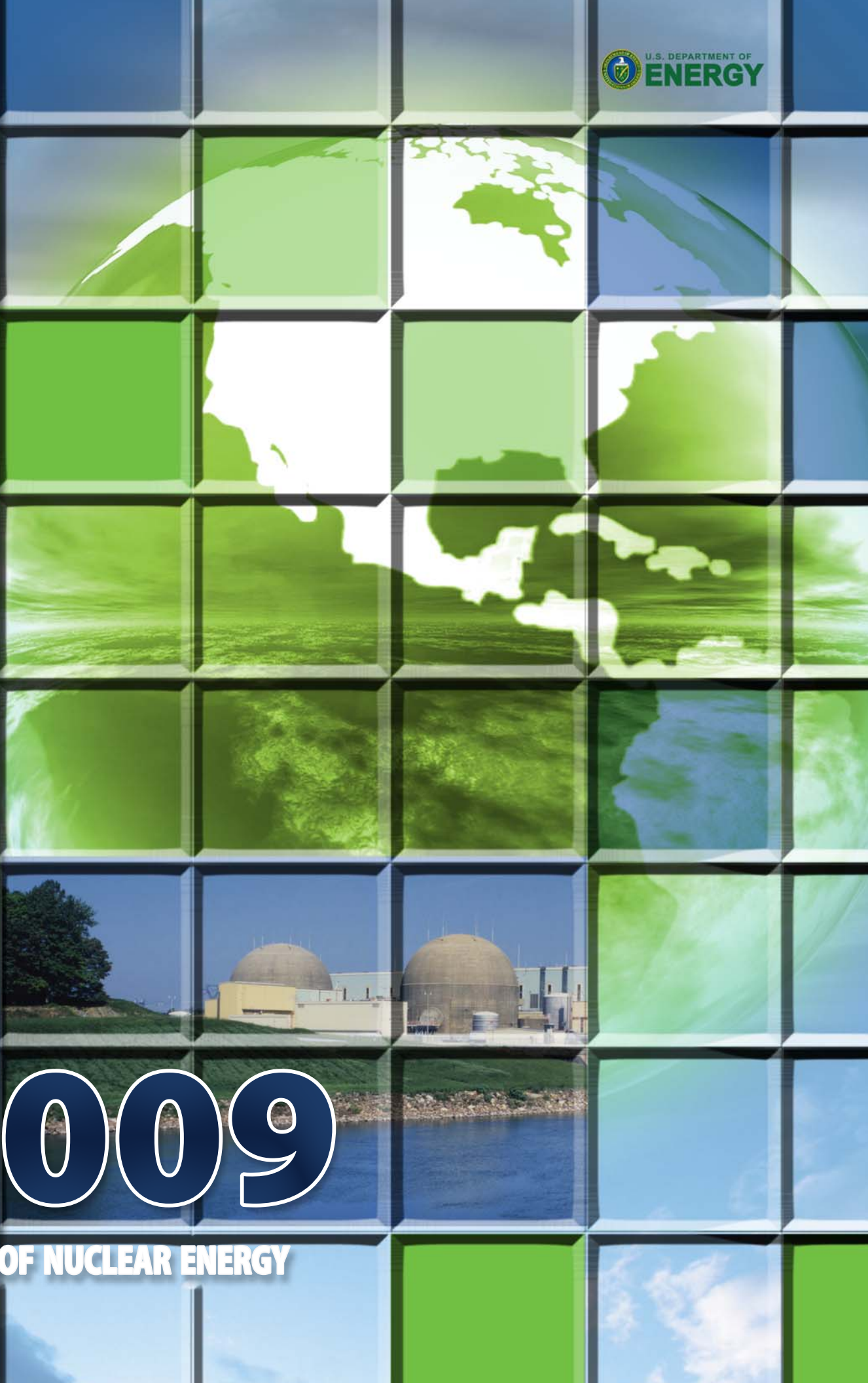


PERFORMANCE PLAN

2009

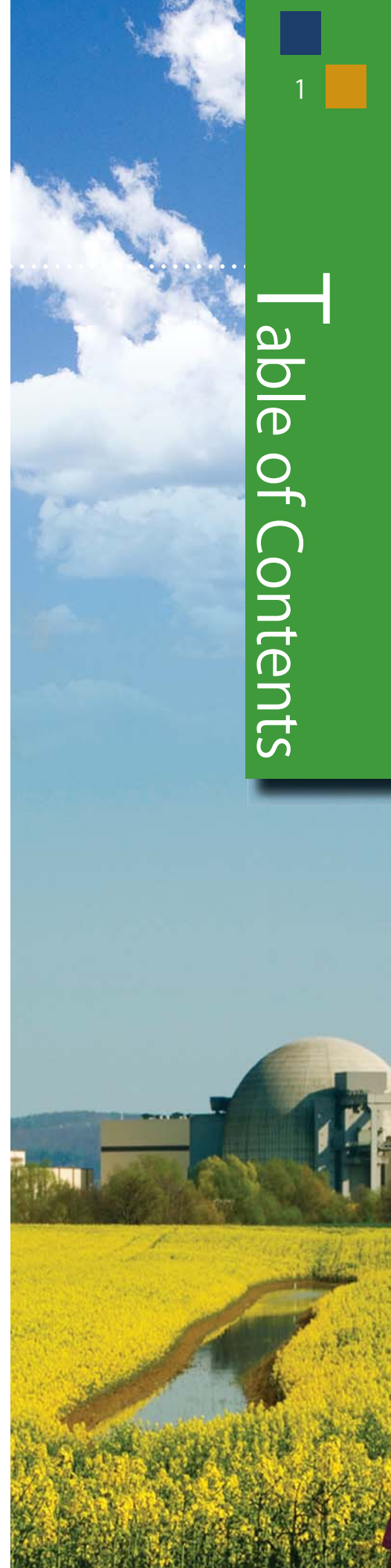
OFFICE OF NUCLEAR ENERGY



Fiscal Year 2009 Nuclear Energy Performance Plan

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Foreword

This 2009 Performance Plan captures the Office of Nuclear Energy's (NE) performance in critical program areas for Fiscal Year (FY) 2008 and describes how progress will be assessed in FY 2009. In addition, it provides our stakeholders with an overview of NE's programs, funding profile, and the Office's designated role within the U.S. Department of Energy's (DOE) Strategic Plan. This document, which contains FY 2009 Budget Request and Continuing Resolution funding information, will be updated annually to reflect NE's continued progress toward meeting its long-term performance goals and objectives. It is our hope that this summary of the Office and its performance framework will help you understand the importance of our work and the contributions we are making toward advancing nuclear energy in the United States and abroad.

Nuclear energy is an important source of energy in the United States, supplying approximately 20 percent of the Nation's electricity and over 70 percent of our clean, non-carbon electricity. More than 100 nuclear power plants currently operate within the United States, providing reliable and affordable baseload electricity without air pollution or emissions of greenhouse gases. A plentiful, reliable supply of energy is the cornerstone of our Nation's sustained economic growth and prosperity.

NE leads Federal efforts to develop new nuclear energy generation technologies to meet energy and climate change goals and advanced, proliferation-resistant technologies that maximize energy from nuclear fuel. An important NE priority is to support expanded use of nuclear energy in the United States through programs such as Nuclear Power 2010 (NP 2010) as well as through implementation of incentives enacted in the Energy Policy Act of 2005 (EPAct) that encourage building new nuclear plants in the United States. NE is actively engaged in several international research and development (R&D) activities, including the development of advanced reactor designs through the Generation IV International Forum (GIF) and through International Nuclear Energy Research Initiative projects. Through its Advanced Fuel Cycle Initiative, NE also seeks to ensure the long-term sustainability of nuclear power as a viable energy resource through the development of technical options to the Nation's current fuel cycle management strategy.

NE works with the private sector, overseas partners, and other agencies to assure the benefits of nuclear technology continue to contribute to the Nation's security and quality of life. In addition, NE's Federal Advisory Committee, the Nuclear Energy Advisory Committee (NEAC), advises NE to ensure NE's long-range plans, priorities, and strategies are consistent with both the policy and technical aspects of civilian nuclear energy. By focusing on the development and deployment of advanced nuclear technologies, NE supports DOE's strategic goal to develop new generation capacity while making improvements in environmental quality.

Nuclear Energy Overview

Mission

The Office of Nuclear Energy promotes nuclear power as a resource capable of meeting the Nation's energy, environmental, and national security needs by resolving technical and regulatory barriers through research, development, and demonstration.

Vision

Increasing demand for clean, efficient, and economical energy generation technologies shapes NE's vision for today, tomorrow, and the future. We envision nuclear energy as a widely accepted, safe, clean, and sustainable energy resource that helps meet our Nation's energy security goals, while contributing to global climate change abatement.

Today . . . NE is laying the groundwork for a nuclear renaissance in the United States. New nuclear power plants will soon be licensed and under construction. Renewed investments in the national nuclear infrastructure, including advanced computing and simulation and research into aging phenomena of materials, equipment, and structures, will support innovations in nuclear energy applications, including next-generation nuclear power and fuel cycle technologies. Expanding partnerships and outreach with industry, academia, and the global community will ensure nuclear energy contributes to the cleaner, safer, and more energy-secure world of tomorrow.

Tomorrow . . . NE supports and promotes the continued revitalization and expansion of the U.S. nuclear industry. The first new nuclear plants are beginning operation, construction activities are underway on additional new nuclear plants, and existing nuclear plants have the technical basis to support extending their operating licenses beyond 60 years. These new and existing plants are producing economic and safe carbon-free energy. A robust national nuclear R&D infrastructure has been re-established, enabling the demonstration of next-generation nuclear power and associated co-generation technologies, as well as advanced fuel cycle technologies. Strong educational programs and partnerships with local communities and regional governments continue to contribute to an informed public and skilled nuclear workforce. The future of deep space exploration is more assured due to the new, sustainable domestic production of radioisotopes for space power systems.

Future . . . NE continues to push the frontiers of advanced nuclear energy R&D. The national nuclear infrastructure is fully restored, with advanced engineering techniques and fully mature computing and simulation technologies aiding in the development of new materials and fuels capable of enhancing nuclear plant operation, supporting increases in the efficiency of energy generation, enabling the design of advanced reactor technologies "beyond next generation," and developing new applications for nuclear power. The nuclear fuel cycle is fully optimized with technically and economically viable fuel cycle management options for industry consideration, including the use of fast reactor technologies for resource conservation and waste management. The space power systems program meets national objectives for deep space exploration. The United States has regained its role as the global leader in nuclear energy technologies.





