



MANAGEMENT'S DISCUSSION AND ANALYSIS

Operating Principles

ENSURE SAFE, SECURE, AND ENVIRONMENTALLY
RESPONSIBLE OPERATIONS

ACT WITH A SENSE OF URGENCY

WORK TOGETHER

TREAT PEOPLE WITH DIGNITY AND RESPECT

MAKE THE TOUGH CHOICES

KEEP OUR COMMITMENTS

EMBRACE INNOVATION

ALWAYS TELL THE TRUTH

DO THE RIGHT THING

— History and Mission —

Our Mission

DISCOVERING THE
SOLUTIONS TO POWER AND
SECURE AMERICA'S FUTURE



Our Vision

A UNIFIED DEPARTMENT OF ENERGY
THAT KEEPS ITS COMMITMENTS
TO ACHIEVE RESULTS FOR AMERICA



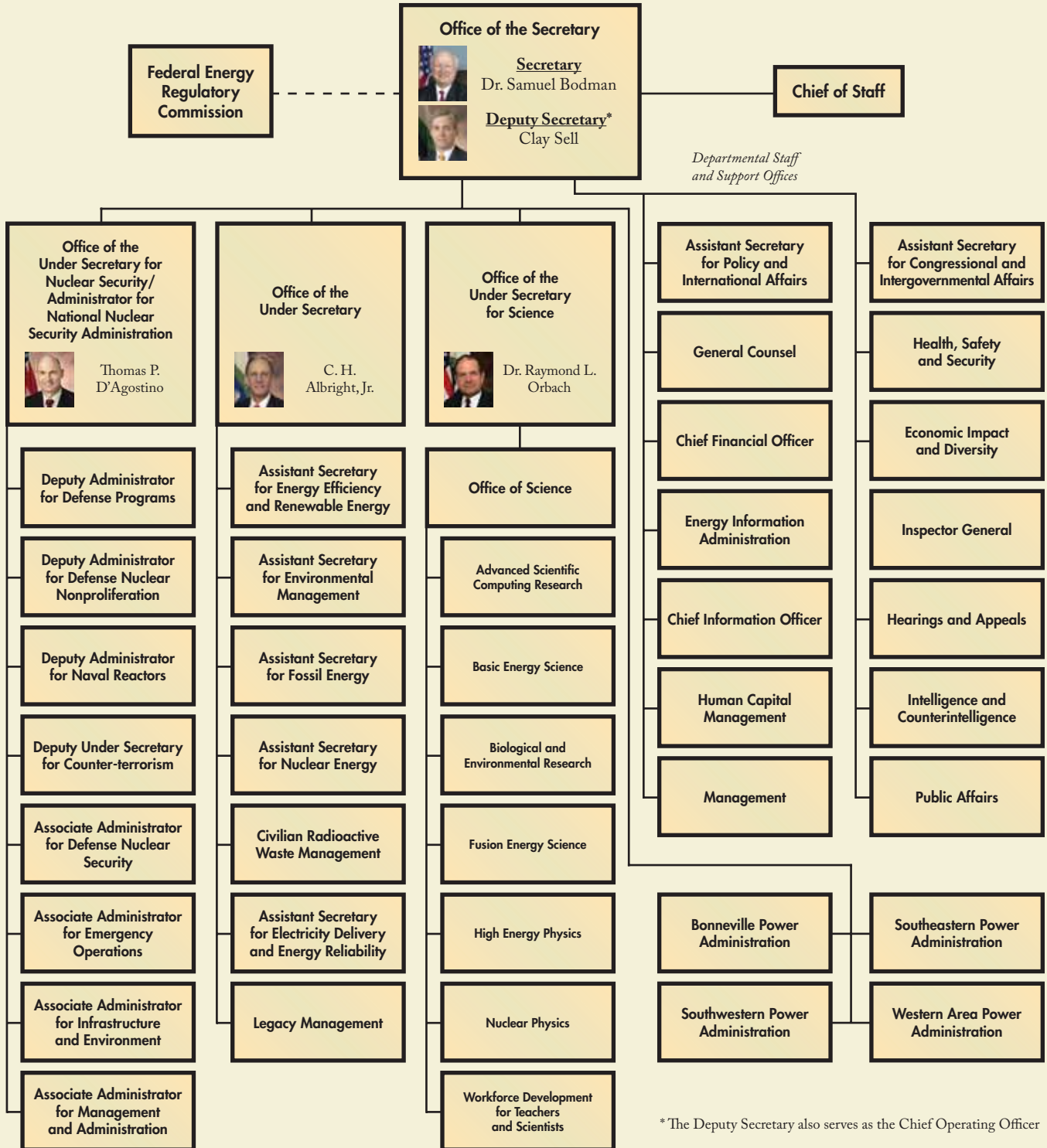
The Department has one of the richest and most diverse histories in the Federal Government, with its lineage tracing back to the Manhattan Project and the race to develop the atomic bomb during World War II. Following that war, Congress created the Atomic Energy Commission in 1946 to oversee the sprawling nuclear scientific and industrial complex supporting the Manhattan Project and to maintain civilian government control over atomic research and development. During the early Cold War Years, the Commission focused on designing and producing nuclear weapons and developing nuclear reactors for naval propulsion. The creation of the Atomic Energy Commission ended the exclusive government use of the atom and began the growth of the commercial nuclear power industry, with the Commission having authority to regulate the new industry.

In response to changing needs and an extended energy crisis, the Congress passed the *Department of Energy Organization Act* in 1977, creating the Department of Energy. That legislation brought together for the first time, not only most of the government's energy programs, but also science and technology programs and defense responsibilities that included the design, construction and testing of nuclear weapons. The Department provided the framework for a comprehensive and balanced national energy plan by coordinating and administering the energy functions of the Federal Government. The Department undertook responsibility for long-term, high-risk research and development of energy technology, Federal power marketing, some energy conservation activities, the nuclear weapons programs, some energy regulatory programs, and a central energy data collection and analysis program.

Over its history, the Department has shifted its emphasis and focus as the energy and security needs of the Nation have changed. Today, the Department contributes to the future of the Nation by promoting our energy security, maintaining the safety and reliability of our nuclear stockpile, cleaning up the environment from the legacy of the Cold War, and developing innovation in science and technology.

— Organization Structure —

Organizational Highlights

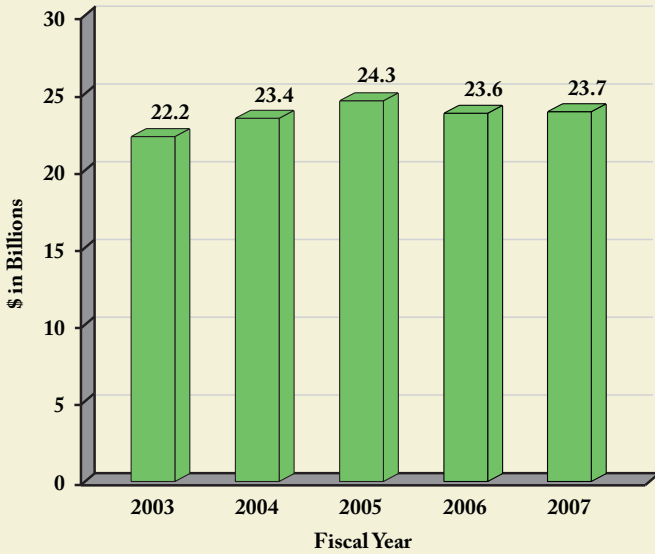


*The Deputy Secretary also serves as the Chief Operating Officer

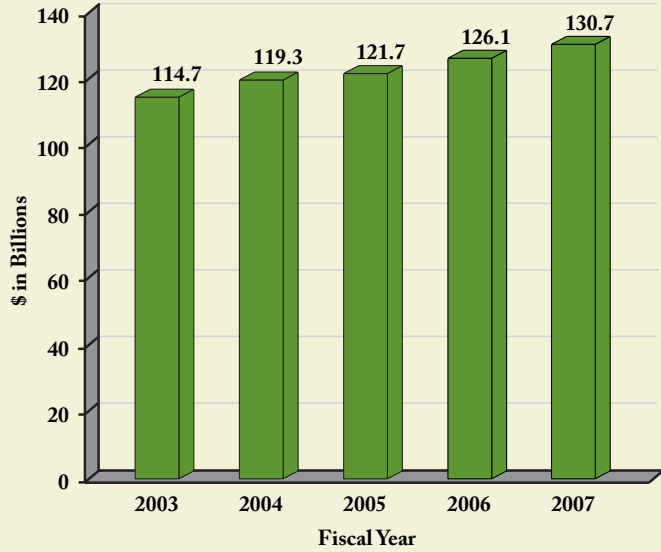
MANAGEMENT'S DISCUSSION AND ANALYSIS

Financial Resources

Adjusted Appropriated Amounts*



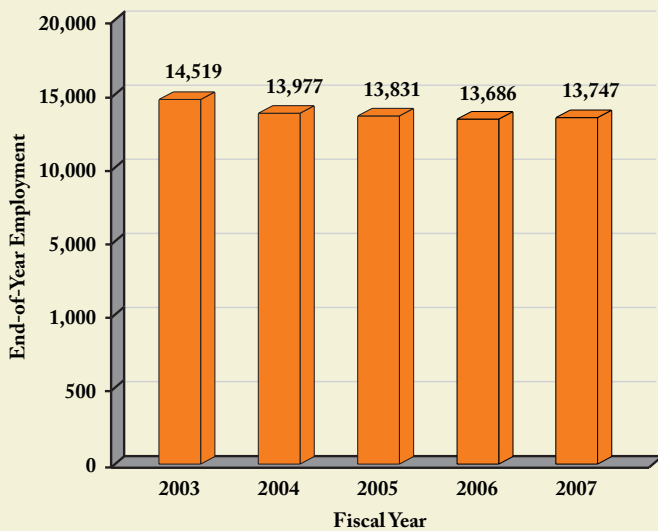
Assets



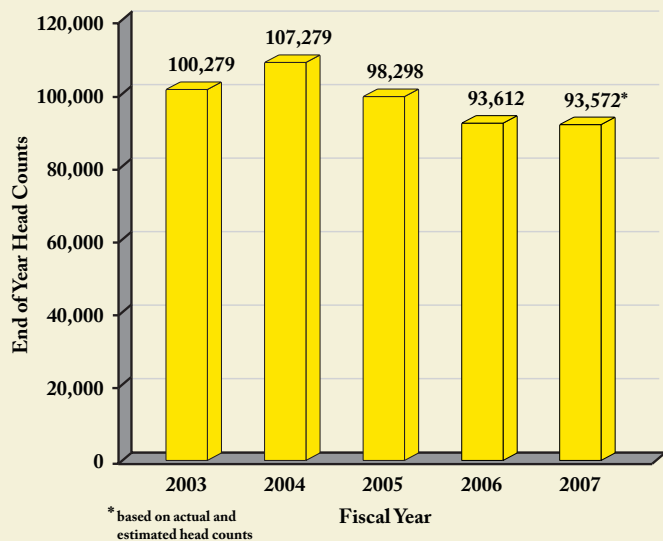
* Adjustments to the Department's operating plan include reprogrammings, transfers-in from other Federal agencies and rescissions.

Human Capital Resources

DOE Federal Employees

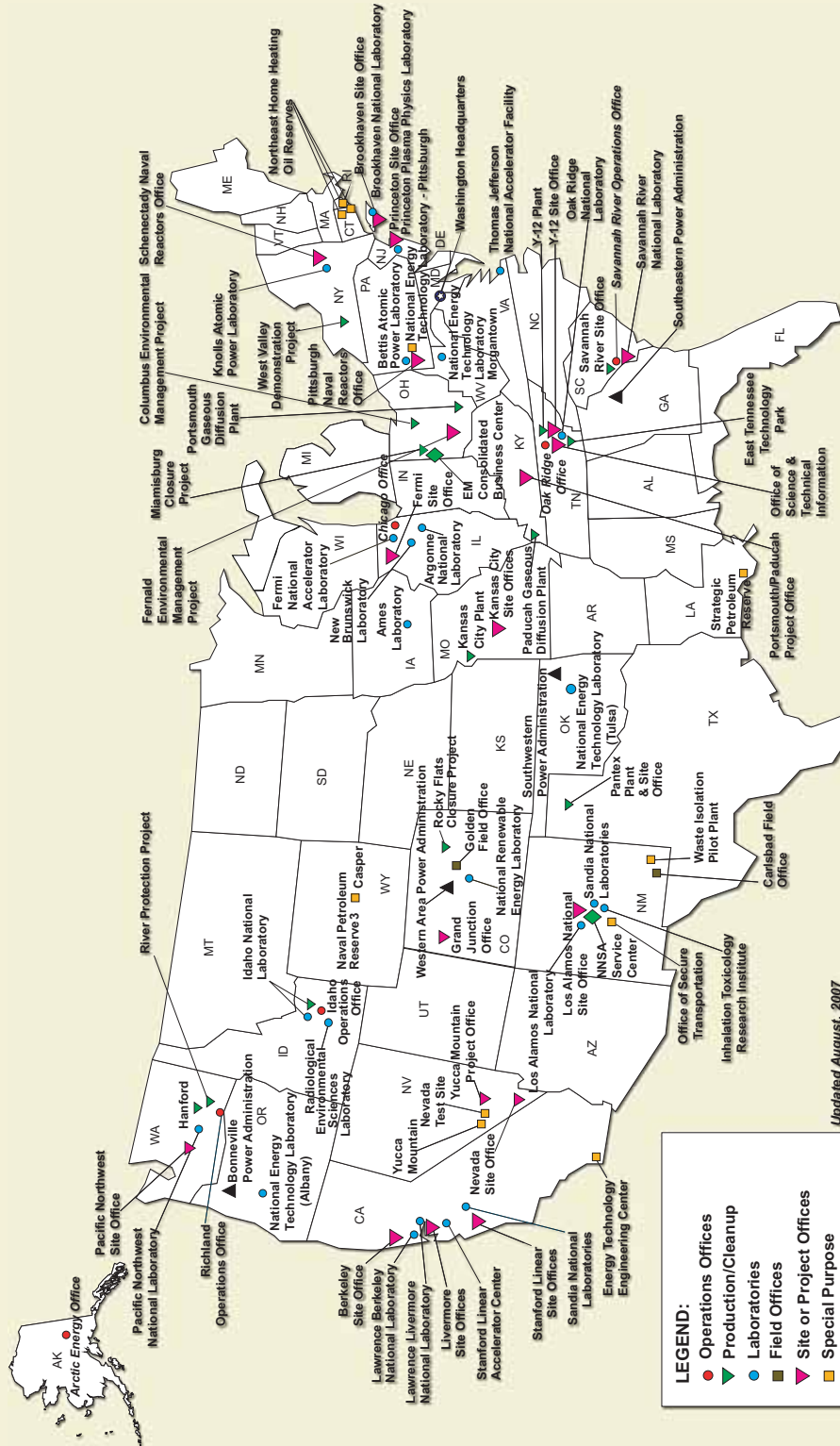


Contractor Employees



* based on actual and estimated head counts

— Major Laboratories and Field Facilities —



Updated August, 2007
NOTE: Location within each state is not to scale

— Strategic Themes and Goals —



In fiscal year (FY) 2006, the Department extended its commitment to the DOE mission by updating its Strategic Plan for FY 2007 and beyond. Under the new strategic road-map, the Department strives to deliver results

along five strategic themes and 16 strategic goals to achieve its mission. The performance, financial and other related information presented in this report is structured around these themes and goals. The Department's Strategic Plan can be viewed at www.energy.gov/about/strategicplan.htm.

