and plutonium; and technical support for U.S. initiatives to reduce foreign surplus of weapons-usable plutonium.

Sale of Russian Origin Uranium

Section 3112(b) of the USEC Privatization Act of 1996 provided that the United States Enrichment Corporation (USEC), pursuant to the Russian HEU Agreement, transfer to DOE the natural uranium equivalent associated with at least 18 metric tons of Russian origin highly enriched uranium purchased from the Russian Executive Agent. The Russian HEU Agreement was executed to help meet U.S. nuclear nonproliferation objectives as well as to provide greater economic stability to Russia A total of 5,521 metric tons of natural uranium was transferred to DOE in December 1996, in accordance with a memorandum of agreement between USEC and DOE.

In accordance with the provisions of the Act, DOE must sell this uranium over a seven year period. During FY 1997, 1,446 metric tons of this material were sold to Global Nuclear Services and Supply Limited (GNSS), the Russian Executive Agent's representative. An additional 296 metric tons (99 metric tons in FY 1998 and 197 metric tons as of November 1998) has subsequently been sold to GNSS.

20. Supporting Schedule of Net Cost for Environmental Quality *(in millions)*

	FY 1998		FY 1997	
Environmental Restoration		$1,951		$1,994
Waste Management		1,966		2,044
Nuclear Materials and Facilities Stabilization		1,308		1,455
Uranium Enrichment Decontamination and Decommissioning				
Program Costs	$298		$234	
Less Earned Revenues	(98)		(86)	
		200		148
Facility Safety		88		103
Health Studies		75		69
Civilian Radioactive Waste Management				
Program Costs	$406		$342	
Less Earned Revenues	(198)		(162)	
		208		180
Nuclear Technology Research and Development		14		26
Termination Costs		108		125
Uranium Programs		55		60
Legacy Waste Cleanup Adjustment		(5,632)		(5,206)
Total Environmental Quality Net Costs		$341		$998

ENVIRONMENTAL QUALITY ACTIVITIES - understand and reduce environmental, safety, and health risks and threats and develop the technologies and institutions required for solving domestic and global environmental problems.

Environmental Restoration - in accordance with Federal and State laws and other legal agreements, protects human health and the environment from risks posed by inactive, surplus DOE facilities and contaminated areas; conducts remediation activities, including both cleaning-up or containment of contamination including soil, ground water, and surface water; and performs decommissioning of contaminated facilities including reactors and chemical processing buildings.

Waste Management - provides for the safe treatment, storage, and disposal of waste from operations. The different categories of waste managed by this program include high-level, transuranic, mixed transuranic, low-level, mixed low-level, uranium mill tailings, hazardous, sanitary, and special case waste.

Nuclear Materials and Facilities Stabilization - provides for: stabilizing, consolidating, and storing special nuclear materials,

including plutonium and highly enriched uranium prior to final disposition; deactivating surplus facilities to a safe and low maintenance condition while awaiting final decommissioning; and managing spent nuclear fuel, including treatment and storage. Integral to these functions is continuous surveillance and maintenance, which is required for safety and security.

Uranium Enrichment Decontamination and Decommissioning - consists of remedial action and other related environmental clean-up activities at sites leased and operated by the United States Enrichment Corporation, including DOE facilities at these sites, and, additionally, provides for partial reimbursement of remediation costs attributable to other uranium and thorium purchased by the Federal government. Revenue from assessments against domestic utilities is recognized when such assessments are authorized by legislation. Revenue recognized includes known adjustments for transfers between utilities and other reconciliation adjustments. Increases in current and future assessments due to changes in the Consumer Price Index are recognized in each fiscal year as such changes occur.

Facility Safety - provides Departmental management with technical assistance and conducts independent oversight in areas of nuclear safety, occupational health and safety, environmental compliance implementation assistance including the National Environmental Policy Act activities, safeguards and security, and safety assistance. These are the bases for such initiatives as the Integrated Safety Management System formulated for improving safety DOE-wide.

Health Studies - include Occupational Medicine which is medical surveillance of current and former workers, Epidemiologic Studies which is surveillance of worker injury and illnesses, Public Health Activities which encompasses health studies, health education, and other health related activities at DOE sites, International Health Programs which provide health related studies and activities in the Marshall Islands, the former Soviet Union, and Japan through the Radiation Effects Research Foundation.

Civilian Radioactive Waste Management - development and management of a permanent Federal depository for spent nuclear fuel from civilian reactors and high-level radioactive waste from atomic energy defense activities in a manner that assures public and worker safety and protects the environment. The Nuclear Waste Policy Act of 1982 requires DOE to assess fees against owners and generators of high-level radioactive waste and spent nuclear fuel to fund the costs associated with management and disposal activities under Titles I and II of the Act. Fees assessed in FY 1998 and FY 1997 totaled $608 million and $585 million, respectively. An additional $5 million was earned in FY 1997 from the net gains from activities related to the investment of Treasury securities. Adjustments are made annually to defer the recognition of revenues until earned (i.e, as costs are incurred for the Civilian Radioactive Waste Management program).

Nuclear Technology Research and Development - development of electrometallurgical technology for the treatment of DOE spent nuclear fuel.

Termination Costs - cost-effectively shut down terminated Federal programs and conduct the activities necessary to place unneeded Federal nuclear research facilities into an industrially and radiologically safe shutdown condition.

Uranium Programs - manage the Department's excess uranium and depleted uranium hexafluoride inventories, pre-existing contractual liabilities, and maintain nonleased facilities in a safe and environmentally sound condition.

Legacy Waste Cleanup Adjustment - operating expenditures related to legacy waste cleanup activities which represent a reduction of DOE's environmental liabilities. These costs are excluded from current year program expenses since the expense was accrued in prior years when DOE recorded the environmental liabilities.

21. Supporting Schedule of Net Cost for Science and Technology *(in millions)*

	FY 1998		FY 1997	
Biological and Environmental Research		$387		$366
Fusion Energy Sciences				
Program Costs	$233		$246	
Less Earned Revenues	(1)		--	
		232		246
Basic Energy Sciences		655		671
High Energy Physics		639		596
Nuclear Physics		258		275
Computational and Technology Research		156		157
Superconducting Super Collider		6		(17)
Small Business Innovative Research/Technology Transfer		94		93
University and Science Education		4		14
Technical Information Management Program		10		13
University Nuclear Science and Reactor Support		8		4
Advanced Radioisotope Power System		32		38
Isotope Production and Distribution				
Program Costs	$34		$31	
Less Earned Revenues	(12)		(11)	
		22		20
Technology Development		261		357
Environmental Sciences		79		60
Other Energy Research Activities		2		4
Legacy Waste Cleanup Adjustment		(275)		(346)
Total Science and Technology Net Costs		$2,570		$2,551

SCIENCE AND TECHNOLOGY ACTIVITIES - provide science and tools needed to develop energy technology options, to understand the health and environmental implications of energy activities, and to understand the fundamental nature of energy and matter; provide large scale facilities required in natural sciences to ensure U.S. leadership in the search for knowledge; and apply research and development competencies to help ensure the availability of scientific talent.

Biological and Environmental Research - fundamental science in the pursuit of understanding the consequences to health and the environment of energy production, development, and use, including DOE's support of the national Human Genome and Global Climate Change programs, and providing unique national user facilities for the scientific community.

Fusion Energy Sciences - research and development needed for an economically and environmentally attractive fusion energy source, namely advancing plasma science, developing fusion science, technology, and plasma confinement innovations, and pursuing fusion energy science and technology as a partner in the international effort.

Basic Energy Sciences - fundamental research on materials sciences, chemical sciences, geosciences, biosciences, and engineering sciences that underpins the DOE missions in energy and the environment, that advances energy related basic science on a broad front, and that provides unique national user facilities for the scientific community.

High Energy Physics - research to understand the nature of matter and energy at the most fundamental level, as well as the basic forces which govern all processes in nature, that requires accelerators and detectors utilizing state-of-the-art technologies in many areas, including fast electronics, high speed computing, superconducting magnets, and high power radio-frequency devices.

Nuclear Physics - research to understand the structure and properties of atomic nuclei and the fundamental forces between the constituents that form the nucleus. Nuclear processes determine essential physical characteristics of our universe and the composition of the matter that forms it.

Computational and Technology Research - research that extends from fundamental investigations to technology development, which includes high performance computing and communications, information infrastructure, advanced energy concepts, and technology transfer research.

Superconducting Super Collider - expenditures are for the orderly termination of this activity.

Small Business Innovative Research/Small Business Technology Transfer - DOE-supported research and development of energy related technology that will significantly benefit U.S. businesses, including a pilot technology transfer program initiative.

University and Science Education - provides assistance in science education (precollege through postdoctoral), including reactor fuel assistance, scientific instrumentation, and technology transfer.

Technical Information Management Program - activities to direct, coordinate, and implement the management and dissemination of scientific and technical information resulting from DOE research and development and environmental programs. The program also provides worldwide energy information to the DOE, U.S., industry, academia, and the public through scientific and technical information exchange agreements.

University Nuclear Science and Reactor Support - maintain the capability in the U.S. to conduct research, address pressing environmental challenges, and preserve the nuclear energy option.

Advanced Radioisotope Power System - development, demonstration, testing, and delivery of radioisotope power systems.

Isotope Production and Distribution - serve the national need for a reliable supply of isotope products and services for medicine, industry, and research by developing new or improved isotope products and services that enable medical diagnoses and therapy, and other applications that are in the national interest.

Technology Development - research and development of new more effective and less expensive technological remedies to the environmental and safety problems of the Environmental Management Program. The new technologies are necessary to reduce risks to humans and the environment, reduce cleanup cost, and resolve significant related problems for which no solutions currently exist. Operating expenditures related to legacy waste cleanup activities represent a reduction of DOE's environmental liabilities and are therefore reflected as a legacy waste cleanup adjustment. These costs are excluded from current year program expenses since the expense was accrued in prior years when DOE recorded the environmental liabilities.

Environmental Sciences Program - provides strategic basic research to strengthen the Office of Environmental Management's basic science and engineering activities through a competitive process offered to the DOE national laboratories, academic, and industrial organizations. The program will lead to long-term reduced cleanup costs and risks to workers and the public.

22. Supporting Schedule of Net Cost for Other Programs

(in millions)

	FY 1998		FY 1997	
Inspector General		$27		$31
Energy Information Administration		68		75
Federal Energy Regulatory Commission				
Program Costs	$192		$185	
Less Earned Revenues	(192)		(208)	
		0		(23)
Reimbursable Work Programs				
Program Costs				
Intragovernmental	$1,300		$1,321	
Public	272		136	
Less Earned Revenues				
Intragovernmental	(1,258)		(1,249)	
Public	(210)		(127)	
		44		81
Services Provided for the U.S. Enrichment Corporation				
Program Costs	$323		$521	
Less Earned Revenues				
Intragovernmental	(324)		(515)	
		(1)		6
Technology Transfer Activities				
Program Costs	$82		$66	
Less Earned Revenues	(85)		(60)	
		(3)		6
Other Goods and Services Provided				
Program Costs				
Intragovernmental	$22		$20	
Public	39		54	
Less Earned Revenues				
Intragovernmental	(29)		(30)	
Public	(48)		(55)	
		(16)		(11)
Other Programs				
Program Costs	($10)		$13	
Less Earned Revenues	(25)		(7)	
		(35)		6
Total Other Programs Net Costs		**$84**		**$171**

Office of Inspector General

The Office of Inspector General conducts investigations, audits, and inspections to detect and prevent fraud, abuse, and violations of law, and promotes economy, efficiency, and effectiveness of DOE operations.

Energy Information Administration

The Energy Information Administration functions as an independent statistical/analytical agency, develops and maintains a comprehensive energy database, publishes a wide variety of energy reports and analysis as required by law, and responds to energy information inquiries from DOE decision- and policy-makers, the Congress, other government entities, and the general public. Information disseminated includes data on energy reserves, production, distribution, consumption, prices, technology, and related international economic and financial market information.

Federal Energy Regulatory Commission

The Federal Energy Regulatory Commission (FERC) is an independent regulatory organization within DOE which is responsible for setting rates and charges for the transportation and sale of natural gas and for the transmission and sale of electricity and the licensing of hydroelectric power projects. FERC assesses most of its administrative program costs as an annual charge to each regulated entity. These revenues are returned to Treasury when collected.

Reimbursable and Cooperative Work

DOE performs work for other Federal agencies and private companies on a reimbursable work basis and on a cooperative work basis. Whereas reimbursable work is generally not DOE's direct mission, but part of the customer's mission, cooperative work is part of DOE's direct mission. Reimbursable work is financed by funds of Federal agencies ordering the work or by cash advances from non-Federal customers, and DOE receives no appropriated funds for such work or services. Cooperative work, however, is financed by funds appropriated to DOE that may be used in a cooperative effort with one or more Federal or non-Federal participants. Authorities for DOE to perform reimbursable work include the Economy Act of 1932, the Atomic Energy Act of 1954, Intergovernmental Cooperation Act of 1968, Intergovernmental Personnel Act of 1970, and DOE Organization Act of 1977. Authorities for performance of cooperative work include Public Law 98-438, the Energy Reorganization Act of 1974, section 107(a), and Public Law 95-224, the Federal Grant and Cooperative Agreements Act of 1977.

DOE's policy is to establish prices for materials and services provided to public entities at the Department's full cost and to other Federal agencies at the Department's full cost less depreciation. In some cases, the full cost information reported by DOE in accordance with OMB's Statement of Federal Financial Accounting Standards Number 4, *Managerial Cost Accounting Concepts and Standards for the Federal Government*, exceeds revenues. This results from implementation of provisions contained in the Economy Act of 1932, as amended, the Atomic Energy Act of 1954, as amended, and a conditional waiver granted by OMB, which provide DOE authority to charge customers an amount less than the full cost of the product or service.

OMB's Statement of Federal Financial Accounting Standards Number 7, *Accounting for Revenue and Other Financing Sources*, requires that when goods and services are provided to the public or another Federal agency, reporting entities should disclose practices where revenue received is less than the full cost of the goods and services provided, as well as an estimate, if practicable, of the amount of revenue foregone. The amount for reimbursable and cooperative work was estimated by computing the difference between the full cost reported for the financial statement purposes, including appropriate allocations of costs, and the revenue reported for financial statement purposes, including the collection of Departmental overhead and depreciation. Accordingly, DOE estimates revenue foregone for reimbursable and cooperative work activities for FY 1998 and FY 1997 of $44 million and $81 million, respectively.

Services Performed for the U.S. Enrichment Corporation (USEC)

USEC leases DOE's gaseous diffusion plants. While DOE does not receive payment from USEC for the lease, USEC does pay for all services provided by DOE or its contractors. Most of the reimbursements are for the cost of providing electricity to operate the gaseous diffusion plants.

Technology Transfer Program

DOE has entered into cooperative research and development agreements to increase the transfer of Federally funded technologies to the private sector for the benefit of the U.S. economy. This program is primarily implemented through Cooperative Research and Development Agreements between DOE's laboratories and the private sector (may include industry, non-profits, universities, state or local governments, or individuals). The non-Federal party may provide funds, personnel, services, facilities, equipment or other resources to conduct specific research and development work consistent with the mission of the laboratory.

23. Costs Not Assigned to Programs

(in millions)

	FY 1998	FY 1997
Excess nuclear materials and weapons components	($12)	$1,259
Change in capitalization threshold	34	694
Provision for net loss on USEC inventory transfers		384
Changes in unfunded environmental liabilities estimates (see Note 13)	12,181	(47,749)
Change in unfunded safety and health liabilities (see Note 15)	898	(346)
Change in unfunded liability for USEC (see Note 15)	(242)	
Contingent liability for NWF (see Note 16)	500	
Other costs	20	70
Total	$13,379	($45,888)

Excess nuclear materials and weapons components

DOE reduced the value of the nuclear materials stockpile in FY 1995 and 1996 based on materials that were declared excess to national security needs and for which there was no non-defense programmatic requirement for the materials within the Department. During FY 1997, a determination was made that additional nuclear materials and weapon components were excess to national security and programmatic needs, which resulted in a loss of $1,259 million.

Change in capitalization threshold

In FY 1997, DOE raised its capitalization threshold from $5,000 to $25,000 for all field elements except the power marketing administrations. This change in accounting policy resulted in a charge to expense during FY 1997 of $694 million. An additional $34 million was charged to expense in FY 1998.

Provision for net loss on USEC inventory transfers

DOE recognized an estimated loss of $184 million during FY 1997 related to nuclear materials inventory transfers mandated by Public Law 104-134, the United States Enrichment Corporation Privatization Act of 1996. Pursuant to the law, the United States Enrichment Corporation (USEC) transferred uranium hexafluoride with a carrying value of $143 million to DOE for sale to Russia and others. The law also required DOE to transfer up to 50 metric tons of highly enriched uranium and up to 7,000 tons of natural uranium to USEC. Pursuant to Section 3112 of the USEC Privatization Act of 1996, DOE transferred 50 metric tons of highly enriched uranium and 7,000 metric tons of natural uranium to USEC on April 21, 1998. The historical cost of the uranium transferred was approximately $416 million. This amount was recorded as a liability on DOE's FY 1997 financial statements and represented an increase of $327 million from the FY 1996 estimated liability balance. The net of the $327 million increase in the liability and the $143 million carrying value of uranium transferred from USEC to DOE resulted in the net loss of $184 million in FY 1997.

24. Prior Period Adjustments

(in millions)

	FY 1998	FY 1997
Environmental liabilities	$106	($5,271)
Correction of prior accumulated depreciation expense	0	(174)
Fast Flux Test Facility	0	136
Write-down of legacy waste facilities and equipment	(173)	(749)
Other	104	(18)
Total	$37	($6,076)

Environmental liabilities

As discussed in Note 13, DOE accrued an environmental liability totaling $1,421 million in FY 1996 for its share of unreimbursed nuclear waste fund program costs incurred, plus accrued interest. During FY 1997, DOE recorded a prior period adjustment of $5,271 million to recognize its share of the total-system life cycle costs associated with the disposal of its high-level waste and spent nuclear fuel.

Correction of prior period accumulated depreciation expense

Errors in recording depreciation and related capitalization entries in prior years were corrected in FY 1997.

Fast Flux Test Facility (FFTF)

The FFTF was written off in FY 1995 after DOE determined that the FFTF had no further research mission. In January 1997, DOE directed that the FFTF be held in standby until a final decision could be made as to whether or not it was needed for tritium and/or medical isotope production. The decision to place the FFTF in standby resulted in an increase to capitalized property, plant, and equipment and invested capital.

Write-down of legacy waste facilities and equipment

DOE changed its capitalization practices related to environmental management processing facilities and equipment during FY 1995. DOE implemented the guidance of the Financial Accounting Standards Board (FASB) Emerging Issues Task Force Issue 90-8, Capitalization of Costs to Treat Environmental Contamination. This guidance requires the expensing of facilities that treat, store, or dispose of existing wastes generated by past operations (legacy facilities and equipment). Analysis conducted in FY 1997 and FY 1998 identified additional facilities and equipment resulting in write-downs of capitalized property.

25. Transfers Out

(in millions)

	FY 1998	FY 1997
Proceeds from the sale of NPR-1	($3,341)	
Proceeds from the sale of oil		
Naval Petroleum Reserves	(21)	($513)
Strategic Petroleum Reserve		(220)
Federal Energy Regulatory Commission Revenues	(192)	(205)
Other	(58)	(90)
Total	($3,612)	($1,028)

26. Financing Sources Yet to Be Provided

(in millions)

	FY 1998	FY 1997
Changes in unfunded environmental liabilities estimates (see Note 13)	$12,181	($47,749)
Change in unfunded safety and health liabilities (see Note 15)	890	(346)
Change in unfunded liability for USEC (see Note 15)	(242)	
Other unfunded liability changes	(58)	8
Total	$12,771	($48,087)

27. Custodial Activities

(in millions)

Power Marketing Administrations

The Southeastern, Southwestern, and Western Area power marketing administrations are responsible for collecting and remitting to Treasury revenues attributable to the hydroelectric power projects owned and operated by the U.S. Department of Defense, Army Corps of Engineers; the U.S. Department of Interior, Bureau of Reclamation; and the U.S. Department of State, International Boundary and Water Commission. These revenues are reported as custodial activities of DOE.

Petroleum Pricing Violation Escrow Fund

Custodial revenues for the Petroleum Pricing Violations Escrow Fund result primarily from interest earned from investment of the fund balance, which is invested in U.S. Treasury Bills and Certificates of Deposit with minority owned financial institutions, pending determination of the disposition of the funds. Funds are disbursed to individuals and groups who are able to provide proof of financial injury related to the violations of Petroleum Pricing Regulations during the 1970's and early 1980's. The Department's Office of Hearings and Appeals also distributes funds to the U.S. Treasury and to the States, Possessions and Territories of the United States.

28. Other Matters

Formerly Utilized Sites Remedial Action Program

DOE transferred the Formerly Utilized Sites Remedial Action Program (FUSRAP) to the U.S. Army Corps of Engineers effective October 1997. The estimated remediation costs included in DOE's environmental liability as of September 30, 1997, totaled $1.4 billion.

Consolidating Schedules - Balance Sheet
As of September 30, 1998 and 1997

	FY 1998					FY 1997				
	Federal Energy Regulatory Commission	Power Marketing Administrations	All Other DOE Programs	Eliminations	Consolidated	Federal Energy Regulatory Commission	Power Marketing Administrations	All Other DOE Programs	Eliminations	Consolidated
ASSETS										
Intragovernmental										
Fund balance with Treasury	$36	$777	$10,356	$0	$11,169	$35	$571	$8,639	$0	$10,845
Investments	0	0	10,200	0	10,200	0	0	8,147	0	8,147
Accounts Receivable, Net	0	14	1,858	(1,190)	682	0	18	1,585	(1,057)	556
Regulatory Assets	0	5,228	0	0	5,228	0	5,226	0	0	5,226
Other Assets	0	0	7	(2)	5	0	0	10	(3)	7
Investments	0	0	283	0	283	0	0	245	0	245
Accounts Receivable, Net	8	343	4,232	0	4,583	6	371	4,272	0	4,649
Inventory, Net										
Strategic Petroleum Reserve	0	0	15,087	0	15,087	0	0	15,087	0	15,087
Nuclear Materials	0	0	21,729	0	21,729	0	0	22,591	0	22,591
Other Inventory	0	88	415	0	504	0	98	425	0	521
General Property, Plant, and Equipment, Net	19	5,004	14,817	0	19,840	18	5,361	15,377	0	20,756
Regulatory Assets	0	8,031	0	0	8,031	0	7,936	0	0	7,936
Other Assets	0	216	611	0	827	0	237	356	0	592
Total Assets	$63	$19,702	$79,374	($1,192)	$97,947	$60	$19,920	$77,881	($1,060)	$96,801
LIABILITIES										
Liabilities Covered by Budgetary Resources										
Intragovernmental Liabilities										
Accounts Payable	$1	$43	$89	($14)	$119	$0	$49	$112	($16)	$149
Debt	0	8,906	0	0	8,906	0	8,063	0	0	8,063
Appropriated Capital Owed to Treasury	0	1,966	0	0	1,966	0	2,309	0	0	2,309
Deferred Revenues		2	1,389	(1,178)	217	0	0	1,286	(1,042)	244
Other Liabilities	0	42	218	0	260	1	22	227	0	250
Accounts Payable	6	290	2,980	0	3,278	5	221	3,358	0	3,584
Debt	0	7,066	0	0	7,066	0	7,166	0	0	7,166
Deferred Revenues	0	437	10,628	0	11,065	0	277	9,074	0	9,351
Other Liabilities	28	121	1,881	0	2,030	24	70	1,329	0	1,423
Funded Environmental Liabilities	0	0	918	0	918	0		1,148	0	1,148
Total Liabilities Covered by Budgetary Resources	$35	$18,883	$18,107	($1,192)	$35,833	$30	$18,194	$16,534	($1,060)	$34,698
Liabilities Not Covered By Budgetary Resources										
Environmental Liabilities	0	0	183,495	0	183,495	0	0	179,466	0	179,466
Pension and Other Actuarial Liabilities	0	0	6,508	0	6,508	0	0	6,282	0	6,282
Other Unfunded Liabilities	9	9	1,916	0	1,934	9	8	1,315	0	1,332
Contingencies	0	0	506	0	506	0	0	11	0	11
Total Liabilities Not Covered By Budgetary Resources	$9	$9	$194,425	$0	$194,443	$9	$8	$187,074	$0	$187,091
Total Liabilities	$44	$18,892	$212,532	($1,192)	$230,276	$39	$18,202	$203,608	($1,060)	$221,788
NET POSITION										
Unexpended Appropriations	9	18	4,912	0	4,939	12	0	5,356	0	5,368
Cumulative Results of Operations	10	792	(136,070)	0	(137,268)	9	718	(131,083)	0	(130,356)
Total Net Position	$19	$810	($133,158)	$0	($132,329)	$21	$718	($125,727)	$0	($124,988)
Total Liabilities and Net Position	$63	$19,702	$79,374	($1,192)	$97,947	$60	$19,920	$77,881	($1,060)	$96,801

Consolidating Schedules of Net Cost
For the Years Ended September 30, 1998 and 1997

(In millions)	FY 1998					FY 1997				
	Federal Energy Regulatory Commission	Power Marketing Administrations	All Other DOE Programs	Eliminations	Consolidated	Federal Energy Regulatory Commission	Power Marketing Administrations	All Other DOE Programs	Eliminations	Consolidated
Costs										
Energy Resources										
Program Costs	$0	$3,083	$1,785	$0	$4,868	$0	$2,718	$2,116	$0	$4,834
Net Gain on Sale of Naval Petroleum Reserves			(2,848)		(2,848)					
Earned Revenues	0	(3,114)	(13)	0	(3,127)	0	(3,015)	(712)	0	(3,727)
Net Cost of Energy Resources Programs	$0	($31)	($1,076)	$0	($1,127)	$0	($297)	$1,404	$0	$1,107
National Security										
Program Costs	$0		$5,728	0	5,728	$0		$5,876	0	$5,876
Earned Revenues	0		(3)	0	(3)	0		(41)	0	(41)
Net Cost of National Security Programs	$0	$0	$5,725	$0	$5,725	$0	$0	$5,835	$0	$5,835
Environmental Quality										
Program Costs	$0		$1,025	($88)	937	$0		$1,622	($77)	$1,245
Earned Revenues	0		(296)	0	(296)	0		(248)	0	(248)
Net Cost of Environmental Quality Programs	$0	$0	$729	($388)	$341	$0	$0	$1,375	($377)	$998
Science & Technology										
Program Costs	$0		$2,602	(13)	2,589	$0		$2,575	(13)	$2,562
Earned Revenues	0		(13)	0	(13)	0		(11)	0	(11)
Net Cost of Science & Technology Programs	$0	$0	$2,589	($13)	$2,576	$0	$0	$2,564	($13)	$2,551
Other Programs										
Program Costs	$182		$2,143	(80)	2,266	$185		$2,326	(89)	$2,422
Earned Revenues	(182)		(2,059)	80	(2,171)	(208)		(2,132)	89	(2,251)
Net Cost of Other Programs	$0	$0	$84	$0	$84	($23)	$0	$194	$0	$171
Costs Not Assigned to Programs	0		13,379	0	13,379	0		(45,888)	0	(45,888)
Less Earned Revenues Not Attributable to Programs	0		(14)	0	(14)	0		(23)	0	(23)
Net Cost of Operations	$0	($31)	$21,414	($497)	$20,956	($23)	($297)	($34,339)	($390)	($35,249)

Consolidating Schedules of Changes in Net Position
For the Years Ended September 30, 1998 and 1997

