DOE This Month

U.S. DEPARTMENT OF ENERGY

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Building stakeholder trust at the Rocky Flats Site

Secretary Richardson message to employees

Ecology reserve established at Brookhaven Lab

DOE This Month

U.S. Department of Energy

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On our cover

The Department of Energy's Rocky Flats Field Office takes stakeholder input seriously and has worked hard to build public trust in the cleanup activities at the Rocky Flats Environmental Technology Site. Affording stakeholders the ability to "see for themselves" is considered a natural extension of the public process to accomplish the Site's mission of safe, accelerated cleanup and closure. A series of deactivation and decommissioning tours has been implemented to give the community a "hands-on" understanding of the progress at Rocky Flats, including for the first time a tour of Building 771—a plutonium processing building—and a chance to use firsthand the new plasma arc technology.

For more on the site tours, see page 4.

Message from Secretary Richardson . . .

Perhaps more than any other period, the year-end holiday season moves us to reflect on all that has occupied our time, energy, and emotions during previous months. I hope that people throughout the Department of Energy complex nationwide can join me in feeling that we have dedicated ourselves to work where our common goal was to do what is right.

I am very grateful to have been part of a diverse team of patriotic Americans who give so much of themselves to further our country's interests. I hope everyone had a joyful holiday season and offer my gratitude for the way that you have pitched in so that together we could accomplish even more than what I expected when I arrived here a little more than two years ago.

Budget cuts and personnel downsizing had taken a toll on our agency before I became Secretary in August of 1998. The Energy Department had lost some of its edge so I enlisted the help of people throughout our complex and in other parts of government to restore the Department's role in promoting world-class science.

That was a priority for me coming in. So was improving security and counterintelligence at our nuclear weapons labs and throughout the agency's complex. Together we have done more to improve the security of our facilities during the past two years than what had been done in the previous 20.

I also wanted to send out a clear signal that our country needs to stand by employees of our agency—past and present—when it becomes apparent that their work has hurt their health. We reversed a decades-old government practice of opposing health claims of nuclear weapons workers who helped us win World War II and the Cold War. We no longer turn our backs to these people. Instead, we now have a compensation package provided by statute to help these workers and their families.

We also now have in place the strongest worker-protection program in the world to prevent lung disease associated with exposure to beryllium, which is the main cause of health problems being addressed through the new compensation package.

With consumer interests in mind, we aggressively led the Administration's effort to combat rising oil prices, successfully negotiating increases in oil production levels and pressing for more stability in long-term market prices. U.S. consumers continue to pay some of the lowest gasoline prices among developed countries.

We've also been aggressive advocates for a national energy policy that stresses efficiency, renewable energy and increases in our own domestic oil production.

Electricity restructuring legislation was developed by our agency to bring needed competition to a monopolized market, saving Americans $20 billion a year. To address the long-term need for electricity, we aggressively called upon Congress throughout the past year to address the electricity reliability issue. Legislation can help spur new investments in powerplants and transmission facilities. It also could produce a more efficient transmission system that would allow states to import more power from each other and lead to more funding for energy efficiency programs.

While waiting for congressional action in this important area, we have moved ahead with stricter efficiency standards for air conditioners and other household appliances that draw heavily from available power.

Protecting our natural environment has been a principal concern of mine so we have expedited the cleanup of contaminated Energy Department sites and have committed realistic budgets to the work. It is important that we protect ecologically significant property as Energy Department sites are closed or scaled back so we have set aside more than 300,000 acres for wildlife protection.

Our agency negotiated an agreement to clean up more than 10 tons of radioactive uranium mill tailings that threatened the drinking water of several Western states and millions of their citizens. That same agreement returned 84,000 acres of Energy Department land to the Ute Indian Tribe and protected as environmentally sensitive a 75-mile stretch of the Green River in Utah.

Our determination to make workplace improvements, such as more-affordable in-house child care and greater access to physical fitness facilities, recently moved the Office of Personnel Management to recognize the Energy Department as having made the most dramatic improvements in work life among all federal agencies.

Beyond that, I am happy to say that we have worked tirelessly to diversify our workforce. More than two-thirds of my appointees have been women or minorities, and we have been vocal and vehement while battling racial profiling.