Theme	Federal Employees*	Program Costs (\$ in millions)
Theme 1: Energy Security <i>Promoting America's energy security through reliable, clean and affordable energy.</i> Strategic Goals ① Energy Diversity ③ Energy Infrastructure ② Environmental Impacts of Energy ④ Energy Productivity	6,663	\$6,552
Theme 2: Nuclear Security <i>Ensuring America's nuclear security.</i> Strategic Goals ① Nuclear Deterrent ③ Nuclear Propulsion Plants ② Weapons of Mass Destruction	2,684	\$9,200
Theme 3: Scientific Discovery and Innovation <i>Strengthening U.S. scientific discovery, economic competitiveness and improving quality of life through innovations in science and technology.</i> Strategic Goals ① Scientific Breakthroughs ③ Research Integration ② Foundations of Science	1,117	\$4,004
Theme 4: Environmental Responsibility <i>Protecting the environment by providing a responsible resolution to the environmental legacy of nuclear weapons production.</i> Strategic Goals ① Environmental Cleanup ② Managing the Legacy	1,643	\$5,918
Theme 5: Management Excellence <i>Enabling the mission through sound management.</i> Strategic Goals ① Integrated Management ③ Infrastructure ② Human Capital ④ Resources	1,640	\$690

* These Federal employee numbers do not include 1,296 at the Federal Energy Regulatory Commission.

— Performance and Accountability Report Card —

Organizational Highlights

Score	Requirement or Initiative	Supporting Indicators	
G	Government Management Reform Act – Financial Statement Audit	• Audit Opinion – Unqualified Opinion	
G	Federal Managers’ Financial Integrity Act – Internal Controls (Section II) Financial Systems (Section IV)	• No Material Weakness (Section II) • Financial Systems generally conform to (Section IV) requirements and no FISMA significant deficiencies identified.	
G	OMB Circular A-123, Appendix A	Implementation: G	Remediation: G
G	Federal Financial Management Improvement Act (FFMIA)	• Substantially comply with Federal financial management system requirements	
Y	Federal Information Security Management Act (FISMA)	• No FISMA significant deficiencies identified, however, annual report identified continued problems (http://ig.energy.gov/documents/IG-0776.pdf)	
G	Improper Payments Information Act	• <1% Erroneous Payment Rate Not Considered Significant Risk by OMB	
President’s Management Agenda Scorecard www.Results.gov		Current Status as of September 30, 2007	Progress in Implementation
Human Capital		G	R
Competitive Sourcing		R	R
Financial Performance		R	G
E-Government		Y	Y
Performance Improvement		G	Y
Real Property		G	Y
<p>Green (G): Implementation is proceeding according to plan. Yellow (Y): Some slippage or other issue(s) requiring adjustment. Red (R): Initiative in serious jeopardy absent significant management intervention.</p>			

MANAGEMENT’S DISCUSSION AND ANALYSIS

— Departmental Goals and Key Activities —

The Departmental Goals and Key Activities listed below are connected to the Department's Strategic Themes through seven of the Department's 16 Strategic Goals.

The Department's performance programs are designed to achieve well-defined outcome goals that support the strategic goals of the Department's Strategic Plan (www.energy.gov/about/strategicplan.htm). Those strategic goals are organized around the five Departmental strategic themes: Energy Security, Nuclear Security, Scientific Discovery and Innovation, Environmental Responsibility and Management Excellence.

The following performance summary section discusses each of the Departmental Goals and Key Activities and provides a performance summary.

Each discussion identifies the progress made during the year, accomplishments and challenges in working to meet each of these goals and key activities. Background information is provided in each performance summary, including useful web links to provide the reader a clear perspective of what the Department is doing and why it's important for America. In February 2008, additional detailed performance information will be available in the Department's Annual Performance Report (APR) both on the web at www.energy.gov and in the Congressional Budget submission (www.mbe.doe.gov/crog/cf30.htm) to Congress.

Theme 1

Energy Security

Promoting America's energy security through reliable, clean, and affordable energy.

Advanced Energy Initiative (AEI)

The goal of the AEI is to achieve significant technology advancements that can, within the next decade, change the way Americans power their homes, businesses and vehicles, and over time, significantly reduce America's dependence on imported sources of energy. The Initiative includes activities in Nuclear Energy including the Global Nuclear Energy Partnership and Nuclear Power 2010, to promote the use of nuclear energy internationally and domestically; in Fossil Energy including the President's Coal Research Initiative and FutureGen, to improve and demonstrate options for near-zero atmospheric emission coal power; in Energy Efficiency and Renewable Energy including the Solar America Initiative and Biofuels Initiative to make photovoltaic and biofuels more competitive; and in Science including the ITER Fusion reactor.

Theme 2

Nuclear Security

Ensuring America's nuclear security.

Complex Transformation

The Department seeks to transform the nation's nuclear weapons stockpile by creating a supporting infrastructure more responsive to the threats of the 21st Century.

Material Security in Russia

The Department will continue to thwart nuclear terrorism through improved and increased material security in Russia and the former Soviet Union.

Improved Performance of the DOE Nuclear Weapons Complex

The Department seeks to improve the productivity and reliability of the nuclear weapons complex and reclaim the confidence of our customer at the Department of Defense (DoD).

Theme 3

Scientific Discovery and Innovation

Strengthening U.S. scientific discovery, economic competitiveness, and improving quality of life through innovations in science and technology.

American Competitiveness Initiative (ACI)

The ACI seeks to decisively strengthen American leadership in technology, innovation, and the global marketplace by doubling federal funding for basic research in the physical sciences over the next ten years.

Theme 4

Environmental Responsibility

Protecting the environment by providing a responsible resolution to the environmental legacy of nuclear weapons production.

Yucca Mountain

The Department is working to meet the government's obligation to accept spent nuclear fuel and build, license and operate the Yucca Mountain Repository.

Environmental Management (EM)

The Department seeks to reduce risk and cleanup of the environmental legacy of the Nation's nuclear weapons program.

Theme 5

Management Excellence

Enabling the mission through sound management.

Improve Human Capital Management

The Department will improve human capital management to build and sustain a future workforce of skilled scientists, policymakers, and executive managers to ensure that we have the appropriate personnel to successfully fulfill our mission and achieve our goals and priorities.

DOE Strategic Themes, Goals and Supporting Programs

Strategic Themes	Strategic Goals	Supporting Offices
Energy Security	<ul style="list-style-type: none"> • Energy Diversity • Environmental Impacts of Energy • Energy Infrastructure • Energy Productivity 	<ul style="list-style-type: none"> • Nuclear Energy • Fossil Energy • Energy Efficiency and Renewable Energy • Electricity Delivery and Energy Reliability
Nuclear Security	<ul style="list-style-type: none"> • Nuclear Deterrent • Weapons of Mass Destruction • Nuclear Propulsion Plants 	<ul style="list-style-type: none"> • National Nuclear Security Administration
Scientific Discovery and Innovation	<ul style="list-style-type: none"> • Scientific Breakthroughs • Foundations of Science • Research Integration 	<ul style="list-style-type: none"> • Science
Environmental Responsibility	<ul style="list-style-type: none"> • Environmental Cleanup • Managing the Legacy 	<ul style="list-style-type: none"> • Environmental Management • Legacy Management • Civilian Radioactive Waste
Management Excellence	<ul style="list-style-type: none"> • Integrated Management • Human Capital • Infrastructure • Resources 	<ul style="list-style-type: none"> • Chief Information Officer • Chief Financial Officer • Intelligence and Counterintelligence • General Counsel • Congressional and Intergovernmental Affairs • Human Capital Management • Health, Safety and Security • Economic Impact and Diversity • Inspector General • Hearing and Appeals • Management • Public Affairs • Policy and International Affairs

— Energy Security —

Promoting America's energy security through reliable, clean, and affordable energy.

ADVANCED ENERGY INITIATIVE

The Advanced Energy Initiative (AEI) aims to set us more clearly on the path to ending our reliance on the petroleum economy and establishing greater energy security. Its intent is to enable commercial frameworks and free enterprise to accelerate the development and deployment of new energy technologies to address these energy challenges head on.

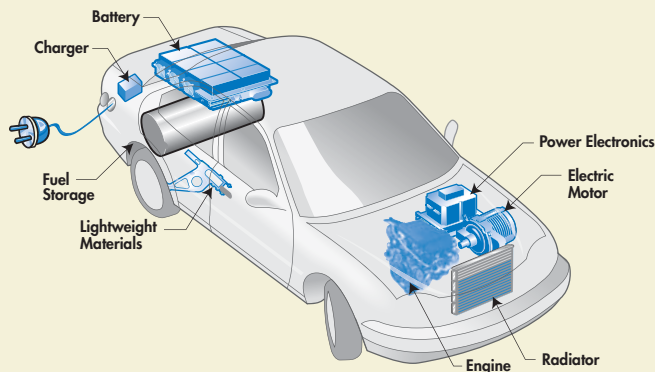
Relevance of Progress

By improving the cost and performance of domestic clean energy technologies, the Department aims to increase the attractiveness of advanced energy sources in the marketplace, which could help reduce dependence on foreign sources of energy and diversify our electricity supply.

Supporting the DOE Mission

The AEI supports the Department's Strategic Themes of:

- THEME 1** Energy Security - *Promoting America's energy security through reliable, clean, and affordable energy.*
- THEME 3** Scientific Discovery and Innovation - *Strengthening U.S. scientific discovery, economic competitiveness, and improving quality of life through innovations in science and technology.*



Hybrid Electric Vehicle (HEV)

A hybrid is any vehicle that uses two or more sources of power— in today's HEVs, the two sources are electricity (from batteries) and mechanical power (from a small internal combustion engine).

This initiative invests in technologies that increase our energy security and reduce our dependence on oil by changing the way we power our cars, homes and businesses. This initiative accelerates the research, development and deployment of clean energy technologies to diversify our Nation's energy mix.

Background

Replacing gasoline with electricity, ethanol and hydrogen could dramatically reduce future oil use and improve America's security. The Department is committed to minimizing supply disruptions that pose a threat to our economy and national security. At the same time, the Department is focused on satisfying the energy needs of America while protecting the environment. As a result, the Department has invested more than \$10 billion from 2001-2007 towards developing clean, affordable and domestically produced energy sources.

Advances in alternative vehicles and fuels offer the potential to significantly reduce oil consumption. The Department is researching advanced battery technologies to help bring down the cost and increase the driving range of highly efficient hybrid-electric vehicles. DOE-supported improvements in lithium ion batteries are increasing the attractiveness of hybrid vehicles. Models of research results achieved between 2003-2007 project that the production costs for high-powered, 25 kW batteries could be reduced 41 percent.

Biofuels have the potential to be a major contributor to the President's "Twenty in Ten" plan which includes 35 billion gallons per year of renewable and alternative fuels by 2017. Advanced technologies are needed to help reach this potential. One example includes research and development on enzymes that will produce sugars from biomass coupled with fermentative organisms that can convert these sugars efficiently to ethanol. The Department funded research and development has helped reduce the cost of producing a fermentable stream of cellulosic biomass by 40 percent from 2000-2007. These advances are needed to reduce processing costs of cellulosic ethanol to be cost-competitive in the ethanol blend market by 2012, with the ultimate goal to make ethanol cost competitive in the full fuel market in support of the President's AEI.

Research on hydrogen-powered fuel cell vehicles and technologies that produce hydrogen from non-Green House Gas (GHG) emitting domestic sources can enable significant reductions in future oil consumption. In FY 2007, the Department's researchers cut hydrogen storage volumes to one-half of what was required in 2003, improving the driving range of hydrogen fuel cell vehicles.



Wind energy can help secure America's energy supply.

The Department aims to diversify our electricity supply, in part by reducing demand for natural gas from power generation, which would help enable affordable electricity and natural gas supplies for the entire economy.

Solar and wind power have seen explosive growth over the past 5 years, but require additional support from the Department to improve the cost-effectiveness and lower the market barriers on these technologies. A DOE industry partner demonstrated the ability of a concentrating photovoltaic cell to convert 40.7 percent of the sun's energy into electricity, setting a world record. A DOE partnership has resulted in the first residential wind turbine designed for suburban environments. Manufacturing has begun for this turbine and sales are brisk. Reductions in the cost of producing utility-scale power from wind have enabled the U.S. wind energy industry to install approximately 3,000 megawatts of generating capacity nationwide in 2007. The Department's wind program has experienced challenges with increasing the number of states with 100 megawatts or more of installed wind power. In FY 2007, the country had 16 states that achieved or exceeded this level of installed wind power, but the Department was striving for at least 20 states. The challenges for many states are the uncertainties associated with the extension of the Production Tax Credit, radar policy, turbine availability and inadequate transmission capacity. The Department is addressing



Roof mounted photovoltaic can supply household energy needs.

these challenges by working with regional wind institutes to build technical expertise and local knowledge. The Department will also work closely with states to address deployment issues including siting, public perception and environmental issues. The Department expects to have 25 states with over 100 megawatts of wind power by the end of FY 2008. As the costs for advanced solar and wind technologies fall, their attractiveness in the market will increase, further diversifying and securing America's energy supply.

The Department is investing in clean coal technologies that supply low cost, near-zero atmospheric emission electricity using America's ample coal resources (<http://www.fossil.energy.gov/programs/powersystems/cleancoal>). Nuclear power also provides energy security, with plentiful uranium reserves in North America. Advanced reactors and fuel cycle technologies that can dramatically reduce the volume of spent nuclear fuel and radioactive waste requiring permanent disposal are a priority for the Department's researchers.

A recent Energy Information Administration (EIA) report showed renewable energy consumption increasing seven percent from 2005 to 2006, while total U.S. energy use declined one percent. The increase was driven by expanded use of biofuels for transportation and wind for electricity production.

Global Nuclear Energy Partnership, Part of the AEI

The expansion of nuclear power is a key component of the AEI, helping to ensure our nation's energy security. The Department is focused on encouraging industry deployment of advanced nuclear power plants, and on developing next generation nuclear technologies that are safer, more economical and more efficient than existing designs. In addition, the Department is implementing the Global Nuclear Energy Partnership (GNEP) initiative, a comprehensive nuclear energy strategy that will help enable the global expansion of nuclear energy, while satisfying requirements for a controlled, proliferation-resistant nuclear materials manage-

ment system. Specific FY 2007 programmatic activities related to nuclear energy are discussed throughout the Program Summaries section.

In September 2007, the United States joined 15 other countries in signing the Global Nuclear Energy Partnership “Statement of Principles,” which emphasizes the need for international cooperation in peaceful uses of nuclear energy. In July 2007, the Department selected four industry consortia to conduct technical and supporting studies for an initial fuel recycling center and advanced recycling reactor to support GNEP. In addition, a vigorous Research and Development (R&D) campaign at our national laboratories continued to develop GNEP technologies.

The Department’s Office of Nuclear Energy (NE) leads the implementation of GNEP, which supports the development of advanced fuel cycle technologies to enable a sustainable path forward for nuclear power (<http://www.nuclear.gov>). Nuclear power contributes to the Department’s strategic goal of supporting energy technologies that help improve the quality of the environment by reducing GHG emissions. GNEP also promotes the Department’s non-proliferation goals by working toward a closed fuel cycle, to prevent the spread of nuclear and radiological materials for use in weapons of mass destruction and in acts of terrorism.

The U.S. currently has 104 operating commercial nuclear reactors providing approximately 20 percent of our domestically produced electricity. This results in over 2,000 metric tons of spent nuclear fuel (SNF) per year. Expansion of nuclear power is a key component of the National Energy Policy (NEP).

Historically, the U.S. has used a ‘once through’ or ‘open’ fuel cycle in which nuclear fuel is used a single time in the reactor prior to disposal. The Department’s Advanced Fuel Cycle Initiative program in NE develops and demonstrates new technologies that support beneficial recycling of SNF. Successful development and deployment of these technologies would enable the U.S. to ultimately move to a ‘closed’ fuel cycle in which SNF is recycled to allow the useful components to produce additional energy.

Recycling would also significantly reduce the volume, thermal output and radiotoxicity of waste requiring permanent disposal in a geologic repository. This would reduce the amount of waste that would potentially need to be disposed of in a geologic repository.

Advanced Fuel Cycle Technologies and Infrastructure

In FY 2007, the Department continued laboratory-scale demonstrations of advanced separations technologies using actual spent fuel, developed systems analyses of advanced fuel cycles, developed information in support of advanced reactor designs, began work to qualify optimized waste forms for geological disposal and continued development of high burn-up transmutation fuels.