(In millions)	FY 1998 Federal Energy Regulatory Commission	FY 1998 Power Marketing Administrations	FY 1998 All Other DOE Programs	FY 1998 Eliminations	FY 1998 Consolidated	FY 1997 Federal Energy Regulatory Commission	FY 1997 Power Marketing Administrations	FY 1997 All Other DOE Programs	FY 1997 Eliminations	FY 1997 Consolidated
Net Cost of Operations	$0	$51	($21,414)	$407	($20,956)	$33	$297	$34,509	$390	$35,249
Financing Sources (Other Than Exchange Revenues)										
Appropriations Used	169	6	17,078	(388)	16,864	161	7	17,759	(377)	17,550
Taxes (and Other Non-Exchange Revenues)	0	0	2	0	2	0	0	(11)	0	(11)
Imputed Financing	8	7	64	0	79	8	23	66	0	97
Transfers-in	0	0	(1,167)	1,167	0	0	0	(1,297)	1,197	(100)
Transfers-out	(175)	(15)	(2,935)	(1,196)	(3,612)	(166)	(36)	504	(1,210)	(908)
Net Results of Operations	$1	$49	($7,676)	$0	($7,626)	($4)	$301	$51,560	$0	$51,857
Prior Period Adjustments	0	26	11	0	37	0	(12)	(6,064)	0	(6,076)
Net Change in Cumulative Results of Operations	$1	$75	($7,665)	$0	($7,589)	($4)	$289	$45,496	$0	$45,781
Change in Nuclear Waste Fund Options Reserves			945		945			211		211
Increase (Decrease) in Unexpended Appropriations	(3)	17	(711)	0	(697)	(12)	0	(521)	0	(533)
Change in Net Position	($2)	$92	($7,431)	$0	($7,341)	($16)	$289	$45,186	$0	$45,459
Net Position - Beginning of Period	21	718	(135,727)	0	(134,988)	37	429	(179,913)	0	(179,447)
Net Position - End of Period	$19	$810	($139,158)	$0	($142,329)	$21	$718	($125,727)	$0	($134,988)

Consolidating Schedules of Budgetary Resources
For the Years Ended September 30, 1998 and 1997

(In millions)	FY 1998 Federal Energy Regulatory Commission	FY 1998 Power Marketing Administrations	FY 1998 All Other DOE Programs	FY 1998 Eliminations	FY 1998 Consolidated	FY 1997 Federal Energy Regulatory Commission	FY 1997 Power Marketing Administrations	FY 1997 All Other DOE Programs	FY 1997 Eliminations	FY 1997 Consolidated
BUDGETARY RESOURCES										
Budgetary Authority	$165	$245	$17,184	($471)	$17,103	$169	$329	$17,080	($468)	$16,990
Unobligated Balances - Beginning of Period	8	811	1,947	0	2,464	13	362	2,276	0	2,651
Spending Authority from Offsetting Collections	0	2,637	2,059	0	4,696	0	2,471	2,169	0	4,640
Adjustments	1	(7)	(161)	0	(167)	1	51	(64)	0	(32)
Total Budgetary Resources	$172	$3,086	$21,009	($471)	$24,096	$183	$3,113	$21,441	($468)	$24,249
STATUS OF BUDGETARY RESOURCES										
Obligations Incurred	169	2,843	19,380	(471)	21,921	157	2,545	19,195	(468)	21,429
Unobligated Balances Available	3	1,433	1,254	0	2,690	6	1,578	1,774	0	3,358
Unobligated Balances - Not Available	0	(990)	375	0	(615)	0	(1,010)	472	0	(538)
Total, Status of Budgetary Resources	$172	$3,086	$21,009	($471)	$24,096	$163	$3,113	$21,441	($468)	$24,249
OUTLAYS										
Obligations Incurred	169	2,843	19,380	(471)	21,921	157	2,545	19,195	(468)	21,429
Less Spending Authority from Offsetting Collections and Adjustments	(1)	(2,639)	(2,085)	6	(4,725)	(1)	(2,476)	(2,194)	0	(4,671)
Obligated Balance, Net - Beginning of Period	19	211	7,673	0	7,903	24	224	8,239	0	8,487
Obligated balance Transferred, Net	0	0	2	0	2	0	0	2	0	2
Less Obligated balance, Net - End of Period	(21)	(342)	(7,709)	0	(8,072)	(19)	(211)	(7,673)	0	(7,903)
Total Outlays	$166	$73	$17,261	($471)	$17,029	$161	$82	$17,569	($468)	$17,344

Consolidating Schedules of Financing
For the Years Ended September 30, 1998 and 1997

(In millions)	FY 1998 Federal Energy Regulatory Commission	FY 1998 Power Marketing Administrations	FY 1998 All Other DOE Programs	FY 1998 Eliminations	FY 1998 Consolidated	FY 1997 Federal Energy Regulatory Commission	FY 1997 Power Marketing Administrations	FY 1997 All Other DOE Programs	FY 1997 Eliminations	FY 1997 Consolidated
OBLIGATIONS AND NONBUDGETARY RESOURCES										
Obligations Incurred										
Category A, Direct	$169	$2,669	$17,530	($471)	$19,897	$157	$2,409	$17,300	($466)	$19,391
Reimbursable	0	174	1,850	0	2,024	0	143	1,895	0	2,038
Less Spending Authority from Offsetting Collections and Adjustments										
Earned Reimbursements										
Collected	0	(2,913)	(2,452)	83	(4,982)	0	(2,471)	(2,496)	91	(4,876)
Receivable from Federal Sources	0	(1)	55	0	54	0	(1)	9	0	8
Change in Unfilled Orders (Decreases) Increases	0	(1)	(94)	0	(95)	0	2	161	0	163
Recoveries of Prior-Year Obligations	(1)	(2)	(25)	0	(28)	(1)	(5)	(28)	0	(34)
Financing Imputed for Cost Subsidies	8	6	64	0	78	8	8	66	0	82
Transfers Out	(175)	(15)	(3,400)	(18)	(3,612)	(196)	(26)	(793)	(13)	(1,028)
Exchange Revenues Not in the Budget	0	0	1,549	0	1,549	0	0	1,260	0	1,260
Other	0	(212)	0	0	(212)	0	(246)	0	0	(246)
Total Obligations as Adjusted, and Nonbudgetary Resources	$1	$5	$15,104	($497)	$14,703	($32)	($186)	$17,376	($390)	$16,757
RESOURCES THAT DO NOT FUND NET COST OF OPERATIONS										
Change in Amount of Goods, Services, and Benefits Ordered but Not Yet Received or Provided	9	(3)	105	0	102	5	(43)	412	0	374
Costs Capitalized on the Balance Sheet										
General Property, Plant, and Equipment	(2)	(37)	(1,234)	0	(1,274)	(1)	(319)	(1,275)	0	(1,595)
Purchases of Inventory	0	0	(463)	0	(463)	0	(9)	(514)	0	(523)
Financing Sources That Fund Costs of Prior Periods	0	(27)	(8,274)	0	(8,301)	0	(14)	(8,023)	0	(8,037)
Other	0	(389)	(1,021)	0	(1,410)	0	(291)	(1,274)	0	(1,565)
Total Resources that Do Not Fund Net Cost of Operations	($3)	($456)	($8,937)	$0	($9,346)	$4	($676)	($8,674)	$0	($9,346)
COSTS THAT DO NOT REQUIRE RESOURCES										
Depreciation and Amortization	2	414	1,458	0	1,875	2	491	1,409	0	1,902
Revaluation of Assets and Liabilities	0	0	(161)	0	(161)	1	0	625	0	626
Loss on Disposition of Assets	0	0	484	0	484	0	(1)	84	0	83
Other	0	(65)	685	0	620	2	77	2,797	0	2,876
Total Costs That Do Not Require Resources	$2	$349	$2,477	$0	$2,828	$5	$567	$4,855	$0	$5,427
FINANCING SOURCES YET TO BE PROVIDED (Note 25)	0	1	12,770	0	12,771	0	8	(48,065)	0	(48,057)
NET COST OF OPERATIONS	$0	($91)	$21,414	($497)	$20,856	($23)	($287)	($34,539)	($390)	($35,249)

Consolidating Schedules of Custodial Activities
For the Years Ended September 30, 1998 and 1997

(In millions)	FY 1998					FY 1997				
	Federal Energy Regulatory Commission	Power Marketing Administrations	All Other DOE Programs	Eliminations	Consolidated	Federal Energy Regulatory Commission	Power Marketing Administrations	All Other DOE Programs	Eliminations	Consolidated
SOURCES OF COLLECTIONS										
Cash Collections										
Power marketing administrations	$0	$426	$0	$0	$426	$0	$436	$0	$0	$436
Petroleum Pricing Violation Escrow Fund	0	0	74	0	74	0	0	80	0	80
Other	3	0	0	0	3	3	0	0	0	3
Net Collections	$3	$426	$74	$0	$505	$3	$436	$80	$0	$521
Accrual Adjustment										
Power marketing administrations		12	0		12	0	4	0		4
Petroleum Pricing Violation Escrow Fund	0		(50)		(50)	0		(53)		(53)
Total Revenue	$3	$440	$24	$0	$467	$3	$442	$27	$0	$472
DISPOSITION OF REVENUE										
Transferred to Others										
Treasury	(3)	(440)	3	0	(440)	(3)	(437)	(97)	0	(537)
Other	0	0	(57)	0	(57)	0	0	(54)	0	(54)
Increase (Decrease) in Amounts to be Transferred	0	0	53	0	53	0	(5)	153	0	148
Collections Used for Refunds and Other Payments	0	0	(2)	0	(2)	0	0	(2)	0	(2)
Retained by DOE	0	0	(21)	0	(21)	0	0	(30)	0	(30)
Net Custodial Activity	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

Required Supplementary Stewardship Information Reporting

This section of the report provides information for the Department on stewardship and deferred maintenance. Stewardship information is a requirement of OMB's Statement of Federal Financial Accounting Standards (SFFAS) No. 8, "Supplementary Stewardship Reporting," which is a new reporting requirement for FY 1998. Currently, deferred maintenance information is a requirement under OMB's SFFAS No. 6, "Accounting for Property, Plant and Equipment."

Stewardship Information

SFFAS No. 8 requires Federal agencies to report on certain resources entrusted to it, identified as stewardship property, plant, and equipment and stewardship investments. To meet this requirement, the Department is reporting the following information on its research and development activities.

Required Supplementary Stewardship Report for Research and Development
(Dollars in Thousands)

	Direct Costs	Allocable Costs	Total Costs	Total Business Line Costs
BASIC				
Energy Resources				**$43,128**
Coal R&D	1,943	383	2,326	
Other Fossil Energy Activities	1,371	215	1,586	
Power Marketing Administrations	–	–	3,016	
Utility Technology	26,969	9,231	36,200	
National Security				**$11,257**
Verification and Control Technology	9,582	1,675	11,257	
Science and Technology				**$2,414,343**
Basic Energy Science	571,788	82,257	654,045	
Biological and Environmental Research	303,722	31,019	334,741	
Computational and Technology Research	121,857	13,294	135,151	
Environmental Sciences Program	57,386	9,377	66,763	
Fusion Energy Sciences	202,857	21,968	224,825	
High Energy Sciences	494,312	144,555	638,867	
Nuclear Physics	205,695	51,338	257,033	
Small Business Innovative Research Technology	90,186	4,133	94,319	
Superconducting Super Collider	4,379	1,852	6,231	
Other Energy Research Activities	2,008	360	2,368	
Total Basic	**$2,094,055**	**$371,657**	**$2,468,728**	
APPLIED				
Environmental Quality				**$306,522**
Civilian Radioactive Waste Management	299,529	6,993	306,522	
Energy Resources				**$370,444**
Building Technology	4,021	478	4,499	
Coal R&D	48,582	9,585	58,167	
Gas R&D	43,759	7,480	51,239	
Industrial Technology	29,280	2,921	32,201	
Other Fossil Energy Activities	5,274	818	6,092	
Other Nuclear Energy Activities	106	447	553	
Petroleum R&D	22,989	3,257	26,246	
Transportation Technology	51,803	5,184	56,987	
Power Marketing Administrations	–	–	10,470	
Utility Technology	112,086	11,904	123,990	

Required Supplementary Stewardship Report for Research and Development
(Dollars in Thousands)

(APPLIED Continued)	Direct Costs	Allocable Costs	Total Costs	Total Business Line Costs
National Security				**$1,332,293**
Stockpile Management	36,709	20,890	57,599	
Stockpile Stewardship	985,968	155,347	1,141,315	
Verification and Control Technology	113,727	19,652	133,379	
Science and Technology				**$221,501**
Biological and Environmental Research	49,411	3,799	53,210	
Computational and Technology Research	19,553	1,018	20,571	
Technology Development	115,141	28,891	144,032	
University and Science Education	3,409	279	3,688	
Total Applied	**$1,941,347**	**$278,943**	**$2,230,760**	
DEVELOPMENT				
Environmental Quality				**$6,246**
Uranium Programs - All Other	5,880	366	6,246	
Energy Resources				**$691,876**
Building Technology	16,161	1,656	17,817	
Clean Coal Technology	84,795	8,639	93,434	
Coal R&D	46,639	9,202	55,841	
Gas R&D	65,638	11,221	76,859	
Industrial Technology	91,686	10,099	101,785	
Other Fossil Energy Activities	7,045	1,090	8,135	
Other Nuclear Energy Activities	1,937	761	2,698	
Petroleum R&D	34,483	4,886	39,369	
Transportation Technology	150,534	15,697	166,231	
Power Marketing Administrations	--	--	17,144	
Utility Technology	102,005	10,558	112,563	
National Security				**$1,238,034**
Fissile Materials Disposition	49,533	8,580	58,113	
Naval Reactors	588,534	33,603	622,137	
Stockpile Stewardship	410,294	75,079	485,373	
Verification and Control Technology	58,660	13,751	72,411	
Science and Technology				**$102,764**
Advanced Radioisotope Power System	27,931	3,892	31,823	
Technology Development	56,711	14,230	70,941	
Total Development	**$1,798,466**	**$223,310**	**$2,038,920**	
TOTAL RESEARCH & DEVELOPMENT	**$5,833,868**	**$873,910**	**$6,738,408**	

Required Supplementary Stewardship Report for Research and Development

Environmental Quality

Civilian Radioactive Waste Management *Applied* - Research activities were carried out in support of the Yucca Mountain Site Characterization Program.

Uranium Programs *Development* - Activities involved the development and demonstration of enrichment related technologies and the conversion or alternative uses of depleted uranium hexafluoride.

Energy Resources

Building Technology *Applied & Development* - Activities included strategies and techniques for the integration of conversion and renewable measures for new and existing residential and commercial buildings.

Clean Coal Technology *Development* - Activities conducted in support of the clean coal technology/innovative clean coal technology development and demonstration projects.

Coal R&D *Basic, Applied & Development* - Activities related to improving acceptable technology for converting coal to liquid and gaseous fuels, improving methods for the direct combustion of coal, and advancing power conversion systems for generating electricity from coal.

Gas R&D *Applied & Development* - Activities carried out in support of natural gas recovery methods.

Industrial Technology *Applied & Development* - Activities conducted to support energy conservation and energy supply for the industry sector.

Other Fossil Energy Activities *Basic, Applied & Development* - Cooperative research activities carried out as a result of awards from competitive solicitations initiated under the Fossil energy Federal/State Program. *Applied & Development* - Also included research conducted on the mining safety and health programs.

Other Nuclear Energy Activities *Applied* - Research activities were carried out in support of the Space Reactor Program. *Development* - Activities were carried out in support of the Light Water Reactors Program.

Petroleum R&D *Applied & Development* - Activities conducted to support advanced technologies for the petroleum and oil from oil shale recovery of oil and natural gas.

Power Marketing Administrations *Basic, Applied & Development* - Research activities primarily supported the Fish and Wildlife programs at Bonneville Power Administration.

Transportation Technology *Applied & Development* - Activities conducted in support of energy conservation for the transportation sector, including automotive alternative fuels and electric vehicles.

Utility Technology *Basic, Applied & Development* - Research activities included investigations of new ideas related to Photovoltaic research, geothermal electric deployment, high temperature superconductivity, and other solar energy projects.

National Security

Fissile Materials Disposition *Development* - Activities included the development and demonstration of technologies that enable the Department and the world to dispose of surplus weapons effectively.

Naval Reactors *Development* - Activities included development, demonstration, improvement, and safe operation of nuclear propulsion plants and reactor cores for application to submarines and surface ships.

Stockpile Management *Applied* - Research activities supporting new technological capabilities necessary to maintain the nuclear weapons stockpile's safety and reliability.

Stockpile Stewardship *Applied* - Research activities supporting new or upgraded experimental, computational, and simulation capabilities necessary to maintain the nuclear weapons stockpile's safety and reliability. *Development* - Development activities supporting the technical, experimental, and physical infrastructure necessary to maintain the nuclear weapons stockpile's safety and reliability.

Verification and Control Technology *Basic, Applied & Development* - This program utilizes unique science and technology development capabilities at the Department's National Laboratories to reduce the threat to U.S. National Security posed by weapons of mass destruction.

Science and Technology

Advanced Radioisotope Power System *Development* - Activities provided compact, safe nuclear power systems and related technologies to space, national security and other customers.

Basic Energy Science *Basic* - Research activities were directed at fostering and supporting fundamental research in natural sciences and engineering. As part of its mission, the program planned, constructed and operated major scientific user facilities to serve researchers at universities, national laboratories, and industry.

Biological and Environmental Research *Basic* - Research activities developed knowledge needed to identify, understand, and anticipate the long term health and environmental consequences of energy production, development, and use. *Applied* - Research activities included developing beneficial applications of nuclear and other energy-related technologies for medical diagnosis and treatment.

Computational and Technology Research *Basic* - Fundamental research was conducted in advanced computing research relevant to complex problems of the Department. Provided world class supercomputer and networking facilities for scientists working on problems important to the Department. Conducted activities to establish the feasibility of novel, energy related concepts spanning the Department's mission. *Applied* - Research activities supported high risk, energy-related research to advance science and technology to enable applications impacting energy economy.

Environmental Sciences Program *Basic* - Activities supported the long term basic research necessary for the Office of Environmental Management's Technology Focus areas.

Fusion Energy Sciences *Basic* - Broad-based, fundamental research efforts aimed at producing knowledge on fusion.

High Energy Sciences *Basic* - Fundamental research activities directed at understanding the nature of matter and energy.

Nuclear Physics *Basic* - Research activities were directed at understanding the fundamental forces and particles of nature as manifested in nuclear matter.

Other Energy Research Activities *Basic* - The Energy Research Analyses program evaluated the quality and impact of DOE research programs and projects.

Small Business Innovative Research Technology *Basic* - Activities supported the Department's science and technology missions with small businesses.

Superconducting Super Collider *Basic* - This program continued to incur termination costs from the Super Conducting Super Collider, a high energy physics facility.

Technology Development *Applied & Development* - Research activities were conducted to obtain fundamental scientific and technical knowledge to meet the needs of environmental restoration and waste management. In addition, other activities ensured that private industry and other federal agencies were participants in developing and deploying such technologies.

University and Science Education *Applied* - This program had responsibility for ensuring the Department effectively utilized and leveraged the resources of its laboratory based system to support mathematics and science education.

Deferred Maintenance

SFFAS No. 6 requires an amount for deferred maintenance to be disclosed as of the end of the fiscal year. Deferred maintenance is defined in SFFAS No. 6 as "maintenance that was not performed when it should have been or was scheduled to be and which, therefore, is put off or delayed for a future period." Deferred maintenance estimates were developed for (1) *structures and facilities* and (2) *capital equipment* as follows:

Structures and Facilities.

- The condition assessment survey (periodic inspections) method was used in measuring a deferred maintenance estimate for buildings and other structures and facilities except for some structures and facilities where a physical barrier was present (e.g., underground pipe systems). In those cases, where a deficiency is identified during normal operations and correction of the deficiency is past due, a deferred maintenance estimate would be applicable. In situations where complete condition assessments were not available for all assets, estimates were extrapolated from results of condition assessments performed on similar assets. Also, where appropriate, results from previous condition assessments have been adjusted to estimate current plant conditions. Deferred maintenance for excess property was reported only in situations where maintenance is needed for worker and public health and safety concerns.
- In accordance with standards identified in the *National Association of College and University Business Officers*, in managing the facilities portfolio, the acceptable operating condition standard is equal to a Facility Condition Index (FCI) of ≤ 5 percent.
- An amount of $925 million of deferred maintenance was estimated to return the assets to acceptable operating condition. The percentage of active buildings above acceptable operating condition is estimated at 86 percent.

Capital Equipment.

- Pursuant to the cost/benefit considerations provided in SFFAS No. 6, the Department has determined that the requirements for deferred maintenance reporting on personal property (capital equipment) is not applicable to property items with an acquisition cost of less than $100,000, except in situations where maintenance is needed to address worker and public health and safety concerns.
- Various methods were used for measuring deferred maintenance for capital equipment including condition assessment survey, inspection and maintenance contracts, inspection and review of work orders, statistical sampling and extrapolation, and other methods as appropriate.
- The requirements and standards used in determining acceptable operating condition for capital equipment include the use of equipment indices, manufacturer and engineering specifications, and user recommendations.
- An amount of $2 million of deferred maintenance was estimated to return the assets to acceptable operating condition.

Performance Measure Results

The following pages contain the detailed performance results for all commitments contained in the Secretary's FY 1998 Performance Agreement with the President.

Energy Resources

ER 1-1 BOOSTING THE NATION'S PRODUCTION OF DOMESTIC OIL

Assessment: Fully Successful

Description: Support research and development, policies, and improved regulatory practices capable of ending the decline in domestic oil production before 2005.

☐ Success will be measured by:

- *Demonstrating advanced production enhancement technologies for shallow-shelf carbonate reservoirs, adding 27 million barrels of reserves.*

Results: Advanced technologies for improved seismic imaging, geologic modeling of complex carbonate strata, innovative CO2 injection design, and use of horizontal wells are boosting oil recovery while cutting production costs in the Permian, Williston, and Paradox basins.

Five demonstration projects in shallow shelf carbonate reservoirs have achieved important production and reserves increases even though the full benefits will not be achieved until the projects are completed in 1999-2000. Reserve additions were 17 million barrels in early 1998 and are expected to reach 27 million barrels by 2002. In 1998, production increases for the five projects totaled over 2.3 million barrels per year.

One project alone has located an additional 12 million barrels of original oil in place (in Foster and South Cowden Fields, Texas.) In this project, advanced seismic technology is providing increased reserves at a cost of 20 cents per incremental barrel.

Assessment: Fully Successful

- *Developing and transferring to industry six new technologies to characterize the heterogeneity in naturally fractured reservoirs.*

Results: A group of seven research projects that were competitively selected in 1996 have yielded innovative modeling tools for use by industry in finding and developing fractured reservoirs that only produce about 10 percent of original oil in place using current technology. Involvement of industry partners throughout the projects assures that the techniques are being applied in producing fields, a foundation for future production benefits.

- 3-D Hierarchial Fracture Model, developed by Golder Associates, facilitates generation of geologically realistic models of fractured reservoirs and use of the models with computer simulations of oil recovery processes such as Thermally Assisted Gravity Drainage (TAGD.) Use of the model for fluid-contact reservoir management in advance of TAGD increased production 20 percent in Yates field, Texas.
- TerraTek, working with the University of California at Berkeley and the Utah Geological Survey, has developed strategies to boost well productivity by modeling stress-sensitive reservoir permeability associated with surface expressions of the Duchesne Fault Zone.
- Science Applications International Corporation, working with Indiana University and Phillips Petroleum, has modified CIRF.B for use in carbonate reservoirs and tested the modeling package in Andector (Ellenburger) field, Texas. This software allows use of conventional subsurface and geophysical information to make quantitative predictions of fracture locations and characteristics.
- Southwest Research Institute, working with Texas A&M University and Union Pacific Resource Corp., developed a model to integrate seismic data into reservoir models to increase the accuracy of fracture related permeability estimates. The model was validated using data from Lodgepole (Wyoming) and Buena Vista Hills (California) fields.
- University of Utah used fracture data from an exhumed mining district that is analogous to many fractured petroleum reservoirs to develop an improved finite element model of multiphase flow.
- The Geological Survey of Alabama and the University of Alabama used area balancing techniques to model geology and recovery in the fractured Gilbertown field. The study determined that recompletion of existing

Results are classified as "FULLY SUCCESSFUL", "SUCCESSFUL", "PARTIALLY SUCCESSFUL", or "UNSUCCESSFUL" for performance judged to be effectively 100% or better, 80-100%, 50-80%, or less than 50% respectively.

wells has the potential to add up to 60 feet of additional productive section.

- University of Texas Bureau of Economic Geology using core and outcrop fracture analysis has developed a method to relate microfracture observations in inexpensively collected sidewall-cores to microfractures that control reservoir productivity.

Assessment: Fully Successful

- *Completing work in four States, giving them the capability to establish variances for oil and gas injection wells in areas of low environmental risk, and implementing risk-based data management systems for improved regulatory decision-making in 10 States, towards overall program objective of reducing cumulative industry compliance costs by $16 billion by 2010.*

Results: Area of Review Variance projects were completed in California, Kansas, Oklahoma, and Texas. These projects provided each of the participating States with the capability to implement programs to waive the Area of Review (AOR) requirements for new injection wells where it can be demonstrated that the risk of contamination is small.

Under the current requirements, an operator who wishes to install an injection well must review all other wells within a quarter-mile radius to ensure that the injection well will not contaminate an underground source of drinking water (USDW). Performing the review and correcting problems with existing wells can cost an operator $2,500 to $5,000 per injection well.

With the variance program developed and demonstrated through these projects, States now have a mechanism to evaluate the potential for contamination and grant variances to the review requirements where there is little or no possibility of contaminating a USDW. For example, if there is no groundwater suitable for drinking water in the area of the injection well, then there is no reason to impose protection requirements.

At the close of these projects, DOE sponsored a workshop for all oil and gas producing States. At the workshop, representatives from all four states explained their projects and provided information and advice to other states on implementing an AOR Variance Program. A written summary of the workshop will be prepared and distributed to all oil and gas States.

The Risk-Based Data Management System (RBDMS) was developed to provide States with a way to gather and evaluate data for Underground Injection Control (UIC) programs. RBDMS saves money for both the States and the operators by allowing the regulators to quickly and effectively analyze large volumes of data that previously required hours of manual data gathering from scattered and inconsistent paper files. To date, 12 States and one Environmental Protection Agency (EPA) region have implemented RBDMS. Three other states and at least one other EPA Regional office are evaluating whether to adopt RBDMS.

The value of RBDMS is demonstrated by the fact that States have invested their own money to customize the system for their use and to develop additional capabilities that are then shared, without charge, with other users. The States have developed an RBDMS users group to share information, experiences, and ideas for implementing and enhancing the system.

DOE has recently developed a generic version of RBDMS that is available on CD-ROM. The generic version builds on the developments and ideas of the 12 user States. It is designed to be user friendly and to require minimal changes to meet a given State's specific needs.

Assessment: Fully Successful

ER 1-2 MAINTAINING AN EFFECTIVE STRATEGIC PETROLEUM RESERVE

Assessment: Fully Successful

Description: Maintain an effective Strategic Petroleum Reserve (SPR) to deter and respond to oil supply disruptions, and act cooperatively with the importing member nations of the International Energy Agency.

❒ Success will be measured by:

- *Degassing 11 million barrels of additional oil inventory to complete the degasification effort at a total of 169 million barrels, thus increasing oil availability for drawdown to the total SPR inventory amount.*

Results: Degassified an additional 13 million barrels of oil inventory with higher-than-normal gas content by December 13, 1998. This completed the oil degassification effort ahead of schedule, bringing the total amount degassed to 172 million barrels and thereby

removing the gas-in-oil impediment to the drawdown of the total SPR oil inventory.

Assessment: Fully Successful

- *Performing an annual assessment of commercial systems' capability to distribute SPR crude into the marketplace, defined as 120 percent of SPR drawdown rate capability.*

Results: While the SPR is continually monitoring the U.S. commercial oil distribution system, it will also be performing an annual, comprehensive assessment of the present and projected commercial system capability to distribute SPR crude oil into the marketplace. Adequate SPR connectivity to the marketplace, at a minimum, is defined as off-site commercial distribution capability for the SPR complex at the maximum drawdown rate plus redundancy of at least 20 percent so sustainable drawdown and distribution program performance objectives can be achieved. The annual assessment on SPR connectivity to the commercial distribution system was conducted and finalized by the fiscal year end.