Organization

Under the Assistant Secretary for NE, the organization includes Deputy Assistant Secretaries (DAS) who oversee NE functional areas, and the Manager of the Idaho Operations Office. The NE reporting structure for each program element in relation to its DAS office and Idaho Operations Office is illustrated in Figure 1 and summarized hereafter.

Nuclear Power Deployment

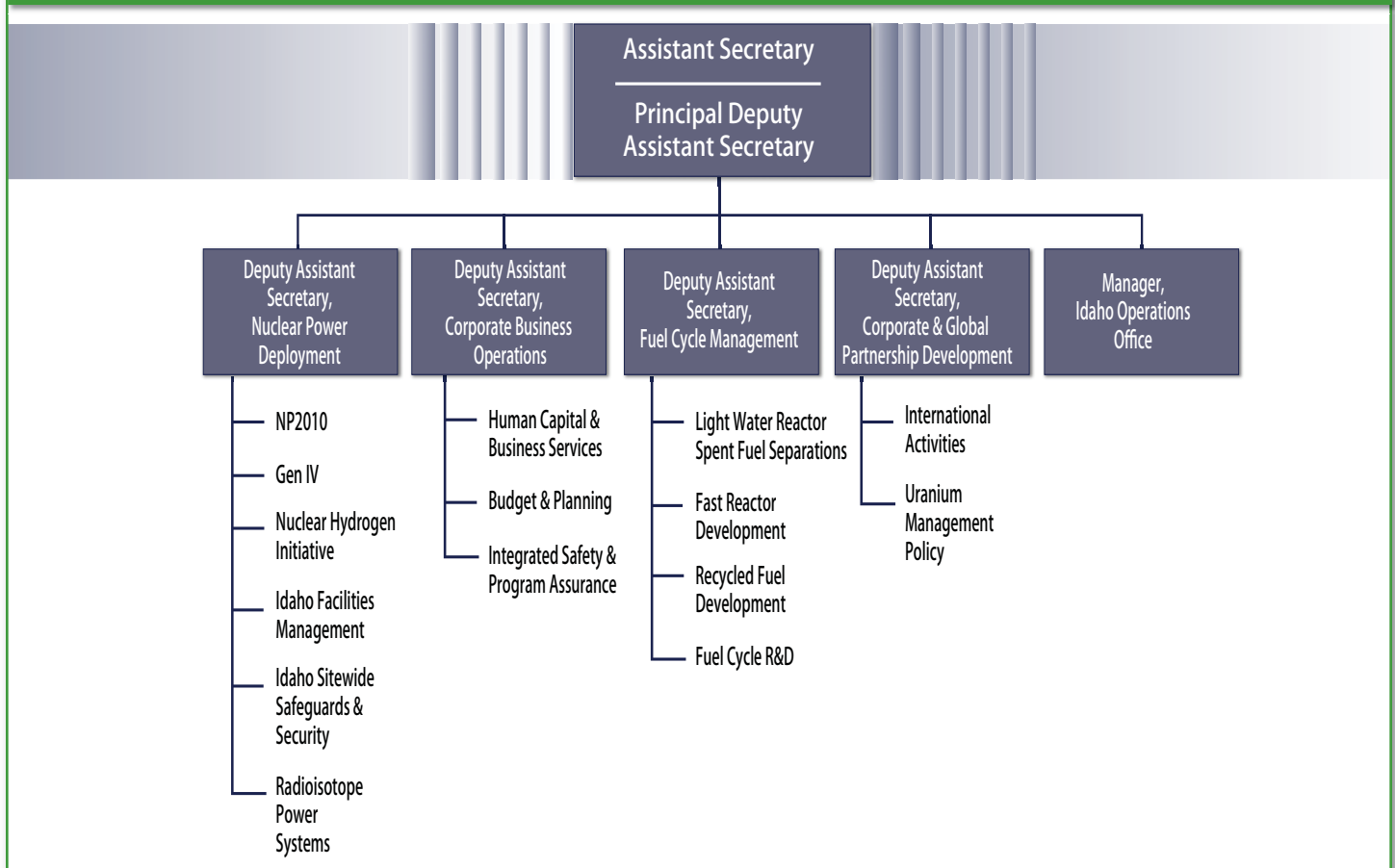
The Office of Nuclear Power Deployment leads programs that advance deployment of light-water and gas-cooled nuclear reactors and nuclear power applications; manage collaborative R&D activities with universities; support the National Aero-

navics and Space Administration (NASA) and national security needs for radioisotope power systems; and serve as the operational interface in support of NE's Lead Program Secretarial Officer responsibilities at the Idaho National Laboratory (INL). Program elements that report to the DAS for Nuclear Power Deployment include Nuclear Power 2010 (NP 2010), Generation IV Nuclear Energy Systems Initiative (Gen IV), the Nuclear Hydrogen Initiative (NHI), Idaho Facilities Management (IFM), Idaho Sitewide Safeguards and Security, and Radioisotope Power Systems.

Corporate Business Operations

The Office of Corporate Business Operations provides support to NE operations, policy implementation, strategic planning, budget and administrative management, human resources,

Figure 1. Office of Nuclear Energy Organizational Chart



Nuclear power produces over 70 percent of our Nation's electricity generated by carbon-free sources.



information technology, program performance measurement and evaluation, quality management programs, safety and security programs, and intergovernmental activities. This office is also responsible for overseeing National Environmental Policy Act (NEPA) compliance activities. Also, this office prepares outreach activities for NE customers and stakeholders, and other corporate announcements related to NE programs.

Fuel Cycle Management

The Office of Fuel Cycle Management provides technical leadership and expertise in advanced fuel cycle R&D focused on reducing the radiotoxicity, volume, and heat associated with used nuclear fuel and other wastes requiring geologic disposal. It is also responsible for developing technical and policy options to the Nation's current fuel cycle management strategy. The program elements directly related to Fuel Cycle Management include the Advanced Fuel Cycle Initiative (AFCI).

Corporate and Global Partnership Development

The Office of Corporate and Global Partnership Development is responsible for all international activities, including formulation of U.S. international nuclear energy policy in conjunction with other Federal agencies and oversight of technical and business activities related to the export of U.S. nuclear goods and services (i.e., bilateral and multilateral cooperative efforts). This office is also responsible for the Department's uranium management policy.

Idaho Operations Office

The Idaho Operations Office (ID) provides procurement, contract, cooperative agreement, and grant support for NE program activities. Working together as an integrated organization, NE Headquarters and the Idaho Operations Office staff are supporting the creation of INL as a world-class nuclear energy and national security R&D laboratory.

In addition to INL, NE conducts program activities with other national laboratories, universities, and private-sector partners involved in nuclear energy R&D, isotope production, and manufacture of radioisotope power systems. Figure 2 on the next page highlights the primary DOE locations where NE-sponsored R&D is being conducted.

Program Summary

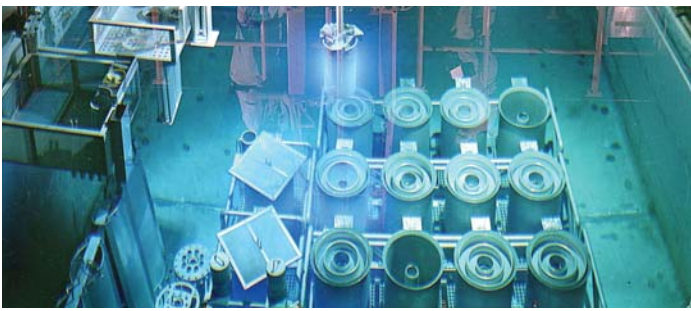
NE's program activities support the Department's Energy Security strategic goal of developing new generation capacity to fortify U.S. energy security while making improvements in environmental quality through reductions in greenhouse gas emissions. Nuclear power is the third-most abundant source of electric energy in the United States, according to the Energy Information Administration, and existing plants are among the most economic sources of electricity on the grid today. NE focuses on the development of advanced nuclear technologies in four broad areas to assure diversity in the U.S. energy supply.

Deliver Energy Products to Market

NE's primary and most fundamental goal is to sustain and expand nuclear power's role in helping U.S. industry meet domestic energy demand in a safe, economic, efficient, and environmentally sustainable manner. NE is achieving this goal through three key activities.

The NP 2010 program is focused on the deployment of Generation III+ nuclear reactors by partnering with industry to demonstrate untested regulatory processes for the siting, licensing, construction, and operation of nuclear plants. Through 50-50 cost-shared arrangements with industry, the program has supported the industry submission of two combined construction and operating licenses to the Nuclear Regulatory Commission (NRC). These applications serve as reference applications that provide over 70 percent of the standard content of 11 of 17 new plant applications currently under review by the NRC. The program is also working to help industry manage the financial risk associated with nuclear power deployment by providing standby support/risk insurance for operating delays attributed to regulatory delays or litigation. The program is also providing support to the Department's loan guarantee program to support the construction of new nuclear power plants.

Within the Gen IV program, R&D activities are underway to help provide a technical basis for safely extending the life of existing nuclear reactors beyond their current 60-year licenses. Activities include laboratory and industry cost-shared research projects on material and component aging and fuel degradation that challenge nuclear plant operations beyond 60 years and have applicability to today's reactors, as well as future reactors.