Transition is underway in Washington but the vast majority of employees who have contributed to the Energy Department's success during recent years will remain duty-bound in their posts. I wish you all well and, again, thank you for your dedication.

You've helped make my past few years productive and memorable, and I wish you all the best while serving your country and caring for your families in the new year.

Bill Richardson

Rocky Flats builds stakeholder trust through site tours

On a beautiful late summer Colorado morning, 16 stakeholders boarded a bus for a tour at the visitor center outside the Department of Energy's (DOE) Rocky Flats Environmental Technology Site. This was not to be a typical windshield tour of the buffer zone with its unique mixture of virgin western prairie, wetlands environment, and abundant wildlife. This time the tour took the stakeholders into the inner sanctums of a plutonium processing building.

The journey took them one mile into the Rocky Flats Site, through the barbed wire and electronic security system encircling the Protected Area, and into Building 771. The tour group passed armed guards, processed through metal detectors, and submitted to hand scans to gain entry. Building 771 was erected nearly 50 years ago to reprocess operations waste for plutonium recovery. Now, it is the second plutonium processing building at Rocky Flats to undergo deactivation and decommissioning (D&D), including eventual demolition.

On the tour, both the stakeholders and their DOE hosts marveled over how far both groups had traveled to get to this point. The stakeholders once would not even venture into Building 60—the visitor center—for public meetings. But several years ago, the Department's Rocky Flats Field Office decided to attack a number of issues, from security limitations to safety requirements, that stood as barriers to stakeholder trust.

Affording stakeholders the ability to see for themselves ongoing work inside and outside the buildings was considered a natural extension of the public process to accomplish the Site's mission of safe, accelerated cleanup and closure. A series of D&D tours was implemented to give stakeholders a "hands-on" understanding of the progress at Rocky Flats.

The 16 stakeholders on the Building 771 tour had been extensively briefed and prepared with countless presentations and data on the daily work inside the building and elsewhere on the site. Rocky Flats Site personnel conduct and support more than 40 public meetings a year, including monthly Stewardship Working Group meetings, which look at the Site beyond 2006, and the annual State of the Flats, which serves as a regular public accountability session.

Stakeholder John Marler, Rocky Flats Coalition of Local Governments, tests the new plasma arc technology in use at the Rocky Flats Site Building 771.

But nothing could compare to the firsthand knowledge gained from being inside Building 771. The stakeholders saw a stark picture of what operations used to be like, as well as exactly what is being accomplished today and the many constraints imposed on workers.

New technologies and safer approaches continuously have been incorporated into the D&D work inside Building 771. One ongoing project is size-reducing 240 enormous, contaminated, stainless steel glove boxes into sections to fit into waste containers. Recently, implementation of a new plasma arc technology for this work has reduced cost, saved time, and greatly improved worker safety. With a concentrated 20,000° F to 30,000° F focused plasma beam, the arc passes through stainless steel, up to six inches thick, like a hot knife through butter.

Under tightly controlled and supervised conditions of an uncontaminated and shielded bay in the machine shop, stakeholder John Marler, Rocky Flats Coalition of Local Governments, was given the opportunity to don protective gloves, helmet, and jacket to cut through two pieces of scrap yard steel using the new plasma arc technology. "I am amazed at how efficiently and smoothly this tool does the job," Marler said. "I'm also grateful for the chance to see it all firsthand. These tours are answering our questions and allowing us to confront our concerns and curiosities right here at ground zero."

"DOE has gone the extra mile to set up these status tours," adds Mary Harlow, City of Westminster. "As a local government representative, I really appreciate the opportunity to see firsthand the process for decontaminating buildings prior to destruction so that I can answer questions on this process from Westminster citizens, staff, and elected officials."

The hands-on status tours are now an integral part of the Department's commitment to stakeholder involvement and participation in the accelerated safe closure of the Rocky Flats Site. The deactivation and decommissioning of Building 771, including its scheduled demolition by August 2004, are no longer abstract concepts for stakeholders to imagine. ❖

Ecology reserve established at Brookhaven

The Department of Energy and the U.S. Fish and Wildlife Service recently signed an agreement to permanently preserve a unique Pine Barrens ecosystem at the Department's Brookhaven National Laboratory in Upton, N.Y. The 530-acre Upton Ecological and Research Reserve provides a home to more than 220 species of plants and 162 species of mammals, birds, reptiles, and amphibians.