Assessment: Fully Successful

- *Initiating an additional 17 percent of the infrastructure life extension program to maintain SPR systems' reliability, bringing implementation to 93 percent.*

Results: Successfully initiated the full complement of planned FY 1998 life extension projects, thereby executing another 16 percent of the $320 million program baseline and bringing total execution to 92 percent. Slight difference in planned versus actual percentage of projects initiated (six tenths of one percent) is due to rounding and does not represent material differences in the projects executed.

Assessment: Fully Successful

ER 1-3 DIVERSIFYING THE INTERNATIONAL SUPPLY OF OIL AND GAS

Assessment: Fully Successful

Description: Diversify the international supply of oil and gas.

☐ *Success will be measured by continuing DOE leadership in international energy initiatives (such as those fostered by Binational Commissions of Russia, Ukraine, and South Africa, the Caspian working group, Summit of the Americas, Asia Pacific Economic Cooperation (APEC), U.S.-China Energy and Environment Initiative as well as key bilateral relationships with China, Mexico, Venezuela, Brazil, India, and others), that are instrumental in developing, through government- to-government efforts, an effective legal and regulatory framework for private sector energy investment and policies to encourage development of a broad portfolio of fuel supplies.*

Results: DOE efforts to diversify the international supply of oil and gas through continued leadership in international energy initiatives are firmly "On-Track." DOE leadership was particularly effective in promoting progress in the past year in the U.S.- Russia and U.S.-Mexico Binational Commissions; in the U.S.-China Energy and Environmental Cooperation Initiatives; in the APEC, Summit of Americas, and G-8 Energy Ministerials; in support for the President's trips to Africa and Latin America; and in support for the Administration's Caspian region energy development and transportation initiatives. In addition, the Department took the lead in coordinating, developing, and improving our overall international oil supply emergency preparedness policy in response to the Iraq sanction crises, the sale of oil from the Strategic Petroleum Reserve, and the lapse of the antitrust provisions of Energy Policy and Conservation Act.

Assessment: Fully Successful

ER 1-4 DEVELOPING ALTERNATIVE TRANSPORTATION FUELS AND MORE EFFICIENT VEHICLES

Assessment: Successful

Description: Develop alternative transportation fuels and more efficient vehicles that can reduce year 2010 projected oil (crude plus refined products) imports of 12 million barrels per day by 10 percent.

☐ Success will be measured by:

- *Developing technologies to convert fossil and waste fuels to high quality transportation fuels at costs of $20-$25 per barrel. Specifically,*

- *developing a conceptual process design for oxygen separation using a new type of ceramic membrane to advance Fischer-Tropsch technology for conversion of remote low-valued natural gas to high quality alternate liquid transportation fuels, and*
- *initiating development of catalysts for coproducing chemical feedstocks and premium, ultra low emission diesel fuels from solid carbonaceous feedstocks.*

Results: A six month delay in finalizing contractual arrangements with the prime contractor, subcontractors, and cooperating National Laboratories will delay completion of the conceptual process design until FY 1999. The major development of baseline operating pressures, temperature regimes, and ceramic compositions necessary for conceptual process design began in June 1998. Finalization of all elements of the 7-8 year work effort is projected for December 1998. The prime Contractor is making up delays by aggressive action and believes that its team will make up the time lost because of contract delays within three years.

Assessment: Successful

- *Expanding the Clean Cities program to more than 65 participating communities.*

Results: The Department exceeded the 65 participating communities goal by the end of FY 1998.

Assessment: Successful

- *Completing the design of a 10 million gallons of ethanol per year first-of-a- kind refinery for producing ethanol from agricultural crop waste.*

Results: Additional equipment has been purchased for the front-end hydrolysis step. Financial arrangements are 70 percent completed.

Assessment: Successful

- *Completing initial performance specifications for the high efficiency diesel to replace current low efficiency engines in class 1and 2 trucks.*

Results: The Department exceeded the goal of 35 percent efficiency improvement by obtaining 50 percent efficiency improvement. Emission goals have not been reached.

Assessment: Successful

ER 1-5 MAXIMIZING THE PRODUCTIVITY OF FEDERAL OIL FIELDS

Assessment: Fully Successful

Description: Maximize the productivity of Federal oil fields, consistent with Congressional legislation.

- ☐ *Success will be measured by carrying out the sale of the Elk Hills oil field at maximum market value by February 1998.*

Results: On February 5,1998, DOE concluded sale of the Elk Hills Naval Petroleum Reserve to Occidental Petroleum Corporation for $3.65 billion. Based on estimates made by outside experts, the Department is confident that it received maximum value for this asset.

Assessment: Fully Successful

ER 1-6 TAKING MEASURES TO AVOID DOMESTIC ENERGY DISRUPTIONS

Assessment: Successful

Description: Take measures to avoid, but when needed, respond to domestic energy disruptions.

- ☐ Success will be measured by:
- *Completing the development of a modeling capability and performing analyses to guide the design of legislative options regarding reliability under electric utility restructuring.*

Results: The Department has developed a modeling capability and performed analyses that has guided the development of legislative language regarding advancing competition in the electric power industry that will lead to improved efficiency, enhanced environmental performance, and reduced costs to customers. The Electricity Modeling System has been used to estimate the impact that competition will have on the electric power industry and has been used to evaluate items such as the renewables portfolio standard, the public benefit fund, and other changes in the industry inherent with competition. The results of these analyses are embodied in the Comprehensive Electricity Competition Act (CECA) submitted to the Congress in June 1998. The results of the analysis can be found on the DOE home page at http://198.124.130.244/ceca/ceca.htm.

Assessment: Successful

- *Ensuring that each power system control area operated by a Power Marketing Administration receives, for each month of the fiscal year, a Control Compliance Rating of "Pass" using the North American Electric Reliability Council performance standard.*

Results: Bonneville Power Administration, Western Area Power Administration, Southeastern Power Administration, and Southwestern Power Administration all received "Pass" ratings.

Assessment: Fully Successful

ER 2-1 ESTABLISHING A MORE OPEN, COMPETITIVE ELECTRIC SYSTEM

Assessment: Fully Successful

Description: Propose legislation and support administrative actions to promote establishment of a more open, competitive electric system, with improved environmental performance.

- ☐ *Success will be measured by completing the development of a modeling capability and performing analyses to guide the design of legislative options regarding electric industry competitiveness, environmental performance, and affordable customer service.*

Results: The Department has developed an Electricity Modeling System and has used it to perform analyses that have guided the development of the Administration's Comprehensive Electricity Competition Act. These analyses, which were critical to achieving Administration consensus on the detailed provisions of our proposal, are summarized in a "Supporting Analysis" report published and released on the DOE website in July 1998. The analysis quantifies the benefits of competition in the electric power industry that will lead to improved efficiency, enhanced environmental performance, and reduced costs to customers.

Assessment: Fully Successful

ER 2-2 BOOSTING THE NATION'S PRODUCTION OF NATURAL GAS

Assessment: Fully Successful

Description: Support R&D policies and improved regulatory practices that can increase domestic natural gas supplies, moderate future price increases, and fuel 25 percent of the anticipated 6 TCF increase in natural gas demand (of which 3.5 TCF is for electricity generation) through 2010.

- ☐ Success will be measured by:

- *Demonstrating three advanced drilling and well completion technology systems that could contribute an additional 6 TCF to domestic gas reserves.*

Results: Following successful field demonstration of the Light Weight Solid Additives (LWSA), additional lab testing of the glass beads was conducted to investigate the edge of the performance envelope of this material for potential use in offshore drilling muds. The LWSA could potentially be a key factor in the utilization of riserless drilling in the Gulf of Mexico. The final report on this project will be available after December 31, 1998.

A paper was presented on the field test results at the Society of Petroleum Engineers (SPE) annual conference and exhibition. Industry's recognition of the potential of this technology was acknowledged by the SPE subsequently publishing the paper in the November issue of their archive journal, Journal of Petroleum Technology.

The electromagnetic-measurement while drilling (EM-MWD) prototype tools have been demonstrated to the California oil and gas industry. Several complete commercial field kits (systems) for use in the Midcontinent area of the U.S. have also been developed. The system included downhole sensors, telemetry and a steerable mud motor. These kits represent the beginning of commercialization/implementation of this EM-MWD technology. The technology is an essential element of the ability to economically explore for and develop U.S. gas resources. It can also be viewed as an "enabling" technology which makes it possible for underbalanced drilling technology to be utilized in a wider range of directional and horizontal drilling environments.

The prototype High Pressure Simulator (HPS) has been built and tested to better study the performance of hydraulic fracturing fluids under dynamic conditions, and to prove the feasibility of the Fracture Fluid Characterization Facility (FFCF) concept. Fluid rheology R&D studies at the FFCF to date have shown that effective viscosity measurements of cross-linked gels by standard industry tests are in error by as much as 250 percent. Similarly, perforation friction loss of

crosslinked fluids was found to be significantly higher than reported by standard industry measurements. Several large-scale demonstrations have been conducted for understanding the flow mechanisms and initiation point of back production of proppant by utilizing the unique capabilities of the HPS. Three technical papers were presented at the annual and region SPE conferences. Two additional peer-reviewed papers were selected and published by SPE.

Assessment: Fully Successful

- *Conducting feasibility studies and developing conceptual designs for alternative storage technologies for the power generation markets in the Northeast and South Atlantic regions.*

Results: In FY 1998, work was initiated on four alterative gas storage projects. The projects investigated the feasibility and commercialization potential of storing natural gas in "Lined Rock Caverns" (LRC), in "Refrigerated-Mined Cavern Storage" (RMC), "Natural Gas Hydrates as a Storage Medium" (Hydrates), and "Improved Modeling of Salt Cavern Design and Integrity" (Salt Cavern). The "Lined Rock Cavern" project is exploring the engineering and economics of constructing facilities in Atlanta, Georgia, (4 Bcf of working gas), and in Boston, Massachusetts, (2 Bcf of working gas). The "Refrigerated-Mined Cavern Storage" study was completed for a 5 Bcf working gas facility in the Baltimore/Washington D.C. metropolitan area that shows that the concept is economically competitive with Liquified Natural Gas (LNG) storage. Initial results from the "Improved Modeling of Salt Cavern Design" study indicate that minimum working gas pressures in most existing salt cavern storage facilities can be lowered 10 percent without compromising cavern stability.

Assessment: Successful

ER 2-3 DEVELOPING RENEWABLE DOMESTIC ENERGY

Assessment: Successful

Description: Develop renewable energy technologies and support policies capable of doubling non-hydroelectric renewable energy generating capacity by 2010.

☐ Success will be measured by:

- *Initiating the government, industry, and State partnership to put solar panels on one million roofs.*

Results: On April 27, 1998, the Assistant Secretary for Energy Efficiency and Renewable Energy released the Million Solar Roofs Draft Action Plan that contains 10 points for accomplishing the goals of the initiative. Activity is underway on each of the 10 points in the Draft Action Plan, and the Department has conducted two quarterly progress meetings of all Million Solar Roofs stakeholders to assess progress and inform stakeholders. As of September 30, 1998, the Department of Energy has received written expressions of interest for 526,000 solar roofs, including a commitment from the Federal government to install 20,000 solar energy systems on Federal buildings by 2010. Nine partnerships have been identified.

Assessment: Fully Successful

- *Achieving retail sales by U.S. industry of eight percent efficient cadmium telluride large area photovoltaic modules.*

Results: Solar Cells Inc. (Toledo, OH) has introduced commercial cadmium telluride modules. They now produce 8.1 percent efficient 6700 cm2-area cadmium telluride modules on their commercial manufacturing line. Solar Cells Inc. has fabricated over 100 kW of these commercial modules that have been used for product introduction. The modules are in several demonstration projects, including 10 kW with Toledo Edison and 25 kW at the Air Force's China Lake facility in California. Solar Cells Inc. is also shipping product to various vendors to finalize initial product specifications. Solar Cells Inc.'s R&D in CdTe device and process development has been funded as part of DOE's Thin Film PV Partnership since SCI's inception about a decade ago. In addition, it has also received more recent support for manufacturing optimization through the PV Mat program. Another manufacturer, BP Solar (Fairfield, CA) is also developing a commercial cadmium telluride process line.

Assessment: Fully Successful

- *Completing 100-hour acceptance test for Solar Two power tower in California, achieving 90 percent system availability and producing 1,500 MW- hours of electricity for a one-month period.*

Results: The 100-hour acceptance test was successfully completed on January 21, 1998. Since then, the performance at Solar Two has met or exceeded expectations. The performance measure to achieve 90 percent system availability was based on running the plant for two years. Startup issues delayed the initiation of operational testing, resulting in only one year of operation by the end of FY 1998 instead of the planned two years. Nevertheless, the plant did achieve the design goal of 80 percent system availability during the first year of operation, during June and July 1998, when Solar Two operated for 32 out of 39 (82 percent) consecutive days. Solar Two also exceeded its long-term DOE performance measure of 1500 megawatt-hours in a 30-day period by generating 1633 megawatt-hours between June 14 and July 13, 1998.

Assessment: Successful

- *Completing gas analysis and operational testing of the Vermont biomass gasifier.*

Results: The gasifier construction and preliminary testing of subsystems have been completed. As of September 30, 1998, 75 percent of the parametric testing had been completed. The gasifier has been operated at 100-150 tons/day (designed for 200 tons/day).

Assessment: Partially Successful

- *Beginning construction of multi-megawatt geothermal demonstration power plant based on advanced heat recuperation technology.*

Results: Preliminary engineering on the 5-MWe Kalina Cycle plant at Steamboat, Nevada, is complete except for negotiation of cost of construction. The DOE Golden Field Office has received comments on its pre-decisional draft Environmental Assessment of the project and is preparing a final determination of either a Finding of No Significant Impact (FONSI) or that an Environmental Impact Statement is needed.

Assessment: Partially Successful

- *Completing requirements for International Standards Organization accreditation for wind turbine certification testing at the National Wind Technology Center.*

Results: International Standards Organization (ISO) accreditation requirements are specified by ISO Guide 25, which requires the testing organization to develop a management quality assurance procedure, and procedures for conducting certification tests. These procedures must be accredited according to ISO Guide 25 to assure that the test results will be accepted by international certification bodies. The National Wind Technology Center (NWTC) has drafted ISO Guide 25 procedures which conform to the International Electrotechnical Commission (IEC) 61400-12 (Power Performance Measurements) and IEC 61400-11 (Acoustic Emission Measurements) standards. American Association for Laboratory Accreditation (A2LA) has completed their evaluation of these procedures and has issued a certificate of accreditation for performing tests at the NWTC according to these procedures.

Assessment: Fully Successful

- *Increasing the routine use of renewable energy technologies at Federal facilities through the completion of one government-wide solar technology Super-Energy Savings Performance Contract (Super ESPC);assisting 10 sites in assessing renewable potential; and completing two model delivery orders integrating cost-effective solar technology and energy efficiency.*

Results: (1) FEMP awarded the Photovoltaics Super ESPC in August 1998. (2) FEMP has completed assessments of renewable energy potential at 13 Federal facilities (EPA labs in ADA OK, Gulf Breeze FL, Research Triangle Park NC, Golden CO; NOAA sites on Maui, Oahu and Guam; NPS sites in Kona HI, Cleveland OH, Yosemite CA, Tumacacoli NM and Fort Baker, CA; and USCG Air Station San Francisco). (3) At least six Super ESPC delivery orders integrating solar and energy efficiency are in progress. Requests-for-Proposals have been sent to Super ESPC contractors including photovoltaics at Yosemite NP, CA, and solar water heating at Bliss Army Community Hospital, AZ. Site data package (delivery order documentation) is complete for solar ventilation preheat deliver order at National Renewable Energy Lab, Golden, CO. Other deliver orders, integrating solar and energy efficiency, are under development for solar ventilation preheat at the Waste Isolation Pilot Plant in Carlsbad, NM, and for solar thermal rehabilitations at Job Corps, Gary TX and Indian Health Service Hospital, Talequa OK.

Assessment: Fully Successful

ER 2-4 REDUCING EMISSIONS FROM EXISTING FOSSIL FUEL POWER PLANTS AND DEVELOPING CLEAN HIGH EFFICIENCY FOSSIL FUELED POWER PLANT FOR THE 21ST CENTURY

Assessment: Successful

Description: By 2010, significantly reduce emissions from currently existing fossil fuel powerplants, and from new plants by: (1) developing market-ready coal power systems with efficiencies over 60 percent (new plants are currently about 35 percent), emissions to less than 1/10 of New Source Performance Standards (NSPS), and CO2 emissions 45 percent below conventional plants; and (2) integrating advanced turbine and fuel cell technology to achieve market-ready gas-fueled powerplants with efficiencies over 70 percent.

☐ Success will be measured by:

- *Completing milestones, including initiation of gasification testing and completion of the pressurized fluidized bed combustion (PFBC) test module, at the Wilsonville, AL, Power Systems Development Facility, leading to development of advanced integrated gasification combined cycle (IGCC) and PFBC systems with efficiencies over 60 percent, 30-50 percent lower CO2 emissions, and up to 20 percent lower electricity costs.*

Results: PFBC test module was completed in April 1998. Gasification testing delayed due to decision to continue testing on the transport reactor to get additional hot gas filter data in support of Lakeland Clean Coal Technology project.

Assessment: Successful

- *Continuing accomplishments in the Clean Coal Technology Demonstration Program, including:*
  - *Initiating the design of one commercial-scale Circulating Atmospheric Fluidized Bed Combustion Project (Jacksonville) and one Advanced Circulating Pressurized Fluidized Bed Project (Lakeland) capable of achieving SO2 reductions of at least 95 percent and NOx reductions of at least 80 percent.*
  - *Commencing construction of a Coal- fired Diesel Engine Project for small utility and industrial applications.*
  - *Completing operations of a processing facility producing a coal product fuel with a sulfur content as low as 0.3 percent and heating value up to 12,000 btu/lb.*
  - *Commencing operations of commercial-scale, advanced combustor facility (Healy) for electrical power generation with reductions greater than 70 and 90 percent, respectively, for NOx and SO2.*

Results: Initiated designs of the Jacksonville project in September 1997 and the Lakeland project in January 1998. Coal processing facility has delivered over 220,000 tons of enhanced low-rank western coals. Coal-fired Diesel Engine Project construction commenced on August 1997. Healy Project commenced operation on April 1998.

Assessment: Successful

- *Completing the scheduled test runs of the first complete natural gas fueled solid oxide fuel cell power plant, and continuing the product improvement and cost reduction of molten carbonate fuel cell (MCFC) power plants leading to 60 percent efficient systems that will be market-ready in the year 2002 time frame and capable of achieving competitive costs in distributed power generation.*

Results: Scheduled test runs successfully completed - 3,360 hours of operation with the generation of 398 megawatt hours of electricity. MCFC activities are continuing on schedule.

Assessment: Fully Successful

- *Completing Phase III Advanced Turbine System technology readiness testing for utility-scale turbines, and initiating prototype tests of a 60 percent efficient, ultra-low NOx emissions advanced gas turbine system for market applications in the year 2000 time frame.*

Results: General Electric completed activities as planned on time. Westinghouse slightly behind schedule because of transaction with Siemens which were completed in August 1998.

Assessment: Successful

ER 2-7 IMPROVING EXISTING NUCLEAR POWER PLANTS AND MAINTAINING NUCLEAR POWER AS A VIABLE OPTION FOR THE FUTURE

Assessment: Fully Successful

Description: Improve nuclear power plant reliability and availability to increase the capacity factor of existing nuclear power plants from the 1996 average of 76 percent to 85 percent by 2010. Maintain a viable nuclear option for future, carbon-free baseload electricity through cooperative technical development activities with U.S. electric industry, national laboratories, and universities that would maintain domestic nuclear capabilities and that would facilitate a U.S. order of an advanced nuclear power plant by 2010.

- ☐ *Success will be measured by working with industry to facilitate NRC final design approval of the Westinghouse AP600 design by September 1998 for passively safe nuclear reactors.*

Results: The Nuclear Regulatory Commission (NRC) issued a final design approval (FDA) for the Westinghouse AP600 standard nuclear reactor design on September 3, 1998. The design was developed in partnership with DOE. Issuance of the FDA completed the NRC's technical review. Formal design certification by the NRC is expected in 1999. The Department and the U.S. nuclear industry also cooperated in successful, cost-shared efforts to develop two other Advanced Light Water Reactor plant designs. The other two plant designs--the Combustion Engineering System 80+ design and the General Electric ABWR design—were certified by the NRC in 1997.

Assessment: Fully Successful

ER 2-9 DEVELOPING ADVANCED TURBINES FOR COGENERATION

Assessment: Successful

Description: Develop and introduce advanced turbines for cogeneration that can reduce annual industrial energy costs by $500 million and carbon emissions by nearly 1.7 million metric tons in 2010.

- ☐ *Success will be measured by field testing of ceramic components for an advanced industrial turbine for 4,000 hours.*

Results: A test was successfully conducted for 3,000 hours, achieving the general technical objective.

Assessment: Successful

ER 3-1 DESIGNING AND DELIVERING THE VEHICLES OF THE FUTURE

Assessment: Successful

Description: Develop and deploy vehicles, fuels, and systems of the future, contributing significantly to the Partnership for a New Generation of Vehicles to develop, by 2004, prototype mid-sized cars capable of 80 miles per gallon that will reduce NOx and CO2 emissions by two-thirds compared to today's new car average without compromising safety, comfort, and cost.

- ☐ *Success will be measured by completing laboratory validation tests on hydrogen-fueled 50 kW (full-scale) proton exchange membrane fuel cell propulsion systems that can be tested under automotive drive cycle requirements.*

Results: Preliminary tests achieved 50 percent fuel efficiency at full power and 60 percent fuel efficiency at one-quarter power, which exceeded expectations.

Assessment: Successful

ER 3-2 IMPROVING EFFICIENCY OF ENERGY INTENSIVE INDUSTRIES

Assessment: Successful

Description: By 2010, reduce industrial energy use per unit of output by 25 percent by supporting industry/government/academia partnerships in R&D to improve efficiency of the Nation's energy intensive industries.

- ☐ Success will be measured by:

- *Initiating work on facilitating a Mining and Agriculture Industry Vision, and facilitating development of selected State-wide Industries of the Future strategies. Roadmaps will be completed in the Aluminum, Chemical, Forest Products, Glass, Metalcasting, and Steel Industries, and will drive the DOE R&D portfolio.*

Results: Agiculture Vision "Plant/Crop Based Renewable Resources 2020" completed. Mining Industry vision is in draft. Roadmaps completed for aluminum,

forest products, glass, metalcasting and steel industries. First chemical roadmap released in final by industry.

Assessment: Fully Successful

- *Continuing support for Industrial Assessment Centers operating at 30 participating universities that will conduct approximately 750 combined energy, waste and productivity assessments.*

Results: Thirty Centers conducting assessments. One center dropped out of the program which reduced the number of assessments performed in FY 1998 to about 725. A replacement center, an historical black college (Prairie View), began operating in late 1998.

Assessment: Successful

ER 3-3 IMPROVING THE ENERGY EFFICIENCY OF BUILDINGS

Assessment: Successful

Description: By 2010, improve the energy efficiency of the existing U.S. building stock, and increase the energy efficiency of new homes by 30 percent and other new buildings by 20 percent, compared to 1996 average new buildings.

☐ Success will be measured by:

- *Weatherizing approximately 63,335 low-income homes.*

Results: Weatherized 63,389 low-income homes through September 30, 1998.

Assessment: Successful

- *Adding windows to the Energy Star product portfolio; doubling the number of retail stores labeling Energy Star appliances to 2,400 nationwide; recruiting four major appliance manufacturers to label Energy Star appliances at the factory; and increasing sales of Energy Star appliances by 30 percent over 1997.*

Results: Launched Energy Star windows program, March 1998. Signed three appliance manufacturers and 20 window and glass manufacturers to label and promote ENERGY STAR products. Signed a major retailer buyers group representing over 1,200 stores nationwide, which will double the number of stores labeling Energy Star appliances. Recruited "Home Base," a major California retail chain, to promote ENERGY STAR products.

Assessment: Successful

- *Recruiting 55 new Rebuild America partnerships to join the program, increasing the total number of Rebuild America communities to 195, representing all 56 States and territories.*

Results: During FY 1998, the Rebuild America program added 55 new community partnerships. The program has community partnerships in 47 States and three U.S. territories. Of these, 28 States and territories are partnerships themselves. In FY 1998, 19 partnerships have completed Action Plans for implementing building energy retrofits, while another five partnerships have begun to conduct multi-building retrofits.

Assessment: Successful

- *Building 200 energy efficient homes in partnership with industry. These homes will be designed to save 50 percent of energy used for heating, cooling, & hot water at no incremental costs. Activities will be coordinated with the public and private Partnership for Advanced Technology in Housing.*

Results: In FY 1998, 300 energy efficient holmes were built, leading to a total of 605 houses since program inception under partnerships with the Building America program..

Assessment: Successful

ER 4-1 PLANNING FOR ENERGY RELATED GREENHOUSE GAS REDUCTIONS

Assessment: Successful

Description: Develop policies, programs, and information to facilitate energy sector reductions in greenhouse gas emissions.

☐ Success will be measured by:

- *Completing a climate change technology strategy in partnership with national laboratories, private industry and top universities as part of the President's Climate Change Technology Initiative to develop path-breaking technologies to address climate change.*

Results: In FY 1999, the Department's civilian energy R&D budgets, as appropriated by Congress, witnessed the addition of a number of new R&D initiatives aimed at expanding and accelerating research in renewables, efficiency, fossil energy, and nuclear energy, the goals of which, although not focused explicitly on climate change, are expected to contribute to increased energy efficiency and enhanced use of zero or low carbon emission energy technologies in the future.

Assessment: Fully Successful

- *Maintaining our 600+ existing Climate Challenge partnership agreements supporting integration of energy efficiency and renewable energy technologies into our partner's carbon abatement programs.*

Results: The Climate Challenge electric utility partners now numbers 651. These utilities are on target to deliver a total pledged amount of 47.6 MMTCE of voluntary greenhouse gas reductions in the year 2000.

Assessment: Fully Successful

- *Developing and assessing options for implementing the new international agreement proposed at the Kyoto Conference of the Parties to the U.N. Framework Convention on Climate Change by:*
  - *Supporting, through quantitative analyses and international contacts, Administration efforts to obtain meaningful commitments for reducing greenhouse gas emissions from developing countries.*
  - *Providing institutional arrangements and technologies for the Monitoring and Verification of treaty compliance under the Framework on Climate Change.*
  - *Completing assessments of alternative approaches for implementing domestic and international greenhouse gas emissions trading.*

Results: Conducted a study of the cost effectiveness of policies to achieve GHG reductions. Participated in workshops on the Clean Development Mechanism in Brazil, India, and China. Provided members to U.S. delegations visiting various developing countries to discuss climate change and the benefits of taking on meaningful commitments. Conducted a workshop with the U.S. national laboratories on methodologies for monitoring and verification of the Kyoto Protocol in January 1998 in New Mexico. Participated in workshops in Moscow and meetings with "umbrella" group countries on emissions trading. Participated in interagency meetings to develop the U.S. position on emissions trading and other flexibility mechanisms. Also participated in the June 1998 Bonn Subsidiary Body meetings where these issues were discussed and negotiated. Analyzed proposed Brazilian methodology for determining future emission budgets for developing and developed countries, and participated in international meetings reviewing this proposal. Supported analysis of negotiation and implementation issues concerning the treatment of carbon sinks, and monitoring and verification methods. Led development of International Climate Technology Initiative. Obtained financial support from other developed countries and active interest of many developing countries. Actively participated in the technical and negotiating sessions of the fourth Conference of the Parties (COP IV) in Buenos Aires.

Assessment: Successful

ER 4-2 COOPERATING INTERNATIONALLY TO DEVELOP OPEN ENERGY MARKETS

Assessment: Successful

Description: Cooperate with foreign governments and international institutions to develop open energy markets, and facilitate the adoption and export of clean, safe, and efficient energy technologies and energy services.