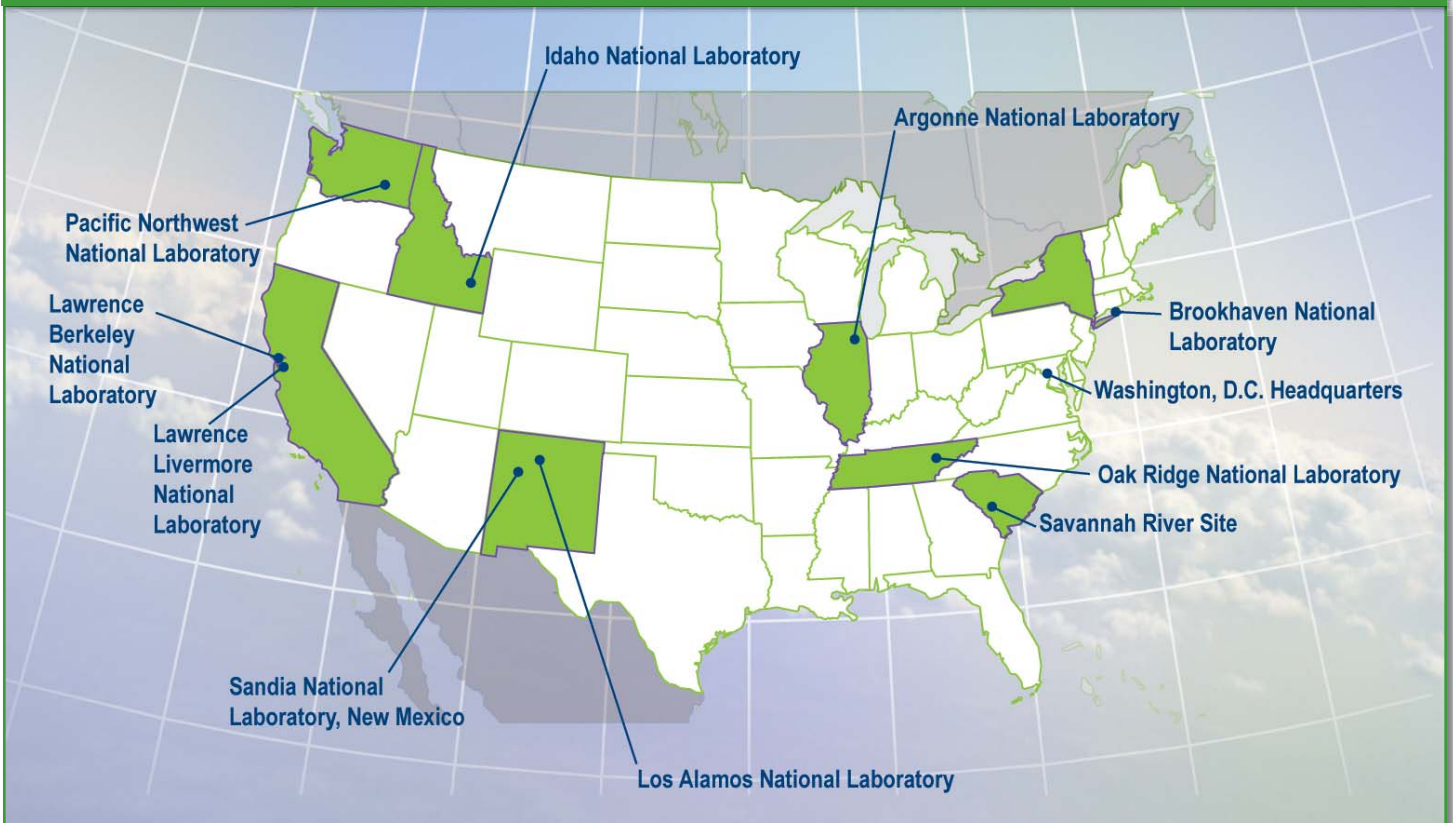


The Gen IV program is also developing the Next Generation Nuclear Plant (NGNP) project, which employs a Very High Temperature Reactor (VHTR) design to enhance the safety, sustainability, cost-effectiveness, and proliferation-resistance of future nuclear reactors. This technology will be competitive with advanced fossil and renewable technologies, enabling power providers to select from a diverse group of options that are economical, reliable, safe, secure, and environmentally acceptable. In addition, the NGNP reactor concept will be capable of providing high-temperature process heat for various co-generation applications, including the production of hydrogen (through the NHI) and coal-to-liquid gasification.

Rebuild U.S. Nuclear Energy Infrastructure

A strong national nuclear R&D capability, comprised of both national laboratories and universities, is required to support the development of advanced nuclear energy production and fuel cycle technologies. The Idaho National Laboratory, managed for NE by Battelle Energy Alliance, is the nexus for all NE R&D activities. NE's Idaho Facilities Management program supports R&D activities by providing and maintaining safe and secure research and demonstration facilities at INL.

Figure 2. Primary Nuclear Energy R&D Sites within DOE





NE actively supports university R&D activities in advanced nuclear technologies. Through the INL Center for Advanced Energy Studies (CAES), a public/private partnership comprised of the three Idaho public universities, private industry, and the Idaho National Laboratory, NE is providing 20 percent of its R&D program funding to the Nation's university community to support nuclear technology R&D. NE is also supporting university research through the Advanced Test Reactor (ATR) National Scientific User Facility (NSUF) at INL, which has attracted new research users supporting basic and applied nuclear R&D activities.

Through the Space and Defense Power Systems program, NE supports and oversees activities at INL and other national laboratories in the development, manufacture, test, and delivery of radioisotope power systems (RPS) for space exploration and national security missions. NE is currently supporting RPS production, testing, and delivery operations for the NASA Mars Science Laboratory mission planned for launch in 2009.

Develop Options for Fuel Cycle Management

The long-term sustainability of nuclear power as a viable energy resource is largely dependent upon the optimization of the nuclear fuel cycle. The AFCI focuses on developing technology options for optimizing the U.S. nuclear fuel cycle to reduce high level waste (HLW) radiotoxicity, volume, and thermal (heat) load associated with used nuclear fuel. New technologies under development by AFCI are designed to support the operation of current nuclear power plants (Generation II and III), new Generation III+ light water nuclear power plants currently under consideration by industry, and future advanced Gen IV nuclear power plants by developing better management options for used fuel while providing new sources of reactor fuel.

Develop People and Partnerships to Leverage Federal Investments

Realizing the vision of a renaissance in nuclear energy will require revitalization of not only national nuclear R&D capabilities but full sectors of industry, including heavy manufacturing and construction. The Department estimates that construction of the 17 new light water reactors currently undergoing NRC license review will require approximately: 2,700 pipefitters; 2,900 electricians; 1,800 construction professionals; 600 boilermakers; 2,500 sheet metal workers; and 2,900 iron workers. In addition, an operating nuclear power plant employs 800 highly skilled technicians and managers. Along with industry, NE is exploring partnerships with skilled trade and vocational organizations to help develop training programs to support increased demand for nuclear power.

Internationally, NE has a long history of cooperation in its R&D of advanced nuclear energy technologies. Partnering with other nations enables knowledge-sharing to help alleviate the need to replicate R&D domestically, allowing for the more efficient use of limited financial resources. International cooperation has been executed through active participation in various international organizations, including the International Atomic Energy Agency (IAEA), the Organization for Economic Cooperation and Development (OECD), Nuclear Energy Agency (OECD-NEA), the Generation IV International Forum, and the Global Nuclear Energy Partnership (GNEP). NE is also a member of several bilateral and multilateral agreements and participates in ad hoc technical forums.

NE funds its activities through two appropriation accounts: Nuclear Energy and Other Defense Activities. NE requests all funding for R&D and Infrastructure activities in the Nuclear Energy account. Funding for Safeguards and Security activities at INL is requested within the Other Defense Activities account. A summary of FY 2008 appropriations, FY 2009 budget request, and FY 2009 funding under the current Continuing Resolution is found in Figure 3. For additional information on NE's FY 2009 budget request, please refer to <http://www.nuclear.gov/budget/nebudgetfy09CongRequest.html>.



The Office of Nuclear Energy is helping enable industry to construct and operate new nuclear power plants.

Figure 3. FY 2008 – FY 2009 Nuclear Energy Funding Summary (in \$ thousands)

Office of Nuclear Energy Activities	FY 2008 Adjusted Appropriation	FY 2009 Budget Request	FY 2009 Continuing Resolution
Nuclear Energy			
Research and Development			
Nuclear Power 2010	133,771	241,600	157,300
Generation IV	113,732	70,000	70,000
Nuclear Hydrogen Initiative	9,668	16,600	10,000
Advanced Fuel Cycle Initiative	178,017	301,500	90,000
Infrastructure			
Radiological Facilities Management	48,119	38,700	57,720
Idaho Facilities Management	115,935	104,700	119,700
Idaho Sitewide Safeguards and Security*	75,261	78,811	78,811
Program Direction	80,872	80,544	80,544
Less Security Charge for Reimbursable Work	(-3,003)	-	(-3,003)
Total Nuclear Energy	\$752,372	\$932,455	\$661,072

* Funded in the Other Defense Activities appropriation

Nuclear Energy Performance

Strategic Context within the Department

DOE's overarching mission is to "discover the solutions to power and secure America's future." The framework of the DOE Strategic Plan guides DOE's mission and efforts to ensure America's energy safety and security. DOE designed its Strategic Plan to deliver results along five Strategic Themes:

- ◆ Strategic Theme I: Energy Security
- ◆ Strategic Theme II: Nuclear Security
- ◆ Strategic Theme III: Scientific Discovery and Innovation
- ◆ Strategic Theme IV: Environmental Responsibility
- ◆ Strategic Theme V: Management Excellence

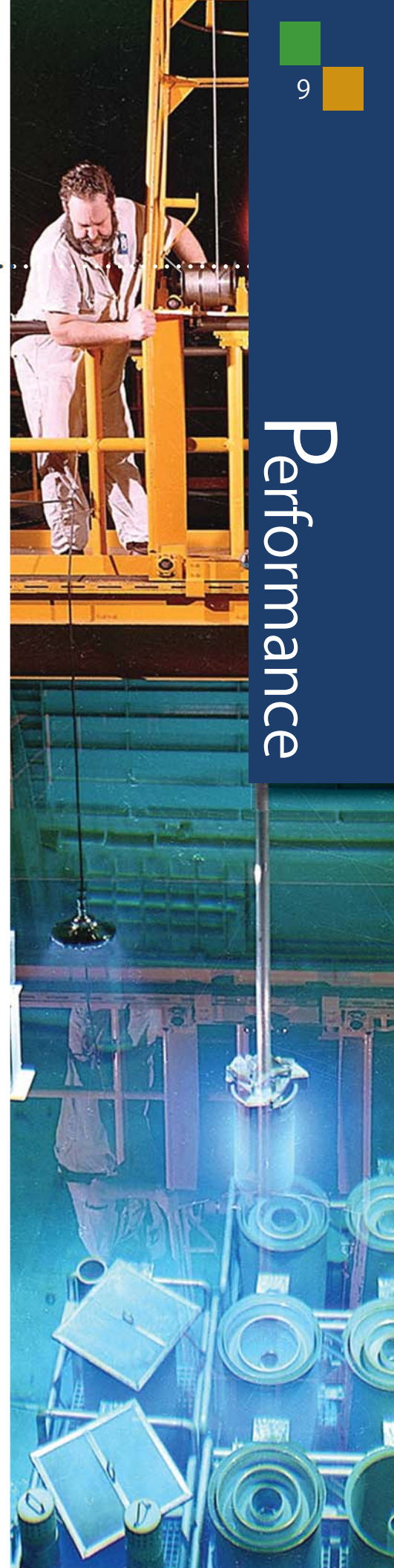
Within these themes, there are 16 Strategic Goals designed to help DOE achieve its ongoing mission. The Office of Nuclear Energy supports one of the 16 Strategic Goals. In Strategic Theme I, Goal 1.2 is to improve the quality of the environment by reducing greenhouse gas emissions and environmental impacts to land, water, and air from energy production and use. NE partners with industry, academia, state and local governments, and other countries to promote nuclear facilities that rely upon advanced fuel technologies that will help to address nuclear waste disposal issues.