In addition to separations and fuels R&D, the Department selected four industry consortia to conduct technical and supporting studies for the Consolidated Fuel Treatment Center and Advanced Burner Reactor. Industry involvement is helping the program analyze the feasibility of commercial deployment and identify approaches that would accomplish GNEP goals.

The Department also continued work on the Programmatic Environmental Impact Statement (PEIS) to evaluate potential sites in the U.S. for GNEP facilities. In FY 2007, eleven grants were awarded to communities interested in hosting GNEP facilities to complete facility siting studies in conjunction with PEIS activities.

These R&D and conceptual design activities are all focused on establishing the information needed to determine a path forward for GNEP in FY 2008, as well as a recommendation on the need for a second geologic repository for SNF.



In September 2007, representatives from 16 nations signed the GNEP “Statement of Principles.”

International Engagement and Collaboration

To be sustainable, the global expansion of nuclear power must use a nuclear fuel cycle that enhances energy security, while promoting non-proliferation. The GNEP initiative proposes that nations with secure, advanced nuclear capabilities will provide fuel services — fresh fuel and recovery of used fuel — to other nations that agree to employ nuclear energy for power generation purposes only.

In September 2007, the United States and 15 other nations signed the GNEP “Statement of Principles,” which addresses the global expansion of nuclear energy in a safe and secure manner that supports clean development without GHG emissions, while reducing the risk of nuclear proliferation.

In support of the Statement of Principles, the U.S. has signed Bilateral Nuclear Energy Action Plans with Japan and Russia. These Action Plans outline GNEP cooperative research and development on advanced reactors, exportable small and medium power reactors, nuclear fuel cycle technologies, and non-proliferation, with the focus on achieving the long-term GNEP vision.

NP 2010, Part of the AEI

The Advanced Energy Initiative (AEI) includes many components including the NP 2010. The NP 2010 program is a cost-shared program with industry that is focused on reducing the technical, regulatory and institutional barriers to deployment of new nuclear power plants (<http://www.nuclear.gov>). In March 2007, the Nuclear Regulatory Commission (NRC) approved two Early Site Permit applications, paving the way for the submission of combined Construction and Operating Licenses for new U.S. nuclear power plants.

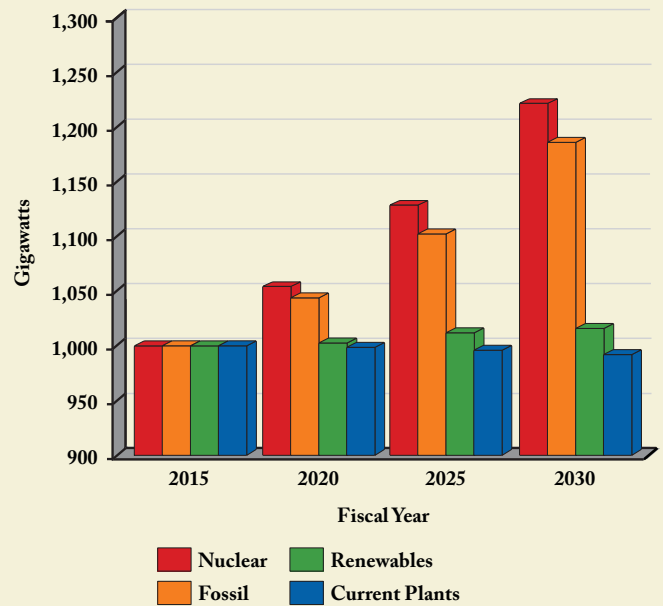
The technology focus of the NP 2010 program is on Generation III+ advanced, light-water reactor designs, which offer advancements in safety and economics over current nuclear plant designs and the nuclear plant designs certified by the NRC in the 1990s.

In FY 2002, the Department initiated cooperative projects with industry to obtain NRC approval of three sites for construction of new nuclear power plants under the NRC's Early Site Permit process. This licensing process approves sites for new nuclear plants prior to a power company's commitment to build. In FY 2003, three Early Site Permit applications were submitted by power companies to the NRC for review and approval. Having approved two of the three applications in March 2007, NRC is currently considering approval of the final Early Site Permit application.

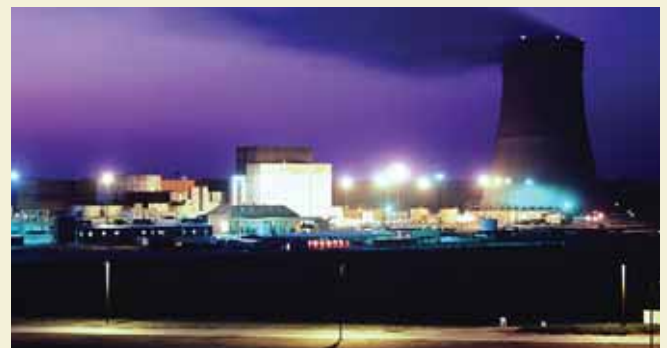
In FY 2007, NP 2010 also continued assisting industry in the preparation of combined Construction and Operating License (COL) applications. The COL is a 'one-step' licensing process by which NRC approves and issues a license to build and operate a new nuclear power plant.

As a result of the success with the Early Site Permits and COLs, ten Department consortium-partner members have notified NRC of their intent to submit COL applications for up to 26 new nuclear power units in the next few years. Additionally, four industry partners have, independent of the Department, ordered large component forgings for potential new nuclear plants, representing a significant step toward deployment.

Future Need for Additional Generating Capacity



To maintain nuclear energy's current share of domestic electricity production, deployment of new nuclear power plants must begin by 2015.



In March 2007, Entergy Nuclear received NRC approval for an early site permit for a possible new nuclear unit at the Grand Gulf site in Mississippi.

— Nuclear Security —

Ensuring America's nuclear security.

COMPLEX TRANSFORMATION

The nuclear weapons complex of the future is one that is smaller, more secure, more responsive, and more efficient than the complex is today. Complex Transformation refers to the reconfiguration of the nuclear weapons complex by the year 2030. It includes significant dismantling of retired warheads, consolidating special nuclear materials, eliminating duplicative capabilities, establishing new capabilities; such as a consolidated plutonium center, with associated improvements in its business practices. Improvements in business practices, technical processes, information management systems, and program management across the complex enhances agility, cost effectiveness, and responsiveness in all operations. The agility and flexibility promoted by these actions supports the specific stockpile requirements and maintains the essential U.S. nuclear capabilities needed for an uncertain global future.

The current complex lacks the ability to rapidly adjust to changing requirements and unpredictable threats, and without reconfiguration, budget increases would be required due to escalating costs for security functions and greater demands of maintaining an aging stockpile. "Responsive" refers to the ability of the enterprise to respond in a timely manner to technical problems in the stockpile and to emerging national security needs. Infrastructure is broadly defined to encompass people, processes, facilities, and equipment. One result of complex

transformation is illustrated in the planned footprint reduction at the Y-12 National Security Complex shown below, reducing maintenance, security, and personnel costs while enhancing current capabilities.

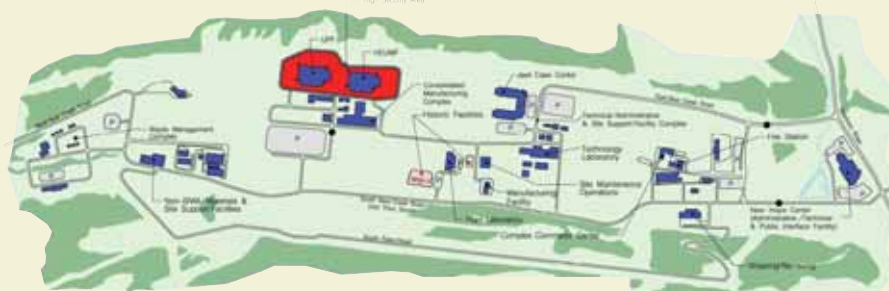
Relevance of Progress

Transforming to a modernized, cost-effective nuclear weapons complex involves major federal actions and decisions that warrants completing a National Environmental Policy Act (NEPA) process. The NEPA process requires all Federal agencies to consider the environmental impacts of proposed actions, such as the transformation of the certain facilities within the nuclear weapons complex, before selecting among alternative actions. As part of the NEPA process, during FY 2007, the Department, through its National Nuclear Security Administration (NNSA) issued in the Federal Register a Notice of Intent, http://www.nnsa.doe.gov/docs/newsreleases/2006/Complex_2030_NOI_10-19-06.pdf, to prepare an Environmental Impact Statement, which is currently entitled the "Draft Complex Transformation Supplemental Programmatic Environmental Impact Statement". The notice outlined the alternatives that the NNSA will consider in transforming the nuclear weapons complex to better meet future national security requirements.

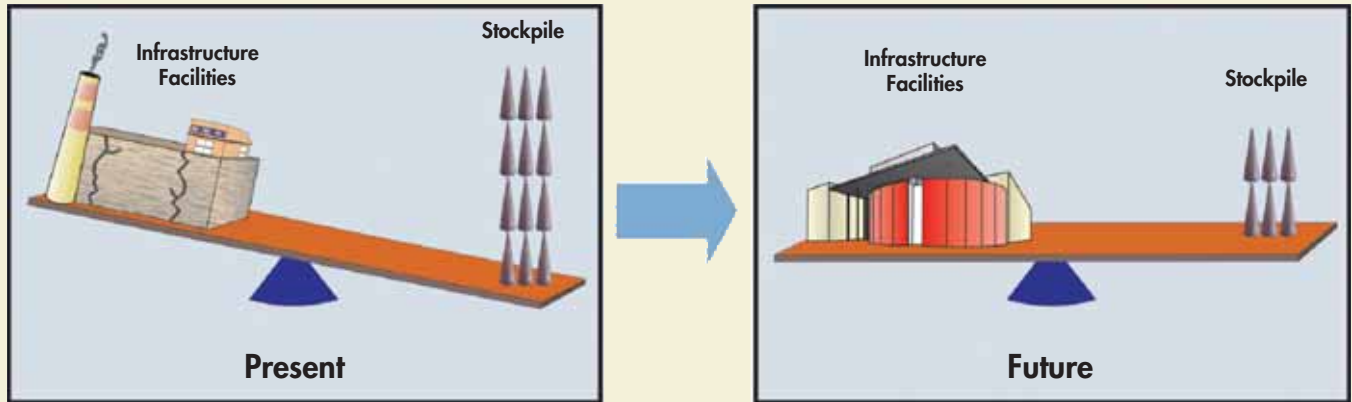
Present



Future



Special Nuclear Material Consolidation at the Y-12 Complex



Development of a credible, responsive nuclear weapons infrastructure facilitates a reduction in the size of the stockpile and greater reliance on deterrence by capability.

Supporting the DOE Mission

The Complex Transformation strategy to transform the nuclear weapons complex is a key Departmental activity and supports the Department's Strategic Theme of:

THEME 2 Nuclear Security – *Ensuring America's nuclear security.*

Under this Theme, these activities directly impact the Nuclear Deterrent Goal – Transform the Nation's nuclear weapons stockpile and supporting infrastructure to be more responsive to the threats of the 21st Century. NNSA's Office of Defense Program (<http://www.nnsa.doe.gov/defense.htm>) manages the Complex Transformation strategy and implementing actions to transform the nuclear weapons complex.

Background

The Department, through the NNSA, in partnership with the Department of Defense (DoD), is responsible for ensuring the U.S. has a safe, secure and reliable nuclear deterrent. The Administration has concluded that a nuclear deterrent relying more on capabilities and less on deployed weapons will be more credible in a future of uncertain and

evolving threats. A transformed production complex with demonstrated responsiveness will ensure that the Nation's nuclear deterrent remains credible and enable the President's vision for the smallest possible nuclear weapons stockpile consistent with national security.

The NNSA plans to achieve Complex Transformation through actions currently underway with major progress measures in the near- (0 to 5 years), mid- (5 to 15 years) and long- (15 to 25 years) term. This is no easy task. The major challenge facing the Complex Transformation is to continue to meet the DoD requirements of successful current weapon systems activities while transforming to a nuclear weapons complex of the future. Also, Complex Transformation relies on increased uniformity of business practices to create a more cohesive and responsive complex but the NNSA contractor sites each currently apply a different business practice at their respective location that may be impacted. The Complex Transformation approach builds on existing programs and management structures to transform the complex.

To learn more about the Complex Transformation strategy and progress, please go to: http://www.nnsa.doe.gov/future_of_the_nuclear_weapons_complex.htm

MATERIAL SECURITY IN RUSSIA

In June 2007, the Department's Secretary, Samuel W. Bodman and Russian Federal Atomic Energy Agency (Rosatom) Director, Sergey Kiriyenko completed the fifth Bratislava report for the Bratislava Nuclear Security Cooperation initiative between the two countries.

The plan will help sustain and maintain security upgrades at Russian nuclear material sites. These security enhancements that the U.S. installed over the last 14 years at Russian nuclear sites will be preserved by Russia under this new plan.

Relevance of Progress

The required bi-annual report to Presidents Bush and Putin details significant work completed by the United States and Russia over the past six months in the areas of emergency response, nuclear security procedures and best practices, security culture, research reactors and nuclear site security. It serves not only as a progress report, but also as a symbol of the Administration's commitment to the historic 2005 nonproliferation initiative.



A Department sponsored emergency management training course for Russian nuclear facility managers in a refurbished Moscow training center.

Supporting the DOE Mission

Securing nuclear and radiological material in Russia is a key Departmental activity that supports the Department's Strategic Theme of:

THEME 2 Nuclear Security – *Ensuring America's nuclear security.*

The National Nuclear Security Administration's (NNSA) Office of Defense Nuclear Nonproliferation (DNN) (<http://www.nnsa.doe.gov/na-20>) manages programs to secure, detect and dispose of dangerous nuclear material in Russia and around the world. Significant progress in the areas of securing civil nuclear and radiological material and weapons material has been achieved, resulting in the accomplishing of important nonproliferation goals and minimizing of materials and sensitive technologies available to terrorists. To further work towards

these nonproliferation and anti-terrorism objectives, the Department is working with Russian counterparts to equip all of Russia's border crossings with radiation detection devices and has continued its work in the elimination of weapons-usable material in Russia.

Background

During the 2005 meeting in Bratislava, U.S. President Bush and Russian President Putin committed both governments to securing nuclear weapons and materials to prevent the possibility that such weapons or materials could fall into the hands of terrorists. One of the key aspects of the Bratislava agreement two years ago was the adoption of an accelerated schedule for upgrading security at nuclear materials sites in Russia. Each country has reaffirmed its commitment to this schedule to complete upgrades work by the end of calendar year 2008. The Department's efforts have secured 75 percent of Russian nuclear weapons sites of concern, and will continue with work underway at the balance of sites to be completed in FY 2008.

To support this initiative, the Department spent \$316.3 million in FY 2007 and continue to thwart nuclear terrorism through improved and increased material security in Russia and throughout the former Soviet Union.

The Department is working to overcome challenges. As with any international cooperation effort, negotiating with international partners can slow the process of agreement, especially when the safety regulations and security cultures differ. This fact can often make progress appear haphazard, which can in turn negatively affect the flow of funding from year to year. In spite of these obstacles, the Department has made sound progress in key areas.

The Department has successfully completed the return of about 500kg of Russian-origin highly enriched uranium (HEU) and completed security upgrades in 91 of 125 sites, with the remainder in progress. Russia has agreed to preserve these security enhancements through a long-term sustainability plan. These efforts have been accelerated by the Bratislava initiative.



Vehicle portal monitors detect the illegal transport of nuclear and radioactive materials.

Before



After



Completed Materials Protection Control & Accounting (MPC&A) Security Upgrades at a Storage Facility: Before and After

The Department not only focuses on securing stored material at various sites, but also secures dangerous material during transit from site to site. In June 2007, the U.S. and Russia agreed to equip all of Russia's border crossings with radiation and detection devices by 2011, six years ahead of what was originally planned prior to the Bratislava Agreement. These efforts are building upon the 110 crossings already equipped with radiation detection devices.