☐ Success will be measured by:

- *Assisting to remove policy, regulatory and fiscal barriers to U.S. companies in energy efficiency, renewables, oil and gas, coal bed methane and clean coal technology, and nuclear energy markets, in China, India, Indonesia, the Philippines, Mexico, Venezuela, Argentina, Chile, Brazil, Russia, Ukraine, Caspian countries, South Africa, and in other developing economies.*

Results: The Department has continued to engage the international marketplace throughout FY 1998 with a view toward removing barriers to trade and investment, and the deployment of new energy technologies. The Department's efforts have been successful in many parts of the Asia-Pacific region, the Caspian, and in Latin

America. Unforseen political and economic instabilities in a number of countries, in particular Russia, Ukraine, India, Pakistan, and Indonesia have severely retarded our reform efforts.

Assessment: Successful

- *Continuing coordination of the Russian-American Fuel Cell Consortium (RAFCO) which has as one of its primary goals the opening up of the Russian market to U.S. manufactured fuel cells.*

Results: Nine R&D projects have been funded and are underway, one demonstration project for fuel cells in Arctic Regions has been funded and is beginning, and a joint venture proposal to manufacture fuel cell components (separator plates for molten carbonate fuel cells) in a former nuclear weapons warhead manufacturing facility at Arzamas-16 has been submitted for funding under the Nuclear Cities Initiative. In addition, through RAFCO consultations and good offices, the Russian market for American fuel cells has been opened up with the purchase of an International Fuel Cells PC25 phosphoric acid fuel cell to Gazprom.

Assessment: Successful

ER 5-1 EXPANDING PUBLIC ACCESS TO ENERGY INFORMATION

Assessment: Fully Successful

Description: Develop and expand public access to energy data, forecasts, analyses, and educational materials.

❒ Success will be measured by:

- *The average number of unique monthly users of the Energy Resources Board Web Sites (http://www.eia.doe.gov/, and http://www.eren.doe.gov/) will grow at least 20 percent per year through 2003 (from about 71,000/month in 1997).*

Results: The monthly averages for users of the sites specified are as follows: FY 1998 EIA Average-192,132; FY 1998 EREN Average-62,564; and FY 1998 Energy Resources Board Web Site Average-254,696.

Assessment: Fully Successful

- *Completing by April 1998, for submission to Congress, an initial Comprehensive National Energy Strategy that integrates major Federal government energy-related activities.*

Results: The Comprehensive National Energy Strategy was completed and published in April; subsequently, distributed to Congress; and also made available to the public on the Department's Internet Home Page.

Assessment: Fully Successful

- *Publishing domestic and international Annual Energy Outlooks, forecasting future energy supply and consumption through the year 2020.*

Results: "Annual Energy Outlook 1998" was released on December 18, 1997. The release of "Annual Energy Outlook 1999" was released in December 1998.

Assessment: Fully Successful

ER 5-2 DEVELOPING INNOVATIVE OPTIONS FOR 21ST CENTURY ENERGY MARKETS

Assessment: Fully Successful

Description: Carry out research and scenario analysis to help identify and understand options that could revolutionize 21st century energy markets.

❒ *Success will be measured by completing analysis of data from test well in Mackenzie Delta to help define the volume and production characteristics of Arctic methane hydrates.*

Results: Preliminary analyses of data and samples collected in March 1998 from Mallik 2L-38 well, Mackenzie Delta, N.W.T., Canada, the first documented natural gas hydrate samples from beneath permafrost collected in the world, were presented on October 20-22, 1998, in Chiba City, Japan, at the Conference on "Methane Hydrates: Resources in the near future?" The well and the subsequent studies represent a unique collaborative effort including the Japan National Oil Corporation (JNOC), the Geological Survey of Canada (GSC), the U.S. Geological Survey, and the DOE. Geochemical, sample, and well log analysis as well as studies of sediment-hydrate interactions will be reported at the conference, then made public.

Assessment: Fully Successful

National Security

NS 1-1 MAINTAINING THE ENDURING STOCKPILE

Assessment: Successful

Description: Extend the life of U.S. nuclear weapons by continuing the Stockpile Life Extension Program and Stockpile Maintenance activities. Improve detection and prediction capabilities for assessing nuclear weapon component performance and the effects of aging, and continually evaluate the safety, reliability, and performance of the nuclear weapons stockpile.

☐ Success will be measured by:

- *Certifying nuclear weapons stockpile safety, reliability, and performance according to DOE/DoD procedures.*

Results: The establishment of an annual process for the review and certification of the safety and reliability of the nuclear weapons stockpile was directed by President Clinton and is crucial to this Nation's pursuit of the Comprehensive Test Ban Treaty. The Secretaries of Defense and Energy must advise the President each year whether the nuclear stockpile has any safety or reliability concerns that require underground testing. In reaching their conclusion they are advised by the Directors of DOE's national weapons laboratories, the Commander of the U.S. Strategic Command, and the joint Nuclear Weapons Council.

Two annual certifications have been successfully completed, the latest submitted to Congress by the President on February 12, 1998. The DOE portion of the 3rd Annual Certification was completed on July 31, 1998. Final 1998 DOE laboratory reports, reviewing the status of the nine types of warheads in the enduring stockpile, were published during July 1998, and signed out by Defense Programs for distribution to the members of the Nuclear Weapons Council Standing and Safety Committee for their use in preparing the 3rd NWC Annual Stockpile Certification report.

Assessment: Fully Successful

- *Meeting all DoD annual weapons alteration, modification, and surveillance schedules.*

Results: Surveillance activities are required to properly assess the safety and reliability of weapons in the Nation's stockpile. Surveillance includes both tests on weapon components at DOE's nuclear weapons laboratories and flight tests of unarmed weapons to examine delivery performance. During FY 1998, the Department completed 40 of the 45 planned flight tests and 82 of the planned 100 laboratory tests. The flight test shortfall was due to logistics issues between the DoD and DOE. The laboratory test shortfall was due to an expiration of the W62 Nuclear Explosive Safety Study and other facility related issues. Weapon alterations and modifications are crucial to upgrade the stockpile to meet higher safety standards, replace faulty components, meet changed military requirements, or extend the life of the weapon. During FY 1998, the Department had eight weapon alterations and modification ongoing (either research and development activities or refurbishment). The alterations were for the B61 (three), W87 (two), B83 (two), and the W76. The modification was for the B83. All of these activities were performed on schedule. The one modification this year was completed on schedule. DOE plans to complete the remaining required tests next fiscal year. Even with this shortfall, the DOE was able to give the DoD a reliability assessment.

Assessment: Successful

NS 1-4 DEVELOPING A REPLACEMENT SOURCE OF TRITIUM

Assessment: Successful

Description: Provide a reliable source of tritium as required for the nuclear weapons stockpile by FY 2005 or FY 2007 depending on the production option selected.

☐ *Success will be measured by completing the analysis to support the selection by December 1998 of a new production source for tritium.*

Results: Tritium, is a radioactive isotope of hydrogen essential to the proper function of all U.S. nuclear weapons. Tritium decays at about five percent per year and must, therefore, be replaced in weapons periodically.

Results are classified as "FULLY SUCCESSFUL", "SUCCESSFUL", "PARTIALLY SUCCESSFUL", or "UNSUCCESSFUL" for performance judged to be effectively 100% or better, 80-100%, 50-80%, or less than 50% respectively.

No new tritium has been produced by the U.S. since 1988. Tritium is recycled from dismantled weapons to meet stockpile requirements. A reliable source of tritium production for the stockpile must be available by FY 2005 or FY 2007 depending on the technology selected. In late 1995, DOE announced it would pursue a dual track approach to examine and demonstrate the two most promising supply alternatives, the purchase of an existing or partially complete commercial light water reactor (CLWR) or purchase of irradiation services therefrom or the design and construction of an accelerator for the production of tritium (APT). In January 1998, the Tritium Supply Program completed the analysis of the primary tritium source options necessary to support a possible 2nd Qtr. FY 1998 technology decision by the Secretary. A decision, however, was not made at that time. Both projects continued development, demonstration, and design activities through FY 1998; and the analysis was updated for a decision expected by the end of December 1998. CLWR activities during this fiscal year include the following: In October 1997, 32 tritium-producing rods were placed in the Tennessee Valley Authority's (TVA) Watts Bar reactor for an irradiation demonstration. Two draft environmental impact statements were completed and issued for public comment: Draft Environmental Impact Statement for the Production of Tritium in a Commercial Light Water Reactor and Draft Environmental Impact Statement for Construction and Operation of a Tritium Extraction Facility at the Savannah River Site. Preliminary design of the Tritium Extraction Facility, a FY 1998 milestone, has been completed and an independent, parametric cost estimate conducted. As required by Congress, an interagency review of nonproliferation policy issues has been completed. A technical report has been prepared and submitted to the Nuclear Regulatory Commission. DOE received a proposal from the TVA for the Department to provide funds for completion of TVA's Bellefonte Unit 1 reactor in exchange for long-term irradiation services. An interagency agreement for irradiation services without completion of Bellefonte was also a possibility. Concluding an agreement with TVA, a FY 1998 milestone, was delayed until FY 1999, pending the Secretary's selection decision. In December 1998, the Secretary made a decision selecting irradiation services from TVA's Watts Bar and Sequoyah reactors to meet the Department's tritium needs.

Accelerator Production of Tritium (APT) activities this fiscal year include the following: An engineering development and demonstration program successfully demonstrated key elements of a tritium production accelerator. Performance testing of a laser beam through the Chalk River Injector Test Stand radio-frequency quadrupole (RFQ) was successfully completed and exceeded requirements. Fabrication and assembly of the copper RFQ for the Low Energy Demonstration Accelerator was completed. Installation of the RFQ and preparations for tests of beam through the RFQ were nearly completed. Preliminary engineering design of the APT plant was initiated in October 1997. An APT Modular Design Study, optimizing plan configurations for START-I and START II stockpile requirements, was completed in May 1998. Safety presentations to independent reviewers and the Defense Nuclear Facilities Safety Board (DNFSB) were conducted throughout the year. Issues raised by these reviewers have resulted in features being incorporated into the APT design to increase its safety. A draft Environmental Impact Statement to construct and operate the APT at the Savannah River Site was completed and approved, public hearings were held, and the final EIS was completed for review. In keeping with the Secretary's decision to use irradiation services as the primary source of tritium, the accelerator option has been designated the backup technology.

Assessment: Successful

NS 2-1 REPLACING UNDERGROUND TESTING WITH SCIENCE

Assessment: Fully Successful

Description: Develop the advanced simulation and modeling technologies necessary to confidently mitigate the loss of underground testing by FY 2004.

- ☐ *Success will be measured by meeting established schedules for the development and installation of a 3- trillion operations per second computer system.*

Results: The Accelerated Strategic Computing Initiative (ASCI) is a time-critical, essential element of the Department of Energy's Stockpile Stewardship Program. ASCI will enable DOE to develop the advanced simulation and modeling technologies necessary to shift from the past stockpile management approach based on new weapon development and nuclear testing to a

science-based approach based on maintenance of the existing stockpile through advanced simulation and fundamental experiments. Specifically, ASCI will create and provide to all stewardship activities the leading-edge weapon simulation capabilities that are essential for maintaining the safety, reliability, and performance of the nation's nuclear stockpile under the current nuclear test moratorium and to meet the challenge set forth by the Comprehensive Test Ban Treaty. Currently, ASCI is meeting all established schedules for the development and installation of a 3-trillion operations per second computer system. The initial delivery of a computer system was received in FY 1997, and the technology refresh was installed in the first half of FY 1998. Code development teams, including weapons designers, at the national weapons laboratories are using the system performing at a level of between 400-900 billion operations per second and running weapons simulations that are larger and more complex than was possible on previous machines. These simulations include higher resolution, improved physics models, and more robust computational math. At the end of September 1998, three months ahead of schedule, IBM benchmarked the 3-teraflops computer system at a sustained 1-teraflops calculation.

Assessment: Fully Successful

NS 2-2 DEVELOPING NEW EXPERIMENTAL CAPABILITIES FOR UNDERSTANDING WEAPONS SCIENCE

Assessment: Fully Successful

Description: Develop new nuclear weapons physics experimental test capabilities.

- ☐ *Success will be measured by beginning the physical construction according to schedules in the Project Execution Plan for the National Ignition Facility (NIF).*

Results: The NIF Project is essentially on schedule and on cost, and all aspects of the Project are making satisfactory progress. All of the Project's firm fixed price building contracts have been awarded. In June, major concrete pours for the Target Building and Switchyard floors were completed essentially on schedule. Construction of the Laser Building and Central Plant, which are on the critical path for Conventional Facilities, is currently delayed 2-4 weeks, but the Project completion date is being held. The critical task for the remainder of this year is to get the roofing and siding completed by the start of the next rainy season. Design and procurement of special equipment and materials are the most challenging aspects of the NIF Project. Design reviews continue to be successfully completed and production of engineering drawings continues, although at a slower rate than planned. The beam transport system procurement was awarded in June, and the target chamber contract is on schedule. Establishment of needed manufacturing capacity at optics vendors is proceeding well as they prepare for pilot production beginning in early FY 1999. More information on the NIF project can be obtained at http://lasers.llnl.gov/lasers/nif.html

Assessment: Fully Successful

NS 2-3 CONDUCTING EXPERIMENTS TO ADVANCE OUR UNDERSTANDING OF WEAPONS BEHAVIOR

Assessment: Partially Successful

Description: Advance our understanding of the fundamental characteristics of weapons behavior through systems engineering and advanced experiments and modeling to support future assessments of weapons safety, reliability, and performance.

- ☐ *Success will be measured by conducting three to four subcritical experiments to provide information about the behavior of nuclear materials during the implosion phase of a nuclear weapon.*

Results: Subcritical experiments are designed to provide an improved understanding of certain dynamic material properties of plutonium, the fissile material in most primaries, and are considered essential for assessing nuclear warhead performance, reliability, and safety in the absence of nuclear testing. These experiments also make a significant contribution to maintaining nuclear test readiness, required by Safeguard C of the Comprehensive Test Ban Treaty and Presidential Decision Directive. On March 25, 1998, we conducted the first subcritical experiment of FY 1998, Stagecoach, a Los Alamos National Laboratory experiment. On September 26, 1998, Bagpipe, a Lawrence Livermore National Laboratory subcritical experiment, was successfully executed. Extensive preparatory work has

been completed for Cimarron and Clarinet, the third and fourth subcritical experiments planned for FY 1998. Planned execution for Cimarron is November 1998, and Clarinet is planned to follow one or two months thereafter. The Stagecoach subcritical experiment was used to obtain additional data on the equation of state of high explosively shocked plutonium materials at high pressures and to develop diagnostic instrumentation for future experiments. In addition to providing information that will be used on future subcritical experiments, Bagpipe was also used to further understanding of the effects on plutonium of aging, the use of different coating materials, and the effects of different manufacturing methods. Data from subcritical experiments will be used to develop the science-based stewardship computer models.

Assessment: Partially Successful

NS 3-1 DOWNSIZING AND MODERNIZING THE NATIONAL SECURITY ENTERPRISE

Assessment: Partially Successful

Description: Provide an appropriately-sized, cost-effective, safe, secure, and environmentally sound national security enterprise. Ensure that sufficient scientific and technical personnel are available to meet DOE's long-term national security requirements.

☐ Success will be measured by:

- *Ensuring that all facilities required for successful achievement of the Stockpile Stewardship and Management Plan remain operational, and the established schedules for downsizing and modernization of the production facilities are met.*

Results: Two key activities are underway to provide operational production facilities for the successful implementation of the Stockpile Stewardship Plan. These two activities are the reestablishment of a Pit Production Program at the Los Alamos National Laboratory in New Mexico and resumption of Enriched Uranium Operations (EUO) at the Y-12 Plant near Oak Ridge, Tennessee. During FY 1997, shipping/receiving, assembly/disassembly, depleted uranium operations, and evaluation of canned subassemblies operations were all restored. Phase A1 of the enriched uranium operations resumption process (resuming casting, rolling and forming, and machining operations) restarted in June 1998. Phase A2 (materials control and accountability functions) has been delayed and rescheduled to November 1998. The final phase (phase B) of resumption provides chemical processing capabilities, is scheduled for completion in calendar year 1999.

The Pit Production Program successfully demonstrated on schedule the first major step in its plan to reestablish a pit production capability. In February 1998 the first early development unit pit was successfully produced. While not meeting the full certification requirements to enter the stockpile, this pit did successfully demonstrate the first series of capabilities needed to produce a fully certified pit. The downsizing and modernization of production facilities are planned under the Stockpile Management Restructuring Initiative. This includes the tritium facilities at the Savannah River Site near Aiken, South Carolina; uranium machining, recycling and storage facilities at the Y-12 Plant at the Oak Ridge Reservation, Oak Ridge, Tennessee; assembly/disassembly and high explosive fabrication facilities at the Pantex Plant near Amarillo, Texas; and non-nuclear production facilities for electronic, electro-optical devices, plastic and machined parts at the Kansas City Plant in Kansas City, Missouri. Construction funds for the downsizing at Savannah River and Y-12 were received in FY 1998 and construction funds for Pantex and Kansas City have been requested in the FY 1999 Budget. Title I design for the project at Savannah River, scheduled to commence the second quarter of this fiscal year was delayed to the third quarter. Physical construction started in the third quarter on schedule. Due to rescoping, the start of the Title I design of the Y-12 project was delayed from the first quarter of this fiscal year to the fourth quarter. For the projects at Pantex and Kansas City, critical decision two (approval of baselines) was not approved in the fourth quarter as scheduled.

Assessment: Partially Successful

- *Conducting Security System Reviews and Joint Tactical System Analyses at six major DOE facilities and validate through that process that adequate security measures exist.*

Results: As of September 30,1998, eight physical security system reviews and six Joint Tactical System Analyses have been conducted.

Assessment: Successful

- *Working in cooperation with other Departmental elements to add at least 90 protective force personnel at various DOE field sites to enhance protection of SNM; start S&S upgrades at five facilities; and complete S&S upgrades at two facilities.*

Results: As of September 30, 1998, a total of 73 additional protective force personnel had been hired. Upgrades have been initiated at Idaho, Los Alamos National Laboratory, Savannah River, and Headquarters. S&S upgrades are nearing completion at Pantex and Lawrence Livermore National Laboratory.

Assessment: Successful

- *Continuing shipment of Rocky Flats plutonium pits to Pantex with the goal of completing all shipments by FY 1999.*

Results: Shipments of surplus weapons pits from the Rocky Flats Environmental Technology Site (RFETS) to the Pantex Plant are ongoing. Non-recurring budgetary and technical problems, since resolved, have caused a one-time delay in the shipping rate with the result that completion is scheduled for mid FY 1999.

Assessment: Successful

NS 3-3 PROTECTING NUCLEAR MATERIALS, INFORMATION, AND FACILITIES

Assessment: Partially Successful

Description: Ensure and enhance protection of nuclear materials, sensitive information, and facilities. Provide DOE-related intelligence and threat assessment support to members of the national security community.

☐ Success will be measured by:

- *Developing and field testing an advanced vehicle portal test bed designed to prevent entry of unauthorized personnel and contraband.*

Results: The vehicle portal test bed is currently undergoing full scale development and testing. Test reports are due this fiscal year. The project is on track, with respect to project plans, and is expected to meet all recorded milestones.

Assessment: Successful

- *Completing plans and preparations for initiating in FY 1999, the correction of DOE infrastructure vulnerabilities identified by the President's Commission on Critical Infrastructure Protection.*

Results: Presidential Decision Directive 63 on Critical Infrastructure Protection was signed by the President and issued in May 1998. The DOE Critical Infrastructure Protection Task Force was established in June with the organizational structure approved in July. Plans for the DOE Critical Infrastructure Protection and a national plan that incorporates the energy sector protection requirements have been drafted and are under review. Completion was delayed until just after FY 1998. Submission of plans to the National Security Council was accomplished on November 18, 1998.

Assessment: Partially Successful

NS 3-5 MAINTAINING READINESS FOR NUCLEAR EMERGENCIES

Assessment: Fully Successful

Description: Maintain nuclear test readiness and enhance emergency management capabilities to address any nuclear weapons, radiological, or other emergency in the United States or abroad.

☐ Success will be measured by:

- *Ensuring that the capability to resume underground testing is maintained in accordance with the Presidential Decision Directive and Safeguard C of the CTBT through a combined experimental and test readiness program.*

Results: Maintaining the capability to resume nuclear testing requires DOE to maintain (1) test facilities and equipment at the Nevada Test Site (NTS) and (2) nuclear testing skills of personnel at both the NTS and the nuclear weapons laboratories. Experiments requiring large quantities of high explosives or small amounts of special nuclear materials driven by small amounts of high explosives, the latter referred to as subcritical experiments, are conducted at the NTS. These experiments and specially designed test readiness exercises maintain NTS personnel test readiness skills including containment, security, assembly, storage and transportation, insertion and emplacement, timing and control, arming and firing, diagnostics, test control center activities, and postshot drilling. Two subcritical experiments, Stagecoach and Bagpipe, and 29 high-explosive experiments have been conducted at the

NTS in FY 1998. In September 1998, we conducted VENTEX98, a table-top exercise that simulated a mass venting of an underground nuclear test at the Nevada Test Site for the purpose of exercising the emergency response systems that could be needed during a nuclear test. The NTS also has an ongoing archiving program capturing on videotape the knowledge and testing experience of departing personnel as well as data, photos, drawings, procedures, nuclear explosive safety studies, containment evaluation plans, lesson learned, and other information. In FY 1998, almost 84 hours of video taping of subject matter experts discussing 11 functional areas was completed; over 32,000 pages of documents were scanned and indexed into the archiving database; and encyclopedic-style CD-ROMs covering five functional areas were produced. Hundreds of stockpile stewardship experiments have been conducted this fiscal year at nuclear weapons laboratory facilities such as the Flash X-Ray, Pulsed High-Energy Radiographic Machine Emitting X-Rays, Pegasus, Los Alamos Neutron Science Center, Nova Laser, High Explosive Applications Facility and PBFA Z which exercise many nuclear testing related skills and technologies, including nuclear design, experiment integration, nuclear chemistry, and weapons engineering.

Assessment: Fully Successful

- *Maintaining robust emergency response assets in accordance with Presidential Decision Directive 39, The Atomic Energy Act of 1954, and Executive Order 12656 to ensure Departmental response to any nuclear weapons or radiological emergency in the United States or abroad.*

Results: The Department's Emergency Response program provides a national capability to respond to any radiological emergency or nuclear accident within the United States and abroad. The all-volunteer force that makes up the cadre of deployment forces is mostly from the nuclear weapons laboratories. The seven major capabilities/assets maintained are the Aerial Measuring System (AMS), the Accident Response Group (ARG), the Atmosphere Release Advisory Capability (ARAC), the Federal Radiological Monitoring & Assessment Center (FRMAC), the Radiological Assistance Program (RAP), the Nuclear Emergency Search Team (NEST), and the Radiation Emergency Assistance Center & Training Site (REAC/TS). These capabilities are maintained primarily through participation in national, state and local operations, exercises, and training.

The Department's emergency response program performed at a Fully Successful level for FY 1998. Highlights of these activities for the fiscal year are as follows: During FY 1998, DOE radiological emergency response assets participated in 32 U.S. and overseas exercises and 17 real-world events. Also, REAC/TS responded to 67(60 U.S.- 7 Foreign) calls for medical assistance for 224 individuals and provided radiation accident management training to 399 health professionals. During June 1998, emergency response assets participated in an interagency exercise ELLIPSE ALPHA in Virginia Beach, Virginia. The objective of the exercise was to evaluate the federal capabilities of responding to a domestic radiological Weapon of Mass Destruction. In September 1998, Departmental emergency assets also participated in a major overseas exercise ELLIPSE BRAVO. The objective of the exercise was to evaluate and validate the U.S. federal response to a radiological Weapon of Mass Destruction in an international environment. On October 15, 1997, emergency response support was provided to the National Aeronautics and Space Administration for the launch of the Cassini Space Mission to Saturn. The Department participated with multiple agencies to identify support requirements and develop ground operations and emergency response plans and procedures in the event of a launch accident and the release of radioactive material. On board generators contained 32.8 kilograms of plutonium dioxide. Over 100 personnel and equipment from RAP, ARAC, REAC/TS, and FRMAC, capable of providing onsite and offsite radiological support, participated in the launch. A joint U.S./U.K. nuclear weapon accident command post exercise DIAGONAL GLANCE was conducted in the United Kingdom during the period September 15-18, 1998. The scenario involved a U.S. Air Force aircraft carrying nuclear weapons crashing on U.K. soil. The primary objective of DIAGONAL GLANCE was to evaluate international, national, and local government agreements, policies, procedures, and interfaces as they apply to a U.S. nuclear weapon accident occurring on U.K. soil. Between April 2-8, 1998, RAP teams were deployed to provide assistance to the State of Connecticut and the Environmental Protection Agency (EPA) in conducting surveys for radioactive contamination in buildings previously used in the clock

manufacturing and the radium dial painting industry. Ten buildings in four different cities were surveyed. Contamination was found in four of the five occupied buildings. As lead Federal Agency, the EPA recommended follow-up resolutions and protective actions. With respect to Domestic Preparedness Training in support of the Nunn, Lugar, Domenici legislation, RAP and REAC/TS elements participated in 29 city visits and training activities. In April 1998, the Department of State requested DOE radiological advisory assistance to the United Arab Emirates to validate either the presence or absence of radiological contamination threat at the crash site of an airliner. The Departmental assets performed an assessment of the threat of "Red Mercury" being aboard the aircraft which had crashed in the desert on December 16, 1997, killing 77 individuals. No evidence of radiological contamination was detected.

Assessment: Fully Successful

NS 4-1 REDUCING THE WEAPONS STOCKPILE

Assessment: Fully Successful

Description: Dismantle nuclear warheads that have been removed from the U.S. nuclear weapons stockpile in a safe and secure manner.

- ☐ *Success will be measured by adhering to schedules for the safe and secure dismantlement of approximately 1,000 nuclear warheads that have been removed from the U.S. nuclear weapons stockpile.*

Results: In FY 1998, 1,062 U.S. nuclear warheads were dismantled versus a fiscal year goal of 1,004. The majority of dismantlements were W69 Short-Range Attack Missile warheads, in addition to some W79 Artillery-Fired Atomic Projectile warheads and surveillance units.

Assessment: Fully Successful

NS 4-2 REDUCING INVENTORIES OF SURPLUS WEAPONS-USABLE FISSILE MATERIALS WORLD-WIDE IN A SAFE, SECURE, TRANSPARENT, AND IRREVERSIBLE MANNER

Assessment: Successful

Description: Implement the disposition of surplus highly enriched uranium (HEU) and plutonium and provide technical support to attain reciprocal actions for the disposition of surplus Russian plutonium. Minimize the future demand for HEU in civilian programs through the development of alternative low enriched uranium (LEU) fuels for research reactors and targets for medical isotope production. Support international efforts to place excess fissile materials under International Atomic Energy Agency (IAEA) safeguards.

- ☐ Success will be measured by:

- *Successfully completing irradiation of advanced LEU research reactor fuel test assembly to medium burn-up level at the ATR reactor in Idaho by March 1998.*

Results: Successfully completed in March 1998, the irradiation of advanced LEU research reacator fuel test assembly to medium burn-up level at the ATR reactor in Idaho.

Assessment: Fully Successful

- *Completing the dilution of 13 metric tons of excess HEU (approximately 3.5 metric tons in FY 1998) to LEU and implementing international safeguards at the Portsmouth Gaseous Diffusion Plant by August 1998.*

Results: Approximately 3 metric tons uranium (MTU) were blended down during FY 1998. Of this total, the IAEA was present to verify the blending down of more than 1.33 MTU. The project was completed in July, ahead of its August 1998 scheduled completion date. Portsmouth was able to blend down a total of approximately 14 MTU, nearly 1 MTU more HEU than originally calculated in the 13.198 MTU amount because of successful operations practices at the plant. This additional material did not jeopardize the end date of this task.

Assessment: Fully Successful

- *Conducting international inspection of the dilution of 7 metric tons of HEU by September 1998.*

Results: Conducted international inspection of the dilution of 7 metric tons of HEU by September 1998. USEC/DOE Memorandum of Agreement governing the disposition/downblending schedule for 50 metric tons of

excess HEU (including 7 metric tons referenced above) was signed on April 21, 1998. The dilution of the 7 metric tons of HEU will take place at a commercial downblending facility contracted by USEC. Due to delays in signing the MOA and certification of shipping containers, the current schedule is to ship the 7 metric tons of HEU to the commercial downblending facility by September 30, 1999.