Under this Strategic Goal, NE directly supports two Government Performance and Results Act (GPRA) Program Goals (Figure 4).

The first GPRA Program Goal is associated with NE's R&D activities, while the second represents NE's infrastructure activities. Each GPRA Program Goal and its contribution to the Department's mission is defined below.

Figure 4. Strategic Goals

Department of Energy Strategic Goals	
	Goal 1.2 Environmental Impacts of Energy
GPRA Program Goals	Develop New Nuclear Generation Technologies
	Maintain and Enhance National Nuclear Infrastructure





GPRA Program Goal 1.2.14.00: Develop New Nuclear Generation Technologies — By 2015, enable industry to construct and operate new nuclear power plants; promote safe, reliable, and carbon-free energy production through the standardization of Generation III+ plant designs; successfully demonstrate nuclear plant permitting and licensing processes; advance Gen IV plant technologies; construct pilot-scale hydrogen production experiments; and commence proliferation-resistant used nuclear fuel recycling technology demonstration activities.

NE Contribution to GPRA Program Goal 1.2.14.00 — The NE R&D program supports near-term technology development and demonstration activities to enhance long-term U.S. energy independence and reliability and expand the contribution of nuclear power to the Nation's energy portfolio. The NP 2010 program supports this program goal by identifying sites for new nuclear power plants; developing and bringing to market advanced standardized nuclear plant designs; evaluating the business case for building new nuclear power plants; and demonstrating untested regulatory processes for nuclear plants in the United States, leading to an industry decision to build by 2010. Gen IV supports this program goal through the development of innovative, next-generation reactor technologies. The Gen IV program supports R&D that could help achieve the desired goals of sustainability, economics, and proliferation resistance, and includes examining material and component aging and fuel degradation that challenge nuclear plant operations beyond 60 years. NHI contributes to this program goal by researching, developing, and demonstrating economical hydrogen production technologies using high-temperature heat from advanced nuclear energy systems. NHI will develop hydrogen production technologies that are compatible with nuclear energy systems through scaled experiments. The AFCL enables the safe, secure, economic, and sustainable expansion of nuclear energy by conducting research, development, and demonstration activities focused on nuclear fuel recycling and waste management.

GPRA Program Goal 1.2.15.00: Maintain and Enhance National Nuclear Infrastructure — Maintain, enhance, and safeguard the Nation's nuclear infrastructure capability to meet the Nation's energy, medical research, space exploration, and national security needs.

NE Contribution to GPRA Program Goal 1.2.15.00 — The Idaho Facilities Management and Radiological Facilities Management programs contribute to this goal by ensuring the Department's unique facilities, required for advanced nuclear energy technology R&D, are maintained and operated such that they are available to support national priorities. Key activities conducted under this program include ensuring NE facilities meet essential safety and environmental requirements and are maintained at user-ready levels. Other key activities include managing all special nuclear materials contained in these facilities and the disposition of DOE materials under NE ownership.

Measuring Fiscal Year 2008 Performance Results

As part of the annual budget submission to Congress, NE includes performance measures that describe critical activities necessary to the achievement of the program's mission and success. These measures are high level, are outcome oriented, and demonstrate progress toward near- and long-term program goals. It is important to note that these measures are supported through hundreds of lower-level measures tracked internally at the individual program level, both at Headquarters and in the field.

Following from the discussion of NE's contribution to the Department's Strategic Plan in the previous section, NE FY 2008 performance results roll up into the two GPRA program goals (Figures 5 and 6). Referring to the figures that follow, commentary and action plan narratives are included for each annual measure. Commentary narrative is meant to provide additional context to the achievement of the performance measure, and the action plan narrative describes how the achieved performance contributes to future programmatic activities. Supporting documentation explains how DOE obtained each performance result.

The Office of Nuclear Energy’s budget supports important work to deploy new nuclear plants by the next decade.

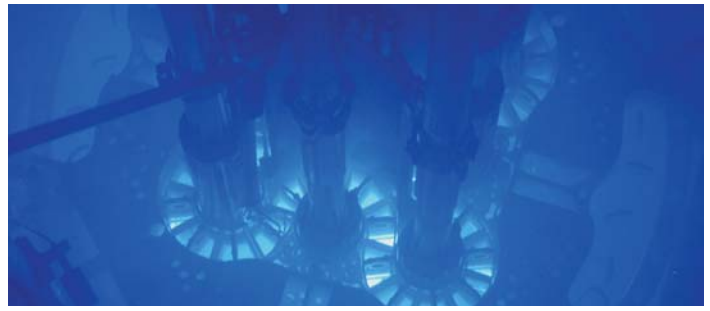
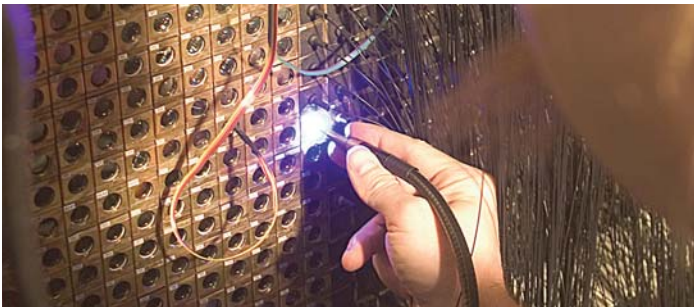


Figure 5. GPRA Program Goal 1.2.14.00

GPRA Program Goal 1.2.14.00 Develop New Nuclear Generation Technologies FY 2008 Rating = GREEN			
Annual Targets	Significance of Achievement	Future Actions	Supporting Documentation
<p>1.2.14.1: Maintain total administrative overhead costs in relation to total R&D program costs of less than 8 percent. Rating = Green</p>	<p>For FY 2008, the Office of Nuclear Energy maintained a total administrative overhead cost efficiency of 6.51 percent, in relation to total R&D program costs. Achievement of the annual target shows that R&D program management costs are being effectively controlled.</p>	<p>The Department is pursuing a common approach for calculating total administrative overhead costs in its applied R&D programs, allowing some measure of comparability among program offices. The Office of Nuclear Energy will continue to work to increase its R&D program management efficiency during FY 2009.</p>	<ul style="list-style-type: none"> ◆ Quarterly Measure Calculation ◆ Program Manager Performance Certification Memorandum
<p>1.2.14.2: Enable industry to make a decision to build a new nuclear power plant by 2010 by supporting New Nuclear Plant Licensing Demonstration Projects and by administering the Department’s standby support program. Rating = Green</p>	<p>In FY 2008, the program met its annual performance measure through completion of final reports for the cost and schedule baselines from the program’s two reactor manufacturing partners, issuance of Conditional Agreement guidance for the standby support program, and completion of a lessons-learned report on the Early Site Permitting process. NP 2010’s cost-shared regulatory demonstration program supported the submission of two combined Construction and Operating License (COL) applications by industry partners to the Nuclear Regulatory Commission (NRC) in the first half of FY 2008. Achievement of these activities ensures that ongoing engineering, licensing, and financial assistance activities necessary to enable an industry decision in 2010 to build a new nuclear power plant are properly planned and executed.</p>	<p>The NP 2010 program will continue to support its industry and reactor vendor partners’ work in achieving approved COLs and certified designs from NRC, leading to an industry decision to build and finalization of standardized new plant designs. Additionally, the program will continue to work with nuclear power utilities as they apply for conditional agreements and standby support contracts to build new plants in the next decade. The program anticipates issuing conditional agreements in FY 2009, which is one of nine conditions precedent for standby support contracts.</p>	<ul style="list-style-type: none"> ◆ Monthly Program Reports and documentation validating specific milestones ◆ Program Manager Performance Certification Memorandum

Legend

Green (G)—Met Yellow (Y)—Partially Met Red (R)—Unmet



NE leads the development of new nuclear energy generation technologies to meet energy and climate change goals.

Figure 5. GPRA Program Goal 1.2.14.00 (continued)

GPRA Program Goal 1.2.14.00 Develop New Nuclear Generation Technologies FY 2008 Rating = GREEN			
Annual Targets	Significance of Achievement	Future Actions	Supporting Documentation
<p>1.2.14.3: Determine a path forward for the design and construction of a Next Generation Nuclear Power Plant (NGNP) by 2011 by submitting an NGNP licensing strategy to Congress and completing NGNP conceptual design technology selection studies.</p> <p>Rating = Green</p>	<p>In FY 2008, Gen IV met its annual performance measure through a number of research, design, and regulatory activities, including submission of the NGNP Licensing Strategy, prepared jointly by DOE and the Nuclear Regulatory Commission (NRC), to Congress in August 2008. In addition, the program completed NGNP conceptual design technology selection studies and evaluated alternatives for entering into formal cost-sharing partnerships with industry. The program also made significant progress in fuels, graphite, and high-temperature materials R&D in support of the NGNP.</p>	<p>As a result of its FY 2008 accomplishments, the program is prepared to complete the first round of testing on potential fuels and high-temperature materials for the NGNP. In FY 2009, the program will initiate the second round of testing of fuels and materials. The program will also continue cooperation with NRC on NGNP R&D activities; these activities are focused on the early resolution of generic safety issues for gas-cooled reactors. Finally, an Offer of Financial Assistance engaging industry in the cost-shared, public-private partnership for development of the NGNP is tentatively planned for FY 2009.</p>	<ul style="list-style-type: none"> Monthly Program Reports and documentation validating specific milestones Program Manager Performance Certification Memorandum
<p>1.2.14.4: Select a hydrogen production technology by 2011 that will be demonstrated in a pilot-scale experiment by conducting integrated laboratory-scale (ILS) experiments on sulfur-iodine, thermochemical and high-temperature electrolysis (HTE) processes.</p> <p>Rating = Green</p>	<p>In FY 2008, the program met its annual performance measure through the operation of ILS experiments for both sulfur-iodine (S-I) and HTE hydrogen production processes. The S-I ILS achieved its first integrated operation in April 2008, with hydrogen being produced from reactants that were generated within and transferred among the three sections of the experiment. In September 2008, the HTE ILS was operated at full power (with three modules installed) to produce hydrogen. In addition, a multi-cell electrolyzer for the Hybrid Sulfur cycle was successfully tested in March 2008, demonstrating the potential for that technology to be scaled up to meet commercial needs. These tests provided valuable data on operating procedures, chemical reaction data, and performance of proposed materials of construction which will be incorporated into decision criteria for the technology to ultimately be carried forward.</p>	<p>Successful achievement of the FY 2008 performance measure enables the program to continue experiments on the HTE, S-I, and Hybrid Sulfur hydrogen production technologies during FY 2009. This experimentation will help inform the selection of a hydrogen production technology to demonstrate at pilot scale by 2011.</p>	<ul style="list-style-type: none"> Monthly Program Reports and documentation validating specific milestones Program Manager Performance Certification Memorandum