In addition to securing and detecting dangerous nuclear material, the Department works to dispose of weapons-usable material in an environmentally sound manner. The Department has worked with Russia to down-blend (taking highly enriched uranium and making low enriched uranium, which can still be used as a commercial nuclear energy source but is less attractive as a weapon) more than 300 metric tons of former Soviet weapons HEU (HEU is one of the two fissile materials that can be used to make a nuclear weapon.) for use in U.S. nuclear power plants, providing ten percent of U.S. electricity.

The Department is also working with Russia to dispose of 68 metric tons of U.S. and Russian plutonium. In September 2000, the United States and Russia signed the Plutonium Management and Disposition Agreement. Under the agreement, the U.S. and Russia will each dispose of 34 metric tons of surplus weapon-grade plutonium, enough for thousands of nuclear weapons. In August 2007, the Department began construction on the Mixed Oxide (MOX) Fuel Fabrication Facility. The facility will provide the means for disposing of the surplus-weapons grade plutonium.

Finally, the Department is using its innovative research and development programs to develop technologies to enhance emergency response capabilities pivotal in fulfilling the Bratislava initiative.

The continued commitment of all parties involved in the programs aimed at fostering Russian nuclear security cooperation is of the highest priority for the Department.

IMPROVED PRODUCTION PERFORMANCE IN THE DEPARTMENT OF ENERGY NUCLEAR WEAPONS COMPLEX

The Department, through NNSA, operates the Nuclear Weapons Complex that maintains the Nation's stockpile of nuclear weapons. Increased regulatory and administrative requirements over the past two decades had sufficiently decreased production efficiency and increased costs to the point that operations were becoming prohibitively expensive. Additionally, the NNSA was being criticized as not being very responsive to the DoD and Congress. To address this issue, the Secretary of Energy and the NNSA Administrator requested that a plan be developed to improve the complex production performance. As a result, improved processes and procedures were developed that reduced barriers to operations while maintaining safety and improving communications to more quickly resolve production problems. The approach included the use of a selected group of senior federal and contractor managers to analyze the central issues.

Relevance of Progress

This activity focused on increasing production and efficiency, and maintaining safety, while maintaining or reducing costs. Success is essential to meeting National Security commitments on a reasonable timeframe, including the nuclear stockpile reductions called for by the Treaty of Moscow. It also allows selected material to be recycled to other uses, including providing fuel for nuclear energy.

Supporting the DOE Mission

This activity supports the Department's Strategic Plan. Improved performance of the Department Nuclear Weapons Complex supports the Department's Strategic Theme of:

THEME 2 Nuclear Security – *Ensuring America's nuclear security.*

Under this Theme, these activities directly impact the Nuclear Deterrent goal – Transform the Nation's nuclear weapons stockpile and supporting infrastructure to be more responsive to the threats of the 21st Century.

Background

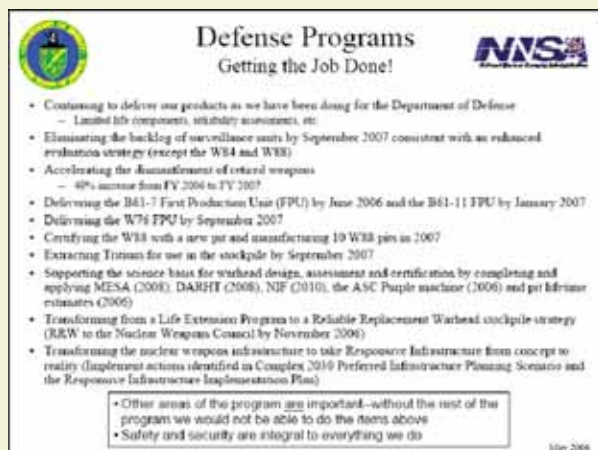
Two action plans have been developed to improve production "throughput" in the production facilities at the Pantex Plant and the Y-12 National Security Complex. The term "throughput" refers to the assembly rate of nuclear weapons from parts provided from throughout the complex or the disassembly rate and disposition of parts and materials. These actions also support the NNSA key list of goals known as the "Defense Programs Getting the Job Done" – with the first five items directly relating to production throughput.

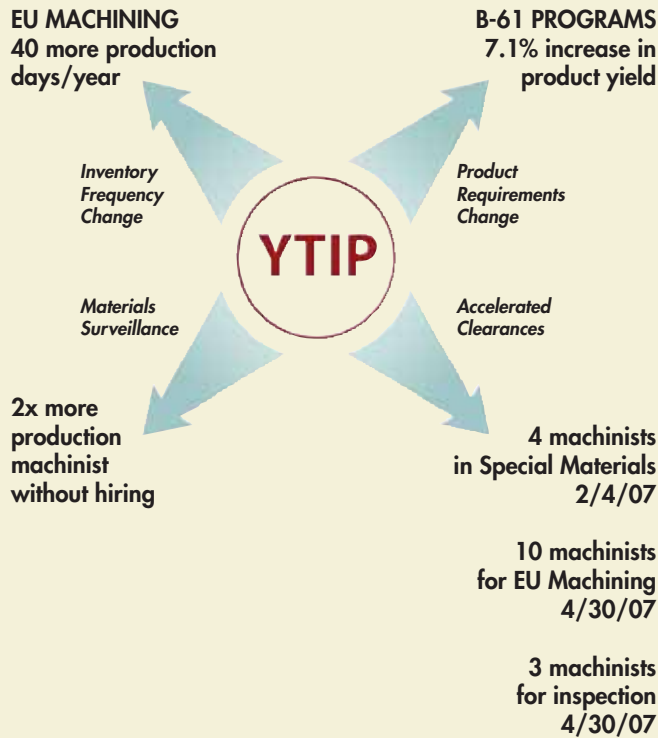
Pantex Plant Throughput Improvement Plan (PTIP)

The Pantex Plant in Texas has major responsibilities for nuclear weapons assembly and disassembly. This was the first location for an integrated attempt to address the regulatory and administrative requirements hampering efficient plant operations. Since these requirements were usually externally imposed, senior Department-NNSA management attention was necessary to review and, where possible, relieve, consolidate or otherwise mitigate barriers to productivity, while maintaining a safe operating environment. A senior NNSA Management Team convened and evaluated processes and procedures, developed a plan of improvement actions and identified a clear series of action steps, with dates to be tracked by the team. One example of an improvement was identification, analysis, and relaxation of rules related to the staging of parts material at the plant, leading to a "just in time" inventory system similar to that used in industry. This improvement was accomplished without impacting safety. Results have significantly increased the dismantlement of retired or returned nuclear weapons (146 percent above the goal for FY 2007), cost and cycle time reductions and improved production accomplishments. As of September 2007, 22 of the 23 PTIP items (95 percent) are complete on schedule and the remaining item is expected to be completed in FY 2008.

Y-12 Throughput Improvement Plan (YTIP)

The process used to implement the Pantex Plan was replicated at the Y-12 National Security Complex in Tennessee, another key production location. The Y-12 plan initially focused on 13 actions concerning nuclear weapons parts production and dismantlement of retired or returned nuclear weapons on time and within budget. The improvement actions involved security; production processes; design requirements and specifications and prioritization of work. Additional improvement actions are being developed to maintain continuous improvement and address additional areas identified. Initial results have been good. A key goal is for Y-12 to provide Pantex with at least a 90-day lead time between receipt of Y-12 material and subsequent delivery of weapons to the military. When the improvement plan was initiated, the actual lead time was only 30 days. That lead time has since been increased to 80 days.





Y-12 Initiatives

The Y-12 Throughput Improvement Plan, illustrated above, is challenging and involves integration of actions and participants from across the complex. This integration is essential because some of the primary issue areas, such as design, cannot be overcome by Y-12's efforts alone as they involve the Design Agencies at the Los Alamos, Lawrence Livermore and Sandia National Laboratories. Implementing the improvement plan has allowed Y-12 to make dramatic

improvements in productivity in certain critical areas that were constraining production throughput, doubling the throughput in key areas in the short time since improvements were initiated. For example, the most significant results came from two recently completed tasks — reducing the frequency of material inventories in some processing areas and improving the material surveillance process. These initiatives focused on maintaining or enhancing security without imposing restrictions on the safe, efficient, and cost-effective performance of work.

Other Department/NNSA Improvement Actions

In addition to Throughput Improvement Plans, other actions have been put in place to improve the complex. For example, a set of actions focusing on improving management at headquarters and the site offices has been initiated. Some of the actions include: strengthening line management and authority; reviewing delegations of critical activities; redefining relationships with external oversight organizations; reducing burden of regulations, orders, and policies; soliciting improvements on regulation process and implementing cost-benefit determination for new regulations and orders; redefining oversight model to empower contractors and reduce micromanagement; strengthening incentives for high performance and create multi-site incentives and improving strength and the competence of federal managers.

The NNSA has taken the initiative to improve the performance of the Nuclear Weapons Complex and that progress is reviewed regularly by the Deputy Secretary, who challenges the complex to ensure that safety improvement continues, that production improvements are cost-effective and that information is provided to the key nuclear weapons customer, the DoD, and a key advisory body, the Defense Science Board. Success of the activities has been briefed to the appropriate Congressional committees and to OMB staff. Additional opportunities for improvements and the accomplishments from those improvements will result in near-and long-term efficiencies in the performance of the complex.

— Scientific Discovery and Innovation —

Strengthening U.S. scientific discovery, economic competitiveness, and improving quality of life through innovations in science and technology.

AMERICAN COMPETITIVENESS INITIATIVE

In February 2006, President Bush announced the American Competitiveness Initiative (ACI). Designed to stimulate “America’s investments in science and technology...and to build on our successes and remain a leader in science and technology.” The American Competitiveness Initiative committed \$10.66 billion in FY 2007 to increase investments in research and development, strengthen education and encourage entrepreneurship. Over ten years, the Initiative commits \$50 billion to increase funding for research and \$86 billion for R&D tax incentives. Federal investment in R&D has proved critical to keeping America’s economy strong.

The Department is one of three agencies, along with the National Institute of Standards and Technology (NIST) and the National Science Foundation (NSF), identified to receive increased funding by the ACI. Within the Department, several program areas have been impacted by the ACI, including the Office of Science (<http://www.sc.doe.gov>), the Office of Energy Efficiency and Renewable Energy (<http://www.eere.energy.gov/>), the Office of Fossil Energy (<http://fossil.energy.gov/>) and the Office of Nuclear Energy (<http://www.ne.doe.gov/>). The Department’s Office of Science (SC), along with NIST and NSF, has been specifically called out to have its budget doubled between FY 2006-16. The reason for this investment is simple; the Office of Science supports “scientific studies and infrastructure for a wide range of R&D related to economically significant innovations including high-end computing and advanced networking, nanotechnology, biotechnology, energy sources and other materials science research. It is the principal supporter of world-class Federal research facilities, providing scientists with the necessary tools to advance scientific understanding for innovation and discovery.” Given this R&D focus, the following summary will concentrate on performance made by the Office of Science.

Relevance of Progress

In FY 2007, the Department made progress in multiple areas including opening facilities that support transformational science such as: nanotechnology, biofuels, fusion energy and high performance computing.

Supporting the DOE Mission

The Department has opened new facilities that support nanotechnology research and has launched an initiative to establish bioenergy research centers to focus on development of biofuels. The Department also continues to be at the forefront of fusion energy research that someday could lead to a new source of clean energy. Finally, the Department’s computing facilities continue to improve the scientific community’s ability to simulate and model experiments that would be impossible to perform in a laboratory.

The facilities created and managed by the Department, along with the R&D supported by these facilities, contribute primarily to the following Strategic Themes:

- THEME 1** Energy Security – Promoting America’s energy security through reliable, clean, and affordable energy.
- THEME 3** Scientific Discovery and Innovation – Strengthening U.S. scientific discovery, economic competitiveness, and improving quality of life through innovations in science and technology.

The Department’s national user facilities are shared with the science community worldwide and offer some technologies and instrumentation that are not available anywhere else.

Background

The Department’s national user facilities include particle and nuclear physics accelerators, synchrotron light sources, neutron scattering facilities, genome sequencing facilities, supercomputers and high-speed computer networks. In FY 2007, over 21,500 researchers from universities, other government agencies and private industry used these facilities.

The Department’s commitment to the ACI was demonstrated by the opening of new facilities in FY 2007 that support nanotechnology research and biofuels. The Department also continues to be at the forefront of U.S. support of an international project on fusion energy research that someday could lead to a new source of clean energy.

Availability of sufficient environmentally friendly energy sources to meet the needs of a rapidly growing and developing world population is one of the biggest challenges America faces today and in the coming decades. Current technologies cannot meet this challenge and incremental improvements in these technologies will not suffice. The U.S. needs transformational discoveries, leading to technologies that fundamentally change the rules of the game – and that means the U.S. needs fundamental scientific breakthroughs enabled by world leading research tools.

Nanotechnology

Just as the resolution of a digital picture determines the clarity of very small features, the resolution of scientific equipment determines the clarity with which scientists can “see” very small objects such as viruses or even atoms.

Nanotechnology involves imaging, measuring, modeling, and manipulating matter at dimensions of roughly 1 to 100 nanometers (a nanometer is 1×10^{-9} meters). In terms of atomic dimensions, it is 3 to 300 atoms in length. All the elementary steps of energy conversion (charge transfer, molecular rearrangement and chemical reactions) take place on the nanoscale. Thus, the development of new nanoscale materials, as well as the methods to characterize, manipulate and assemble them, creates an entirely new paradigm for developing new and revolutionary energy technologies. The improvements in the ability to see small objects and observe processes are crucial to building the world-class nanofabrication and nanomanufacturing capabilities America needs.

The Basic Energy Science Nanoscale Science Research Centers are located near major scientific facilities



Four Nanoscale Science Research Centers (NSRCs) were operational in FY 2007 at Argonne, Oak Ridge, Lawrence Berkeley and Los Alamos and Sandia National Laboratories. A fifth NSRC will become operational at Brookhaven National Laboratory in FY 2008. The NSRCs are dedicated to the synthesis, processing and fabrication of nanoscale materials. The NSRCs are collocated with existing or emerging world-class DOE facilities for X-ray, neutron or electron scattering to provide sophisticated characterization and analysis capabilities. In addition, the NSRCs will provide specialized equipment and support staff not readily available to the research community.



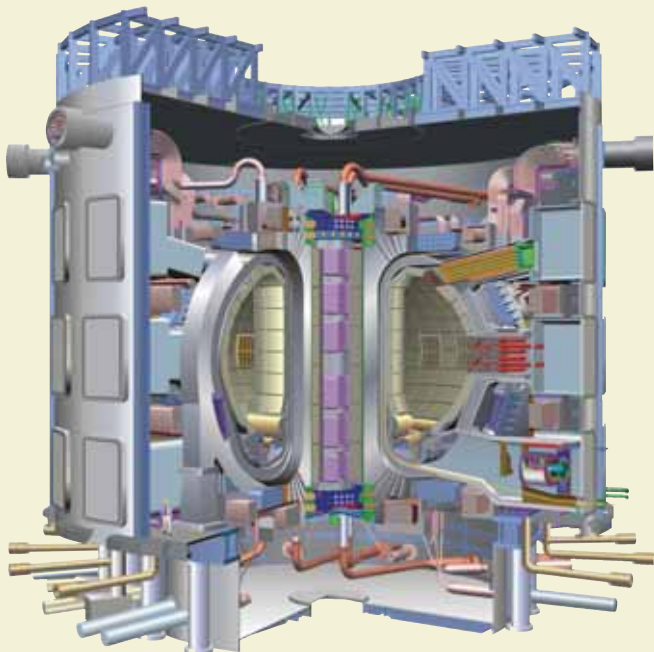
How Cellulosic Ethanol is Made

- 1- Biomass is harvested and delivered to biorefinery.
- 2- Biomass is cut into shreds and pretreated with heat and chemicals to make cellulose accessible to enzymes.
- 3- Enzymes break down cellulose chains into sugars.
- 4- Microbes ferment sugars into ethanol.
- 5- Ethanol is purified through distillation and prepared for distribution.