Assessment: Fully Successful

- *Ensuring 100 percent completion of progress reports on technical, legal, and financial issues of the Trilateral Initiative and conduct evaluation of verification and monitoring technology by August 1998.*

Results: Progress reports completed and approved on technical, legal, and financial issues of the Trilateral Initiative. Conducted evaluation of verification and monitoring technology in August 1998.

Assessment: Fully Successful

- *Fully implementing all transparency monitoring tasks associated with the dilution of 24 metric tons of HEU from dismantled Russian nuclear weapons to low enriched uranium (LEU) for purchase by the United States Enrichment Corporation.*

Results: The DOE has completed all allowable monitoring trips to the five processing facilities at four locations covered by Agreements. This included the newly added conversion facility at Mayak Production Assoc. in Ozersk and the fluorination and blending facility in Seversk. We also maintained a permanent monitoring presence at the Ural Electrochemical Integrated Plant in Novouralsk for a second year.

The HEU Transparency Implementation Program demonstrated the operation of Blend Down Monitoring System (BDMS) equipment at the Paducah Gaseous Diffusion Plant to a Russian delegation. This allowed us to ship 44 crates of equipment to the Ural Electrochemical Integrated Plant in preparation of permanent installation on their blending pipes. We are supporting UEIP in their efforts to secure licensing and approval for the installation and operation of the BDMS at the plant.

Assessment: Successful

- *Beginning the transfer of U.S. surplus HEU to the United States Enrichment Corporation for dilution and subsequent sale.*

Results: The Department shipped the first installment of surplus highly enriched uranium (HEU) from the Portsmouth Gaseous Diffusion Plant to the BWX Technologies blending facility in Lynchburg, VA, on September 15, 1998. A total of 50 metric tons of surplus HEU will be transferred to the United States Enrichment Corporation over the next six years.

Assessment: Fully Successful

- *Completing initial demonstration of a prototype integrated plutonium pit disassembly and conversion system.*

Results: The initial demonstration of the prototype integrated plutonium pit disassembly and conversion system was completed in October 1998, with "hot" operations scheduled to begin in November 1998. The prototype system is located at Los Alamos National Laboratory and will serve as the basis for the design of a full-scale pit disassembly and conversion facility. This capability will enable the United States to convert plutonium in surplus weapons components to forms suitable for disposition and international inspection.

Assessment: Successful

- *Completing procurement for a private sector consortium to provide MOX fuel fabrication and irradiation services.*

Results: The Request for Proposals for obtaining mixed oxide (MOX) fuel fabrication and irradiation services to dispose of surplus weapons plutonium was released on May 19, 1998. Proposals from the private sector were received on September 4, 1998, with contract award expected in December 1998.

Assessment: Successful

- *Initiating development of a Russian plutonium conversion and nondestructive assay prototype system.*

Results: The first phase of a feasibility study to determine the technology to be used to convert Russian plutonium to a form suitable for disposition and the conceptual design of the nondestructive assay component

of the plutonium conversion system were completed in mid-FY 1998. The Russian system, when built, will convert plutonium metal to an oxide form suitable for disposition and international inspection.

Assessment: Fully Successful

NS 5-1 STRENGTHENING THE NUCLEAR NONPROLIFERATION REGIME

Assessment: Successful

Description: Strengthen the nuclear nonproliferation regime through support of treaties and international agreements.

☐ Success will be measured by:

- *In support of a Comprehensive Test Ban Treaty (CTBT), finalizing a plan for joint cooperation with the Russians to conduct a confidence- building activity by September 1998.*

Results: Plans for a bilateral test site verification CTBT were put on hold. By the end of September 1998, plans for a joint U.S.-Russian Federation Comprehensive Test Ban Treaty On-Site Inspection Table Top Exercise in Chelyabinsk, Russia, in October, are near completion. In August, DOE sponsored a conference commemorating the 10-year anniversary of the Joint Verification Experiment between the United States and the former Soviet Union. Delegations from Russia and Kazakhstan participated.

Assessment: Partially Successful

- *Beginning a long-term nuclear spent fuel maintenance program in the Democratic Peoples Republic of Korea (DPRK) by June 1998, assuring a stable, non-corrosive storage for the duration of the program.*

Results: The work was put on hold temporarily due to DPRK's concerns about U.S. commitment to the U.S. DPRK Agreed Framework, especially their frustration with the absence of a firm schedule for deliveries of heavy fuel oil to DPRK. However, DOE staff is now on the ground in North Korea and will be allowed to resume canning work by October 1, 1998. Discussions will commence on the long-term maintenance program.

Assessment: Partially Successful

- *Leading, via Joint Chairmanship, the interagency task force on warhead and fissile material to create START III options for warhead elimination by January 1998.*

Results: Preliminary report was provided to the National Security Council in January 1998, with the final report being provided to the National Security Council in March 1998.

Assessment: Fully Successful

- *Providing equipment, technologies, and expertise to the IAEA and the United Nations Special Commission (UNSCOM) to perform monitoring and intrusive inspections in North Korea and Iraq sufficient to verify compliance with their obligations under the NPT.*

Results: Equipment, technologies, and expertise have been provided to the IAEA and the United Nations Special Commission (UNSCOM) to perform monitoring and intrusive inspections in North Korea and Iraq sufficient to verify compliance with their obligations under the NPT.

Assessment: Fully Successful

NS 5-2 MINIMIZING THE RISKS OF PROLIFERATION

Assessment: Fully Successful

Description: Work with the states of the former Soviet Union and others to minimize the risks of proliferation.

☐ Success will be measured by:

- *Making progress in material protection, control and accounting (MPC&A) upgrades at each of the 53+ facilities in Russia, the Newly Independent States (NIS), and the Baltics that use or store weapons-usable nuclear material.*

Results: MPC&A work is continuing at each of the 53+ facilities in Russia, the NIS, and the Baltics that use or store weapons-usable nuclear material. Rapid site-wide upgrades have been completed at 19 locations, and we expect six more sites to be completed by the end of the calendar year.

Assessment: Partially Successful

- *Commissioning the MPC&A system at the Chelyabinsk-70 pulse research reactor by July 1998.*

Results: Completed commissioning of the MPC&A system at the Chelyabinsk-70 pulse research reactor in July 1998.

Assessment: Fully Successful

- *Completing the rapid security upgrades on at least 1/2 of the 35 rail cars used to transport weapons-usable nuclear materials in Russia by September 1998.*

Results: Completed 80 percent of the rapid security upgrades on at least 1/2 of the 35 rail cars used to transport weapons-usable nuclear materials in Russia. The remaining security upgrades on the rail cars will be completed by November 1998.

Assessment: Successful

- *Developing and implementing 12 commercial development projects at six primary biological and chemical weapons research and production facilities in Russia and Kazakhstan engaging an estimated 80 weapons experts. At least six projects will have subcontracts in place by April 1998 with the remaining six subcontracts in place by September 1998.*

Results: Developed and implemented 18 commercial development projects at biological and chemical weapons research and production facilities in Russia and Kazakhstan engaging an estimated 80 weapons experts. All subcontracts were in place by September 1998.

Assessment: Fully Successful

- *Developing and implementing 30 commercial development projects at nuclear weapons research and production facilities in Russia, Ukraine, and Kazakhstan engaging approximately 1,000 weapons experts. All subcontracts will be in place by September 1998.*

Results: Developed and implemented 34 commercial development projects at biological and chemical weapons research and production facilities in Russia, Ukraine, and Kazakhstan engaging approximately 1,000 weapons experts. All subcontracts were in place by September 1998.

Assessment: Fully Successful

- *Completing technical assistance initiatives in Russia, Ukraine, and Kazakhstan by May 1998 to develop a cadre of export control and technical advisors on supplier policy and nuclear transfer activities.*

Results: Core technical teams in Russia, Ukraine, and Kazakhstan have been identified and will continue to provide support to government authorities on supplier policy and nuclear transfer activities.

Assessment: Successful

- *Commencing prototypic fuel testing by July 1998 to support the core modifications required for the cessation of plutonium production at three Russian reactors.*

Results: Prototype fuel and absorbers were loaded into one of the plutonium production reactors at Seversk for testing in August 1998. Additional test cells are planned to be loaded into the reactor in November 1998.

Assessment: Successful

NS 5-3 ADVANCING NONPROLIFERATION TECHNOLOGY

Assessment: Successful

Description: Develop technologies and systems for detection of nuclear weapons proliferation and treaty verification.

- Success will be measured by:

- *Transferring to the FBI newly developed technology which will provide a capability for rapid, sensitive, in-field analysis of hazardous biological materials and quick determination of associated terrorist threats.*

Results: The joint DOE/FBI science and technology development and transfer initiative has 18 funded projects underway, representing an investment of nearly $8M of FBI funding over a two-year period. These advanced measurement and detection technologies, developed by DOE national laboratories, will be integrated into the FBI Crime Laboratory and a new national network of technical centers to support forensics investigations and to counter biological weapons of mass destruction.

Assessment: Partially Successful

- *Delivering to the CTBT U.S. National Data Center a commercializable prototype of an ultrasensitive near- real-time analyzer for nuclear explosion produced Xenon isotopic gases.*

Results: The DOE prototype is ready for delivery. Actual delivery will occur upon the imminent completion of the Air Force procurement process with the commercialization contractor.

Assessment: Successful

- *Completing an airborne demonstration of a one-of-a-kind, quantitative chemical plume characterization capability, that uses lasers for weapons production facility monitoring.*

Results: Field tests of the airborne system were completed successfully in June and July 1998.

Assessment: Fully Successful

- *Delivering to the U.S. Air Force spacecraft integrating contractor the first five flight units of an extended-energy-range X-ray sensor for monitoring of nuclear explosions in space.*

Results: The first five flight units have been delivered: one each on March 30, April 28, June 16, June 25, and August 26, 1998.

Assessment: Fully Successful

NS 6-1 PROVIDING SPECIAL NUCLEAR POWER SYSTEMS FOR NATIONAL SECURITY

Assessment: Fully Successful

Description: Provide the U.S. Navy with safe, militarily-effective nuclear propulsion plants and ensure their continued safe and reliable operation. Meet ongoing and future national security requirements for special nuclear power systems.

☐ *Success will be measured by developing new reactor plants, including the next generation reactor, the design of which will be 75 percent complete in FY 1998 and ensuring the safety, performance reliability, and service-life of operating reactors.*

Results: Naval Reactors continues to meet Program goals in carrying out testing, development, and analyses in the applicable technology areas to ensure the safe and reliable operation of reactor plants in Navy warships. A key indicator of the success of these efforts is that, in FY 1998, nuclear-powered warships have safely accumulated an additional 100 reactor years of operation, resulting in over 114 million miles steamed without a reactor incident. Development of the next generation reactor for the Navy's New Attack Submarine is progressing on schedule. Testing and development is proceeding on components and systems, such as the mechanical test cell and control drive mechanism units to demonstrate design acceptability. Reactor assessments are supporting the Navy's Analysis of Alternatives for a new aircraft carrier.

Assessment: Fully Successful

NS 7-1 ENHANCING THE SAFETY OF SOVIET-DESIGNED REACTORS AND PROMOTING INTER-NATIONAL NUCLEAR SAFETY

Assessment: Successful

Description: Assist countries in reducing the risks from Soviet-designed nuclear power plants and implement a self-sustaining nuclear safety improvement program capable of reaching internationally accepted safety practices. Promote nuclear safety culture improvements internationally by providing strong leadership in international nuclear safety organizations and centers.

☐ Success will be measured by:

- *Completing development of plant models and descriptions, conducting training programs, and performing safety analysis calculations at the South Ukraine Unit 1 in Ukraine and the Kola Unit 4 in Russia, as part of in-depth safety assessments at nuclear power plants in Ukraine and in Russia.*

Results: This success measure was met for the projects at both plants. Plant models and descriptions were developed, training programs were conducted, and safety analysis calculations were performed as scheduled at South Ukraine Unit 1 and Kola Unit 4. The completion of these plant specific models and descriptions and the associated training provides a safety significant resource to the plant engineers on the operation and safety functions of the nuclear power plant.

Assessment: Successful

- *Completing nuclear power plant simulator projects at Novovoronezh in Russia and at Khmelnytskyy and Chornobyl in Ukraine.*

Results: This success measure was met for the projects at all three plants. The full-scope simulator for Khmelnytskyy and the analytical simulators for Chornobyl and Novovoronezh were completed and are being used for training reactor operators. The simulators provide a superior state-of-the-art tool for conducting realistic operator training on plant operations and emergency control procedures.

Assessment: Successful

- *Completing the installation of Safety Parameter Display Systems at the Zaporizhzhya plant in Ukraine and at the Novovorenezh plant in Russia.*

Results: This success measure was met for the projects at both plants. The Zaporizhzhya Unit 5 safety parameter display system was installed and site acceptance testing was successfully completed. Installation and testing of the Novovoronezh Unit 3 safety parameter system equipment were completed in the September/October outage of the plant. The safety parameter display system provides an excellent tool both to prevent accidents by alerting the operators of the approach to abnormal conditions, and also to reduce the consequences of accidents by assisting the operators in interpreting and responding to accident conditions.

Assessment: Successful

NS 7-3 ASSISTING IN THE SHUTDOWN OF THE CHORNOBYL NUCLEAR POWER PLANT

Assessment: Successful

Description: Work closely with the United States Agency for International Development to assist in the multi-national effort to shut down Chornobyl Units 1, 2, and 3 in Ukraine before January 2001 and reduce the risk of possible collapse of the Unit 4 sarcophagus.

☐ Success will be measured by:

- *Providing the Chornobyl plant with equipment for dose reduction, nuclear safety monitoring, dust suppression, and industrial safety.*

Results: This success measure is on track for completion in FY 1999. Significant milestones were met to-date, and equipment originally planned has been purchased and delivered. Additional requests received in late FY 1998 have been accepted and will be fulfilled during early FY 1999. Repairs were completed in July 1998 to the structure supporting the ventilation stack located between the operating Unit 3 and the Shelter over the destroyed Unit 4. These repairs returned the badly damaged stack to its design strength, removing risks to both the Shelter and to Unit 3 posed by the possibility that the damaged stack might collapse. Electronic personnel dosimeters, portable radiation work enclosures, dose modeling and shielding software, radiation monitoring instruments, radiation zone access control and dose tracking software, and HEPA filter test equipment were delivered to Ukraine. The lead shielding blankets provided were instrumental in reducing dose rates from "hot spots" on the Unit 3/4 ventilation stack repair projects. Trial quantities of portable HEPA air filtration units (for localized control of airborne radioactive particles), airborne radioactivity sampling equipment, and HEPA filter-equipped vacuum cleaners were delivered to Ukraine. Based on evaluations of this equipment, the balance of required quantities were defined and procurements initiated. Nuclear criticality safety monitoring equipment was delivered to Ukraine assembled and tested during FY 1998. It is scheduled to be installed in the Shelter n early FY 1999, followed by a final check out by U.S. personnel. Dust suppression equipment was delivered to Ukraine to assist in maintaining good radiological cleanliness in peripheral areas of the shelter. This equipment consists of airless sprayers for decontamination solution and strippable coating applications, portable HEPA filter vacuum cleaners, and sophisticated steam/vacuum cleaning equipment. Various equipment to support improvement in the industrial safety protection of Chornobyl Shelter workers is also being provided. Equipment delivered to Ukraine includes: video remote surveillance equipment, photo digitizing and processing software, hearing protection, first aid equipment, portable radios, gas bottle carts, welding gloves and curtains, hard hats, a CPR training mannequin, fall protection devices, a rebar locator, portable electrical generators, air compressors and jack hammers, ladders and scaffolding, and concrete drilling and sawing equipment.

Assessment: Successful

- *Reaching an agreement with the Ukrainians on Chornobyl Unit 1 defueling.*

Results: Activities are being implemented in support of the necessary safety documentation and shutdown program that will facilitate obtaining an agreement from Chornobyl NPP for the defueling of Unit 1. The Ukraine Cabinet of Ministers and Nuclear Regulatory Administration (NRA) require that a shutdown program for Unit 1 be developed and approved prior to the start of defueling of Unit 1. The shutdown program identifies the activities to be conducted during the shutdown stage at Unit 1, including defueling of the Unit 1 reactor building. Also provided in the shutdown program are the schedule and funding requirements for the activities to be conducted. The shutdown stage for Unit 1 encompasses the period up until all spent fuel has been removed from the reactor building, at which point the decommissioning stage begins. The Unit 1 Shutdown Program has been developed by the Chornobyl NPP and Slavutych Laboratory of International Research and Technology (SLIRT), with technical assistance by the Pacific Northwest National Laboratory (PNNL). The Unit 1 Shutdown Program has been approved by Chornobyl NPP and Energoatom management, the NRA, the Ukraine Ministry of Energy, and the Ukraine Ministry of Environmental Protection and Nuclear Safety. The Program remains to be approved by the Ukraine Ministries of Finance and Economy. Approval by these two ministries is being delayed because of the current Ukraine government budget/financial crisis. The Unit 1 Shutdown Program requires funding by the Ukraine government to implement. Given the current financial crisis in the Ukraine, neither the Ministry of Finance nor Economy is willing, at this time, to approve a document that commits additional Ukraine government resources. The Unit 1 Shutdown Program provides a schedule for defueling of the Unit 1 reactor building. Defueling of 1,417 assemblies from the Unit 1 reactor is scheduled to begin by the end of 1998 and to be completed by the end of 1999. Defueling of 1,353 assemblies from the Unit 1 storage pool is scheduled to begin in early 2000 and to be completed by the end of 2003. The extended schedule for defueling of the storage pool is due to the lack of available storage capacity at the Chornobyl NPP interim spent fuel storage facility. A new interim storage facility is being provided with funding by the EBRD, but will not be available for receipt of spent fuel until August 2001 at the earliest. Because of the Ukraine government funding crisis, defueling of both the Unit 1 reactor and storage pool is likely to be delayed. However, the Chornobyl NPP Deputy General Director for International Projects and Decommissioning continues to emphasize in informal discussions that defueling of the Unit 1 reactor will begin as scheduled, although completion of defueling is likely to be delayed due to the reasons discussed previously. The first planned defueling campaign is for 190 assemblies from the Unit 1 reactor. These assemblies will be shipped to Unit 3 for use as fuel in that reactor.

Assessment: Successful

Environmental Quality

EQ 1-1 REDUCING WORKER, PUBLIC, AND ENVIRONMENTAL RISKS

Assessment: Partially Successful

Description: Identify and fund projects to reduce the most serious risks first and prevent further increases in relative risk at all sites.

☐ Success will be measured by:

- *Stabilizing and safely storing about 3.7 metric tons of heavy metal of spent nuclear fuel (SNF). [Note: SNF data excludes information that is controlled or classified.]*

Results: Spent nuclear fuel stabilization progress at the Idaho National Engineering Laboratory is behind schedule due to the bankruptcy of a sub-tier contractor under Newport News Shipbuilding (NNS). This bankruptcy caused a delay in the design and fabrication of the Heated Vacuum Drying System. The spent fuel drying campaign, which relies on this equipment, impacted 55 percent of the spent fuel scheduled to be stabilized in FY 1998. The scheduled delivery date for the Heated Vacuum Drying System was missed and the system did not arrive until February 1998. Once the

Results are classified as "FULLY SUCCESSFUL", "SUCCESSFUL", "PARTIALLY SUCCESSFUL", or "UNSUCCESSFUL" for performance judged to be effectively 100% or better, 80-100%, 50-80%, or less than 50% respectively.

equipment arrived, functional testing identified several deficiencies. Other work associated with this performance measure was affected by safety analysis issues which required resolution and by equipment and crane failure, which required repair by the DOE prime contractor.

Assessment: Partially Successful

- *Stabilizing approximately 20,000 kilograms bulk of plutonium residue and approximately 7,000 liters of plutonium solution, and safely storing stabilized material.*

Results: A number of issues have impacted solid and liquid stabilization activities under this commitment. Based on a hold on movement and stabilization of plutonium (Pu) in FY 1998 at the Plutonium Finishing Plant (PFP) due to criticality safety concerns, the Richland Operations Office did not achieve any Pu stabilization. Nevertheless, PFP passed a DOE Operational Readiness Review that was conducted during December 1-10, 1998. After correcting pre-start findings, plutonium oxide stabilization is scheduled to resume during the first week of January 1999.

Rocky Flats was only able to achieve about one-quarter of their commitment (about 5,000 kilograms (kgs) of the 19,500 kgs) to stabilize solid plutonium residues due to safety issues and construction delays. The safety issues at Rocky Flats included Building 707 Operational Safety Requirement violations, an administrative criticality safety operating limit infraction, problems with measurement tolerance in criticality analysis and capability to conduct non-destructive assay of stabilized material. To allow acceleration of the work on these residues, the Residue Program at Rocky Flats was rebaselined in FY 1998 to implement a program that allows direct packaging of most of the solid residues for disposal in the Waste Isolation Pilot Plant. Rocky Flats achieved almost half of the projected liquid residue stabilization, about 3,000 liters of the 7,000 liters committed. The lower number resulted from the termination of draining operations in Building 771 earlier in the year due to unexpected safety issues. The original plan had been to drain the 38 piping systems in Building 771 in FY 1998 and then go back in to strip out the piping systems. However, during draining, the site identified unexpectedly high levels of hydrogen in the piping systems due to internal corrosion of the pipes. This safety concern caused a delay in the system draining operation. Nevertheless, the site developed a new strategy to strip out the piping systems immediately following the draining evolutions to address the safety concern. This new approach was implemented in July 1998, optimizing the use of existing trained crews, controls, and procedures used in draining activities. While not achieving the desired commitment from draining of the Pu liquid systems, some additional work scope, involving the stripout of piping, was accelerated and accomplished in FY 1998.

Assessment: Partially Successful

- *Closing one high-level waste storage tank at the Savannah River Site.*

Results: The Savannah River Site closed one high-level waste storage tank in December 1997.

Assessment: Fully Successful

EQ 2-1 ACCELERATE AND COMPLETE GEOGRAPHIC SITE CLEANUP

Assessment: Successful

Description: Clean up as many as possible of the Department's 53 remaining contaminated geographic sites by 2006. Accelerate and complete cleanup of nine large geographic sites by 2006, including the Fernald Environmental Management Project, Mound Plant, Rocky Flats Environmental Technology Site, Portsmouth Gaseous Diffusion Plant, West Valley Site, Weldon Spring Site, Brookhaven National Laboratory, and Lawrence Livermore National Laboratory (Main Site and Site 300). Cleanup 34 of the remaining 36 smaller geographic sites by 2006, including the Uranium Mill Tailings Remedial Action (UMTRA) Project. Accelerate cleanup at the remaining seven large sites (Hanford, Savannah River, Idaho, Oak Ridge Reservation, Los Alamos National Laboratory, Nevada Test Site, and Paducah) where overall completion will not be achieved by 2006, and ramp up disposal operations at the Waste Isolation Pilot Plant (WIPP) to facilitate this accelerated cleanup. Remediation progress will be measured by completion of release sites (i.e., discrete areas of contamination) and facilities (i.e., contaminated structures) that will ultimately lead to the completion of the entire geographic site.

- ☐ Success will be measured by:

- *Completing remediation at six geographic sites. This will bring the total number of completed geographic sites to 66 out of a total of 113 contaminated geographic sites.*

Results: Five geographic sites were completed during FY 1998. This included the remediation of the Center for Energy & Environmental Research in Puerto Rico, two UMTRA sites in Colorado (Maybell & Naturita), and the revocation of the designation of two UMTRA sites in North Dakota (Belfield & Bowman).

Assessment: Successful

- *Making progress on release site completion:*
  - *Completing about 575 release site assessments.*
  - *Completing about 280 release site cleanups. This will bring the number of completed release site cleanups to approximately 4,130 out of a total inventory of about 9,300 release sites.*

Results: Approximately 585 release site assessments and about 288 release site cleanups were completed during FY 1998.

Assessment: Fully Successful

- *Making progress on facility decommissionings:*
  - *Completing about 90 facility decommissioning assessments.*
  - *Completing about 70 facility decommissionings. This will bring the number of completed facility decommissionings to approximately 520 out of a total inventory of about 2,950 facilities.*

Results: Approximately 89 facility decommissioning assessments and about 82 facility decommissionings were completed during FY 1998.

Assessment: Fully Successful

EQ 3-1 OPENING THE WASTE ISOLATION PILOT PLANT

Assessment: Partially Successful

Description: Declare the Waste Isolation Pilot Plant (WIPP) geologic repository open for disposal of transuranic wastes in May 1998 (subject to regulatory approval) and maximize timely shipment of waste from DOE sites.

- ☐ *Success will be measured by shipping between 388 and 592 cubic meters of transuranic (TRU) waste to WIPP for disposal from three DOE sites (Los Alamos National Laboratory, Rocky Flats Environmental Technology Site, and Idaho National Engineering and Environmental Laboratory).*

Results: On May 13, 1998, the Department received certification from the U.S. EPA that WIPP met the standards for the disposal of TRU waste and Secretary Peña notified Congress by declaring WIPP open for the disposal of TRU waste. Shipment of TRU waste to WIPP did not commence in FY 1998 because of the pending reviews by the New Mexico Environment Department (NMED) regarding the DOE's application for a Resource Conservation and Recovery Act (RCRA) Part B permit for mixed waste, the NMED's technical analysis supporting the determination that the waste at the Los Alamos National Laboratory was non-mixed, and existing litigation (1992 Permanent Injunction).

Assessment: Unsuccessful

EQ 3-2 MAKING DISPOSAL READY AND DISPOSING OF WASTE GENERATED DURING PAST AND CURRENT DOE ACTIVITIES

Assessment: Fully Successful

Description: Safely and expeditiously make disposal-ready and dispose of waste generated during past and current DOE activities.

- ☐ Success will be measured by:

- *Disposing of about 4,000 cubic meters of mixed low level waste (MLLW).*

Results: Through September 30, 1998, approximately 11,000 cubic meters of mixed low-level waste have been disposed.

Assessment: Fully Successful

- *Disposing of about 30,000 cubic meters of low level waste (LLW).*

Results: Through September 30, 1998, approximately 30,000 cubic meters of low level waste have been disposed.

Assessment: Fully Successful

- *Producing 200 canisters of high level waste (HLW) at the Defense Waste Processing Facility (DWPF) at the Savannah River Site.*

Results: The Defense Waste Processing Facility exceeded the commitment of 200 canisters. A total of 250 high-level canisters were produced as of September 30, 1998.

Assessment: Fully Successful

- *Producing approximately 88 canisters of HLW at the West Valley Demonstration Project (WVDP).*

Results: The WVDP produced 81 high-level waste canisters in FY 1998. While the canister count goal was not reached, the canisters were filled to a higher level and the number of curies in the 81 canisters exceeded the forecast for curies to be loaded into the 88 canisters.

Assessment: Fully Successful

EQ 4-1 PREVENTING FUTURE POLLUTION

Assessment: Fully Successful

Description: Incorporate pollution prevention, including waste minimization, recycling, and reuse of materials into all DOE activities.

☐ Success will be measured by:

- *Reducing routine waste generation by 40 percent, compared with 1993 waste generation rates.*

Results: According to the Annual Report of Waste Generation and Pollution Prevention Progress 1997, published in September 1998, DOE sites reduced their routine waste generation by 54 percent compared to 1993 waste generation rates.

Assessment: Fully Successful

- *Reducing/avoiding the generation of radioactive, mixed, and hazardous wastes by about 4,000 cubic meters.*

Results: DOE sites reduced/avoided a total of 14,000 cubic meters of waste during FY 1998.

Assessment: Fully Successful

EQ 5-1 CONTINUING WITH YUCCA MOUNTAIN SITE CHARACTERIZATION

Assessment: Fully Successful

Description: Complete the scientific and technical analyses of the Yucca Mountain site, and if it is determined to be suitable for a geologic repository, obtain a license from the Nuclear Regulatory Commission.