Legend

Green (G)—Met Yellow (Y)—Partially Met Red (R)—Unmet

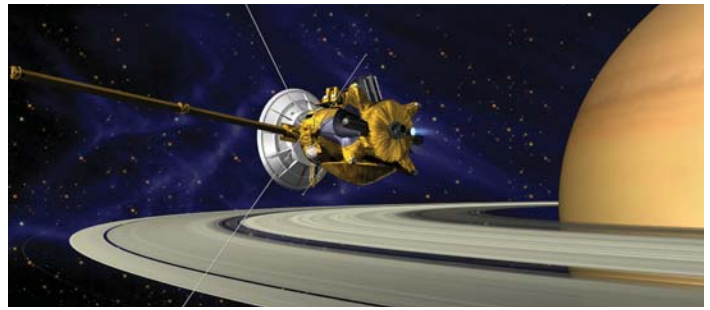


Figure 5. GPR Program Goal 1.2.14.00 (continued)

GPR Program Goal 1.2.14.00 Develop New Nuclear Generation Technologies FY 2008 Rating = GREEN			
Annual Targets	Significance of Achievement	Future Actions	Supporting Documentation
<p>1.2.14.5: Create a technology development document on recycling technology options, including their readiness and risks, the state of technology development achieved to date, future research and development, and economic evaluations needed to achieve the GNEP vision. Rating = Green</p>	<p>In FY 2008, the program met its annual target by completing the "Global Nuclear Energy Partnership Technology Roadmap Phase 1," which provides technology readiness and risks, the state of technology development achieved to date, future research and development, and economic evaluations needed to evaluate and realize potential recycle options. This report is supported by the results of previous fuel cycle R&D activities in the areas of spent fuel separations, advanced recycling reactor; transmutation fuel and related fabrication processes; safeguards and waste forms.</p>	<p>Successful achievement of the FY 2008 annual target validates the need for continuation of advanced fuel cycle R&D activities in FY 2009. R&D results and other relevant information, including public comments on the Draft GNEP Programmatic Environmental Impact Statement will be collected to inform the future direction of the Advanced Fuel Cycle Initiative.</p>	<ul style="list-style-type: none"> ◆ Monthly Program Reports and documentation validating specific milestones ◆ Program Manager Performance Certification Memorandum
<p>1.2.14.6: Complete trade-off studies of new versus existing facilities for an Advanced Fuel Cycle Facility, including economic evaluations. Rating = Green</p>	<p>In FY 2008, the program met its annual target by completing four strategic trade-off studies of new-versus-existing facilities for an Advanced Fuel Cycle Facility. The analysis of existing facilities culminated with the report "Evaluation of Existing Department of Energy Facilities to Support the Advanced Fuel Cycle Facility Mission," issued in September 2008. Additionally, this work was valuable in supporting the development of the draft GNEP Programmatic Environmental Impact Statement (PEIS) and its underlying analyses.</p>	<p>Successful achievement of the FY 2008 performance measure will help re-focus the technology development activities in support of Advanced Fuel Cycle Initiative (AFCI) R&D efforts. The concepts and analyses developed by the program can support AFCI's use of existing facilities for improving integrated laboratory-scale demonstration capabilities involving spent fuel separations, advanced waste form development, transmutation fuel and target fabrication, and integrated advanced safeguards technology.</p>	<ul style="list-style-type: none"> ◆ Monthly Program Reports and documentation validating specific milestones ◆ Program Manager Performance Certification Memorandum



Figure 5. GPR Program Goal 1.2.14.00 (continued)

GPR Program Goal 1.2.14.00 Develop New Nuclear Generation Technologies FY 2008 Rating = GREEN			
Annual Targets	Significance of Achievement	Future Actions	Supporting Documentation
1.2.14.7: Complete initial industry design studies for the Advanced Burner Reactor, including an evaluation of the development costs for the various prototype options. Rating = Green	In FY 2008, the program met its annual target by completing initial industry design studies for the ABR. These activities included an evaluation of industry deliverables, including development costs for various prototype options, received in June 2008. Continuation awards were made to three industry teams in September 2008. An evaluation of the conceptual design studies, along with other related deliverables from the industry consortia, was also used to inform APCI R&D activities for FY 2009 and beyond.	Successful achievement of the FY 2008 performance measure will help re-focus the advanced burner reactor program and technology development activities. The final phase of industry feedback in FY 2009 will continue to help influence the scope of technology development activities within the APCI program.	<ul style="list-style-type: none"> ◆ Monthly Program Reports and documentation validating specific milestones ◆ Program Manager Performance Certification Memorandum
1.2.14.8: Complete technical and economic evaluations of four industry-led conceptual design studies for a nuclear fuel recycling center. Rating = Green	In FY 2008, the program met its annual target by completing initial industry design studies for a nuclear fuel recycling center. These activities included an evaluation of industry deliverables, including development costs for various recycling facility options, received in June 2008. Continuation awards were made to three industry teams in September 2008. An evaluation of the conceptual design studies, along with other related deliverables from the industry consortia, was also used to inform APCI R&D activities for FY 2009 and beyond.	Successful achievement of the FY 2008 performance measure will help re-focus the used fuel recycling program and technology development activities. The final phase of industry feedback in FY 2009 will continue to help influence the scope of technology development activities within the APCI program.	<ul style="list-style-type: none"> ◆ Monthly Program Reports and documentation validating specific milestones ◆ Program Manager Performance Certification Memorandum

Legend

Green (G)—Met Yellow (Y)—Partially Met Red (R)—Unmet

DOE's overarching mission is to "discover the solutions to power and secure America's future."



Figure 6. GPR Program Goal 1.2.15.00

GPR Program Goal 1.2.15.00 Maintain and Enhance National Nuclear Infrastructure FY 2008 Rating = GREEN			
Annual Targets	Significance of Achievement	Future Actions	Supporting Documentation
<p>1.2.15.1: To ensure unique nuclear facilities are available to support critical Departmental missions, achieve cumulative variance of less than 10 percent from cost and schedule baselines at Idaho National Laboratory for Idaho Facilities Management (IFM) program facilities and activities (which include facilities used by the Radiological Facilities Management program), consistent with safe operations.</p> <p>Rating = Green</p>	<p>For FY 2008, the program met its target by achieving cumulative cost and schedule variances at Idaho National Laboratory of less than 10 percent. The cumulative cost variance (CV) was +3.5 percent and the schedule variance (SV) was -4.8 percent. Monitoring performance against established baselines helps managers achieve desired program results consistent with NE's budget execution strategy, and provides early identification of possible problems in program execution.</p>	<p>This measure will be tracked in FY 2009 to continue to demonstrate the program's ability to execute work with established cost and schedule baselines. Maintaining this standard will enable the Office of Nuclear Energy to ensure critical infrastructure at Idaho National Laboratory is available to help meet program goals.</p>	<ul style="list-style-type: none"> ◆ Monthly IFM Project Management Reports ◆ Program Manager Performance Certification Memorandum
<p>1.2.15.2: To ensure unique nuclear facilities are available to support critical Departmental missions, maintain a facility operability index (FOI) of 0.9 for key Idaho Facilities Management (IFM) and Radiological Facilities Management program facilities.</p> <p>Rating = Green</p>	<p>For FY 2008, the IFM program achieved an overall FOI of 0.93; the Space and Defense program achieved an overall FOI of 0.98; and the Medical Isotopes program achieved an overall FOI of 0.99. Successful achievement of the milestones for each program indicates that essential infrastructure and associated activities are operational to ensure that the Department's unique nuclear infrastructure, required for advanced nuclear energy research and development, is available to support national priorities.</p>	<p>This measure will continue to be tracked in FY 2009. The Space and Defense Power Systems program will continue to track the same elements from FY 2008. IFM will evaluate its current list of critical operability elements and determine if revisions are required for FY 2009; due to increased customer requirements, it is anticipated that the number of elements will increase. All programs will continue to maintain an FOI of 0.9 or above.</p>	<ul style="list-style-type: none"> ◆ Annual Operating Plans and Periodic Performance Reports ◆ Program Manager Performance Certification Memorandum

Legend

Green (G)—Met Yellow (Y)—Partially Met Red (R)—Unmet



Fiscal Year 2009 Annual Performance Plan

GPRAs require that DOE establish annual performance goals and then report the actual results achieved toward those goals. In FY 2008, as a result of a Department-initiated review of corporate performance measures, NE revised its performance measures to be more outcome-oriented and to align with measures tracked as part of the Office of Management and Budget's (OMB) Program Assessment Rating Tool (PART). These improvements are also reflected in NE's FY 2009 performance measures.

NE reports actual results achieved quarterly through the CFO's performance monitoring and reporting system, an internal DOE database that contains a complete set of final goals and measures for each fiscal year. NE categorizes individual measures according to which GPRAs program goal they support.

As with its FY 2008 measures, NE's FY 2009 performance measures focus on describing progress made toward critical program goals. NE's FY 2009 performance measures align with funding available under the current Continuing Resolution (CR). As a result, it was determined that a reallocation of performance measures was necessary to better represent the scope of work currently being conducted by NE programs under the CR. To that end, APCI program performance is represented by a single measure in FY 2009, compared with four in FY 2008. Upon receipt of a final FY 2009 appropriation, NE will re-evaluate its performance measures and make adjustments as needed.