Biofuels

The greatest scientific challenge in bio-fuel production is the effort to produce fuels not just from plant starch, as we do with corn-based ethanol today, but also from the inedible fiber of plants or cellulose. This plant matter or biomass would come from specialized feedstock crops, including such plants as switchgrass, miscanthus, willows and hybrid poplar. At the present time, our means of converting cellulose to fuel is neither efficient nor cost effective. Plant cell walls contain a substance called lignin, which is so tightly woven from the cellulose that the enzymes currently available cannot easily penetrate to get at the cellulose and break it up into sugars, which is what is needed to produce fuel.

In FY 2007, the Department launched three new Bioenergy Research Centers (BRCs). A major focus for the BRCs will be on understanding how to reengineer biological processes to develop new, more efficient methods for converting the cellulose in plant material into ethanol or other biofuels. The three centers are: DOE BioEnergy Science Center led by DOE's Oak Ridge National Laboratory in Oak Ridge, Tennessee; DOE Great Lakes Bioenergy Research Center led by the University of Wisconsin in Madison, Wisconsin, in close collaboration with Michigan State University in East Lansing, Michigan; and DOE Joint BioEnergy Institute led by DOE's Lawrence Berkeley National Laboratory.



ITER

An experimental facility aimed at demonstrating fusion energy.

Fusion Energy

One of the most promising future energy solutions lies in fusion. Fusion is the energy that powers the sun and the stars. Fusion energy is generated when nuclei of low-mass elements, such as hydrogen and helium, join together, or fuse, giving off tremendous amounts of energy. Power generated from fusion energy produces no troublesome emissions, is safe, and has few, if any, proliferation concerns. It creates little long-lived waste and runs on fuel readily available to all nations.

Fusion has the potential to provide clean, carbon-free energy for the world's growing electricity needs on an almost limitless scale. The key challenge is sustaining and containing the 100 million degree-plus fusion reaction on earth, safely and efficiently. In cooperation with six international partners, the Department is working side-by-side with counterparts from China, the European Union, India, Japan, the Republic of Korea and the Russian Federation to build and operate an experimental facility called ITER that demonstrates the scientific and technological feasibility of fusion energy.



Super computers, such as the Office of Science's Cray XT4, expand the capability of world-class scientific research beyond the laboratory.

High Performance Computing

The supercomputer is science's newest and most powerful tool, enabling researchers to model and simulate experiments that could never be performed in a laboratory. The Department plans, develops and operates supercomputer and network facilities that are available 24 hours a day, 365 days a year to researchers working on problems relevant to DOE's scientific missions. The Department is expanding the capability of world-class scientific research through advances in mathematics, high performance computing and advanced networks and through the application of computers capable of many trillions of operations per second (terascale to petascale computers).

The advance of networking technologies allows researchers to share very large amounts of scientific data across the country and around the world. The Department's Energy Science Network (ESnet) has entered into a long-term partnership with Internet 2 to build the next generation optical network infrastructure needed for U.S. science. This networking infrastructure is critical to research in climate and particle physics and to large scientific facilities such as the DOE neutron sources and computing facilities.

The Office of Science established two Leadership Computing Facilities (LCF), each with a multiple set of computer architectures, which will enable the most efficient solution critical problems from biology to physics and chemistry.

Computational science is increasingly important to making progress at the frontiers of almost every scientific discipline and to the most challenging feats of engineering. Leadership in scientific computing has become a cornerstone of the Department's strategy to ensure the security of the nation and success in its science and energy missions.

— Environmental Responsibility —

Protecting the environment by providing a responsible resolution to the environmental legacy of nuclear weapons production.

YUCCA MOUNTAIN

In March 2007, the Department submitted legislation to Congress to enhance the nation's ability to manage and dispose of commercial spent nuclear fuel and Defense high-level radioactive waste. The Department also worked on its license application to the Nuclear Regulatory Commission for authorization to construct the repository.

Relevance of Progress

These actions support the Department's best achievable schedule for opening the Yucca Mountain repository in 2017.

Supporting the DOE Mission

The Yucca Mountain Project is a key Departmental activity that supports the Department's Strategic Themes of

- THEME 1** Energy Security – Promoting America's energy security through reliable, clean, and affordable energy.
- THEME 4** Environmental Responsibility - Protecting the environment by providing a responsible resolution to the environmental legacy of nuclear weapons production.

The Department's Office of Civilian Radioactive Waste Management (<http://www.ocrwm.doe.gov>) manages the project. This project will create the nation's only designated high-level nuclear waste repository. A geologic repository increases credibility and public confidence in nuclear energy, allowing it to continue to be an important component of the country's array of clean energy options.

Background

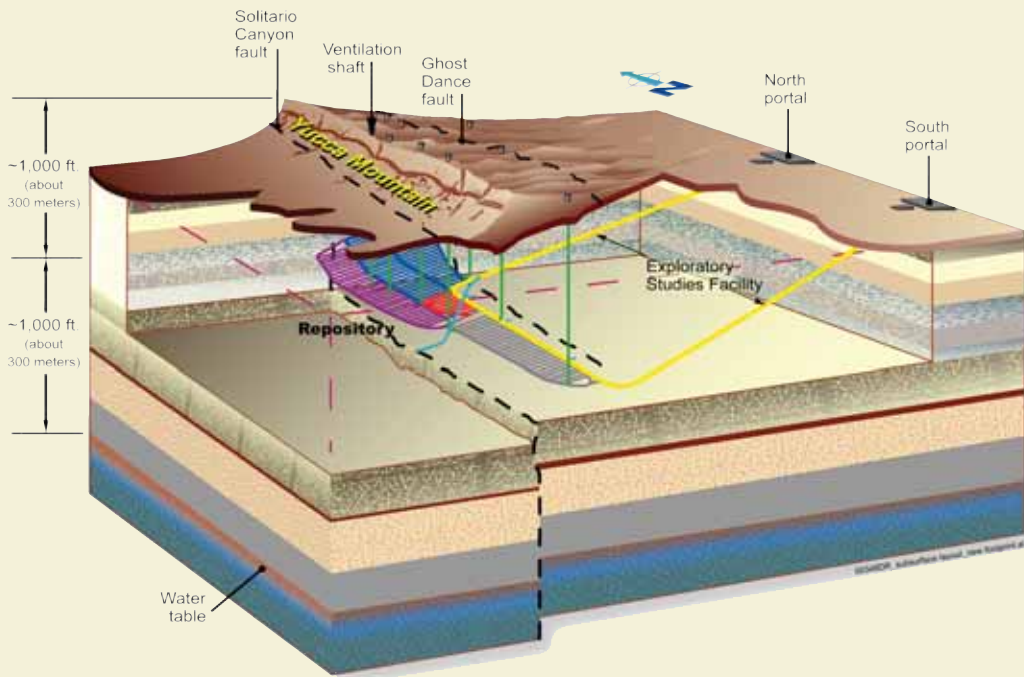
The *Nuclear Waste Policy Act* of 1982 mandates that the Department has responsibility for the ownership and consolidation of waste into a national repository.

One of the missions of the Department is to manage and dispose of this high-level radioactive waste and spent nuclear fuel in a manner that protects health, safety and the environment; enhances national and energy security and merits public confidence.

More than 50,000 metric tons of spent nuclear fuel is located at more than 100 above-ground sites in 39 states and every year, reactors in the United States produce an estimated 2,000 metric tons of additional spent fuel.



Aerial view of crest of Yucca Mountain.



Cutaway image of Yucca Mountain, the rock layers and the planned network of repository tunnels.

Nuclear energy continues to be a significant part of a diverse energy mix that fuels our nation's economy. Approximately 20 percent of U.S. electricity is produced from 104 nuclear reactors. To ensure the continued safe use of reliable and emission-free nuclear energy, the U.S. has searched for a safe and secure place to deposit the spent nuclear fuel. Yucca Mountain, an area in the western U.S., outside of Las Vegas, Nevada, was thoroughly studied and determined to be a suitable site. Yucca Mountain was approved by the President and Congress as the site for the nation's first permanent spent nuclear fuel and high-level radioactive waste geologic repository in FY 2002. Since that time, the Department has been working with the NRC and interested stakeholders to license and open the repository to begin receiving nuclear waste. The Department spent approximately \$445 million on Yucca Mountain activities in FY 2007. In addition to submitting proposed legislation to Congress, the Department worked on drafting the repository's license application to be submitted by June 2008 and preparing for certification of its documentary material for the NRC's Licensing Support Network. In FY 2007,

the Department also worked towards completing draft supplemental environmental impact statements for the Yucca Mountain repository and rail transportation.

The Department has two immediate challenges in order to realize its planned 2017 best opening date, submitting a high quality license application to the NRC as planned, and obtaining adequate funding from Congress for construction. In addition, the program's earned value management system (EVMS), which is necessary for effective and efficient program management, has not been certified as compliant with industry standards. To address these performance issues the Department is dedicating current resources to preparing a high-quality license application and supporting the Administration's effort to pass funding reform and conducting contingency planning if increased and consistent funding is not provided. Additionally, the Department is pursuing certification of the EVMS by the Defense Contract Management Agency or an equivalent entity.

ENVIRONMENTAL MANAGEMENT

In FY 2007, the Department continued progress toward its commitment to clean up the nation's contaminated nuclear sites. Four sites were officially cleaned up in FY 2007, Ashtabula, Columbus, and Fernald sites in Ohio and the Lawrence Berkeley National Laboratory in California.

Relevance of Progress

By completing cleanup at these sites, the Department is making significant progress toward completing cleanup of 100 of its 108 contaminated nuclear weapons manufacturing and testing sites by 2025. Cleanup at the Miamisburg Site in Ohio was planned for completion in FY 2007 but has been changed to FY 2008 due to a Congressionally directed scope increase. This schedule change should not impact the Department's ability to meet the goal as cleanup is still expected to be completed at the three sites planned for FY 2008 (Lawrence Livermore National Laboratory – Site 300 and Inhalation Toxicology Laboratory in California and the Pantex Plant in Texas).

Supporting the DOE Mission

The Department's Environmental Management (EM) program (<http://www.em.doe.gov>) is a key Departmental activity that supports the Department's Strategic Theme of:

THEME 4 *Environmental Responsibility - Protecting the environment by providing a responsible resolution to the environmental legacy of nuclear weapons production.*

The Department is responsible for the risk reduction and cleanup of the environmental legacy of the Nation's nuclear weapons program, one of the largest, most diverse, and technically complex environmental programs in the world. The Department has made significant progress in the last four years in shifting away from risk management to embracing a mission completion philosophy based on cleanup and risk reduction. Through focused project management, the Department is succeeding in the remediation of sites and the reduction of risks to future generations of Americans.

Background

The Department has responsibility for cleaning up a total of 108 sites involved with past research, development, production and testing of nuclear weapons. Taken together, these sites encompass an area of over two million acres – equal to the size of Rhode Island and Delaware combined. Fifty years of weapons production and research generated millions of gallons of liquid radioactive waste, millions of cubic meters of solid radioactive wastes, thousands of tons of spent nuclear fuel and special nuclear material, along with huge quantities of contaminated soil and water.

Unlike many problems posed by industrial operations, the Department's sites pose unique radiation hazards, unprecedented volumes of contaminated water and soil, and a vast number of contaminated structures ranging from reactors to chemical plants for extracting nuclear materials to evaporation ponds. In many cases, the ability to deal with these



At the Fernald Environmental Management Project in Ohio, DOE will manage the long-term protection of the 1,050 acre site as an undeveloped nature and wildlife reserve through monitoring and sampling of the 180 wells and groundwater.

waste challenges was unknown and required the engineering of new approaches or the invention of new innovative technologies to treat and dispose of the waste.

At the end of FY 2007, the Department completed cleanup at 86 of its 108 sites. Prior to FY 2006, however, the completed sites were small and the least difficult to clean up. The FY 2006-2007 completions of Rocky Flats, Lawrence Livermore National Laboratory, Kansas City Plant, Lawrence Berkeley National Laboratory and the three Ohio sites are some of EM's most significant achievements. The remaining large sites – Savannah River, Idaho National Laboratory, Portsmouth, Paducah, Oak Ridge and Hanford – present enormous challenges to the Department. With such long-term completion dates, the estimates for cost and schedule are highly uncertain and subject to change.

The Department also faces the ongoing challenge of increased work scope resulting from the discovery of greater than anticipated contamination at existing cleanup sites, as well as changes in assumptions regarding the cleanup of existing work scope.

The Department utilized approximately \$6.1 billion on environmental cleanup activities in FY 2007. In addition to completing cleanup on the four sites in FY 2007, the Department also marked the completion of its first shipment of remote-handled transuranic waste to the Waste Isolation Pilot Plant in Carlsbad, New Mexico. Other shipments of transuranic waste from Idaho, Savannah River, Los Alamos National Laboratory and Hanford continued to make progress towards accelerating cleanup and reducing risk.

The environmental cleanup program is focused on reducing risk, honoring commitments and producing results worthy of the investment of the American people. The Department is committed to ensuring strong management of this complex cleanup work to secure safe and efficient progress that protects the public, the DOE workers and the environment.



First remote-handled transuranic waste shipment to the Waste Isolation Pilot Plant.

— Management Excellence —

Enabling the mission through sound management.

IMPROVE HUMAN CAPITAL MANAGEMENT

The Department strives to ensure that Human Capital Management programs and policies facilitate the creation of a Department-wide performance culture and attract, motivate and retain a highly skilled and diverse workforce capable of meeting the challenges of the 21st Century. The Department's efforts have made positive strides towards improving the workforce planning processes, identifying critical skill sets, analyzing skill gaps, hiring new talent to fill vacancies more efficiently and implementing new talent and performance management systems.

Relevance of Progress

The people who make up the Department's workforce are our most important resource for accomplishing programmatic goals and objectives.

Supporting the DOE Mission

Improving human capital management supports the Department's Strategic Theme of:

THEME 5 Management Excellence - *Enabling the mission through sound management.*

The Office of Human Capital Management (HC) develops and implements strategies that provide leadership and direction for well thought-out investment in our people. These strategies are linked to the missions and goals of the organization, resulting in improved performance and an exciting, challenging and productive workplace environment.



The Department is working to ensure that it is a great place to work. The Department values a diverse workforce, has a performance-oriented culture, is able to put the right people with the right skills in the right jobs and employs effective leadership principles. Through this type of human capital management, the Department can ensure that employees have the resources available to do the job and hold individuals and organizations accountable for performance.

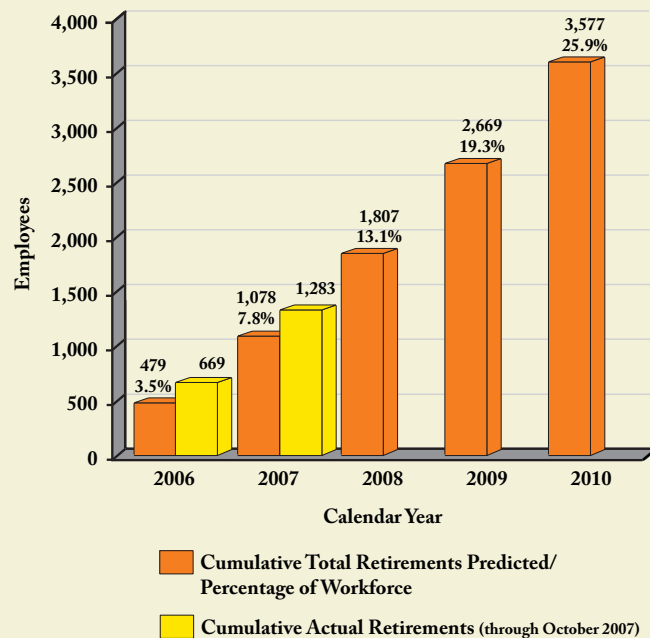
Background

The Department faces a number of challenges in its management of human capital. How do you attract the brightest engineers, physicists, project managers and nuclear scientists to work for DOE? How do you ensure that employees working on cutting edge R&D want to stay with DOE to see new discoveries come to light? At an even more basic level, how do you increase American interest in energy research, conservation and science?