☐ *Success will be measured by completing the viability assessment analyses for licensing and constructing a geologic repository at the Yucca Mountain site. The assessment will consist of four key components:*

- *A design and operational concept of the repository;*
- *An assessment of the performance of that concept in the geologic setting;*
- *A plan and cost estimate to construct and operate the repository; and*
- *A plan and an estimate of the costs to complete a license application.*

Results: The viability assessment was completed as of September 30, 1998, and included the requisite four key components described in the success measure. As of October 1998, the viability assessment is being reviewed by the Secretary of Energy, and its release is planned for the first quarter of FY 1999. Completion of the viability assessment also satisfies the corresponding critical milestone for FY 1998 in the Federal Managers' Financial Integrity Act Fiscal Year 1997 Report.

Assessment: Fully Successful

EQ 5-2 DEVELOPING WASTE ACCEPTANCE AND TRANSPORTATION CAPABILITY

Assessment: Fully Successful

Description: Maintain the capability to respond to potential statutory direction that may include

transportation of spent nuclear fuel and high level waste to a designated interim storage facility.

- Success will be measured by:

- *Completing generic, non-site-specific interim storage facility work and addressing long lead-time issues related to storage of waste including design, engineering, and safety analyses.*

Results: A design and safety analysis for a Centralized Interim Storage Facility (CISF) was completed and a Topical Safety Analysis Report (TSAR) was submitted to the Nuclear Regulatory Commission for final review on September 23, 1998. The CISF was designed as an above-ground facility, but without a specific site for construction.

Assessment: Fully Successful

- *Developing a market-driven approach that uses private sector management and operational capabilities to provide waste acceptance and transportation services. Issuing a revised draft request for proposals.*

Results: A revised draft Request for Proposals (RFP) was issued for comments in November 1997. A revised draft incorporating comments was Noticed in the Federal Register on September 17, 1998.

Assessment: Fully Successful

- *Completing a revised Policy and Procedure for implementation of Section 180(c) of the Nuclear Waste Policy Act.*

Results: A Notice of Revised Proposed Policy and Procedure for implementation of Section 180(c) of the Nuclear Waste Policy Act was issued on April 30, 1998.

Assessment: Fully Successful

EQ 6-1 REDUCING ENVIRONMENTAL CLEANUP COSTS THROUGH ENHANCED PERFORMANCE

Assessment: Successful

Description: Significantly enhance performance, increase efficiency, and reduce costs through increased use of fixed-price competitive contracting, optimized project sequencing, recycling, and other waste minimization techniques, privatization, systems engineering, and benchmarking.

- Success will be measured by:

- *Achieving productivity enhancement targets (Targets to be established as part of the Accelerating Clean-up: Focus on 2006).*

Results: Accelerated site closure targets have been established for Rocky Flats Environmental Technology Site (2010 to 2006) and Fernald Environmental Management Project (2008 to 2005). The Department is working to accelerate the closure of Mound (2005 to 2004). The Department is continually working to achieve productivity enhancements, which are integral to achieving site closure targets. For example, the Department continues to pursue support cost reductions across the complex and has initiated a bench marking study at the Fernald site. In addition, the Department continues to pursue opportunities for achieving enhanced performance through business closure activities, such as, property disposition, post contract benefits, along with integration opportunities and contracting enhancements.

Assessment: Successful

- *Increasing the dollar value and/or number of competitively awarded fixed price contracts, including privatization contracts. Continuing the development of the privatization strategy by:*

  - *Awarding the Oak Ridge Transuranic Waste Treatment Privatization contract;*

  - *Authorizing commencement of the Tank Waste Remediation System (TWRS) contract Phase 1B at Hanford Site in Washington; and*

  - *Awarding the Carlsbad Area Office Contact-Handled Transuranic Waste Transportation Privatization Contract.*

Results: (1) A successful Oak Ridge TRU Waste Treatment Privatization Contract was awarded to Foster Wheeler Environmental Corporation on August 20, 1998. The Department will transfer remote-handled (RH) sludge from 13 different tanks at the Oak Ridge National Laboratory (ORNL) to eight storage tanks. These tanks, located in the Melton Valley area, contain the majority of the waste sludge. Foster Wheeler will remove and treat the sludge and supernate in an on-site facility from the tanks to meet disposal requirements

thereby satisfying the State of Tennessee Commissioner's Order requirements. All TRU solids will be delivered to the private vendor for treatment/repackaging, followed by disposal at WIPP. Due to the successful awarding of this contract, an assessment of "Fully Successful" is warranted. (2) The first phase of the TWRS privatization contract was awarded in September 1996. Two contractors were selected to develop the technical, operational, regulatory, business and financial elements required to provide treatment and immobilization services on a fixed price contract. On August 24, 1998, DOE authorized only one contractor, BNFL, Inc., to proceed forward with the project. Under the project, work will proceed in two parts. During the initial 24 months, BNFL will complete 30 percent of the facility design, prepare to start construction, and obtain financing. This phase of the contract is worth up to $350 million. At the conclusion of the design phase period, DOE will make a decision whether to proceed with BNFL into a construction operation phase. During this phase, BNFL would complete design and construction and provide both high-level and low-activity waste treatment and immobilization services. Approximately 10 percent of the Hanford waste (by mass) would be immobilized which accounts for 20 to 25 percent of the radioactivity. Due to the successful awarding of this contract, an assessment of "Fully Successful" is warranted. (3) Since the Waste Isolation Pilot Plant (WIPP) was unable to receive waste due to ongoing negotiations with the regulators, the Carlsbad Area Office Contact-Handled Transuranic Waste Transportation privatization contract was not awarded during FY 1998. It is anticipated that the contract will be awarded in February 1999; therefore, this milestone is rated as "Partially Successful."

Assessment: Successful

EQ 6-2 DEVELOPING AND DEPLOYING INNOVATIVE CLEANUP TECHNOLOGIES

Assessment: Fully Successful

Description: Develop and deploy innovative environmental cleanup, nuclear waste, and spent fuel treatment technologies that reduce cost, resolve currently intractable problems, and/or are more protective of workers and the environment.

- Success will be measured by:

  - *Accomplishing 49 innovative technology deployments.*

  Results: 122 deployments were accomplished.

  Assessment: Fully Successful

  - *Demonstrating 35 alternative technology systems that meet the performance-specification based needs as identified by the Site Technology Coordinating Groups (STCG).*

  Results: 40 full scale demonstrations were reported from the Focus Areas.

  Assessment: Fully Successful

  - *Making 40 alternative technology systems available for implementation with full cost and engineering performance data.*

  Results: 42 Innovative Technology Summary Reports will be published that include full cost and engineering performance data.

  Assessment: Fully Successful

  - *Completing the final Programmatic Environmental Impact Statement for selecting the long-term management strategy for the depleted UF6.*

  Results: Public comment hearings were held in February and March 1998. Close of comment period was April 23, 1998. Industry meetings were held in June and August 1998. Draft Programmatic Environmental Impact Statement revisions were completed September 30, 1998. The Final Programmatic Environmental Impact Statement is on schedule to be completed in February 1999 with a Record of Decision to be issued in March 1999.

  Assessment: Successful

EQ 6-3 COMPLETING DEACTIVATION OF SURPLUS FACILITIES

Assessment: Fully Successful

Description: Reduce operating costs by completing deactivation of surplus facilities and placing them in a safe and environmentally sound condition, requiring minimal surveillance and maintenance.

- *Success will be measured by completing about 60 surplus facility deactivations.*

Results: Seventy facility deactivations were completed in FY 1998.

Assessment: Fully Successful

EQ 7-1 MAKING DOE LANDS AND FACILITIES AVAILABLE FOR OTHER USES

Assessment: Successful

Description: In conjunction with stakeholders, develop comprehensive land use plans for DOE sites that provide information on alternative uses, ownership, environmental requirements, and implementation schedules.

- Success will be measured by:

- *Submitting to Congress a future use plan for DOE sites, and an analysis of related long-term stewardship issues by October 1998. The plan and analysis will include the Hanford Site, Savannah River Site, Rocky Flats Environmental Technology Site, and Idaho National Engineering and Environmental Laboratory.*

Results: The original submittal date in the 1997 National Defense Authorization Act (NDAA) for the future use plans for Hanford Site, SRS, RFETS, and INEEL was March 15, 1998. The Office of Environmental Management (EM) was subsequently granted an extension for submittal of these plans to Congress by October 15, 1998. EM submitted the "Planning for the Future - An Overview of Future Use Plans at Department of Energy Sites" and individual site plans (with the exception of the Hanford site's plan) in October 1998. The "Hanford Remedial Action Environmental Impact Statement and Comprehensive Land Use Plan" (HRA-EIS) will be submitted to Congress when it is published.

Assessment: Successful

- *Initiating mission justification analysis and providing a schedule for reporting on the amount of excess land and facilities at each site by July 30, 1998.*

Results: Eighty seven percent of the sites initiated mission justification analysis and provided a schedule for reporting excess land.

Assessment: Successful

Science and Technology

ST 1-1 PURSUING INNOVATIVE RESEARCH RELEVANT TO DOE'S MISSION

Assessment: Fully Successful

Description: Conduct relevant, high quality, innovative research that responds to the needs of the DOE mission.

- Success will be measured by:

- *Maintaining the high quality and relevance of DOE's science as evaluated by annual peer reviews and advisory committees.*

Results: Research projects have undergone regular peer review and merit evaluation based on procedures set down in 10 CFR 605 for the extramural grant program and on analogous procedures for the laboratory programs and scientific user facilities. All new projects have been selected by peer review and merit evaluation. The five Energy Research advisory committees have met regularly and have issued timely reports that have had a positive impact on improving the quality and relevance of the program.

Assessment: Fully Successful

- *Completing initial clinical trials of Boron Neutron Capture Therapy (BNCT) to evaluate its safety and feasibility as an alternative method of treating cancers that resist conventional methods of treatment.*

Results: Early clinical trials of BNCT against brain and skin cancers are continuing at Brookhaven National

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Results are classified as "FULLY SUCCESSFUL", "SUCCESSFUL", "PARTIALLY SUCCESSFUL", or "UNSUCCESSFUL" for performance judged to be effectively 100% or better, 80-100%, 50-80%, or less than 50% respectively.

Laboratory and at the Beth Israel Deaconess Medical Center, with a total of 38 patients having been treated at Brookhaven and 15 at Beth Israel as of March 1998.

Assessment: Fully Successful

- *Initiating a new Climate Change Technology program that will underpin new opportunities and technologies in carbon capture.*

Results: With the passage of the FY 1999 budget, and the development of guidance regarding the scope of the program, solicitations can be planned.

Assessment: Fully Successful

- *Advancing the state of human genome research by reducing cost and increasing speed and quality of DNA sequencing, and submitting 20 million subunits of finished human and mouse DNA sequence to publicly accessible databases.*

Results: In FY 1998, the DOE Joint Genome Institute (JGI) determined the sequence of more that 20 million units of humen DNA and submitted data to the public sequence database. This achievement represents a 9.7-fold increase in the combined DNA sequencing output of the three laboratories that make up the JGI. This level of human DNA sequencing also makes the JGI the second leading public sequencer of human DNA in the U.S. and third in the world.

Assessment: Fully Successful

ST 1-2 FURTHERING OUR KNOWLEDGE OF ENERGY AND MATTER

Assessment: Fully Successful

Description: Provide new insights into the fundamental nature of energy and matter.

☐ Success will be measured by:

- *Commencing full operation of all three experimental halls at the Thomas Jefferson National Accelerator Facility to explore the structure of atomic nuclei.*

Results: All three experimental Halls at the Thomas Jefferson National Accelerator Facility are now operational for research. The laboratory is able to deliver simultaneous beams of widely differing energies and currents to each of the Halls to meet the specific requirements of the experiments. The laboratory is now also able to deliver polarized beam to any of the experimental halls. The research program is underway in all three halls, and the facility may selectively turn beam off in one area while leaving simultaneous beams in the other two, to allow access for removal of equipment or for experimental set-up.

Assessment: Fully Successful

- *Commencing research in collaboration with international research community at the new Sudbury Neutrino Observatory (SNO) in Ontario, Canada, to understand why neutrino detection from the sun is much less than expected.*

Results: The SNO neutrino detector, which sits in a nickel mine about 6000 feet below the surface of the earth, is complete. The filling of the region around the detector with water, and the central part of the detector with expensive "heavy water" (D2O), is underway. A major dedication of the laboratory took place in Sudbury, Ontario, on May 28, 1998. A large number of internationally known scientists were present including Stephen Hawking. The laboratory will spend the next few months filling the detector. Initial measurements using the detector will probably commence about the end of calendar year 1998.

Assessment: Fully Successful

ST 1-3 IDENTIFYING AND EMPLOYING THE BEST SCIENTIFIC TALENT

Assessment: Fully Successful

Description: Search for and utilize the best talent from all sources to perform DOE research.

☐ *Success will be measured by establishing partnerships for Academic-Industrial Research (PAIR) Program to enhance opportunities for research partnerships between academic researchers, their students, and industrial researchers.*

Results: A solicitation for the PAIR program resulted in 168 preproposals, 60 of which were encouraged. The 67 full proposals that were received underwent merit review by the procedures set down in 10 CFR 605, and 16 new awards were made.

Assessment: Fully Successful

ST 1-4 PROVIDING SCIENCE TO SUPPORT NATIONAL POLICY MAKING

Assessment: Partially Successful

Description: Develop science to support DOE's participation in energy and other National policy formulations.

- ❒ *Success will be measured by developing a comprehensive Departmental policy for laboratory technology transfer in order to leverage science and technology for our Nation's economic competitiveness with a stronger partnership with the private sector.*

Results: A position paper proposing principles, criteria, and roles and responsibilities for DOE technology partnership activities has been prepared by a group of technology transfer specialists at Headquarters, the field offices and the laboratories. The draft position paper has been circulated for comment and the policy implications have been discussed with the laboratory directors.

Assessment: Partially Successful

ST 1-5 SUPPORTING RESEARCH COLLABORATIONS IN EMERGING AND INTERDISCIPLINARY AREAS

Assessment: Fully Successful

Description: Support emerging sciences that are important to the future of DOE and the Nation, including interdisciplinary research that addresses the Nation's most pressing problems.

- ❒ *Success will be measured by applying advances in instrument miniaturization, computational data processing, and molecular and structural biology to advance the development of highly sensitive medical imaging systems used in the detection of diseases.*

Results: DOE sponsored researchers have applied technological advances from other research areas, such as the semi-conductor field, to develop very small data processing components which can process the large volume of imaging data in record breaking time. Progress has also been made in developing new advanced imaging detectors that are much smaller and many times more efficient at detecting radioisotopes within the body than current imaging systems. A major accomplishment has been the use of high performance computing to better understand and model the molecular mechanisms of scintillator fluorescence. These advances have resulted in the development of a portable gamma camera (prototype) that can be used to detect breast cancer. Progress has also been made in the development of new algorithms to rapidly process and merge the large volume of imaging data collected from the various imaging modalities (i.e., PET, MRI, and X-ray CT).

Assessment: Fully Successful

ST 1-6 LEVERAGING RESOURCES THROUGH INTERNATIONAL COLLABORATIONS ON SCIENCE PROJECTS

Assessment: Successful

Description: Leverage research opportunities through science partnerships and pursue international science collaborations.

- ❒ Success will be measured by:

- *Signing the international agreement to participate in the construction and management of the Large Hadron Collider accelerator and the two major detectors.*

Results: All three documents have been signed. The International Cooperation Agreement between DOE and NSF and the European Organization for Nuclear Research (CERN) was signed on December 8, 1997. Both the Accelerator Protocol and the Experiments Protocol were signed on December 19, 1997.

Assessment: Fully Successful

- *Completing the memorandum of understanding with the National Science Foundation concerning the management of the U.S. Large Hadron Collider activities.*

Results: The Memorandum of Understanding between the DOE and The NSF for joint oversight of the U.S. Large Hadron Collaborative Program with CERN was approved by both DOE and NSF in August 1998 and has been effect since that time.

Assessment: Fully Successful

- *Completing and transmitting to Congress a Strategic Plan for U.S. International Collaborations in Fusion*

Science and Technology Research fulfilling a House Science Committee requirement.

Results: The "Strategic Plan for International Collaborations in Fusion Science and Technology Research" has been completed and forwarded to the Congress.

Assessment: Fully Successful

- *Reaching an agreement on the first annual program of bilateral fusion activities between U.S. and Korea.*

Results: The first program of work under the U.S.-Korea Bilateral Fusion Meeting has been signed by Dr. N. Anne Davies, Associate Director for Fusion Energy Sciences, and Mr. Hun-Gyu Lee, Director General, Basic Science and Manpower Bureau, Korean Ministry of Science and Technology.

Assessment: Fully Successful

- *Completing the review of proposals and initiating projects in FY 1998 to design and develop advanced catalysts, electrodes, and membranes, as well as advanced separator plates and high temperature sealants under the Russian-American Fuel Cell Consortium.*

Results: Since the beginning of FY 1998, we have nine R&D projects funded and underway, which cover the full array of key fuel cell technologies--from molten carbonate, to solid oxide, phosphoric acid and PEM. The overall goal of these R&D projects is to help reduce the cost of fuel cell technology by testing less expensive materials that make up the component parts of fuel cells and by finding useful employment for former Russian nuclear weapons scientists in commercial R&D activities.

Assessment: Fully Successful

- *Continuing cooperative research efforts with Russia, begun in 1973, on fundamental properties of matter, fusion energy science, nuclear reactor safety, environmental restoration, and nuclear waste management by renewing the existing umbrella Peaceful Uses of Atomic Energy Agreement (PUAE), which will expire December 1998, for 12-18 months and beginning negotiations of a new and expanded PUAE Agreement.*

Results: The PUAE agreement covers literally hundreds of activities under four major Memoranda of Cooperation (MOC). Major progress continues in terms of high energy and nuclear physics (including work on the D-O Detector at FERMILAB), fusion science (including the International Thermonuclear Experimental Reactor), nuclear reactor safety upgrades at Russian Soviet-era reactors, and research into the factors affecting environmental restoration and waste management of materials associated with nuclear fission. On the question of renewal of the PUAE umbrella agreement, DOE is proposing a 12-18 month extension of the umbrella.

Assessment: Partially Successful

ST 2-1 DEVELOPING DOE MISSION CRITICAL TECHNOLOGIES

Assessment: Fully Successful

Description: Develop the technologies required to meet DOE's energy, national security, and environmental quality goals.

- ☐ Success will be measured by:

- *Establishing cost and schedule baselines for the three components (ATLAS Detector, CMS Detector and LHC Accelerator) of the planned U.S. contribution to the Large Hadron Collider as specified in the DOE/NSF/CERN Agreement.*

Results: The ATLAS Cost and Schedule Baseline has been completed and approved. The baseline for the LHC Accelerator has been completed and approved by DOE; it is awaiting approval by NSF. A review of the CMS detector on May 19-22, 1998, will determine the CMS baseline.

Assessment: Fully Successful

- *Executing a multi-year contract for development of highly efficient radioisotope power systems in support of NASA's future mission requirements.*

Results: Lockheed Martin Astronautics (LMA) was selected as the system integration contractor to develop an advanced radioisotope power system (ARPS) for possible use on the Europa Orbiter, Pluto-Kuiper Express and other future NASA missions. The goal of the contract is to design a smaller and more efficient

power system. A letter contract was executed on March 6, 1998, and the multi-year contract was negotiated over the next several months and executed on July 31, 1998.

Assessment: Fully Successful

- *Completing 80 percent of the Sandia Hot Cell Facility construction modifications and processing equipment installation activities needed to achieve the facility capability to process 100 percent of the U.S. demand for molybdenum-99.*

Results: Work completed at the end of FY 1998 included the removal of the existing Hot Cell Facility windows, demolition activities, decontamination and construction preparation, construction engineering designs, the design and procurement of the HCF Zone 2A shielding steel and window sleeves, and the design and issuance of a request for bids for the steel containment boxes for installation inside the HCF. Additionally, by the end of October all HCF shielding steel and sleeves will be installed, the design of processing conveyer systems will be completed and the concrete poured for the new HCF airlock shield. Based on current progress of the remaining tasks in the heavy construction activity, the requirements for the 80 percent completion milestone were met at the end of FY 1998.

Assessment: Fully Successful

- *Supplying quality stable and radioactive isotopes for industrial, research, and medical applications that continue to meet customer specifications and maintaining 95 percent on-time deliveries in FY 1998 and beyond.*

Results: Although the High Flux Isotope Reactor (HFIR) experienced several unscheduled outages early in the fiscal year and scheduled deliveries increased 41 percent over FY 1997, the Department was able to accomplish greater than 97 percent of the scheduled deliveries on time. During the outages, the Departmentwas unable to fill 33 orders of medical and industrial isotopes. Several organizations within the Department are working together to attempt to develop an annual HFIR reactor operating schedule and also with other suppliers to avoid future unscheduled interruptions in the supply of isotopes.

Assessment: Fully Successful

ST 2-2 PURSUING PARTNERSHIPS TO DEVELOP AND DEPLOY NEW TECHNOLOGIES

Assessment: Fully Successful

Description: Pursue technology research partnerships with industry, academia, and other government agencies and proactively accelerate the transition of technologies to end users.

☐ Success will be measured by:

- *Initiating 15 multi-year Laboratory Technology Research projects by April 1998 that address the Department's top priorities for science and technology and are cost-shared with industry partners.*

Results: CRADA negotiation on all 17 projects was completed by September 17, 1998. Research on all 17 projects was underway by the end of FY 1998.

Assessment: Fully Successful

- *Review and select for Phase II follow-on funding approximately 80 Small Business Innovative Research proposals that satisfied proof of concept under Phase I funding, and select approximately 200 proposals for Phase I funding.*

Results: Phase II proposals were selected in June 1998, and Phase I proposals were selected in July 1998. Small Business Innovation Research projects not only satisfy the Department's research needs, but also lead to technological innovation. Based on data received from previous awardees, half of the projects have led to commercial sales of products and services derived from the research.

Assessment: Fully Successful

ST 3-1 MANAGING THE DEPARTMENT'S NATIONAL LABORATORIES AND RESEARCH FACILITIES

Assessment: Fully Successful

Description: Manage the National Laboratories, science-user facilities, and other DOE research providers and research facilities in a more integrated, responsive, and cost-effective way, building on unique core strengths

and corresponding roles. Design, construct, and operate research facilities in a timely and cost-effective manner.

- ☐ Success will be measured by:

- *Completing a facilities roadmap which will determine the needs and provide direction to the scientific facilities through the year 2020.*

Results: A facilities roadmap has been finalized, incorporating input from stakeholders, and presented to the Laboratory Operations Board.

Assessment: Fully Successful

- *Reducing laboratory operating costs by an additional $330 million (relative to FY 1994) without reducing research outputs. This will be applied to the goal of saving $1.4 billion by FY 2000.*

Results: Laboratory operating costs for FY 1998 (relative to FY 1994) were reduced by at least $330 million, subject to final determination after issuance of this report.

Assessment: Fully Successful

- *Completing Critical Decision II and issuing the draft Environmental Impact Statement (EIS) to initiate construction of the Spallation Neutron Source.*

Results: Critical Decision II - approval of baselines - was signed by Secretary Peña on December 23, 1997. The draft Environmental Impact Statement (EIS) is scheduled to be available for public comment before the end of 1998.

Assessment: Fully Successful

- *Completing the agreed upon ITER Engineering Design Activities and reaching an agreement on whether to continue into the three-year transition phase leading to construction decision.*

Results: Critical Decision II -- approval of baselines -- was signed by Secretary Peña on December 23, 1997. The draft Environmental Impact Statement (EIS) is scheduled to be available for public comment before the end of 1998.

Assessment: Successful

- *Beginning assembly and installation of the National Spherical Tokomak Experiment at Princeton Plasma Physics Laboratory in FY 1998.*

Results: The assembly and installation of National Spherical Tokomak Experiment (NSTX) has begun. Major systems are being fabricated and tested for quality assurance. Site preparations and modifications are being carried out on schedule. Assembly of subsystems and diagnostics is being completed as components become available.

Assessment: Fully Successful

- *Preserving a U. S. leadership role for the utilization of synchrotron facilities by providing increased user support personnel for beam lines at the National Synchrotron Light Source at Brookhaven National Laboratory.*

Results: Additional funding of $2 million was provided to the National Synchrotron Light Source in FY 1998 for increased user support personnel.

Assessment: Fully Successful

- *Making progress at the following new research facilities:*
  - *B-factory at Stanford Linear Accelerator Center: begin operations;*
  - *Main Injector at Fermilab: complete construction and begin commissioning;*
  - *High Flux Beam Reactor at Brookhaven: Initiate EIS;*
  - *Joint Genome Institute's Production Sequencing Facility: begin operations; and*
  - *William R. Wiley Environmental Molecular Sciences Laboratory (EMSL): begin operations.*

Results: The B-factory Project at SLAC is on schedule and at cost. It is currently undergoing commissioning, and it is expected that it will begin operations by the end of FY 1998. The Main Injector Project at Fermilab is on schedule and at cost. Construction of the Main Injector was completed and commissioning to begin in August 1998. The Environmental Impact Statement (EIS) process was initiated on November 24, 1997. Renovations and outfitting of the DOE Joint Genome

Institute's Production Sequencing Facility (PSF) for high throughput DNA sequencing was completed. This facility will be a state-of-the-art DNA sequencing facility that will be used to meet DOE's DNA sequencing commitments to the U.S. Human Genome Project. The PSF will include robotics and automation to increase production and decrease costs of DNA sequencing. The William R. Wiley Environmental Molecular Sciences Laboratory is operational. Information about the EMSL is available through the EMSL web site at: http://www.emsl.pnl.gov:2080/homepage.html

Assessment: Fully Successful

ST 3-3 MANAGING THE DISSEMINATION OF SCIENTIFIC AND TECHNICAL INFORMATION

Assessment: Fully Successful

Description: Improve the management, dissemination, sharing, and use of scientific and technical information.

- ☐ *Success will be measured by negotiating and implementing an agreement with the U.S. Government Printing Office to provide electronic public access to over 25,000 full-text reports containing scientific and technical information through the DOE Information Bridge.*

Results: In April 1998, the DOE Office of Scientific and Technical Information (OSTI) and the U.S. Government Printing Office (GPO) jointly unveiled the DOE Information Bridge, a new-age information system that provides the public with electronic access to both bibliographic citations and full text of the Department's scientific and technical information resulting from its R&D activities. Designed, developed, and maintained by OSTI, this web-based system is accessible at no charge to the user at http://www.doe.gov/bridge. The site currently includes full text of over 27,000 DOE reports and accompanying records and abstracts in such disciplines as physics, chemistry, materials, biology, environmental cleanup, energy technologies, and other topics. The number of reports in the system is growing daily. Based on interest and activity to date, it is estimated that over 50,000 full-text documents a year will be downloaded via the public access DOE Information Bridge.

Assessment: Fully Successful

ST 3-4 IMPROVING THE EVALUATION PROCESS FOR DOE'S RESEARCH PROGRAMS

Assessment: Fully Successful

Description: Improve peer and program review processes.

- ☐ *Success will be measured by having programs reviewed by independent advisory committees to analyze issues and recommend research direction, specifically completion by the:*
  - *Energy Science Advisory Committee, of a review of the advanced fusion materials program by September 1998; and*
  - *High Energy Physics Advisory Panel, of a Plan for the Future of U.S. High Energy Physics.*

Results: 1)The Fusion Energy Sciences Advisory Committee (FESAC) has completed its review of the advanced fusion materials program. The committee's report contains recommendations for future research directions that have been accepted by the Department and included in FY 1999 plans. 2)The High Energy Physics Advisory Panel's Subpanel completed its study, and the resulting report entitled, "Planning for the Future of U.S. High-Energy Physics" was published in February 1998.

Assessment: Fully Successful

ST 4-1 CONTRIBUTING TO THE NATION'S SCIENCE AND MATH EDUCATION AND PROMOTING SCIENCE AWARENESS

Assessment: Fully Successful

Description: Develop and promote technologies and programs that deliver information and contribute to learning in science, math, engineering, and technology, and in general, expand access to DOE's technical information. Leverage DOE's human and physical research infrastructure, working with the National Science Foundation and other Federal agencies, to promote science awareness, enable advanced educational research opportunities, build capabilities at educational institutions, and improve educational opportunities for diverse groups.