Fiscal Year 2009 includes five performance measures that support GPRAs Program Goal 1.2.14.00 (Develop New Nuclear Generation Technologies); and two measures that support GPRAs Program Goal 1.2.15.00 (Maintain and Enhance National Nuclear Infrastructure). NE's performance measures and associated supporting documentation for FY 2009 are outlined in the following section. Supporting documentation is most often comprised of program reports that validate specific milestones, as well as performance certification memorandums provided by individual program managers.

GPRAs Program Goal 1.2.14.00: Develop New Nuclear Generation Technologies —

Target 1.2.14.01 — Maintain total administrative overhead costs in relation to total R&D program costs of less than 8 percent.

Supporting Documentation — Quarterly Measure Calculation and Program Manager Performance Certification Memorandum.

Target 1.2.14.02 — Enable industry to make a decision to build a new nuclear power plant by 2010 by supporting New Nuclear Plant Licensing Demonstration Projects within the planned scope, schedule, and budget of the program, and by administering the Department's standby support program.

Supporting Documentation — Program reports and documentation validating specific milestones; Program Manager Performance Certification Memorandum.

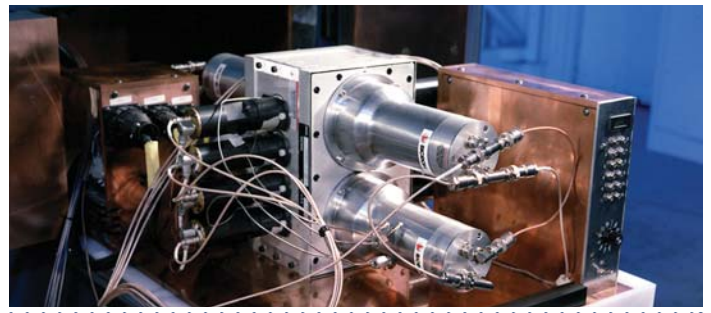
Target 1.2.14.03 — Determine a path forward for the design and construction of an NGNP by 2011 by partnering with private industry on its development, performing environmental assessment activities, and continuing with the research, analysis, design, and licensing — activities needed to identify the preferred and alternative technologies for the reactor system, including examination of fuel and graphite materials.

Supporting Documentation — Program reports and documentation validating specific milestones; Program Manager Performance Certification Memorandum.

Target 1.2.14.04 — Select a hydrogen production technology by 2011 that will be demonstrated in a pilot-scale experiment by conducting thermochemical and high-temperature steam electrolysis integrated laboratory-scale experiments.

Supporting Documentation — Program reports and documentation validating specific milestones; Program Manager Performance Certification Memorandum.

The Office of Nuclear Energy promotes safe, reliable, and carbon-free energy production.



Target 1.2.14.05 — Support the development of advanced technologies to close the fuel cycle by performing specific used fuel separations, transmutation fuels, and fast reactor R&D activities in support of the Advanced Fuel Cycle Initiative.

Supporting Documentation — Program reports and documentation validating specific milestones; Program Manager Performance Certification Memorandum.

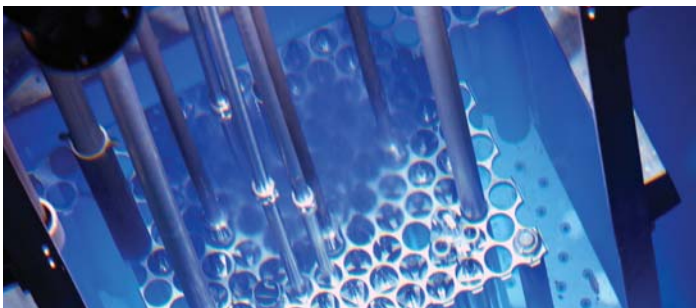
GPRA Program Goal 1.2.15.00: Maintain and Enhance National Nuclear Infrastructure —

Target 1.2.15.01 — To ensure unique nuclear facilities are available to support critical Departmental missions, achieve cumulative variance of less than 10 percent from cost and schedule baselines at Idaho National Laboratory for Idaho Facilities Management program facilities and activities (which include facilities used by the Radiological Facilities Management program), consistent with safe operations.

Supporting Documentation — Monthly Idaho Facilities Management Reports; Program Manager Performance Certification Memorandum.

Target 1.2.15.02 — Ensure unique nuclear facilities are available to support critical departmental missions, maintain a facility operability index of 0.9 for key Idaho Facilities Management, and Radiological Facilities Management program facilities.

Supporting Documentation — Monthly reports from four National Laboratories (Idaho, Los Alamos, Oak Ridge, and Brookhaven); Isotope Business Office, and Program Manager Performance Certification Memorandum.



NE supports the diverse energy programs of the United States.

Program Assessment Rating Tool

OMB developed the Program Assessment Rating Tool (PART) to provide a standardized way to assess the effectiveness of the Federal portfolio of programs. The structured framework of PART provides a means through which programs can assess their activities differently than through traditional reviews. NE's programs have carefully considered the results of PART assessments and have taken the necessary steps to continue to improve management and performance.

Each PART assessment is broken down into four sections and defined as follows:

Section I — Program Purpose and Design;

Section II — Strategic Planning (improving the linkage between budget and performance data at the DOE level);

Section III — Program Management (measuring and achieving cost effectiveness in program execution); and

Section IV — Program Results/Accountability (evaluating the program's progress against established annual and long-term goals).

In FY 2008, a PART reassessment was conducted for the NP 2010 program. The program's assessment improved from Adequate to Moderately Effective, which reflects the program's significant progress toward its long-term performance goals. PART assessments for the Gen IV and AFCI programs took place in FY 2003

(in support of the FY 2005 budget request) and in FY 2004 for the IFM program (in support of the FY 2006 budget request). Figure 7 describes the results for both NE's R&D and Infrastructure programs.

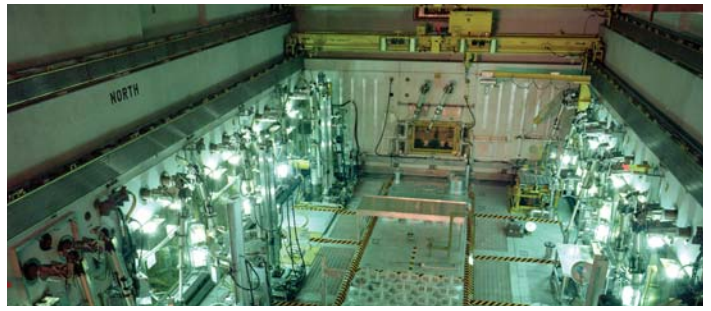
Generally speaking, NE programs were found to be well designed and managed, with adequate performance measurement frameworks. The lower scores in Section IV reflect the inability of the program to sufficiently demonstrate significant progress against established performance metrics. In the case of the National Nuclear Infrastructure assessment, the 0 percent score in Section IV was due to the recent transition of INL to NE from the Office of Environmental Management and the creation of a new set of performance metrics consistent with building a world-class nuclear research laboratory.

In each assessment, OMB recommended follow-up actions to improve program management and performance. These recommendations can be generally categorized as the need for better outcome-oriented performance metrics and the need for more independent program evaluations.

Figure 7. PART Scores

NE Program	Section I	Section II	Section III	Section IV	Overall Program PART Rating
Nuclear Power 2010	100%	70%	100%	53%	Moderately Effective
Generation IV Nuclear Energy Systems Initiative	100%	90%	100%	60%	Moderately Effective
Advanced Fuel Cycle Initiative	100%	90%	100%	53%	Moderately Effective
National Nuclear Infrastructure*	100%	89%	100%	0%	Results Not Demonstrated

*Includes IFM Program



Outcome-Oriented Performance Metrics

In general, OMB PART assessments found that NE programs relied too heavily on process-oriented, output-based performance metrics that did not indicate whether the program was demonstrating meaningful progress against its long-term goals. Where possible, the programs have revised their annual performance targets to clearly identify the outcomes of performance milestones. By focusing on a future outcome, the new measures allow for trending of annual progress toward a consistent objective. NE has attempted to balance the need for more outcome-oriented measures with Departmental concerns over the ability to audit annual performance measure results.

Independent Program Evaluations

PART assessments take into consideration the results of independent program evaluations. OMB has established strict guidelines on what constitutes an “independent” evaluation. Generally, advisory committees established under the auspices of the Federal Advisory Committee Act are not automatically determined to be qualified to perform independent evaluations. Drawing from PART guidance issued by OMB, the Nuclear Energy Advisory Committee (NEAC) formed a separate subcommittee on evaluations in FY 2004.

In FY 2006, as a follow-up action to the National Nuclear Infrastructure assessment, NE contracted with the National Academy of Sciences to conduct an extensive, comprehensive, and independent evaluation of R&D and Infrastructure program goals and plans, including the process for establishing program priorities and oversight. The final report was issued in April 2008; its findings continue to be integrated into NE program plans.

These independent program evaluations have proved valuable as NE continues to work to enhance its program, such that it is able to achieve its mission more effectively and efficiently.

Nuclear Energy Activities that Address DOE 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, some specific areas merit a higher level of focus and attention. These areas often 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 report summarizing what he considers the most serious management and performance challenges facing the Department. These challenges are included in the Other Accompanying Information section of that report. Similarly, in FY 2003 the Government Accountability Office (GAO) identified six major management challenges and program risks to be addressed by the Department.

The Department, after considering all critical activities within the agency and those areas identified by the IG and GAO, has identified nine 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.

The Department’s strategic approach to these challenges is captured in the Department’s Annual Financial Report. NE is actively contributing to the Department’s overall efforts in six of the nine leadership challenges through a variety of activities, as described on the following pages.



Contract and Project Administration

Challenge — Congress has directed that the Department take corrective action to be removed from the GAO High Risk List for inadequate contract and project oversight and management. DOE has been on this GAO list since its inception in 1990.

NE Activities¹ — In 2005, NE became the Lead Program Secretarial Office for the Idaho National Laboratory. NE and the Idaho Operations Office work together to ensure that INL's contractor, Battelle Energy Alliance, manages and operates the laboratory in compliance with contract requirements. NE and ID provide formal written guidance, review detailed work plans and monthly status reports, and conduct frequent face-to-face reviews at the staff and senior management levels.

A 2006 review by the Department's IG recommended improvements in management controls for performance fees within the INL contract. NE and ID have worked to improve the use of outcome-oriented metrics to more appropriately assess and reward contractor performance. Specific performance milestones are captured in the Performance Evaluation Management Plan (PEMP). The PEMP, reviewed annually, ties the contractor's achievements to its performance fee.