The Department requires a highly technical and specialized workforce to accomplish its scientific and technological missions. There is increasing competition for individuals with the knowledge, skills and competencies that the Department needs. As a result, recruitment and retention is more difficult and the Department needs new corporate strategies in this area.

The Department's Federal workforce, consisting of about 13,500 DOE employees, is aging and presenting a significant retirement challenge that threatens to rob the organization of critical skills. The average employee age is over 49 years and a significant number (26 percent) will be eligible to retire in the next three years. Twenty-seven percent of the Department's scientists and engineers will be retirement-eligible in 2008. In 2006, retirements exceeded historical trends and attrition increased by two percent over 2005. A continuation of this trend can deprive the organization of the skills needed to perform its mission.

Retirements



In addition to recruitment, retention and workforce planning issues, additional challenges include increasing diversity within the workforce; improving the efficiency and effectiveness of hiring practices; addressing employee development and training needs; and creating a Department-wide performance culture to improve accountability at the individual and organizational level.

The Department has undertaken a number of initiatives to address these issues and improve human capital management. These initiatives are captured in a new 5-year Human Capital Management Strategic Plan. The plan establishes a systematic Department-wide approach to human capital management that aligns to the agency mission, vision and goals.

The Department is continuing to enhance its recruitment efforts. In FY 2007, the Department participated in over 25 recruitment activities hosted by minority educational institutions and professional organizations and was a major supporter of the Hispanic Youth Symposiums. The Department is continuing to work in partnership with other Federal agencies on proposed legislation to increase hiring flexibilities. In addition, the Department is working to develop new corporate recruitment and outreach strategies and a corporate intern program. The Department's FY 2007 results to date are positive and have reduced the under representation of minorities in the workforce by over 14 percent. The new intern program is beginning to create a pipeline of new talent into the agency with over 40 new interns hired in FY 2007 and by integrating the efforts of many existing intern programs. Targeted recruitment will continue to fill mission critical occupations.

The Department has recognized the challenge of hiring a highly skilled and diverse applicant pool as efficiently as possible. Internal and external reviews of the hiring processes indicated improvements within the context of applicable regulations and Merit System Principles. In FY 2006, the Department improved its vacancy fill rate to 85 percent (from 76 percent in FY 2005 and 50 percent in FY 2004).

The Department's human capital goal to implement a comprehensive enterprise talent management system is moving forward. The organization has identified mission critical occupations and completed a systematic assessment of the skill gaps in these areas to identify developmental and training options designed to close these gaps.

MISSION CRITICAL OCCUPATIONS

- **Electrical Engineers**
- **Nuclear Engineers**
- **Contract Managers**
- **Project Directors**
- **Human Resource Specialists**

The expanding opportunities at the Department are as exciting and challenging as ever before. The Department is working to meet these challenges head on with programs and policies for a talented and engaged workforce that is given the resources to do its jobs and be held accountable for the results.

— President's Management Agenda —



The President's charge to Federal agencies is to make sure all our green and yellow accomplishments convert to greater government effectiveness for FY 2007, FY 2008 and beyond.

In 2001, the President unveiled the President's Management Agenda (PMA) and challenged the Federal Government to become more efficient, effective, results-oriented and accountable. Over the past six years, the PMA has become the primary framework by which the Department has implemented changes to support the President's management goals. The PMA reflects the President's on-going commitment to achieve immediate and measurable results that matter to the American people.

Each agency is held accountable for its performance in carrying out the PMA through quarterly scorecards issued by the OMB. Agencies are scored green, yellow or red on their status in achieving overall goals or long-term criteria, as well as their progress in implementing improvement plans. The Department is scored on six PMA initiatives: five government-wide areas and one agency-specific area. The Department and the OMB consider progress made over the previous year and create

a plan for the upcoming year's PMA-related activities. The plan is used by the Department to guide further management reforms and by the OMB as the baseline for assessing the Department's quarterly performance. Further information on OMB's management of the PMA may be found at <http://www.ExpectMore.gov> and <http://www.Results.gov>

FY 2007 saw continuing accomplishments in some of the six PMA areas. Key achievements include:

Initiative and Current Status as of September 30, 2007	Progress in Implementation
Human Capital	G
Competitive Sourcing	R
Financial Performance	R
E-Government	Y
Performance Improvement	G
Real Property	G

Green (G): Implementation is proceeding according to plan.

Yellow (Y): Some slippage or other issue(s) requiring adjustment.

Red (R): Initiative in serious jeopardy absent significant management intervention.

— Program Assessment Rating Tool —

The Program Assessment Rating Tool (PART) was developed by the OMB in 2002 as a key component for implementing the President's Management Agenda (PMA), particularly the Budget and Performance Integration initiative. PART grew out of the Administration's desire to assess and improve program performance so that the Federal Government can achieve better results. It provides Federal agencies with a disciplined tool for assessing program planning, management, and performance against quantitative, outcome-oriented goals. It is a tool to inform funding and management decisions aimed at making the program more effective. As an instrument for periodically evaluating the efficiency and effectiveness of Federal programs, the PART enables managers to identify and rectify existing and potential problems associated with program performance.

From FY 2002-2007, the Department has evaluated 54 of its current programs. Of these assessed programs, 76 percent are rated as "Moderately Effective" or "Effective." The following chart shows DOE's average results by strategic theme:

	Average Score	Average Rating
Theme 1 Energy Security	69	Adequate
Theme 2 Nuclear Security	84	Moderately Effective
Theme 3 Scientific Discovery and Innovation	86	Effective
Theme 4 Environmental Responsibility	66	Adequate
DOE-Wide Results	76	Moderately Effective

More information on PART scores and OMB's findings are available at www.ExpectMore.gov.

— Improper Payments Information Act —

The *Improper Payments Information Act* (IPIA) of 2002, Public Law (P.L.) No. 107-300, requires agencies to annually review their programs and activities to identify those susceptible to significant improper payments. In addition, the *Defense Authorization Act* (P.L. No. 107-107) established the requirement for government agencies to carry out cost effective programs for identifying and recovering overpayments made to contractors, also known as "Recovery Auditing." The OMB has established specific reporting requirements for agencies with programs

that possess a significant risk of erroneous payments and for reporting on the results of recovery auditing activities.

While the Department does not have any programs that meet the OMB criteria for significant risk, improper payments are monitored on an annual basis to ensure our error rates remain at minimal levels. The Department's information on improper payments is located in the Other Accompanying Information section.

— Analysis of Financial Statements —

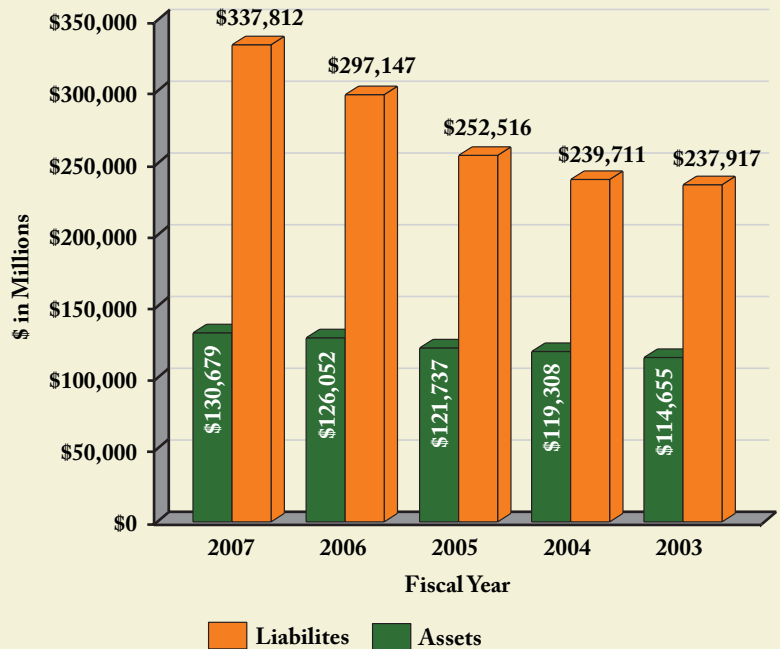
The Department's financial statements are included in the Financial Results section of this report. Preparing these statements is part of the Department's goal to improve financial management and provide accurate and reliable information that is useful for assessing performance and allocating resources. The Department's management is responsible for the integrity and objectivity of the financial information presented in these financial statements.

The financial statements have been prepared to report the financial position and results of operations of the entity, pursuant to the requirements of 31 U.S.C. 3515(b). The statements have been prepared from the Department's books and records in accordance with generally accepted accounting principles (GAAP) prescribed by the Federal Accounting Standards Advisory Board and the formats prescribed by the OMB. The financial statements are prepared in addition to 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 realization that they are for a component of the U.S. Government, a sovereign entity.

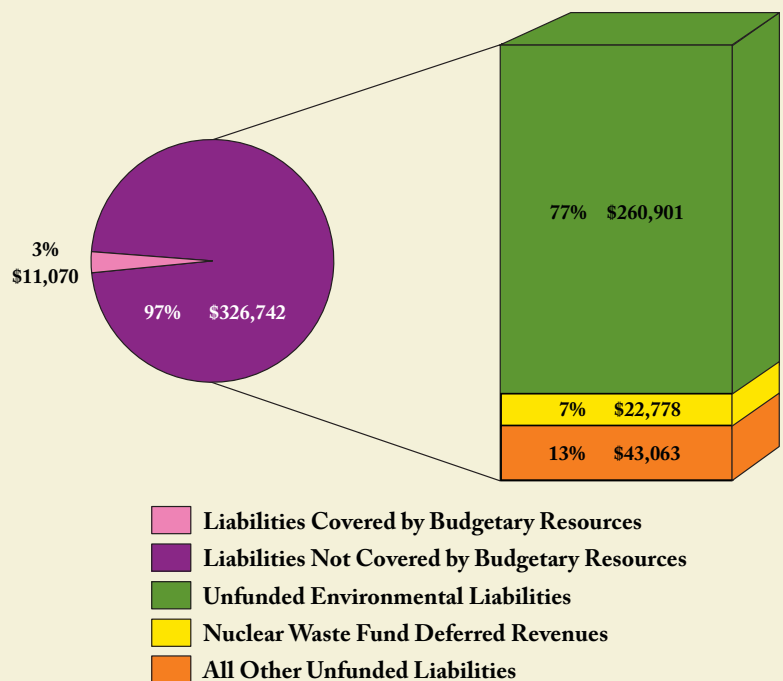
Balance Sheet. The Department has significant unfunded liabilities that will require future appropriations to fund. The most significant of these represent ongoing efforts to cleanup environmental contamination resulting from past operations of the nuclear weapons complex. The FY 2007 environmental liability estimate totaled \$264 billion and represents one of the most technically challenging and complex cleanup efforts in the world. Estimating this liability requires making assumptions about future activities and is inherently uncertain. The future course of the Department's environmental management program will depend on a number of fundamental technical and policy choices, many of which have not been made. The cost and environmental implications of alternative choices can be profound.

Changes to the environmental baseline estimates during FY 2007 and FY 2006 resulted from inflation adjustments to reflect constant dollars for the current year; improved and updated estimates for the same scope of work; revisions in acquisition strategies, technical approach or scope; regulatory changes; cleanup activities performed; additional scope and transfers out of the environmental baseline estimates; and additions for facilities transferred from the active and surplus category.

Total Assets and Total Liabilities (\$ in millions)



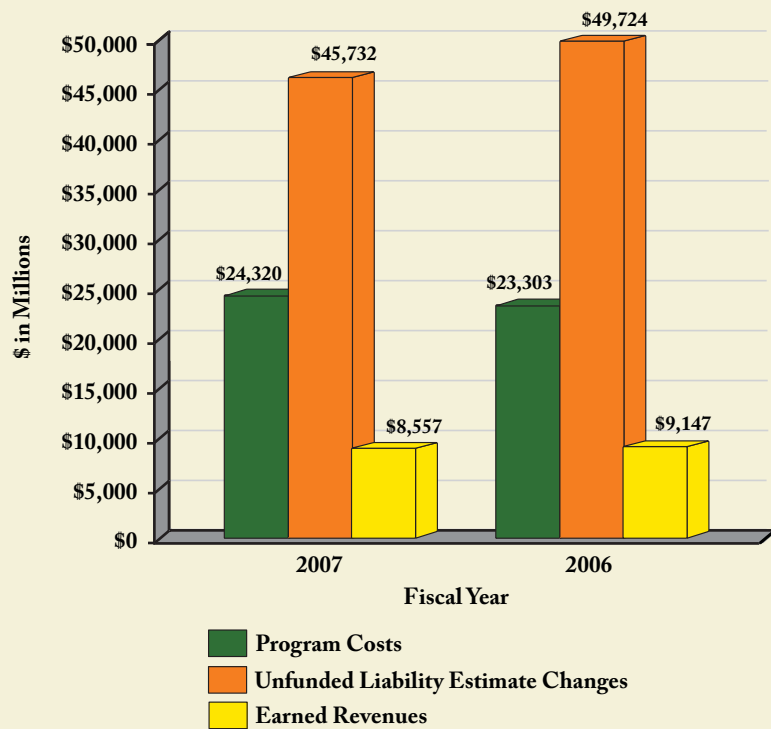
Breakdown of FY 2007 Liabilities (\$ in millions)



Net Cost of Operations. The major elements of net cost (see chart above) include program costs, unfunded liability estimate changes and earned revenues. Unfunded liability estimate changes result from inflation adjustments; improved and updated estimates; revisions in acquisition strategies, technical approach, or scope; and regulatory changes. The Department's overall net costs are dramatically impacted by these changes in environmental and other unfunded liability estimates. Since these estimates primarily relate to the cost of multiple years operations, they are not included as current year program costs, but rather reported as "Costs Not Assigned" on the Consolidated Statements of Net Cost. Program costs also exclude current-year outlays for environmental cleanup work as those costs were accrued in prior years.

Budgetary Resources. The Combined Statements of Budgetary Resources provide information on the budgetary resources that were made available to the Department for the year and the status of those resources at the end of the fiscal year. The Department receives most of its funding from general government funds administered by the Department of the Treasury and appropriated for Energy's use by Congress. Since budgetary accounting rules and financial accounting rules may recognize certain transactions at different points in time, Appropriations Used on the Consolidated Statements of Changes in Net Position will not match costs for that period. The primary difference results from recognition of costs related to changes in unfunded liability estimates.

Major Elements of Net Cost (\$ in millions)



Obligations Incurred (\$ in millions)



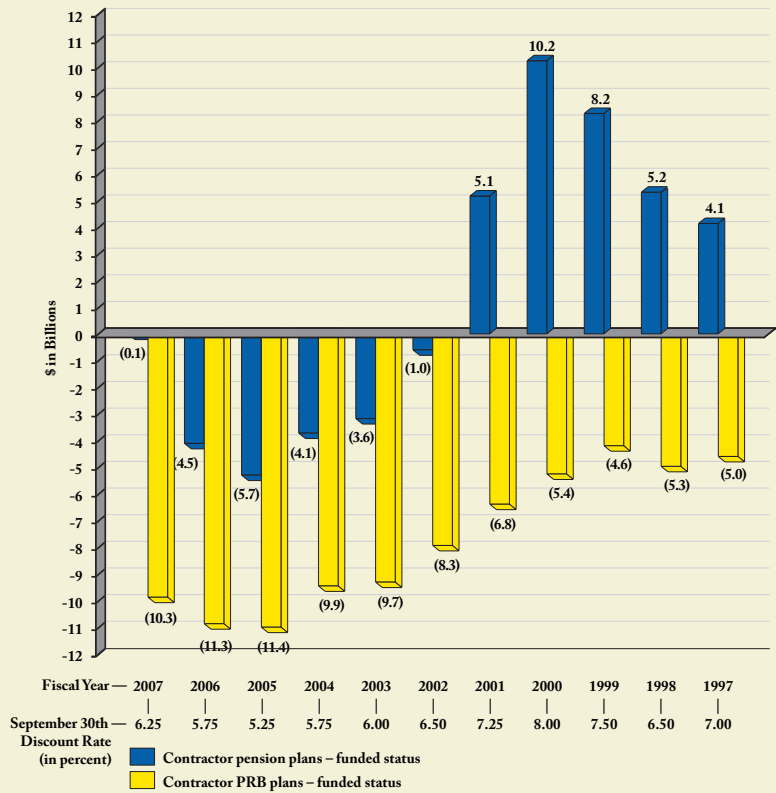
Pension/Postretirement Benefit Obligations Trend

Analysis. A 50 basis point increase in the discount rate (to its highest level in five years) used to estimate contractor employee pension plan obligations was one of the primary reasons for an improvement in the funded status from an under funding of almost \$4.5 billion in FY 2006 to an under funding of less than \$0.1 billion in FY 2007 for these plans. The discount rate increase improved the funded status by \$2.2 billion. In addition, the value of pension plan assets increased by \$2.4 billion in excess of the amount expected based on the contractors' long-term rate of return assumption. These two large improvements in the funded status were offset partially by the cost of additional benefits accruing and other losses during the year.