"With the help of the U.S. Fish and Wildlife Service and Long Island communities, we are making a public commitment to preserve this land and make it available for educational activities and ecological research," Secretary of Energy Bill Richardson said at the Nov. 9 dedication ceremony. "This is the ninth site the Department has reclaimed to ensure natural resources across the country are saved for present and future generations." The Department has preserved over 200,000 acres of unique wild lands at its sites.

The Pine Barrens land in the Upton Reserve creates a unique ecosystem of forests and wetlands. It provides habitat for approximately 27 endangered, threatened, or special concern species, including the endangered eastern tiger salamander and state-threatened banded sunfish. Other wildlife species of interest include the wild turkey, red fox, eastern box turtle, and red-tailed hawk.

The Department of Energy, as the landowner, will manage the environmental compliance, safety, health, fire protection, access, and cleanup activities of the reserve. The Department will provide the U.S. Fish and Wildlife Service $200,000 a year, over a five-year period, for land management activities and research in the Upton Reserve. ❖

Los Alamos Lab wins Green Zia awards

Efficiency and pollution prevention are closely related. When an organization increases efficiency, resources are used more effectively and waste decreases. As a result, pollution is prevented, environmental quality improves, and profitability increases. It is a win-win situation for the organization and the environment, and it's the rationale behind participation by the Department of Energy's Los Alamos National Laboratory (LANL) in the New Mexico Green Zia Environmental Excellence Program—participation that recently led to seven Green Zia Awards.

Green Zia is a voluntary program sponsored by the New Mexico Environment Department and administered by the New Mexico Environmental Alliance, a partnership of state, local, and Federal agencies; academia; private industry; and environmental advocacy groups. The program, based on the Malcolm Baldrige National Quality Award, focuses on the integration of pollution prevention practices and core business management principles to create prevention-based environmental management systems.

Three categories of awards are offered by Green Zia in recognition of organizations and their pollution prevention successes. The Commitment Award is given to organizations in the process of establishing a prevention-based environmental management system and demonstrating a strong commitment to improved environmental quality. The Achievement Award recognizes organizations with prevention-based management systems in place and measurable pollution prevention results. The Excellence Award is reserved for organizations that have fully integrated pollution prevention systems and have demonstrated measurable results and leadership in innovative approaches to waste reduction. To date, no New Mexico organization has received an Excellence Award.

New Mexico Governor Gary Johnson congratulates four LANL Green Zia Award recipients. Left to right are James Dalton, Facilities and Waste Operations; Governor Johnson; Mike Baker, Environmental Science and Waste Technology Division; Judith Snow, High Explosives Science and Technology Group; and Patrick Martinez, Human Resources Division.

In 2000, New Mexico Governor Gary Johnson presented 30 Green Zia awards statewide. LANL's Environmental Science and Waste Technology Division and High Explosives Science and Technology Group, which won Commitment Awards last year, and the Weapon Component Technology Group received Achievement Awards. The laboratory's Business Operations Division, Human Resources Division, Transition Manufacturing and Safety Equipment Project, and Facilities and Waste Operations-Diversified Facilities Group won Commitment Awards.

LANL's Environmental Stewardship Office coordinates the laboratory's participation in the Green Zia Program. An overview of the program is available at **http://emeso.lanl.gov/index.html**. ❖

Shutdown of final Chornobyl unit marks nuclear safety milestone

In April 1986, the world grew anxious as information from media reports described a serious accident at the Chornobyl nuclear power plant in Ukraine. The explosion at Chornobyl Unit 4 was the worst accident in the history of nuclear power.

Nearly 15 years later, the last operating reactor at Chornobyl—Unit 3—shut down on Dec. 15. The shutdown culminates years of work by the United States government and the international community to improve nuclear safety. At President Clinton's request, Secretary of Energy Bill Richardson led the U.S. delegation at the closing ceremonies.