In the area of project administration, NE initiated the application of project management principles contained in DOE Order 413.3A, *Program and Project Management for the Acquisition of Capital Assets*, to programs in FY 2005. Through this effort, NE applied an earned value management system (EVMS) to selected major programs to track a program's cost, technical, and schedule performance against the program's baseline and assure greater control of the program and its resources. NE tracks this program performance quarterly through a database (the Program Information Collection System) tailor-made for this purpose. A report is provided to NE management and is included in NE's quarterly finance and performance review. Additionally, as required by DOE Order 413.3A, NE ensures all of its capital asset projects develop and track their baselines using earned value when appropriate. When

projects are mature enough to track earned value (at critical decision [CD]-2), NE tracks this internally through the same reporting mechanism used for tracking the earned value for programs. When a project attains CD-0, project performance reviews are held quarterly with the NE acquisition executive to ensure project performance is assessed regularly.

Within the area of Federal Project Director (FPD) certification, NE held multiple sessions of two Project Management Career Development Program (PMCDP) courses to provide continuing education opportunities (to maintain certification) for its certified FPDs in the spring of FY 2008. In January 2009, NE is scheduled to hold a PMCDP Level 1 boot camp, bringing required level-one PMCDP courses to NE staff who are not yet certified and providing support to help them attain certification. NE held its first boot camp in FY 2006, training over 50 staff members whose jobs required fundamental knowledge of program and project management principles.

Security

Challenge — 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, infrastructure, and personnel.

NE Activities — On September 30, 2006, the 2003 Design Basis Threat (DBT) was fully implemented at INL. The DBT is an approach for designing safeguards systems to prevent the theft of special nuclear material. NE was in the process of implementing the 2005 DBT at INL when the Department's Graded Security Protection (GSP) policy was issued in August 2008, superseding the 2005 DBT. INL will submit an implementation plan for the GSP in January 2010. In addition, NE has accomplished various activities to bolster security and protect vital assets at INL. In May 2005, the de-inventory of Category I material one INL facility was completed, leaving only two co-located Category I facilities within the INL Materials and Fuels Complex.²

¹Activities within this challenge area also relate to the IG's Acquisition Process Management Challenge area.

²"Category I" refers to the storage of strategic special nuclear material with the risk and potential for its direct use in a clandestine nuclear weapon or for its use in the production of nuclear material for use in a nuclear weapon. Category I material requires an especially high level of security.



In October 2007, the INL Radioactive Scrap and Waste Facility also became a Category I facility with a two-year waiver. NE continues to partner with the Idaho Operations Office and the Office of Health, Safety, and Security to test, develop and deploy new security technologies at INL.

Nuclear Waste Disposal

Challenge — 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, will require annual funding well above current and historic levels. Without funding reform, it is highly uncertain that Congress will be in a position to appropriate the significant increases in annual funding, that will be necessary to construct the repository and transportation systems. Without this increased level of funding the Program will not be able to set a credible opening date for the repository and taxpayer liability will continue to increase.

NE Activities — NE's AFCI program develops fuel cycle technologies that will support the economic and sustained production of nuclear energy while minimizing waste and satisfying requirements for a controlled, proliferation-resistant nuclear materials management system. AFCI is developing these new technologies so that they may be deployed as part of the nuclear fuel cycle to support operation of current nuclear power plants, Generation III+ advanced light-water reactors, and Gen IV advanced reactors.

Cyber Security

Challenge — Cyber attacks are increasing in complexity and frequency, and are becoming more aggressive. DOE is attacked over 10 million times each day in a wide variety of ways. Although DOE has defense-in-depth mechanisms based on industry and government best practices, some of the very sophisticated attacks have been able to penetrate DOE networks and computers. Cyber attacks continue to evolve to avoid detection by these defenses. The DOE comprehensive cyber security program must continually employ the best available management practices and technical defenses to provide adequate protection of its systems and data in the face of the increasing threat.

NE Activities — NE, in collaboration with the DOE Idaho Operations Office and the Battelle Energy Alliance, is working to enhance INL's cyber security framework. In FY 2006, a cyber security project was established to implement unclassified cyber security requirements as defined in the National Institute of Standards and Technology (NIST) 800-53, DOE Orders and Manuals, and the Under Secretary of Energy's (USE) Program Cyber Security Plan (PCSP). Contracted services and experts have been added to INL staff to develop and implement cyber security improvements. As part of the systematic and disciplined approach to solving cyber issues, cyber improvement plans are independently reviewed by industry experts and/or a Site Assistance Visit team. Independent industry experts also perform operational readiness reviews and System Testing and Evaluations of the effectiveness of new policies, standards, processes, and technology.

INL and ID unclassified information system networks have been reconfigured based on NIST standards and received Designated Approval Authority to commence operations in January 2008. The first phase of a three-step, risk-based plan to implement additional cyber security improvements, as defined in the PCSP, was initiated in FY 2007. The first-phase improvements were completed in FY 2008; additional activities will extend into FY 2009 and beyond.

Additional cyber security projects have been established to implement classified cyber security requirements. In September 2008, NE completed a project to convert classified computers to diskless workstations. This achievement, among others, helped NE resolve cyber security issues identified in an Office of Health, Safety and Security inspection of classified computing systems. NE will continue to implement cyber security requirements, as defined in DOE Orders, Manuals, and the USE PCSP.



Existing nuclear power plants are among the most economic sources of electricity on the grid today.

Human Capital Management

Challenge — The Department requires a highly technical and specialized workforce to accomplish its scientific and technological missions. There is an ongoing challenge to maintain a capable workforce. The challenges in creating and implementing innovative human capital management strategies to maintain a workforce with the right people and skills is compounded by increased competition for individuals with the knowledge, skills, and competencies that the Department needs; and the significant retirement challenge that threatens to rob the organization of critical skills. The average employee age is over 49 years and a significant number (30 percent) will be eligible to retire in the next 3 years. In 2007, retirements exceeded historical trends and attrition reached 7.6 percent. The attrition rate for the first half of 2008 climbed higher, to 8.3 percent. A continuation of this trend can deprive the organization of the skills needed to perform its mission. To maintain its workforce, DOE will need to hire more than 5,000 new employees in the next four years.

NE Activities — NE is one of the most programmatically diverse organizations in DOE. NE faces a variety of critical human capital challenges in pursuing its mission and meeting current requirements. The NE Human Capital Plan describes how NE is developing and maintaining a talent pool of well-qualified candidates with skills to meet current and projected needs through: (1) recruiting, re-deploying, and promoting qualified personnel from inside and outside NE; (2) implementing leadership development programs; and (3) working to demonstrate a strong commitment to reducing the under-representation of women and minorities.

NE faces challenges in today's job market. To assist with the challenge, NE is pursuing a wide variety of recruiting and outreach initiatives. Among these are participation in hiring fairs, implementation of an NE Cooperative Education program, participation in the Presidential Management Fellowship program, participation in the Minority Educational Institution Student Partnership Program, and advertising recruitment notices—especially those in professional publications targeting minority groups. With regard to attracting qualified candidates, NE offers a variety of recruitment incentives such as recruitment bonuses, relocation expenses, advance-in-hires, and student loan repayment.

NE employees are encouraged to participate in a variety of career development programs, including the Senior Executive Service Candidate Development Program, Executive Potential Program, Executive Leadership Program, Aspiring Leader Program and the New Leader Program. These programs help develop the leaders of tomorrow, and help reduce the under representation of women and minorities in management positions.

Safety and Health

Challenge — Ensuring the safety and health of the public and the Department's workers is one of our 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.

NE Activities — NE continues 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 the personnel with oversight responsibilities possess appropriate knowledge, skills, and abilities for safety oversight and provide a clear process for the delegation of critical safety authorities. NE continues to augment the safety staff and to address gaps identified in staff safety coverage. NE implements its oversight activities and delegation of safety authorities per approved standard operating procedures. NE is conducting line management assessments and safety oversight of INL with the participation of the Idaho Operations Office, in accordance with an integrated oversight schedule.

Nuclear Energy Supporting Materials

Key Events for Fiscal Year 2009

November 2008

- ◆ NE sponsors first On-line Workshop for its University Program
- ◆ NE issues first call for proposals for Advanced Test Reactor (ATR) National Scientific User Facility experiments

December 2008

- ◆ NE holds public meetings on the draft GNEP Programmatic Environmental Impact Statement
- ◆ NE issues Request for Proposals (RFP) for university R&D projects, infrastructure projects, and scholarship/fellowship awards

January 2009

- ◆ NE approves first Standby Support Conditional Agreement to support an industry decision to deploy a new nuclear power plant

March 2009

- ◆ NE issues Financial Assistance Funding Opportunity Announcement for the Design and Licensing of the Next Generation Nuclear Plant (NGNP)

April 2009

- ◆ NRC issues Safety Evaluation Report with Open Items for Dominion's combined Construction and Operating License (COL) application at the North Anna site
- ◆ Ministerial Conference of the International Atomic Energy Agency in China

May 2009

- ◆ NE makes awards to universities on R&D projects, infrastructure projects, and scholarships/fellowships

June 2009

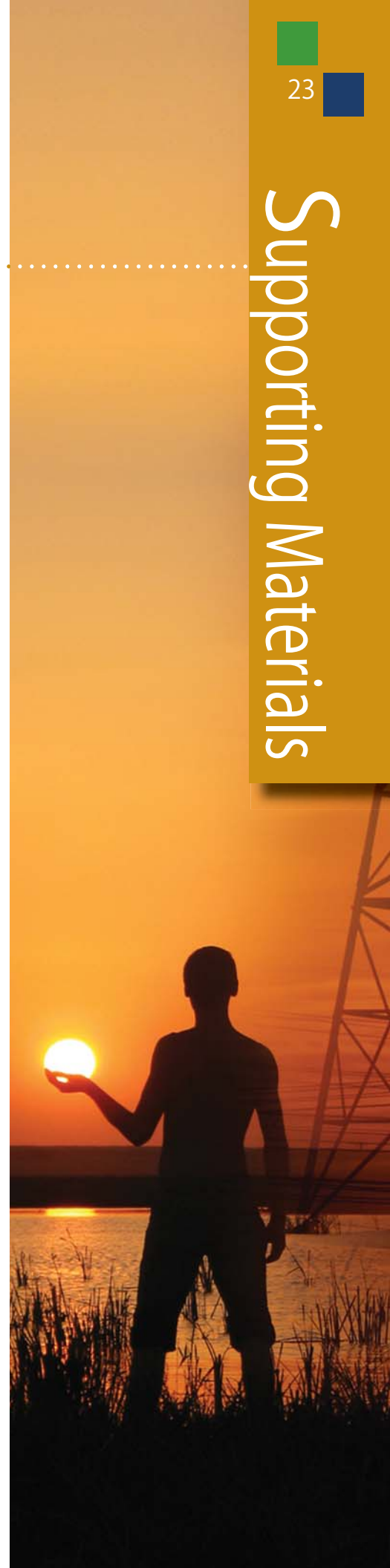
- ◆ NE selects recipients of the Funding Opportunity for the Design and Licensing of the NGNP
- ◆ NE issues Final GNEP Programmatic Impact Statement
- ◆ ATR National Scientific User Facility Summer Session and Workshop meets at INL
- ◆ NE issues final call for proposals for Advanced Test Reactor (ATR) National Scientific User Facility experiments

August 2009

- ◆ NRC issues Safety Evaluation Report with Open Items for portions of NuStart/TVA's combined COL application at the Bellefonte site
- ◆ Annual NE University Program Workshop meets in Washington, DC
- ◆ NE completes preparations for four university experiments into the ATR at INL

September 2009

- ◆ NASA launches Mars Science Laboratory Mission, powered by DOE's Multi-Mission Radioisotope Thermoelectric Generator
- ◆ General Conference of the International Atomic Energy Agency in Vienna, Austria





Authorizing Legislation

NE is guided by authorizing legislation including the Atomic Energy Act, Energy Reorganization Act, Department of Energy Act, and the Energy Policy Act of 2005. The following are brief descriptions of the legislation.