A similar change in the discount rate used to estimate the obligations of contractor postretirement benefits other than pensions (PRB) improved the funded status by \$0.9 billion. In addition, the funded status improved by \$0.1 billion due to other experience gains during the year versus the actuarial assumptions, partially offset by the cost of additional benefits accruing. Assets are not generally set aside to fund PRB plans as they are for pension plans, so PRB plans are not expected to ever become fully funded.

Prior to the adoption of SFAS No. 158 in FY 2007, changes in the estimated plan benefit obligations were generally amortized over an extended time period, and therefore did not result in an immediate change in obligations recorded by the Department. However, under SFAS No. 158 the funded status of the plans is now fully reflected in the assets and liabilities recorded by the Department. The above chart shows the funded status for contractor employee pension and PRB plans and the year-end discount rate from FY 1997 to FY 2007.

Pension/Postretirement Benefit Obligations Trend Analysis (\$ in billions)



— Analysis of Systems, Controls and Legal Compliance —

Management Assurances

The Department's management is responsible for establishing and maintaining an effective system of internal controls to meet the objectives of the Federal Managers' Financial Integrity Act. To support management's responsibilities, the Department is required to perform an evaluation of management and financial system internal controls as required by Sections II and IV, respectively, of OMB Circular A-123, Management's Responsibility for Internal Control, and internal controls over financial reporting as required by Appendix A of the Circular. The following assurances are made based on the results of these evaluations, which are reflected in reports and representations completed by senior accountable managers within the Department.

The Department has completed its evaluation of management and financial system internal controls. Based on that assessment, the Department can provide reasonable assurance that management internal controls over the effectiveness and efficiency of operations and compliance with applicable laws and regulations, as of September 30, 2007, were operating effectively with no material weaknesses found in their design or operation. Evaluation results also indicated that the Department's financial systems generally conform to governmental financial system requirements and substantially comply with requirements of the Federal Financial Management Improvement Act.

In addition, the Department has completed its FY 2007 limited scope evaluation of internal control over financial reporting, which includes safeguarding of assets and compliance with applicable laws and regulations, as required by Appendix A of OMB Circular A-123 and Departmental requirements. The evaluation included an assessment of both entity and process controls, as required. Based on the results of the evaluation, the Department is providing reasonable assurance that internal controls over financial reporting as of June 30, 2007, were working effectively and no material weaknesses were identified in the design or operation of the specific controls over financial reporting evaluated. However, the Department cannot provide complete assurance on the overall financial reporting control system until its baseline assessment is completed in FY 2008 in accordance with the plan approved by OMB.

Samuel W. Bodman

Samuel W. Bodman
November 14, 2007



Federal Managers' Financial Integrity Act

The Federal Managers' Financial Integrity Act (FMFIA) of 1982 requires that agencies establish internal control and financial systems to provide reasonable assurance that the integrity of Federal programs and operations is protected. Furthermore, it requires that the head of the agency provide an annual assurance statement on whether the agency has met this requirement and whether any material weaknesses exist.

In response to the FMFIA, the Department developed an internal control program which holds managers accountable for the performance, productivity, operations and integrity of their programs through the use of internal controls. Annually, senior managers at the Department are responsible for evaluating the adequacy of the internal controls sur-

rounding their activities and determining whether they conform to the principles and standards established by the OMB and the Government Accountability Office (GAO). The results of these evaluations and other senior management information are used to determine whether there are any internal control problems to be reported as material weaknesses. The Departmental Internal Control and Audit Review Council, the organization responsible for oversight of the Internal Control Program, makes the final assessment and decision for the Department.

The Department's evaluation for FY 2007 identified no material weaknesses in the design or operation of its management and financial system internal controls.

Appendix A of OMB Circular A-123

Internal control requirements for publicly traded companies contained in the Sarbanes-Oxley Act of 2002 paved the way for the Federal Government to also strengthen its internal control requirements. The issuance of Appendix A of OMB Circular A-123 provides specific requirements to agencies for conducting management's assessment of internal control over financial reporting. In FY 2006, the Department adopted, with the approval of OMB, a three-year, phased implementation approach for completing a baseline assessment under these requirements by the end of FY 2008. In accordance with this plan, the Department completed the assessment of all high, medium and low-risk activities at our contractor locations and all high and medium-risk activities at our Federal sites. The remaining low-risk activities will be assessed in FY 2008, completing the baseline assessment of all key processes and controls.

The Department's evaluation for FY 2007 did not identify any material weaknesses as of, or subsequent to, June 30, 2007. In addition, actions taken during FY 2007 have sufficiently resolved the material weakness identified in the Department's FY 2006 Performance and Accountability Report related to controls over undelivered orders.

Federal Financial Management Improvement Act

The Federal Financial Management Improvement Act (FFMIA) of 1996 was designed to improve Federal financial management and reporting by requiring that financial management systems comply substantially with three requirements: (1) Federal financial management system requirements; (2) applicable Federal accounting standards; and (3) the United States Government Standard General Ledger at the transaction level. Furthermore, the Act requires independent auditors to report on agency compliance with the three stated requirements as part of financial statement audit reports.

The Department has evaluated its financial management systems and has determined that they substantially comply with Federal financial management systems requirements, applicable Federal accounting standards and the U.S. Government Standard General Ledger at the transaction level.

— Leadership Challenges —

The Department carries out multiple complex and highly diverse missions. Although the Department is continually striving to improve the efficiency and effectiveness of its programs and operations, there are some specific areas that merit a higher level of focus and attention. These areas often times require long-term strategies for ensuring stable operations and represent the most daunting Leadership Challenges the Department faces in accomplishing its mission.

The Reports Consolidation Act of 2000 requires that, annually, the Inspector General (IG) prepare a statement summarizing what he considers to be the most serious management and performance challenges facing the Department. These challenges are included in the Financial Results section of the AFR. Similarly, in FY 2003 the GAO identified six major management challenges and program risks to be addressed by the Department.

The Department, after considering the areas identified by the IG, GAO and all other critical activities within the agency, has identified ten Leadership Challenges that represent the most important strategic management issues facing the Department now and in the coming years. It is the Department's goal that the strategies to address these areas will also help mitigate related IG and GAO management challenges.

To highlight how the Department's strategies for mitigating its Leadership Challenges align with and address the IG and GAO challenge areas, the following table provides a crosswalk of the relationship between the three. Please note that the IG and GAO did identify areas that are not currently reported as Leadership Challenges by the Department. While the ongoing importance of those areas is recognized and they continue to receive appropriate management attention, management no longer considers them to be leadership challenges, due to the progress the Department previously made in those areas.

IG Challenge Areas	GAO Challenge Areas	DOE Leadership Challenges
Contract Management S	Resolve problems in contract management that place the agency at high risk for fraud, waste and abuse S	Contract Administration S Acquisition Process Management S
Safeguards and Security D	Address security threats and problems D	Security D
Environmental Cleanup D	Improve management for cleanup of radioactive and hazardous wastes D	Environmental Cleanup D Nuclear Waste Disposal D
Stockpile Stewardship D	Improve management of the Nation's nuclear weapons stockpile D	Stockpile Stewardship D
Project Management D		Project Management D
Cyber Security S		Cyber Security S
Human Capital Management S		Human Capital Management S
	Enhance leadership in meeting the Nation's energy needs D	
		Safety & Health S
	Revitalize infrastructure S	

IG Watch List

Worker and Community Safety **S**

Infrastructure Modernization **D**

D Mission Direct **S** Mission Support

Contract Administration

DESCRIPTION: Improvements are needed in the oversight of contractors managing and operating the Department's facilities. Specific oversight problems have been identified at environmental cleanup sites and laboratories conducting national security and scientific activities. Adequate oversight is needed to ensure that contractor operations are effective and efficient and that contractors have the appropriate workforce size and skill mix.

KEY STRATEGIES: In FY 2007, the Department's SC program continued implementation of its new restructured organization that places clear line management accountability for the laboratory contracts at the Site Office. SC also utilized its new contract approach to compete the Argonne, Ames and Fermi laboratory contracts. In addition, SC has completed its revision of new performance measures and has been conducting both technical and business reviews with each of their laboratory contracts.

To increase focus on contract management and oversight, the Department restructured EM to include a Deputy Assistant Secretary for Acquisition and Project Management. In addition, in response to direction from the House and Senate Energy and Water Appropriations Subcommittees, the National Academy of Public Administration (NAPA) commenced a review of EM's organization and management, with special emphasis on EM's contracting procedures and oversight. In FY 2007, EM began development of contract execution and procurement processes that implement NAPA recommendations and are cognizant of the recognized best practices in the Government and industry contracting community. Also during FY 2007, EM created a business process that allows procurements to be treated as part of an ongoing system that integrates acquisition planning and project management, leading to more effective management of contracts. In addition, EM is building a centralized acquisition planning structure and establishing a single EM Head of Contracting Activity that will improve EM's capability to process major procurement actions and ensure timely contract awards and efficient procurement operations.

Site Manager reporting in NNSA has been realigned to the Deputy Administrator for Defense Programs to enhance management accountability and provide consistent programmatic, management and administrative guidance to all areas, including contract administration. Additionally, NNSA has implemented independent reviews of contractors' Purchasing and Property systems. This allows managers to evaluate progress in various topical areas of contract administration. Most importantly for this area is NNSA's movement to integrate their Federal oversight and assurance functions with contractor assurance systems, which allows NNSA to manage risks and ensure that contractors take accountability for their actions and operations.

TIMING: Processes and organizational changes were implemented in FY 2007. Assessment of the effectiveness of those changes will be conducted in FY 2009 and beyond.

Acquisition Process Management

DESCRIPTION: The Department is the largest civilian contracting agency in the Federal Government and spends approximately 90 percent of its annual budget on contracts to operate its scientific laboratories, engineering and production facilities and environmental restoration sites. A June 2006 GAO report cited concerns involving delays in awarding contracts and the need for a systematic method to share lessons learned from contract awards.

KEY STRATEGIES: To improve the timeliness in awarding contracts, several actions are underway. EM, which has the majority of complex procurement actions, staffed a new organization to plan and implement its procurements. The Office of Management developed a monthly report for senior leaders on the status of major procurements. Also, regular meetings between senior program, management and procurement leaders were implemented to discuss at-risk procurements.

The Department also continuously identifies and shares lessons-learned with DOE staff. Recent ongoing source evaluation board training conducted in the field provided procurement and technical staff with current policy, the latest guidance and lessons-learned from analysis of past DOE competitive procurements. Additionally, the Department benchmarked other Federal agencies regarding the ways that they share lessons learned among their respective staffs. Lastly, the Department analyzed mechanisms to identify, accumulate and disseminate source-selection lessons learned and best practices.

The Department's Chief Acquisition Officer, and the Office of Procurement and Assistance Management, conducted a systemic review of the process used Department-wide to award major procurements. The process was analyzed through an inspection of acquisition documentation and interviews with a variety of stakeholders. The team also benchmarked the business clearance processes of other agencies and analyzed and process-mapped the DOE process. The goals of the review were to identify and eliminate unnecessary, inefficient and redundant steps, improve timeliness of contract awards and better share lessons learned.

TIMING: The study was completed in FY 2007. The draft report, including recommendations is under review. Implementation of the recommendations, once approved by management, is anticipated for later in FY 2008.

Security

DESCRIPTION: Unprecedented security challenges have evolved since the events of September 11, 2001. The need for improved homeland defense, highlighted by the threats of terrorism and weapons of mass destruction, created new and complex security issues that must be surmounted to ensure the protection of our critical energy resources and infrastructure. These have made it necessary for the Department to reassess and strengthen its security postures.

KEY STRATEGIES: The Department has taken a number of aggressive steps over the past several years to improve security at all its facilities. In May 2004, the former Secretary of Energy announced a set of sweeping new initiatives to improve security across the Department's nationwide network of laboratories and defense facilities, particularly those housing weapons-grade nuclear materials. The Department's continued completion of these initiatives will ensure the Department has a clear strategic security plan outlining the Department's future security course, conducts ongoing threat analyses to establish the framework for continually improving security protective measures and enhances the physical security of our facilities. Actions have focused on implementing the necessary improvements to meet the current Design Basis Threat Policy to include revising vulnerability assessments; evaluating, testing and deploying security technologies; implementing the elite protective force model; consolidating materials; and improving material storage facilities.

Through an integrated approach, the Department is working to coordinate site mission, operations, security technologies and the elite protective force to provide more robust security protection measures at a lower overall cost. The Security Technologies Demonstration conducted at the Idaho National Laboratory in July 2006 showed that the use of technologies, combined with updated protective force tactics, can improve protective force survivability and serve as force multipliers. These methods are now being applied throughout the Department to build an efficient security program that is also flexible to meet both today's threat and tomorrow's challenges.

To address recommendations resulting from the Task Force Review of the Personnel Security Program, completed in February 2007, specific actions are being implemented to strengthen personnel security policies; drug testing requirements; training and certification; reviews of certain clearance cases; and quality control. Additionally, to strengthen the management of the program, a new Office of Departmental Personnel Security, reporting to the Chief Health, Safety and Security Officer was established.

NNSA continued the implementation of processes, procedures and technologies to fully implement the Enhanced Design Basis Threat. Resource and planning documents were developed for the Diskless Workstation Conversion Secretarial initiative. In addition, NNSA continued work with various programmatic and administrative elements to meet portions of Homeland Security Presidential Directive-12 access controls requirements. NNSA also continued to address specific security operations and personnel issues identified by the IG and GAO.

TIMING: Although strategies for minimizing risk are in place, long-term correction is expected due to the continuing nature of security threats.

Environmental Cleanup

DESCRIPTION: EM's mission is to clean up the environmental legacy of nuclear weapons production and nuclear energy research. In the past, programmatic requirements, such as contractual obligations and negotiated compliance agreements as well as unilateral compliance orders and directives have not always been consistent with realistic program funding profiles. This disconnect has continually challenged EM's ability to establish a credible and executable basis to continue cleanup progress and advance risk reduction across the complex. In addition, EM is often put in a position where it is difficult to manage regulator and stakeholder expectations.

KEY STRATEGIES: EM is undertaking an out-year planning initiative that will revisit life-cycle cost profiles to ensure a more optimum allocation of out-year resources at each site. A major component of this effort will be the determination of the magnitude of the Department's unfunded liability primarily the decontamination and decommissioning of hundreds of surplus facilities from other DOE mission programs (i.e., NNSA, SC, and NE). In addition, EM will be able to determine when a site has sufficient capability to accommodate existing EM cleanup scope and new cleanup scope from other Departmental programs. As a result, EM and the Department will have a process by which these unfunded liabilities can be accounted for and transitioned orderly into the EM cleanup program.

TIMING: As of December 2007, all near-term baselines will be validated. Project performance in relation to schedules and costs will continue to be evaluated on a regular basis. Out-year planning exercises will be conducted on an annual basis.