- ☐ Success will be measured by:

- *Expanding sponsorship of collaborations for local and regional science awareness events.*

Results: More than 8,000 students from 1,600 high schools participated in 48 regional science bowl competitions across the country and in the Virgin Islands. This is an increase over previous years and demonstrates the popularity of the Department's National Science Bowl and the support of both the DOE and non-DOE sites to this effort. Over 5,000 volunteers from DOE sites, other Federal agencies, local colleges and universities, technology companies and sponsors served as officials for all the competitions. For the first time, the winning team from the 1998 National Science Bowl will attend the 48th Meeting of Nobel Laureates in Chemistry in Lindau, Germany.

Assessment: Fully Successful

- *Supporting young outstanding scientists through:*
  - *Department's minority colleges and universities (MC&U) program - support for at least teams of faculty and students;*
  - *Hollaender Distinguished post doctoral fellowship program - support for at least eight postdoctoral students;*
  - *Multi-agency Significant Opportunities in Atmospheric Research and Science (SOARS) Program - support for at least two students;*
  - *Continuing the Departmental award program for Junior investigators in Plasma Science; and*
  - *Department's outstanding Junior Investigator program which provides research opportunities for early-career high energy physicists.*

Results: Eight awards were made for FY 1998. These awards involve collaborations between minority students, their faculty advisors, and scientists in DOE laboratories. Five new Hollaender two-year fellowships were awarded in FY 1998. Ten fellowships awarded in FY 1997 were continued into FY 1998. Thus 15 students are being supported in FY 1998. Five of the 19 SOARS proteges are being supported by DOE. (Since these are predominantly minority students, this enhances diversity while recruiting well-qualified students for careers in the atmospheric sciences and global change.) An announcement of opportunity for Junior Investigators in Plasma Science was published in December 1997, applications received in response to this notice were peer reviewed, and two awards were made.

Assessment: Fully Successful

Corporate Management

CM 1-1 INSTITUTING A SOUND ES&H CULTURE

Assessment: Fully Successful

Description: Integrate and embed risk-based outcome oriented environment, safety, and health (ES&H) management practices into the performance of DOE's day-to-day work.

☐ Success will be measured by:

- *Preventing fatalities, serious accidents, and environmental releases at Departmental sites.*

Results: DOE had one work-related fatality during FY 1998. A Type A Investigation was completed and corrective action plan implemented. DOE's work-related fatality record for FY 1998 was the lowest rate since FY 1994.

Assessment: Successful

- *Initiating Integrated Safety Management Systems at all 10 high priority facilities by April 1998.*

Results: All 10 DNFSB priority facilities have begun implementation of integrated safety management systems.

Assessment: Fully Successful

- *Completing documentation of ES&H roles and responsibilities for all appropriate DOE offices and sites by July 1998.*

Results are classified as "FULLY SUCCESSFUL", "SUCCESSFUL", "PARTIALLY SUCCESSFUL", or "UNSUCCESSFUL" for performance judged to be effectively 100% or better, 80-100%, 50-80%, or less than 50% respectively.

Results: The FRAMs for the ten 95-2 priority sites (the responsibility of six DOE Operations/Field Offices) were first issued in July 1997. The DOE Corporate (Headquarters) FRAM was first issued in October 1997. These FRAMs have been updated over the past year and are currently being reconciled to resolve potential conflicts, with a scheduled date for completion of October 1998. In the meantime, several other offices have issued their FRAMs (e.g., Chicago Ops Office, Yucca Mountain Project Management Office, etc.). As the DOE missions evolve, the FRAM updating process would continue, in order to reconcile all of the perceived conflicts between them.

Assessment: Partially Successful

- *Publishing guidance for incorporating environmental justice principles into the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) implementation process.*

Results: The Office of Environmental Policy and Assistance (EH-41) has engaged in a partnership with the EM Center for Risk Excellence (CRE) in providing policy, guidance, and assistance on environmental dose and risk assessment issues of relevance to DOE Program and Operations Offices. This partnership is expected to improve the coordination, effectiveness, and leveraging of risk assessment resources and services, and will allow each organization to be more responsive to DOE Program and Operations Office needs. EH-41 has participated in CRE strategic planning sessions, and has provided input to the development of the CRE Strategic Plan. Several collaborative initiatives in the strategic areas of environmental standards, long-term stewardship, science and technology, and stakeholder partnerships are on-track or being pursued.

EH published and made available in electronic form, a guidance document entitled: "Incorporating Environmental Justice Principles into the CERCLA Process." The guidance describes the activities within the CERCLA response process where data gathering, analysis, or procedures may need to be extended or added in order to ensure that low-income and minority communities play a meaningful role in the agencies CERCLA process. This document includes information for communicating health risks and was written to meet the goals in Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," which requires all agencies to consider environmental justice in the conduct of their mission.

Prepared Risk Management Planning Guidance. EH-41 developed and has made available, both in electronic and in hardcopy form, substantial guidance to the Field to help it comply with CAA requirements to help reduce the risk to human health and the environment from large quantities of toxic, flammable or similarly hazardous materials at our sites.

Assessment: Successful

- *Through independent oversight, provide information and analysis of the effectiveness, vulnerabilities, and trends of the Department's environment, safety, health, and safeguards and security policies and programs to the Secretary and senior line management.*

Results: Conducted and successfully completed two Integrated Safety Management Evaluations: the Lawrence Livermore National Laboratory (November 1997) and the Miamisburg Environmental Management Project (July 1998). Conducted and successfully completed six special reviews: The Albuquerque Operations Office's Transportation Safeguards Division Radiation Protection Program (November 1997). Aviation safety programs throughout the DOE complex (October 1997); the Albuquerque Operations Office's Transportation Safeguards Division Training and Performance Testing Programs (February 1998); and Fissile Material Assurance in the DOE complex (July 1998). Also successfully initiated a complex-wide review of DOE unclassified computer systems. An interim status report was issued in March 1998. In August 1998, completed a complex-wide review of emergency management at the request of the Secretary of Energy. Implemented a comprehensive follow-up program and successfully conducted and completed eight Follow-up Reviews.

Conducted and successfully completed one Safeguards and Security Independent Oversight Evaluation at Rocky Flats Environmental Technology Site (May 1998).

Conducted and successfully completed four Safeguards and Security Profiles describing and monitoring the status of safeguards and security programs and issues at

DOE sites. Successfully updated and issued revisions of three safeguards and security site profiles: Pantex (June 1998). Implemented a comprehensive Accident Investigation program and successfully conducted and completed Accident Investigation Board Chairperson Training in December 1997 using distance learning techniques to simultaneously reach 10 DOE sites, and Accident Investigator Training in January and April 1998 at Albuquerque and Chicago Operations Offices respectively. The Office of Oversight successfully served in the following capacities during accident investigations: board chairperson and board members on a Type A of a fatality at Idaho National Environmental Engineering Laboratory (July 1998); deputy board chairperson and board members on a Type B of an electrical arc blast at Fermi Laboratory (October 1997); board members on a Type B of improper shipment of radiological samples from the Oak Ridge National Laboratory (February 1998); and advisors on two Type B accident investigations: a tanker truck leak at Fernald Environmental Management Project (December 1997) and an injury related to a rotating shaft at Ames Laboratory (March 1998).

Office of Oversight personnel also successfully led an assessment of the Oak Ridge Operations Office investigation of worker respiratory illnesses at Eastern Tennessee Technology Park (K-25) (April 1998).

Developed and successfully completed the 5th update of 20 ES&H Profiles describing and monitoring the most significant ES&H issues at the sites.

Conducted and successfully completed 28 EH Resident Surveillance at seven DOE sites to evaluate performance relative to significant ES&H issues.

Successfully developed Office of Oversight progress reports that assessed the safety management of 18 programmatic and technical areas and 20 DOE sites. These results were further integrated into an assessment of complex-wide safety.

Assessment: Fully Successful

- *Completing an additional four needs assessments to continue building the basis for a more detailed program of medical surveillance, in order to address the health risks to former DOE workers.*

Results: Since October 1997, four new phase I (needs assessments) pilot studies have been initiated at Savannah River Site (production and construction workers), Los Alamos National Laboratory and INEEL. They were completed by the end of FY 1998. The initial six phase I pilots at Richland, Oak Ridge, Nevada Test Site, Paducah and Portsmouth have now moved to the phase II category (identification, notification/worker risk communication and screening) and medical screening is expected to begin this fiscal year.

Assessment: Fully Successful

CM 1-2 ENSURING DOE PROGRAMS APPROPRIATELY ADDRESS ES&H PRIORITIES

Assessment: Fully Successful

Description: Clearly identify and fund ES&H priorities and ensure resources are appropriately spent on those priorities.

- ☐ *Success will be measured by beginning to annually monitor and report on ES&H expenditures and improve related internal controls.*

Results: Successful. The FY1999 Environment, Safety, and Health Budget Plan was issued in May 1998. The issuance of this report of planned expenditures relating to ES&H completed the planned action for FY 1998.

The Unicall guidance issued by the Chief Financial Officer for FY 2000 contains a requirement that field organizations report in October 1998 the status of "execution year" budgeting for prior ES&H commitments. The review of this information by EH-73, in FY 1999, will provide the foundation for determining what kind of improvements to present internal controls are appropriate.

Assessment: Fully Successful

CM 1-3 ENSURING EMPLOYEES ARE QUALIFIED IN THEIR ES&H RESPONSIBILITIES

Assessment: Fully Successful

Description: Ensure that all DOE employees are appropriately trained and technically competent commensurate with their ES&H Responsibilities.

- ☐ *Success will be measured by making progress on implementing the Technical Qualifications Program, by increasing the percentage of employees who are certified from 65 percent in FY 1997 to 75 percent in FY 1998, towards a goal of 90 percent of the 1,750 covered employees by FY 2000.*

Results: Working with senior technical managers throughout the Department, Human Resources produced a revised Implementation Plan for the Defense Nuclear Facilities Board Recommendation 93-3 which was approved by the Secretary. The revision focuses on improving technical workforce competency and includes periodic assessments of HQ and Field Office Technical Qualifications Programs by an independent Federal Technical Capability Panel which reports to the Deputy Secretary. Initial assessments will be completed by the end of October 1998.

Assessment: Successful

CM 1-4 INVESTIGATING FEASIBILITY OF INDEPENDENT EXTERNAL OVERSIGHT OF SAFETY AND HEALTH AT DOE SITES

Assessment: Fully Successful

Description: Work with the Nuclear Regulatory Commission and the Occupational Safety and Health Administration to evaluate the costs and benefits of independent external regulation of safety and health.

- ☐ *Success will be measured by conducting three NRC/DOE pilot projects to assess the DOE facilities against the standards that NRC believes would be appropriate to ensure radiological safety.*

Results: The Department and the Nuclear Regulatory Commission (NRC) have worked closely on a joint pilot program to determine the costs and benefits that would be associated with external regulation of DOE nuclear facilities. Three pilots are nearing completion: one at the Lawrence Berkeley National Laboratory, and two others at facilities at Oak Ridge and Savannah River. DOE has also worked with the Occupational Safety and Health Administration (OSHA) to address worker safety issues, particularly at the Lawrence Berkeley pilot. The Department will forward a report to the Congress by March 31, 1999, outlining the results of the Lawrence Berkeley pilot.

The pilots have highlighted a number of significant, unresolved issues including: ascertaining whether DOE or its contractor should most appropriately hold a license; difficulties in assessing facility design under NRC standards in some older facilities because we lack original construction plans; the extent to which older facilities can be "retrofitted" or upgraded to meet NRC standards; applicable requirements for safeguards and security, and deactivation and decommissioning; and cost.

Next steps are to work with the NRC, Congress, stakeholders, and others to reexamine the extent of unresolved issues.

Assessment: Fully Successful

CM 2-1 INVOLVING STAKEHOLDERS IN THE POLICY-MAKING PROCESS

Assessment: Fully Successful

Description: Foster strong partnerships with neighboring DOE communities, regulators, and other stakeholders to determine priorities and solutions.

- ☐ Success will be measured by:

- *Performing an analysis of public participation training needs at all 11 Operations/Field Offices, and initiating a public participation training program for Headquarters and field managers to enhance stakeholder involvement in DOE decisions.*

Results: The needs assessment was conducted and a DOE-wide training program has been developed and initiated. Between June and August 1998, six training courses in communicating with the public and managing public participation were conducted at Headquarters and in the field (Savannah River, Albuquerque, Oak Ridge and Rocky Flats) for the Deputy Assistant Secretaries, technical staff members, program/project managers, and public affairs and public participation staff.

Assessment: Fully Successful

- *Conducting a series of regional and national stakeholder workshops to increase public involvement in crosscutting EM issues. The workshops will be attended by advisory board*

members, State and local governments, Native American Tribes, and other stakeholders across the country.

Results: During FY 1998, national meetings for soliciting public involvement in the EM program were conducted for the EM Site-Specific Advisory Board Chairs, State and Tribal Government Working Group, National Association of Attorneys General, and National Governors' Association. In June 1998, two regional "Intersite Discussions" for DOE stakeholders across the country provided a unique opportunity for stakeholders from advisory boards, Native American Tribes, State and local governments, interest groups, and members of the public to discuss upcoming DOE decisions on nuclear materials and waste management from a national perspective.

Assessment: Successful

- *Responding to an estimated total of 500,000 public requests for information and documents from the Center for Environmental Management Information within an average of two business days per request.*

Results: As of September 30, 1998, the Center for Environmental Management Information responded to 1,176,581 public inquiries on the EM Program within two business days.

Assessment: Fully Successful

CM 2-2 IMPROVING COMMUNICATIONS WITH CUSTOMERS AND THE PUBLIC

Assessment: Successful

Description: Increase customer and public awareness of DOE's mission areas by improving the quality, timeliness, frequency, and sufficiency of information disseminated on the Department's functions, successes, lessons learned, and future activities.

❒ Success will be measured by:

- *Reducing the Freedom of Information Act backlog by 15 percent and the average case age by 25 percent.*

Results: The Freedom of Information backlog has been reduced by 15 percent through September 30, 1998, which meets the goal.

However, the average case age of requests has only been reduced by 15 percent through September 30, 1998. The cases effecting this success measure involve information that is classified and requires reviews by other agencies which slows down our process. Therefore, we were unable to fully achieve this part of the commitment.

Assessment: Successful

- *Improving the quality and volume of information on DOE's World Wide Web site as indicated by user-interest through numbers of home page visits.*

Results: We have achieved an increase each quarter this fiscal year over last fiscal year in the number of DOE Home Page visits. For example, the first quarter showed an increase of over 34 percent, second quarter 38 percent, 3rd quarters increased 32 percent, and 4th quarter increased 39 percent. Users have been impressed with the quality of our Home Pages.

Assessment: Fully Successful

CM 2-3 INCREASING OPENNESS WITH THE PUBLIC

Assessment: Partially Successful

Description: Increase openness with the public by prudently declassifying information about the Department's activities while maintaining a balance with the Nation's security.

❒ Success will be measured by:

- *Reviewing for possible declassification and release, 3,950,000 pages of DOE documents under Executive Order 12958 bringing the total pages reviewed to 8,460,000 which is 60 percent of the DOE's historically significant records 25 years or older.*

Results: We estimate that approximately 1,600,000 pages will be completed by fiscal year end out of the anticipated 3,950,000 pages for possible declassification and release. We were not completely successful because of the unforeseen reduction in funding, diversion of critical resources to ongoing litigation, and new reviewer training. This measure of success was established prior to the Congressional reduction in the FY 1998 budget and the diversion of resources to other critical efforts (e.g., litigation).

Assessment: Partially Successful

- *Implementing "National Security Information, Classification and Declassification"(Title 10 Code of Federal Regulations, Part1045) through conducting two on-site reviews of other agency Restricted Data programs.*

Results: This performance measure was not accomplished in FY 1998 due to the resignation of the "Outreach Coordinator," who was responsible for conducting the onsite reviews. At present, the Office of Declassification is in the process of filing this critical vacancy.

Assessment: Unsuccessful

CM 3-1 IMPROVING MANAGERIAL PERFORMANCE AND ACCOUNTABILITY

Assessment: Partially Successful

Description: Improve decision-making, ensure accountability, maximize Departmental resources, and achieve intended results by corporately managing the Department's mission, functions, and activities.

❒ Success will be measured by:

- *Utilizing mechanisms such as senior level corporate and business line management councils, a DOE chief operating officer, and performance- based management to foster strategic direction, enhance programmatic integration, and improve Headquarters and field operations.*

Results: The Policy Office is actively pursuing both internal and external advice and consultation on SMS improvement. The Assistant Secretary for Policy solicited such information from all Departmental elements in May 1998. Additional meetings were scheduled with the Deputy Secretary and the Secretary's Executive Advisory Board.

The Policy Office has been sponsoring the Performance-Based Management Special Interest Group (PBM-SIG) of the TRADE organization. That group sponsored a two-day workshop on performance-based management in Washington, DC, attended by approximately 60 people.

The Policy Office also participated on the Business Management Oversight Process (BMOP) steering group and is leading the assessment of BMOP. The BMOP has established performance-based oversight objectives and measures for FY 1997 between Headquarters functional offices and the field offices. As part of the process, the field offices conducted self-assessments and reported on them by January 31, 1998.

The Policy Office is working with a CFO-led team to integrate annual reporting into an "Accountability Report" per OMB's recommendation.

Finally, the Policy Office has been hosting the Strategic Management System (SMS) steering group's weekly meetings to coordinate strategic direction for the Department. The SMS steering group is establishing the process for the FY 2000 internal review budget (IRB) decision-making.

However, we cannot demonstrate enhanced programmatic integration or improved operations.

Assessment: Partially Successful

- *Establishing annual Secretarial Officer Performance Agreements that are linked to the Secretary's Performance Agreement with the President.*

Results: The development and finalization process for the FY 1998 agreements was slow. By the end of January 1998 only three offices (NN, RW, and HR) had submitted their proposed agreements, and it took nearly nine months of the year to sign nine agreements out of the 20 expected. In addition to these nine, six agreements were developed but were not reviewed and signed. The agreements were expected to include commitments made in the agreement with the President, but were to include additional commitments that Secretarial Officers were willing to make to the Secretary. With a few exceptions, these agreements were redundant with the Secretary's Agreement with the President. Having the same information in two places posed the problem of ensuring all changes made in the President's agreement were incorporated in the Secretarial Officer agreement. Many offices resisted the development of these agreements as they did not see it adding value. The agreements were not used to discuss management issues, do performance appraisals, or hold managers accountable.

We are recommending that the Department not continue with Secretarial Officer Agreements in FY 1999, and instead, devote greater emphasis and resources on

evaluating what is reported against the Secretary's Agreement with the President.

Assessment: Partially Successful

- *Expanding the Corporate Executive Information System to provide senior management at Headquarters and field offices with timely and useful management information.*

Results: Further deployed the Corporate Executive Information System to Headquarters and field offices to provide senior management immediate access to Departmental Business Information for analyses to support the decision making process as well as summary level reporting and inquires. Utilization of the Corporate EIS has been expanded during FY 1998 to include a total of 11 Headquarters' Program Offices, 10 Headquarters' Administrative Offices, and 14 field offices.

The CFO's Financial Data Warehouse is currently completing their pilot phase and expanding its user base. Once the user base is expanded, the Financial Data Warehouse will provide an additional resource to satisfy internal reporting requirements.

A Business Management Information System (BMIS) Strategic Information Management (SIM) process was initiated in FY 1998. The purpose of the SIM process is to look at business processes and develop an Information Technology Investment Business Case.

Assessment: Fully Successful

- *Developing annual performance-based budgets by using DOE's corporate Strategic Management System to link resource requirements to five-year plans, make independent project validations, and perform cross-cutting program evaluations.*

Results: The Chief Financial Officer and the Assistant Secretary for Policy and International Affairs published guidance for the preparation of five-year planning summaries in support of the FY 2000 Corporate Review Budget (CRB). This guidance was endorsed by the Deputy Secretary and published on March 30, 1998. The issues identified in this process were partially used to shape the FY 2000 budget. Cross-cutting program evaluations were not performed. However, the budget was prepared and submitted to OMB on time with an annual performance plan addressing FY 1998 results, final FY 1999 commitments, and proposed FY 2000 commitments.

The FY 1999 Congressional Budget was developed by linking the Department's strategic planning process to performance-based planning and budget proposals. The CFO's FY 2000 Field budget guidance required the Field to submit performance-based budgets. Field offices were directed to work closely with Headquarters programs in developing supporting performance measures. Guidance required that construction projects be independently validated before approval of funding during the CRB process. Cross-cutting program evaluations will also be appraised on their fulfillment of the President's strategic objectives during the CRB.

Assessment: Partially Successful

CM 3-2 USING PRUDENT CONTRACTING AND BUSINESS MANAGEMENT PRACTICES

Assessment: Fully Successful

Description: Use prudent contracting and business management approaches that emphasize results, accountability, and competition; improve timeliness; minimize costs; and ensure customer satisfaction.

☐ Success will be measured by:

- *Preparing and submitting Department-wide audited financial statement with an unqualified opinion to the Office of Management and Budget by March 1, 1998.*

Results: The Department-wide audited financial statements were provided to OMB by March 1, 1998, and received an unqualified audit opinion. The Department was one of only two Federal agencies to receive an "A" on our report card.

Assessment: Fully Successful

- *Increasing the number of competitively awarded contracts for major DOE sites and facilities from 13 to 16 by September 1998.*

Results: As of the end of FY 1998, over 20 competitive contracts for major DOE sites were awarded which exceeds our goal.

Assessment: Fully Successful

- *Converting all management and operating contracts awarded in FY 1998 to performance-based management contracts.*

Results: All Management and Operating (M&O) contracts extended or competed in FY 1998 were converted to performance-based contracts.

Assessment: Fully Successful

- *Hiring a privatization director, developing a Department-wide privatization strategy, and identifying and pursuing privatization opportunities.*

Results: The Secretary named a Director of the newly restructured Contract Reform and Privatization Project Office in March 1998.

Assessment: Fully Successful

- *Applying business process reengineering to the highest priority procurement processes by September 1998 with a goal of reducing cycle time by 30 percent.*

Results: We have been applying business process reengineering efforts for all of our procurement processes and have achieved a 40 percent cycle time reduction for support services competitive procurements and a 50 percent reduction for 8A procurements.

Assessment: Fully Successful

- *Improving Federal procurement and property management employee skills by establishing a contracting workforce development program by September 1998.*

Results: Career development programs have been established for both procurement and property professionals and courses started being offered in the summer of 1998.

Assessment: Fully Successful

- *Implementing an automated system to track and measure contractor performance by September 1998.*

Results: The Automated Past Performance Data Base, which tracks DOE contractor performance, has been installed throughout the Department. We have enhanced the system by web enabling it to make it Internet based and more user friendly to the Department's Contracting Officers.

Assessment: Fully Successful

CM 3-3 CONTINUING THE STRATEGIC ALIGNMENT INITIATIVES TO STREAMLINE AND RE-ENGINEER

Assessment: Fully Successful

Description: Continue to streamline and improve operations, further reduce overhead expenditures, and facilitate additional workforce reductions while aiding affected employees and communities.

- ☐ *Success will be measured by realizing annual Strategic Alignment Initiative savings commitments totaling $1.7 billion by the end of FY 2000 by:*

- *Achieving DOE staffing target of 10,874 by the end of FY 1998, a reduction of 294 FTEs from the FY 1997 end-of-year level.*
- *Consolidating Headquarters personnel into six locations by the end of FY 1998 and achieve $3.8 million savings in rent.*
- *Saving $61 million by reengineering information management business processes.*
- *Reducing technical and support service contracting obligations below $ 610 million.*
- *Returning to the Treasury at least $15 million through the sale, transfer, re-use, or disposal of unneeded materials, facilities, land, and other assets.*

Results: We are ahead of schedule with savings of over $1.4 billion against the FY 2000 goal of $1.7 billion. Following is the status of the five key measures: (1) The On-board SAI staffing count, excluding the Power Marketing Administrations and Federal Energy Regulatory Commission, was 10,355 as of September 12, 1998, which is 519 below the end-of-year goal of 10,874; (2) We reduced the Headquarters building inventory from eight to six locations and saved $3.83 million in rent; (3) Savings from reengineering information management business processes is over $69 million for FY 1998; our cumulative savings of $259 million has already exceeded the five-year goal of $245 million; (4) We reduced our use of support service contracts $200 million below the $610 million ceiling

goal in FY 1998; and, (5) The Office of Worker and Community Transition (WT) has been monitoring the Department's sale of excess assets with regard to meeting the $15M goal by the end of FY 1998. The sale of the Naval Petroleum Reserve alone yielded over $3 billion and exceeded the original goal. The Deputy Secretary, in an August 17, 1998, Memorandum, refocused and modified the original SAI goals for this effort and has closed this out as of the end of FY 1998.

Assessment: Fully Successful

CM 3-4 IMPROVING HUMAN RESOURCE PRACTICES

Assessment: Fully Successful

Description: Implement quality management principles, value diversity, and continue to improve human resources systems and practices.

- ☐ Success will be measured by:

- *Hiring 20 Welfare-to-Work recipients by the end of FY 1998 towards the goal of hiring 55 by FY 2000.*

Results: Through the end of FY 1998, the Department has hired 40 former welfare recipients (FERC has hired an additional one), which exceeds the goal of 20. We are on track to hire 55 by the end of FY 2000.

Assessment: Fully Successful

- *Implementing a DOE-wide employee accessible automated personnel system by December 1998.*

Results: Implementation of the Corporate Human Resource Information System (CHRIS) is on target for providing a new automated system for processing personnel actions. With the completion of Phase I activity, a solid foundation of employee and position information will exist from which employees and managers can access a variety of information by December 1998. A phased approach to direct information access, to include employee self-service centers at appropriate locations across the DOE complex, will be utilized until program and field offices have the hardware and software infrastructure in place to enable desktop access for every employee and manager.

Assessment: Successful

- *Expanding the use of Alternate Dispute Resolution by 30 percent compared to FY 1997 in mediation of workplace disputes such as EEO complaints and grievances.*

Results: The use of Alternate Dispute Resolution has been expanded and the Office of Dispute Resolution has had over 40 cases referred for mediation through the end of FY 1998. This is an increase of almost 100 percent which exceeds the fiscal year goal.

Assessment: Fully Successful

- *Using the Malcom Baldrige, President's, or Energy Quality Award Criteria, demonstrating continuous organizational improvement by achieving self-assessment scores of at least 300.*

Results: We increased our average score from 359 in FY 1997 to 457 in FY 1998 which exceeded the goal. The metric used is a composite score calculated from using the median scores of each applicant for each category, and then summing over the seven categories. In this way, we get a consistent measure from year to year.

Assessment: Fully Successful

CM 3-5 APPLYING BUSINESS-LIKE PRACTICES TO MANAGEMENT OF DOE PROJECTS AND ASSETS

Assessment: Successful

Description: Strengthen the management of projects, materials, facilities, land, infrastructure, and other assets, to ensure safe, sound, and cost- effective operations, appropriate maintenance of sites, and to ensure intended project results.

- ☐ Success will be measured by:

- *Meeting established project scope, schedule, and cost baselines by adopting systems based on industry and government best project management practices.*

Results: The Department's field offices are using CM3-5 to strengthen project management systems using best practices in planning and control of project scope, schedule, and cost baselines. Currently, operations offices are reporting they are attaining their annual project scope, schedule, and cost goals on projects; the overall average 94.1 percent calculated is an indicator that best practices based on systems used in industry and

government are in use. Several examples of best practices being used include:

- a site-wide configuration management system has been implemented at Savannah River Office;
- bi-weekly safety and performance site walk-through audits are conducted at area offices in the Chicago Operations Office;
- a site wide system to measure progress toward meeting the baselines for both current (execution year) as well as life cycle is in use at the Richland Operations Office;
- a first-of-its-kind contract which takes advantage of existing material assets to offset the cost of doing work by the contractor is now underway at Oak Ridge Operations Office .

Assessment: Successful

- *Conducting annual business management self-assessments to ensure that sites are maximizing their resources and maintaining safe and secure operations.*

Results: All operations offices report employing on-going project management systems self-assessment and review processes.