The Atomic Energy Act of 1954

This Act is the fundamental U.S. law on both the civilian and the military uses of nuclear materials. On the civilian side, it provides for both the development and the regulation of the uses of nuclear materials and facilities in the United States, declaring the policy that “the development, use, and control of atomic energy shall be directed so as to promote world peace, improve the general welfare, increase the standard of living, and strengthen free competition in private enterprise.” The Act requires licensing for civilian uses of nuclear materials and facilities. For more detailed information, please refer to: <http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr0980/ml022200075-vol1.pdf>.

Energy Reorganization Act of 1974

Under the Atomic Energy Act, a single agency, the Atomic Energy Commission, had responsibility for the development and production of nuclear weapons and for both the development and the safety regulation of the civilian uses of nuclear materials. The 1974 Act split these functions into The Energy Research and Development Administration, NRC, and Energy Resources Council. For more detailed information, please refer to: <http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr0980/rev1/vol-1-sec-2-to-5.pdf>.

The Department of Energy Organization Act of 1977

This Act brought the Federal Energy Administration, the Energy Research and Development Administration, and the Federal Power Commission into a single agency. On October 1, 1977, DOE assumed the responsibilities of the aforementioned agencies, and parts and programs of several other agencies, under one organization governing the responsibility for the development and production of nuclear weapons, promotion of nuclear power, and other energy-related work. For more detailed information, please refer to: <http://uscode.house.gov/download/pls/42C84.txt>

The Energy Policy Act of 2005

This Act encourages the deployment of nuclear power through loan guarantees and protection tax credits for advanced nuclear power facilities. It offers a new form of Federal risk insurance for the first six builders of new nuclear power plants. These incentives, coupled with the authorization of the Next Generation Nuclear Plant and R&D appropriations, move America closer to a vital national goal of energy independence with the aid of new nuclear power. For more detailed information, please refer to: <http://www.ne.doe.gov/energyPolicyAct2005/neEPACT2a.html>.

Validation and Verification

NE conducts various internal and external reviews and audits to validate and verify program performance. Periodic program reviews evaluate progress against established plans. NE holds monthly, quarterly, semi-annual, and annual reviews, consistent with program management plans and project baselines, to ensure technical progress, cost, and schedule adherence, and responsiveness to program requirements.

Internally, NE provides continual management and oversight of its R&D and vital infrastructure programs. Examples of NE’s R&D programs include NP 2010, Gen IV, NHI, and AFCI. NE infrastructure programs, such as the Radiological Facilities Management program and the IFM Program, are managed using similar oversight techniques.

NE has engaged its stakeholders in a number of recent evaluation activities to help define the appropriate scope of NE’s program activities to support nuclear energy’s role in meeting the Nation’s energy security and environmental goals. In July 2008, the Battelle Corporation released its report, *Nuclear Energy for the Future: Executive Recommendations for R&D Capabilities*, which identifies the capabilities and facilities required to support the achievement of the nuclear energy industry’s goals. This report reflects input from the domestic nuclear energy industry and the academic community. In August 2008, the Directors of the Department’s National Laboratories released *A Sustainable Energy Future: The Essential Role of Nuclear Energy*, which describes how nuclear energy should contribute to our Nation’s energy portfolio.

NE conducts various internal and external reviews and audits to validate and verify program performance.



NE has also released several draft reports including *Facilities for the Future of Nuclear Energy Research: A Twenty-Year Outlook* and *Required Assets for a Nuclear Energy Applied R&D Program*. These reports focus on the capabilities required to carry out robust nuclear energy research, development and demonstration programs that are able to support the recommendations of the reports described above.

NE's programmatic activities are also subject to periodic external reviews by Congress, GAO, the Department's IG, NRC, the U.S. Environmental Protection Agency, state environmental and health agencies, and the Department's Office of Engineering and Construction Management. In addition, NE solicits the advice and counsel of external agencies such as Nuclear Energy Advisory Committee and National Academy of Sciences. The following are some examples of external validation and verification activities.

Government Accountability Office

At the end of FY 2006, GAO issued the report, *Status of DOE's Effort to Develop the Next Generation Nuclear Plant*, which stressed that the initial NNGNP R&D activities are favorable and that the project has a well-organized schedule for completing construction of a demonstration plant by 2021 as authorized under EPAct. The report notes that a significant amount of R&D remains to be conducted and that DOE is making progress on its efforts to involve industry stakeholders.

In April 2008, GAO completed a comprehensive audit of NE's Global Nuclear Energy Partnership activities. The report recommended that additional R&D on advanced fuel cycle technologies should proceed prior to either an engineering or commercial scale demonstration of a used fuel recycling facility. The program will revise its schedule to ensure proper alignment of development and deployment activities, and to work with industry to the extent possible.

National Academy of Sciences

In April 2008, the National Academy of Sciences published its final report on NE R&D and Infrastructure program goals and plans. The evaluation resulted in a detailed set of policy and research recommendations and associated priorities for an in-

tegrated agenda of research activities to support the long-term commercial energy option to provide diversity in energy supply. NE is continuing to review the report findings and is working to develop a viable strategy for implementing the committee's recommendations.

Nuclear Energy Advisory Committee

The Department obtains advice on the direction of its programs from NEAC. An independent formal Federal advisory committee, NEAC provides expert advice on long-range plans, priorities, and strategies for the nuclear technology R&D and research infrastructure activities of NE.

In November 2008, NEAC published *Nuclear Energy: Policies and Technology for the 21st Century*, which calls attention to the role of nuclear power and its impact on energy security, the environment, and non-proliferation. The report recognizes the integral role that the Department of Energy has played and will continue to play in securing safe nuclear power for our Nation, including a very important and fundamental role in advancing the technology. The report also emphasizes that a global approach is vital to ensure a sustained U.S. nuclear program at home and international leadership abroad. Finally, it recognizes the importance of strengthening multilateral institutions such as the International Atomic Energy Agency, which recently completed its 20/20 Commission Report that identified a strategy for the strengthening of the non-proliferation agenda and nuclear energy development in an era of international nuclear expansion.

NEAC has several active subcommittees examining various aspects of nuclear technology R&D. Additional reports issued by these subcommittees that address the future of nuclear energy include: "Long-Term Nuclear Technology Research and Development Plan," "Nuclear Science and Technology Infrastructure Roadmap," "A Roadmap to Deploy New Nuclear Power Plants in the United States by 2010," "A Technology Roadmap for Generation IV Nuclear Energy Systems," "Report of the Subcommittee on Nuclear Laboratory Requirements," and "An Evaluation of the Proliferation Resistant Characteristics of Light Water Reactor Fuel with the Potential for Recycle in the United States."



Future use of nuclear energy is vital to meet U.S. needs for carbon-free, dependable, and economical electric power.

List of Acronyms

Acronym Definition

ABR	Advanced Burner Reactor
AFCI	Advanced Fuel Cycle Initiative
ATR	Advanced Test Reactor
CAES	Center for Advanced Energy Studies
CD	Critical Decision
COL	Construction and Operating License
CR	Continuing Resolution
CV	Cumulative Cost Variance
DAS	Deputy Assistant Secretary
DBT	Design Basis Threat (referring to security)
DOE	U.S. Department of Energy
EPAct	Energy Policy Act of 2005
EVMS	Earned Value Management System
FPD	Federal Project Director
FY	Fiscal Year
GAO	Government Accountability Office
Gen IV	Generation IV Nuclear Energy Systems Initiative
GIF	Generation IV International Forum
GNEP	Global Nuclear Energy Partnership
GPRA	Government Performance and Results Act
GSP	Graded Security Protection
HLW	High Level Waste
HTE	High Temperature Electrolysis
IAEA	International Atomic Energy Agency
ID	Idaho Operations Office
IFM	Idaho Facilities Management

Acronym Definition

IG	Office of the Inspector General, U.S. Department of Energy
ILS	Integrated Laboratory-Scale
INL	Idaho National Laboratory
NASA	National Aeronautics and Space Administration
NE	Office of Nuclear Energy
NEA	Nuclear Energy Agency
NEAC	Nuclear Energy Advisory Committee
NEPA	National Environmental Policy Act
NGNP	Next Generation Nuclear Plant
NHI	Nuclear Hydrogen Initiative
NIST	National Institute of Standards and Technology
NP 2010	Nuclear Power 2010
NRC	Nuclear Regulatory Commission
NSUF	National Scientific User Facility
OMB	Office of Management and Budget
OECD	Organization for Economic Cooperation and Development
PART	Program Assessment Rating Tool
PCSP	Program Cyber Security Plan
PEIS	Programmatic Environmental Impact Statement
PEMP	Performance Evaluation Management Plan
PMCDP	Project Management Career Development Program



List of Acronyms (continued)

Acronym	Definition
R&D	Research and Development
RFP	Request for Proposals
RPS	Radioisotope Power Systems
S-I	Sulfur-Iodine
SV	Schedule Variance
USE	Under Secretary of Energy
VHTR	Very High Temperature Reactor





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