Nuclear Waste Disposal

DESCRIPTION: Construction of a repository for the disposal of spent nuclear fuel and high-level radioactive waste, authorized under the Nuclear Waste Policy Act, at Yucca Mountain, Nevada, has been delayed because of external factors and program adjustments. Funding shortfalls, and the scientific and technical challenges encountered in this first-of-a-kind endeavor to develop a disposal system that must potentially endure a compliance period of a million years, have complicated the steady progress necessary to achieve previously published milestones. Finalizing the Environmental Protection Agency radiation protection standards and addressing the licensing requirements of the Nuclear Regulatory Commission (NRC) to submit and defend a license application are the keys to achieving the new milestones published in July 2006.

KEY STRATEGIES: The introduction of the Nuclear Fuel Management and Disposal Act, in April 2006, seeks to provide stability, clarity and predictability to the Yucca Mountain Project. The proposed legislation addresses many of the uncertainties that are currently beyond the control of the Department and have the potential to significantly delay the opening date for the repository. The most important factor is the enactment of a provision that will facilitate Congressional funding needed to implement the Project.

The Program adopted a primarily canister-based approach for handling commercial spent nuclear fuel. The revised approach enabled deployment of necessary surface and sub-surface facilities in a manner that could accommodate future funding and income streams and enhances repository operations and performance.

In January 2006, the Department designated Sandia National Laboratories the lead laboratory to coordinate and organize all scientific work on the Project. Sandia National Laboratories will also review the existing infiltration model and prepare a new model to be used as part of the technical basis for the license application.

The Program is implementing management controls in accordance with DOE Order 413.3, Program and Project Management for the Acquisition of Capital Assets, and performance metrics required under the Department's performance and accountability report system and Office of Management and Budget reporting requirements to ensure it achieves its revised milestones. Additionally, the Program is proceeding to certify its earned value management system, which will be in place prior to critical decision-2, Approve Performance Baseline.

Key strategies that remain include: submittal of a license application to the NRC by June 30, 2008; construction authorization from the NRC by 2011; and receipt of a license amendment from the NRC to receive and possess nuclear material by 2017.

TIMING: Strategies are in place for minimizing risk; however, implementation of the key strategies is a long-term initiative.

Stockpile Stewardship

DESCRIPTION: Stewardship of the Nation's nuclear weapons stockpile is one of the most complex, scientifically technical programs undertaken and the Department needs to ensure that all aspects of this mission-critical responsibility are fulfilled. Based on stockpile stewardship activities, the Secretary, jointly with the Secretary of Defense, annually certifies to the President that the nuclear weapons stockpile is safe and reliable and that underground nuclear testing does not need to resume. Success is dependent upon unprecedented scientific tools to better understand the changes that occur as nuclear weapons age, enhance the surveillance capabilities for determining weapon reliability and extend weapon lives. The Department must ensure that problems in these areas are aggressively addressed.

KEY STRATEGIES: Processes have been put in place to eliminate a backlog of surveillance tests and resolve deficiencies in the investigations conducted when weapons problems are identified. Plans and financial controls over weapons refurbishment have been strengthened. Self-assessments of project management processes of the Enhanced Surveillance Campaign have been completed and all sites have developed an Enhanced Surveillance Campaign Project Management Improvement Plan. During FY 2005, the Enhanced Surveillance Campaign Risk Management Plan was issued. The Life Extension Programs and sub-elements are now subject to the NNSA's Planning, Programming, Budgeting and Evaluation processes and the Department's project management processes. Resource loaded plans that contain cost, scope and milestones were implemented for the Enhanced Test Readiness Program during FY 2005.

In FY 2006, NNSA announced the details of the Nuclear Weapons Complex 2030, a comprehensive plan to enhance the Department's capability to respond to national and global security challenges while facilitating the President's vision of a smaller stockpile consistent with our national security needs. To guide and oversee Complex 2030, NNSA established the Office of Transformation under its Deputy Administrator for Defense Programs. Other major activities initiated to implement Complex 2030 include a Reliable Replacement Warhead, the acceleration of warhead dismantlement to enhance test readiness and the move toward consolidating special nuclear material to fewer sites.

TIMING: The Stockpile Stewardship Program was established to ensure the Nation's nuclear weapons stockpile is safe and reliable without underground testing. The nature of the program makes Stockpile Stewardship a significant management challenge. For this fiscal year and throughout the next several years, the direction of the Stockpile Stewardship Program will be shaped, in part, by the planning underway in support of the transformation of the nuclear weapons complex. Efficient management of contractors, human capital, projects, and security will ensure success of the program overall but will not remove it from being a management challenge.

Project Management

DESCRIPTION: The Department needs to improve the discipline and structure for approving and controlling program and baseline changes to projects as well as the Department wide approach for certifying Federal Project Directors at predetermined skill levels to ensure competent management oversight of resources. In addition, the Department needs stronger policies and controls to ensure that ongoing projects are re-evaluated frequently in light of changing missions.

KEY STRATEGIES: EM has applied project management principles to all cleanup projects having a total estimated cost greater than \$20 million and is continuing its review of resource-loaded cost and schedule baselines for 79 active projects of which 69 are in the execution phase. The baselines describe in detail the activities, schedule and resources required to complete the EM cleanup mission at each site or to construct a major facility at a site. Each site has undergone an independent review that will certify the scope, cost and schedule for each project. Project performance, schedules, and costs continue to be reviewed on a regular basis. Independent project reviews are being completed on 100% of those projects in the execution phase, and corrective actions are being addressed. EM is working to have this independent baseline review effort completed by December 2007. In April 2007, EM completed Phase I of its self-assessment of project management capabilities at nineteen EM selected sites including, Headquarters and the EM Consolidated Business Center. The Phase II site assessments are currently being conducted and are planned to be completed by December 2007. The National Academy of Public Administration (NAPA) is conducting a review of EM's project management capability. During FY 2007, EM began implementation of recommendations identified by the NAPA. Recommendations being implemented include modifying the EM Integrated Planning, Accountability and Budgeting System to include EVMS data and developing an internal cost-estimating capacity.

SC renewed its Facilities for the Future of Science Plan in FY 2007, to ensure its portfolio of major scientific projects are appropriately prioritized and progressing to deliver the transformational science needed to achieve DOE's missions. SC continues to conduct its independent project peer reviews, recognized as a "Best Practice" by the Office of Science and Technology Policy. SC senior managers proactively implement a Watch List procedure that requires a monthly in-depth assessment of progress in resolving critical project issues in poorly performing or high significance projects. SC rigorously implements the DOE corporate project management system and holds its line managers accountable for achieving project technical, cost, schedule, and management objectives.

NNSA continues its efforts in improving its project management performance. NNSA has fully implemented the new project management procedures and policies that were jointly developed by all of the Departmental elements and continues training and certifying Project Managers. NNSA is also integrating project management criteria into various aspects of its program elements, such as the warhead life extension activities.

The Office of Management (MA) issued DOE Order 413.3A, Program and Project Management for the Acquisition of Capital Assets, to provide project management guidance to the Department, including the NNSA, with the focus on delivering projects on schedule, within budget and fully capable of meeting mission performance. To enhance oversight of project management, MA also prepares a monthly project status report for all projects and a summary report that identifies all poorly performing projects for the Deputy Secretary, Under Secretary and the Administrator, NNSA. To improve the implementation of EVMS of the Department's contractors, MA has implemented a program to certify contractors' EVMS and in FY 2007 certified six major contractors' EVMS. In addition, MA conducted a Root Cause Analysis Conference to discuss the root causes of Departmental deficiencies in contract administration and project management. The conference was attended by DOE senior-level personnel, as well as GAO and OMB. Corrective actions will be developed by the Department to mitigate any identified project deficiencies.

TIMING: Because of the overall long-term nature of the Department's programs and projects, the Department must work within a disciplined project management and control system to ensure projects are completed on-time and within budget. To that end, the Department plans to implement additional corrective actions to improve project management acumen in FY 2008. These additional corrective actions will be derived from a FY 2008 root cause analysis of past and present project management deficiencies.

Cyber Security

DESCRIPTION: In FY 2006, the Secretary and Deputy Secretary established an initiative to develop a comprehensive DOE cyber security program, following concerns about cyber security raised by the IG, the Office of Health, Safety and Security (HSS) and the Congress, as well as the increased overall cyber threat environment then facing the Department.

KEY STRATEGIES: A Cyber Security Executive Steering Committee was created to oversee this effort, consisting of the Under Secretaries and others and chaired by the Chief Information Officer (CIO). This resulted in creation of a DOE Cyber Security Revitalization Plan, signed by the Deputy Secretary in March 2006. The Plan established the basis for resolving management, operational, and technical cyber security weaknesses within DOE. This Department-wide effort followed an earlier 2005 cyber security improvement effort that had resulted in a set of proposed actions to improve cyber security across the DOE complex. These actions were incorporated into the Revitalization Plan. Also, in recognition of the importance of cyber security to the Department, an unprecedented DOE Senior Leadership Cyber Summit was held, involving the Deputy Secretary, the Under Secretary, other senior DOE officials, and participants from the National Laboratories. Other major milestones to address Cyber Security issues include:

- Development of DOE Order 205.1A, *Department of Energy Cyber Security Management*, signed by the Deputy Secretary in December 2006, which established a new, federated governance structure for DOE cyber security management in which the Under Secretaries provide direction to their organizations based on their assessment or risk to each organization's systems and data.
- Development of 20 Office of the CIO Cyber Security Guidelines and 18 Technical and Management Requirements documents that provide guidance for the Under Secretaries.
- Issuance of DOE Order 205.1-4, *National Security Systems Manual*.
- Initiation of an effort to improve risk-based Department-wide certification and accreditation processes for systems, including support through site assistance visits to the field.
- Enhancement of defense in depth of DOE systems and networks, including network segmentation and replacement of older, vulnerable system software.
- Creation of a DOE-wide cyber forensics team that focuses on a continuing basis on the most serious cyber threats and attacks that DOE faces.
- Creation of guidance and a reporting process to provide special protection for sensitive unclassified information, including personally identifiable information.
- Initiation of an NNSA reprogramming of FY 2006 funds to address some of the more immediate cyber security issues.

TIMING: Work is underway to improve cyber threat assessment, initiate needed cyber research and development, to identify the most important DOE information assets that need special protection, to strengthen the Department's cyber defenses, to enhance cyber security training, improve information technology system inventory tracking, and to improve corrective action tracking. Long-term corrective action is expected due to the evolving nature of security threats.

Human Capital Management

DESCRIPTION: The Department's workforce is aging and getting smaller. Since 1995, the Department has experienced over a 30 percent reduction in the size of its workforce and the average employee stands at over 49 years. Twenty-six percent of the workforce will be eligible to retire in the next three years. Twenty-seven percent of DOE's scientists and engineers will be retirement-eligible in 2008. The decline in staffing levels and potential future attrition has left the Department with a significant challenge: reinvesting in its human capital to ensure that the right people with the right skills, necessary to successfully meet its missions, are available.

KEY STRATEGIES: The Department's focus on this issue is evidenced by the addition of Management Excellence to its Strategic Plan; and the revision of DOE's Human Capital Management Strategic Plan. In FY 2007, the Department continued to strategically manage its Federal workforce with newly implemented workforce planning techniques throughout the Agency. DOE business elements used this model to analyze, forecast, and plan for future resource requirements. The planned investment in new automated workforce planning and simulation tools will further enhance these efforts in assisting business elements in the development of consistent workforce plans across DOE.

New recruitment and outreach strategies and a new Corporate Recruitment Program are beginning to create a pipeline of fresh talent into the Department. Human Capital offices are improving efficiency of the hiring processes and the Department is continuing to work in partnership with other Federal agencies on proposed legislation to increase recruitment and hiring flexibilities. Additionally, the Department is implementing a comprehensive enterprise talent management system to ensure a competent workforce through a more integrated approach to employee development. The organization identified mission critical occupations; implemented a new performance management system designed to ensure alignment, results-based measurement, and quantitative and qualitative analysis of production.

NNSA continues to build a vibrant human capital management program tailored to NNSA's unique mission needs. The Future Leaders Intern Program appears to be successful. In addition, the Department has developed policies focused on efficient, effective, and innovative plans for merit promotion; recruitment, relocation, and retention incentives; student loan repayment; and strategic management of human capital. Programmatic innovations include a performance management and recognition system; NNSA's organizational change process; the development and use of Managed Staffing Plans in assigning staffing targets, and in identifying critical hiring needs, skills mix imbalances, and buyout eligible occupations; and an automated workforce analysis and planning process, which is a first within the Department.

Most importantly, NNSA is partnered with the OPM in an unprecedented pilot personnel demonstration project, which will commence during 2008, that will be designed to rebuild DOE's basic Civil Service employment system. The effect of the sophisticated changes would be to alleviate many traditional regulation-based encumbrances on managerial discretion and flexibility when hiring, promoting, and rewarding employees, even while assuring adherence to the Government's fundamental personnel laws and merit-based Civil Service regulations.

TIMING: The strategic management of human capital requires ongoing analyses and planning. The Department will continue to conduct strategic human capital analyses to ensure a workforce that is fully capable of meeting its responsibilities and to further efforts at being an employer of choice in the Federal government.

Safety and Health

DESCRIPTION: Ensuring the safety and health of the public and the Department's workers is one of the top priorities in accomplishing our challenging scientific and national security missions. Due to the inherently critical nature of these issues, there is the need for continuous vigilance and improvement. Currently, the Department continues to address emerging safety issues identified within the past year.

KEY STRATEGIES: Significant actions have been taken to mitigate safety and health concerns. On October 1, 2006, the HSS was created to provide a more integrated approach to these functions. Over the past year, the new office has enhanced the effectiveness and efficiency of health, safety and environmental protection programs across the complex by providing line managers and their sites with more effective and consistent policy, assistance, training, enforcement and independent oversight. Significant actions for 2007 include: implementation of 10 CFR 851, Worker Health and Safety rule; establishing an integrated enforcement program for nuclear safety, worker safety and health, and security; enhancing Integrated Safety Management (ISM); increasing communications, interface and feedback on issues related to health, safety and the environment; and integrating safety and security training throughout the Department. Also in FY 2007, the Office of Independent Oversight, within HSS, continued its mission to evaluate the effectiveness of institutional safety and health processes and the implementation of the core functions of ISM.

SC has set performance goals for FY 2007 for improving worker safety based on benchmarks with comparable industries, which are reviewed quarterly. SC has established performance measures based on best-in-class performance by other research and development industries. These goals are institutionalized and incorporated into lab appraisal plans.

In FY 2007, the Office of Nuclear Energy initiated its implementation of DOE Order 226.1, *Implementation of Department of Energy Oversight Policy*. This effort includes development of an Oversight Proficiency Assurance Program to assure appropriate knowledge, skills, and abilities for safety oversight and delegation of safety authorities. It also includes an Oversight Standard Operating Procedure that requires an integrated annual oversight schedule in FY 2007 and beyond.

EM continued its project based approach to monitoring and managing safety performance through the use of the EM EVMS normalization model, during FY 2007. This model uses the Department's safety occurrence reporting system and aligns these occurrences with the contractor's size and performance through their EVMS. This process aligns EM's commitment to manage safety through project performance and offers the ability to normalize safety performance data by site, prime contractor and corporate contractor. EM also published an ISM system description to provide a clear understanding of how headquarters implements its safety-related functions and oversees integrated safety at its field elements. In FY 2007, EM continued to improve the process for approving and implementing Documented Safety Analyses and Technical Safety Requirements for nuclear facilities.

NNSA's Environmental Safety & Health Advisor and the Chief of Defense Nuclear Safety continued their respective efforts with the weapons complex in addressing Defense Nuclear Facilities Safety Board and other DoD safety concerns. The Deputy Administrator for Defense Programs assumed reporting authority for NNSA's site managers in order to strengthen and provide consistent guidance in safety and other management areas.

TIMING: Efforts to ensure a strong safety and health program and to evaluate the effectiveness of this program are a long-term initiative.