Assessment: Successful

CM 3-6 ENSURING THE DEPARTMENT'S INFORMATION SYSTEMS ARE BASED ON COST EFFECTIVE TECHNOLOGY SOLUTIONS

Assessment: Successful

Description: Utilize, under the auspices of the Chief Information Officer (CIO), an integrated Department-wide framework for planning, budgeting, evaluating, and implementing information management requirements to reduce costs and improve operations.

☐ Success will be measured by:

- *Establishing, by October 1997, the Capital Planning Information Technology Investment Board and operationalize the requirements of the Clinger-Cohen Act of 1996.*

Results: The Executive Committee for Information Management (ECIM) approved the Charter in April 1998 assigning the Capital Planning Information Technology Investment Board responsibilities to the ECIM. In addition, they approved a two-tier approach to capital planning at the Department. The recommendation will be presented to the Office of Management and Budget (OMB) in October 1998. The Department is implementing the DOE Information Technology capital planning process.

Assessment: Successful

- *Starting the implementation of a five-year information management plan and producing annual operational plans as part of the Department's budget process.*

Results: The five-year plan for information management is reflected in the Department's Information Management Strategic Plan which was prepared in September 1997. It is updated approximately every three years. Implementation was begun the first quarter of FY 1998 with teams established for each goal and status given on the implementation at the quarterly Information Management (IM) Council meetings. Annual operating plans are prepared in the September timeframe and we produced one in September of 1998 for FY 1999.

Assessment: Fully Successful

- *Implementing, by January 1998, a Department- wide information architecture with supporting standards to foster $100 million in cost avoidances over the next five years.*

Results: The Department-wide Information Architecture (defined in Volumes I-IV and 3 Standards documents) began implementation with the publication of the Guidance document in April 1997. Information architectures are being completed in four programs and five field sites. Additionally, information architectures are being developed/implemented at seven contractor sites. Cost savings/avoidances attributed to the Departmental information architecture include savings from using the TELIS contract, the Corporate Human Resource Information System (CHRIS), etc. We are on track to save $100 million over the next five years.

Assessment: Successful

- *All Departmental elements implementing Year 2000 century date change compliant mission-essential computer systems in accordance with the milestones, guidance, and procedures established by the CIO.*

Results: The Department is slightly ahead of its implementation timeline. Each Program Office is aware of the importance of the year 2000 effort and is working to be compliant according to our timeline. Secretarial Officers will inform the Deputy Secretary of milestones that have been missed or are projected to be missed based on discussion at the Executive Committee for Information Management (ECIM). The CIO will continue to report year 2000 status. The next reporting cycle for the Office of Management and Budget is November 15, 1998.

Assessment: Successful

CM 3-7 MANAGING DIVERSITY TO ACHIEVE THE DEPARTMENT'S MISSION

Assessment: Partially Successful

Description: Create a model organization that fosters and embraces diversity by committing to equity, inclusion, opportunity, accommodation, and non-discrimination.

❒ Success will be measured by:

- *Conducting an employee needs survey in order to enhance diversity and determine future strategic direction.*

Results: We have conducted a random sampling of approximately 300 HQ employees, with approximately more than one-half returns. We must now review the survey responses and analyze the results. This analysis will play a key role in determining future diversity strategies.

Assessment: Partially Successful

- *Evaluating contractor plans and performance to assure full implementation of the Diversity Contract Clause.*

Results: One new management and operating contract awarded January 1, 1998. Evaluation of contractor's plan and performance is scheduled for January 1999. ED will gather data on Diversity Contract Clause implementation on new contracts as they are awarded. At this time, it is too early to assess the outcome provided.

Assessment: Unspecified

- *Diversifying America's science workforce by enhancing opportunities for minority educational institutions and increasing their awards by 20 percent over FY 1997.*

Results: The Department was committed to achieving its long-term goal to enhance opportunities for minority educational institutions by targeting $93,494,400 (a 20 percent increase in funding over 1998) to diversify America's science workforce. The intent was to integrate more minority educational institutions with our technical and scientific operations. However, the goal was unsuccessful because Departmental program offices failed to meet the projected funding goal for the overall program. As a result, actual funding levels indicated a significant decrease from the FY 1998 target levels.

However, more effective goals and strategies will be developed with the objective of achieving our overall targets.

Assessment: Unsuccessful

CM 3-8 MANAGING CONTRACTOR WORK FORCE RESTRUCTURING

Assessment: Successful

Description: Mitigate the impacts on workers and communities from contractor work force restructuring and assist community planning.

❒ Success will be measured by:

- *Implementing a single Department-wide automated contractor workforce employment data system.*

Results: The Work Force Information System is in its final development stage. User training has been provided to DOE and contractor employees in Washington, D.C.; Oak Ridge, TN; Las Vegas, NV; and Albuquerque, NM. The user training conducted at Albuquerque included DOE and contractor personnel from the following Federal sites: Albuquerque, Idaho, Oakland, and Ohio. Also, several contractor personnel, reporting to Richland, Rocky Flats, and Savannah River Offices, were in attendance.

Assessment: Successful

- *Achieving annual recurring cost savings from separated workers that are at least three times the one time cost of separation.*

Results: The Department estimates that within this fiscal year there have been approximately 3,000 separations across the complex with separations costs of approximately $50 million and an estimated total cost savings of $215 million, a ratio of 4.3 to 1.

Assessment: Fully Successful

- *Supporting local community transition activities that will create 8,000 to 12,000 new private sector jobs by the end of FY 1998.*

Results: As of June 30, 1998, over 14,000 jobs have been created or retained. These figures were verified by the independent assessment performed by Booz-Allen & Hamilton, Inc., at the direction of the U.S. Congress.

Assessment: Fully Successful

U.S. Department of Energy
Office of Inspector General
Office of Audit Services

REPORT OF THE OFFICE OF INSPECTOR GENERAL ON THE DEPARTMENT'S INTERNAL CONTROLS

The Secretary
U.S. Department of Energy

We have audited the accompanying consolidated balance sheets of the U.S. Department of Energy (Department) as of September 30, 1998 and 1997, and the related consolidated statements of net cost, changes in net position, budgetary resources, financing, and custodial activity for the years then ended and have issued our report thereon dated January 5, 1999. We conducted our audits in accordance with generally accepted auditing standards; *Government Auditing Standards* issued by the Comptroller General of the United States; and Office of Management and Budget (OMB) Bulletin No. 98-08, *Audit Requirements for Federal Financial Statements*, as amended.

In planning and performing the audit, we considered the Department's internal controls over financial reporting by obtaining an understanding of the significant internal control policies and procedures, determining whether they had been placed in operation, assessing control risk, and performing tests of controls in order to determine our auditing procedures for the purpose of expressing our opinion on the financial statements. Our procedures were not designed to provide assurance on the internal controls over financial reporting. Consequently, we do not provide an opinion on internal controls.

Our consideration of the internal controls over financial reporting would not necessarily disclose all matters that might be reportable conditions. Under standards issued by the American Institute of Certified Public Accountants, reportable conditions are matters coming to our attention relating to significant deficiencies in the design or operation of the internal controls that, in our judgment, could adversely affect the Department's ability to record, process, summarize, and report financial data consistent with the assertions by management in the financial statements. Material weaknesses are reportable conditions in which the design or operation of one or more of the internal control components does not reduce to a relatively low level the risk that misstatements in amounts that would be material in relation to the financial statements being audited may occur and not be detected within a timely period by employees in the normal course of performing their assigned functions.

We noted certain matters, discussed in Exhibits I and II to this report, involving the system of internal controls and its operation that we consider to be reportable conditions. We considered the condition reported in Exhibit I to be a material weakness.

In addition, we considered the Department's internal controls over Required Supplementary Stewardship Information (RSSI). Our consideration included determining whether the internal controls over RSSI had been placed in operation, assessing control risk, and performing tests of controls as required by OMB Bulletin No. 98-08, as amended. Our procedures were not designed to provide assurance on the internal controls over RSSI. Accordingly, we do not provide assurance on such controls.

Finally, with respect to internal controls related to performance measures reported in the Overview to the FY 1998 consolidated financial statements, we obtained an understanding of the design of significant internal controls relating

to the existence and completeness assertions as required by OMB Bulletin No. 98-08, as amended. Our procedures were not designed to provide assurance on internal controls over reported performance measures, and accordingly, we do not provide an opinion on such controls. However, we noted certain significant deficiencies in the presentation of reported performance measures, which are discussed in Exhibit II. In our judgment, these deficiencies could adversely affect the meaningfulness of the programmatic performance measures presented in the FY 1998 consolidated financial statements.

The audit also disclosed a number of other conditions relating to the Department's internal controls that we did not consider to be reportable conditions and that did not materially affect the Department's financial statements. These matters will be communicated to the Chief Financial Officer and to the heads of field elements in separate reports. The recommendations made in these reports are designed to strengthen internal controls or improve operating efficiencies.

In evaluating internal controls, we considered matters reported by the Department in compliance with the Federal Managers' Financial Integrity Act of 1982, our prior and current audit reports, and other independent auditor reports on financial matters and internal accounting control policies and procedures. The Appendix to this report lists operational audit reports published by the Office of Inspector General during Fiscal Year 1998 that were considered in our evaluation of internal controls.

This report is intended for the information of the management of the U.S. Department of Energy, OMB, and the Congress. However, this report is a matter of public record and its distribution is not limited.

Office of Inspector General

January 5, 1999

Exhibit 1.
Material Weakness Finding and Recommendations

Environmental Remediation Liabilities

Background: The Department's estimate of environmental liabilities should reflect future costs associated with remediation of environmental contamination existing as of the last day of the fiscal year. As of September 30, 1998, the Department reported total environmental liabilities of $186 billion. The Environmental Management (EM) portion of this environmental liabilities estimate accounts for over $145 billion in liabilities. The EM portion of the estimate was primarily based on an analysis of the technical scope, cost, and schedule required to complete remediation of environmental contamination. This estimate was communicated in June 1998 by EM's *Accelerating Cleanup: Paths to Closure* (Paths to Closure). Paths to Closure includes cost estimates for completing 353 separate projects at 12 different Departmental sites.

Paths to Closure reflects the most recent evolution of the Department's efforts to estimate the scope, cost, and schedule to complete the cleanup program. The Department deserves much credit for its efforts; however, additional improvements are needed. These efforts began with the first Baseline Environmental Management Report (BEMR) issued in 1995. This was the first systematic effort to document the scope and life-cycle costs of the cleanup program and formed the basis for the Department's environmental liabilities estimate for the Fiscal Year 1995 consolidated financial statements. A second BEMR was issued in 1996 and was the basis for Fiscal Year 1996 consolidated financial statements.

During the latter part of Fiscal Year 1996, the Department embarked on a new vision and strategy for addressing the environmental cleanup of its sites. This new strategy was reported in a June 1997 Discussion Draft, *Accelerating Cleanup: Focus on 2006* (2006 Plan). The 2006 Plan followed up on efforts to improve the BEMR process and was designed to accelerate cleanup and reduce costs. The 2006 Plan, which evolved into the Paths to Closure, provided project-by-project work plans at each site. Compared to the original BEMR effort, the 2006 Plan and the Paths to Closure were more project-driven and used site-specific, end-state assumptions.

Although efforts were made to improve the 2006 Plan over the BEMR, last year the Office of Inspector General reported a material weakness regarding the controls over estimating the Department's environmental liabilities. Specifically, the 2006 Plan data was not updated to fiscal yearend. Also, Headquarters' comments questioning the completeness and accuracy of the 2006 Plan were not addressed, and the 2006 Plan did not contain provisions for uncertainties surrounding potential delays and capacity issues at planned waste disposal sites and the availability of privatization funding.

Exhibit 1 (continued).
Material Weakness Finding and Recommendations

Finding 1: Cost Estimates for Environmental Liabilities

The Department's estimate of environmental liabilities should be adequately supported, complete, and updated periodically when there is evidence that a material change has occurred. As a component of its overall system of internal controls, the Department is responsible for establishing controls to provide reasonable assurance that estimates supporting accruals of unfunded environmental liabilities are complete and readily verifiable. The Department's system for estimating environmental remediation costs did not completely and accurately capture the Department's environmental liabilities as of September 30, 1998. EM cost estimates were not always supported, complete, or updated. The following are examples of the problems our audit identified.

At the time of our review, the Department could not provide adequate documentation to support the cost estimates and cost estimating methodologies for 7 out of 28 project cost estimates tested. The seven project cost estimates had insufficient or no support. Specifically, management could not determine the method used to create the estimate or the support provided differed materially from the Paths to Closure estimates. In response to this finding, the Department developed new estimates for three of the seven projects that were not adequately supported.

Valid environmental liabilities were excluded from the estimate. These costs were for security, waste disposal, long-term storage of surplus special nuclear materials, long-term surveillance and monitoring, and decontamination and decommissioning. In addition, we identified costs that should not have been included in the environmental liabilities estimate. These costs were primarily for non-EM newly generated waste. In addition, the environmental liabilities estimate contained costs that were also reported in a separate financial statement line item as contractor post-retirement benefits. In response to this finding, the Department made several adjustments to the environmental liabilities estimate to address these issues.

Paths to Closure project cost estimates were based on data submitted to Headquarters in February 1998. They were not fully updated through the end of the fiscal year for significant changes. Changes have been made in contracting strategies and technical approaches since the February submittal. However, the Department had not adequately evaluated the impacts or made appropriate adjustments. Also, the approval process used to update the cost estimate at four of the six operations/field offices tested was either not in place or was not operating effectively. In response to this finding, the Department made several adjustments that addressed updating the environmental liabilities estimate.

Established cost estimating guidelines were not consistently applied. Such guidelines were not always used for calculating contingency and site overhead costs.

While the Department has taken some corrective action, enhancements to the overall system of internal controls are still necessary. The Department needs to ensure that its environmental liabilities estimate is fully supported, complete, and updated for material changes. Without such enhancements, there is increased risk that a material misstatement of the Department's environmental liabilities estimate existed and was not detected.

Exhibit 1 (continued).
Material Weakness Finding and Recommendations

Recommendations:

The Acting Assistant Secretary for Environmental Management should institute a system of internal controls over the Paths to Closure project cost estimates that will ensure the estimates are adequately supported, complete, and updated. Specifically, the Acting Assistant Secretary for Environmental Management should:

1. Include in its Paths to Closure update guidance the following requirements:

   Cost estimates must be accompanied by adequate support that will be maintained throughout the audit cycle.
   Cost estimates must be complete.
   Before providing cost estimates to the field financial personnel, cost estimates must be updated to fiscal yearend for material changes in scope, costs, or schedule.

2. Clarify guidance on the use of contingencies in cost estimates.

3. Institute a quality assurance or validation process at each site for the Paths to Closure process to ensure that the guidance is being followed.

In addition, the Chief Financial Officer should direct field financial personnel to:

Review EM Program estimates and site specific Paths to Closure documentation to identify valid costs excluded and invalid costs included in site estimates in accordance with Federal accounting standards.

Work with site program officials to identify material changes in scope, costs, or schedule for cleanup and initiate adjustments to the site liabilities as appropriate.

Ensure baseline changes are incorporated in site estimates.

Management Reaction:

Management generally concurred with the audit recommendations. The EM program indicated that it is actively working to improve the quality of data to support the environmental liabilities cost estimate by implementing a more formal change control process to document revisions to project baselines and other supporting documentation. EM is also pursuing various baseline validation strategies. EM recognizes that more rigor is needed regarding the level of detail and inconsistencies of data supporting the life-cycle cost estimate. The iterative nature of this process will lead to improved data quality and internal control systems. In addition, the Office of Chief Financial Officer (CFO) has agreed to collaborate with EM and bring an accounting perspective to identifying the Department's environmental liabilities. EM and the CFO intend to place additional emphasis on updating site estimates through yearend where material adjustments have occurred.

Auditor Comments:

The Office of Inspector General recognizes the difficulties associated with estimating the Department's environmental liabilities. Management's planned actions are responsive to our recommendations.

Exhibit 2.
Reportable Condition Finding and Recommendation

Performance Measurement Reporting

Background: In accordance with OMB Bulletin No. 97-01, *Form and Content of Agency Financial Statements*, as amended, each annual financial statement should include a narrative overview of the reporting entity. This overview should provide a clear and concise description of the reporting entity, its mission, activities, accomplishments, and overall financial results and condition. It should also include information on whether and how the mission of the reporting entity is being accomplished.

The Department's FY 1998 consolidated financial statements presented performance measure data for each of the Department's business lines in the Overview section. The performance data presented in FY 1998 was based primarily on commitments drawn from the Department's Strategic Plan and the Secretary's Performance Agreement with the President. The Overview presented the Department's commitments, planned goals necessary to accomplish the commitments, and results achieved during the fiscal year.

Our FY 1997 audit of the Department's consolidated financial statements identified that in many cases the usefulness of the programmatic performance measures presented in the Overview to the financial statements was limited. (See Office of Inspector General Report No. IG-FS-98-01.) Management generally concurred with the recommendation and agreed to take corrective action to improve the presentation of the Overview and performance measures. Despite efforts to improve the Overview, problems with its presentation continued.

Finding 2: Performance Measure Reporting

OMB guidance requires the Overview to the financial statements to communicate whether and how the Department is accomplishing its missions using explicit measures of performance. OMB Bulletin No. 97-01, as amended, and Statement of Federal Financial Accounting Concepts No. 2 (SFFAC) require that measures presented in the financial statements contain certain attributes in order to be useful to its readers. In addition, OMB guidance requires that (1) programmatic measures be organized to show how the program's major objectives and most valued attributes have been achieved and (2) entities should strive to develop and report objective measures that, to the extent possible, provide information about the cost effectiveness of programs. However, in many cases the meaningfulness of the programmatic performance measures presented in the Overview was limited. For example, the Overview generally excluded:

Information regarding the Federal Energy Regulatory Commission and the Department's Power Marketing Administrations;

Cost-effectiveness attributes, as costs were not tied to outputs; and

Explanatory information needed to help readers understand the significance of the measures.

We also found instances where the results reported in the Overview were not consistent with the financial statements as follows:

Exhibit 2 (continued).
Reportable Condition Finding and Recommendation

The total FY 1998 budgeted amount presented in the Overview did not agree with the Department's statement of budgetary resources.

The Overview explained that methods were used to control the life-cycle costs of environmental cleanup as well as the operating costs for the Department. However, the financial statements showed that both the overall environmental liabilities and the associated operating costs increased during the fiscal year.

The meaningfulness of the performance measures was limited because the Department's method of summarizing data from the Strategic Plan and the Performance Agreement with the President did not focus on the measurement of performance against goals and, in many cases, eliminated essential detailed goal information. As a result, the Department's presentation method for the Overview limited the readers' ability to assess the Department's performance during Fiscal Years 1997 and 1998.

Recommendation:
The Chief Financial Officer, in conjunction with the Office of Policy, should ensure that the Overview communicates whether and how the Department is accomplishing both its long-term and short-term goals and objectives.

Management Reaction:
Management generally concurred with the recommendation. The Department is committed to improving the Overview and believes that the presentation of the 1998 performance information is an improvement over 1997. The Department intends to improve future reports and increase the usefulness of the performance information presented in the Overview. The Department's next step is to develop performance measures that better present trend data as part of the strategic planning effort in FY 1999.

Auditor Comments:
Management's planned actions are responsive to our recommendation.

Appendix.
Office of Inspector General Fiscal Year 1998 Audit Reports

Report Number	Report Title	Date Report Issued
IG-0412	Audit of the Contractor Incentive Program at the Nevada Operations Office	October 20, 1997
IG-0413	Audit of Funding for Advanced Radioisotope Power Systems	October 17, 1997
IG-0414	Audit of the Department of Energy's Management of Field Contractor Employees Assigned to Headquarters and Other Federal Agencies	December 5, 1997
IG-0415	Audit of Departmental Receipt of Final Deliverables for Grant Awards	December 4, 1997
IG-0416	Audit of Support Services Subcontracts at Argonne National Laboratory	December 23, 1997
IG-0417	Audit of the Department of Energy's Management of Research and Development Integration	March 13, 1998
IG-0418	Audit of Alternatives to Testing at the Tonopah Test Range	March 13, 1998
IG-0419	The Department of Energy's Peer Review Practices	April 6, 1998
IG-0420	The U.S. Department of Energy's Solar Enterprise Zone	April 24, 1998
IG-0421	The Department of Energy's Interagency Agreement With the National Institute of Environmental Health Sciences	July 17, 1998
IG-0422	The U.S. Department of Energy's Participation in the Partnership for a New Generation of Vehicles Program	July 21, 1998
IG-0423	Review of the U.S. Department of Energy's Information Management System	August 7, 1998
IG-0424	Architect and Engineering Costs at Los Alamos and Sandia National Laboratories	August 7, 1998
IG-0425	The U.S. Department of Energy's Facility Reuse at the Rocky Flats Environmental Technology Site	August 20, 1998
IG-0426	Disposal of Low-Level and Low-Level Mixed Waste	September 3, 1998
IG-0427	Department of Energy's Prime Contractor Fees on Subcontractor Costs	September 11, 1998

Appendix.
Office of Inspector General Fiscal Year 1998 Audit Reports

Report Number	Report Title	Date Report Issued
CR-B-98-02	Audit of Management of the Laboratory Directed Research and Development Program at the Lawrence Livermore National Laboratory	November 14, 1997
ER-B-98-01	Audit of the Deactivation, Decontamination, and Disposal of Surplus Facilities at the Savannah River Site	October 23, 1997
ER-B-98-02	Audit of Environmental Monitoring and Health Physics Laboratories at the Savannah River Site	November 3, 1997
ER-B-98-03	Audit of the Union Valley Sample Preparation Facility at Oak Ridge	November 7, 1997
ER-B-98-04	Audit of Selected Government-funded Grants and Contracts at Princeton University	December 2, 1997
ER-B-98-05	Audit of the Department of Energy's Contracts With Envirocare of Utah, Inc.	December 10, 1997
ER-B-98-06	Audit of Fluor Daniel Fernald's Use of Temporary Service Subcontractors	April 6, 1998
ER-B-98-07	Audit of Personal Property at the Oak Ridge Operations Office and the Office of Scientific and Technical Information	April 6, 1998
ER-B-98-08	Audit of the Cost Reduction Incentive Program at the Savannah River Site	June 2, 1998
ER-B-98-09	Audit of Disposal of Tritium Residues at the Los Alamos National Laboratory	July 20, 1998
WR-B-98-01	Audit of the Radioactive Liquid Waste Treatment Facility Operations at the Los Alamos National Laboratory	November 19, 1997
WR-B-98-02	The U.S. Department of Energy's Management of Associated Western Universities Grant Programs	April 8, 1998
HQ-B-98-01	Audit of the U.S. Department of Energy's Value Engineering Program	July 17, 1998

U. S. Department of Energy
Office of Inspector General
Office of Audit Services

REPORT OF THE OFFICE OF INSPECTOR GENERAL ON COMPLIANCE WITH LAWS AND REGULATIONS

The Secretary
U.S. Department of Energy

We have audited the accompanying consolidated balance sheets of the U.S. Department of Energy (Department) as of September 30, 1998 and 1997, and the related consolidated statements of net cost, changes in net position, budgetary resources, financing, and custodial activity for the years then ended and have issued our report thereon dated January 5, 1999.

We conducted our audit in accordance with generally accepted auditing standards; *Government Auditing Standards* issued by the Comptroller General of the United States; and Office of Management and Budget (OMB) Bulletin No. 98-08, *Audit Requirements for Federal Financial Statements*, as amended. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatements. Providing an opinion on compliance with certain provisions of laws and regulations was not an objective of our audit, and accordingly, we do not express such an opinion.

The management of the Department is responsible for complying with applicable laws and regulations. As part of obtaining reasonable assurance about whether the financial statements were free of material misstatements, we performed tests of compliance with certain provisions of laws and regulations, noncompliance with which could have a direct and material effect on the determination of financial statement amounts, and certain other laws and regulations specified in OMB Bulletin No. 98-08, as amended, including the requirements referred to in the Federal Financial Management Improvement Act (FFMIA) of 1996.

The results of our tests of compliance with the laws and regulations described in the preceding paragraph, exclusive of FFMIA, disclosed no instances of noncompliance required to be reported under *Government Auditing Standards* and OMB Bulletin No. 98-08, as amended.

Under FFMIA, we are required to report whether the Department's financial management systems substantially comply with the Federal financial management systems requirements, applicable accounting standards, and the United States Government Standard General Ledger at the transaction level. To meet this requirement, we performed tests of compliance using the implementation guidance for FFMIA included in Appendix D of OMB Bulletin No. 98-08, as amended. The results of our tests disclosed no instances where the Department's financial management systems did not substantially comply with these three requirements.

This report is intended for the information of the U.S. Department of Energy, OMB, and the Congress. However, this report is a matter of public record, and its distribution is not limited.

Office of Inspector General

January 5, 1999

Mapping of Legal Requirements

Reference Index

ACCOUNTABILITY REPORT READER RESPONSE SHEET

We ask your opinion on whether the financial and program information presented is clear, conside and useful. We solicit your ideas to make the presentations more effective. Please fax (301) 903-2550 or mail to : Department of Energy, CR-30, 19901 Germantown Road, Germantown, MD 20874. We value your opinion and will try to improve next year's report based on your response. Thanks for your help.

Please identify yourself by checking appropriate box:

[ ] **CFO/Deputy CFO** [ ] **Program Official**
[ ] **OMB/Treasury/GAO** [ ] **Congressional Staff**
[ ] **IG** [ ] **Other** _____

Please rate the following on a scale of 1 through 5 by checking appropriate box.

Totally Disagree Totally Agree No Opinion
1----------5 X

I. OVERALL IMPRESSION:

1. The report is easy to read.
1[ ] 2[ ] 3[ ] 4[ ] 5[ ] X[ ]

2. The report is balanced, presenting both positive and negative results.
1[ ] 2[ ] 3[ ] 4[ ] 5[ ] X[ ]

3. The report compares favorably with private sector corporate reports.
1[ ] 2[ ] 3[ ] 4[ ] 5[ ] X[ ]

II. PROGRAM PERFORMANCE:

4. The Department's missions and goals are prominently displayed leaving the reader with a view of "where the Department is going."
1[ ] 2[ ] 3[ ] 4[ ] 5[ ] X[ ]

5. The Department's performance information gives the reader a view of "where the Department currently is" in accomplishing its missions and goals.
1[ ] 2[ ] 3[ ] 4[ ] 5[ ] X[ ]

6. Management Control Weaknesses (FMFIA) are integrated with the mission performance data.
1[ ] 2[ ] 3[ ] 4[ ] 5[ ] X[ ]

7. Audit Follow-ups (IG Act Amendments) are integrated with the mission performance data.
1[ ] 2[ ] 3[ ] 4[ ] 5[ ] X[ ]

8. The report leaves you with a feeling of whether the Department is "achieving its mission."
1[ ] 2[ ] 3[ ] 4[ ] 5[ ] X[ ]

9. The Prompt Payment Act, Civil Monetary Penalty, and Debt Management Data are integrated well into the report.
1[ ] 2[ ] 3[ ] 4[ ] 5[ ] X[ ]

III. GRAPHICS:

10. The graphics are easily understood.

1[ ] 2[ ] 3[ ] 4[ ] 5[ ] X[ ]

11. The trends presented graphically are adequately explained in the accompanying narrative.

1[ ] 2[ ] 3[ ] 4[ ] 5[ ] X[ ]

IV. FINANCIAL:

12. The report gives you a clear understanding of the financial condition of the Department's appropriations and funds.

1[ ] 2[ ] 3[ ] 4[ ] 5[ ] X[ ]

13. Financial Statements and Footnotes are informative and understandable.

1[ ] 2[ ] 3[ ] 4[ ] 5[ ] X[ ]

14. The Consolidating/Combining Statements and Supplemental Data sections are useful.

1[ ] 2[ ] 3[ ] 4[ ] 5[ ] X[ ]

15. The auditor's opinion is clear, concise, and understandable.

1[ ] 2[ ] 3[ ] 4[ ] 5[ ] X[ ]

V. BEST AND WORST FEATURES:

16. Is there anything you especially liked about the report?

17. Is there anything that can be improved upon in future reports?

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