The Department of Energy's (DOE) involvement at Chornobyl began in 1992 when a cooperative program was initiated to improve the safety of Soviet-designed reactors in Russia, Ukraine, and Central and Eastern Europe. Some of these reactors share the Chornobyl design, causing significant concern that another accident was possible.

At Chornobyl, the U.S. program focused on improving the safety of the two units that were still operating at that time—Units 1 and 3—to reduce the risk of another accident until they could be shut down. Safety improvements were implemented, including installation of a Safety Parameter Display System and procedures to improve operator response during emergencies. In addition, DOE experts from Headquarters and national laboratories worked with plant officials to perform safety assessments and implement improvements in fire safety, training programs, emergency procedures, maintenance, and quality assurance.

This photo, courtesy of The Kurchatov Institute (Russia) and the ISTC-Shelter (Ukraine), provides a post-accident view in 1986 of the Chornobyl Nuclear Power Plant's Unit 4 (left) and adjacent Unit 3.

The Department also supported activities to improve worker safety and renovate the "shelter," a concrete cover hastily built over Unit 4 soon after the 1986 explosion. In addition, DOE worked with Ukraine to create a research center near Chornobyl to lessen the social impact of the plant closure. The International Chornobyl Center for Nuclear Safety, Radioactive Waste and Radioecology is designed to address environmental, ecological, health and other issues in areas affected by the Chornobyl accident, to diversify the area economy, and to maintain in-country expertise in nuclear sciences.

Chornobyl Unit 2 shut down in 1991 following a major fire in the turbine building. Unit 1 shut down in 1996 due to international pressure for its shutdown and a lack of resources for needed maintenance and repairs. Following the shutdown of Unit 3, an estimated 10 to 15 years is needed to complete deactivation of Units 1, 2 and 3 to prepare them for safe, long-term storage. ❖

Report details employee concerns progress

The Office of Employee Concerns in the Office of Economic Impact and Diversity (ED) has issued its *1999 Employee Concerns Activities Report*. The Employee Concerns Program reports a number of successes in 1999. Most significant is that the program continues to close out approximately 80 percent of the 500 concerns it receives annually, while processing concerns faster and reducing the number of cases pending over six months.

The report highlights ED's partnership with Department of Energy (DOE) employees and contractors in addressing and resolving employee concerns. This partnership ensures that the Employee Concerns Program:

- provides DOE Federal and contractor employees with an effective means of voicing health, safety, environment, waste, fraud, abuse, and whistleblower retaliation concerns;
- avoids, where possible, prolonged and costly litigation by promoting the use of Alternative Dispute Resolution, including mediation, at Headquarters and field sites;
- ensures that employee concerns are appropriately, timely, fully, and fairly considered;
- uses greater management tools to assess the effectiveness of the program; and
- implements the program's vision that "employees of the Department of Energy, its contractors and subcontractors, are free to raise concerns, without fear of reprisal, about policies and practices that adversely affect the Department's ability to accomplish its mission in a safe and efficient manner."

Copies of the report are available from the Office of Employee Concerns, Room 1F-024 Forrestal Building, 202-586-4034. ❖

Department funds natural gas engine research

Three industrial partners have been awarded $15 million over five years by the Department of Energy for research, development and testing of advanced natural gas reciprocating engines. "This public-private partnership aims to improve engine performance by producing more power with less fuel and thereby cutting down on air pollution and the costs of advanced natural gas engines," said Secretary of Energy Bill Richardson. "Greater use of these natural gas engines will improve the reliability of the electrical power grid and reduce the likelihood and severity of future power supply shortages."

The advanced natural gas reciprocating engine is a new or upgraded internal combustion reciprocating piston engine that produces standby, emergency, and peaking power for light manufacturing plants, stores, schools, and office complexes. The three firms will contribute 35 to 45 percent of the research costs. The projects:

- Caterpillar Inc., Lafayette, Ind., will focus on the continued development of engine technology in the areas of combustion, air-intake, exhaust sensors, and control and engine design.
- Cummins Engine Company Inc., Columbus, Ind., will lead a multidisciplinary team with extensive experience in development and manufacturing of high-pressure gas engine systems.
- Waukesha Engine Division, Dresser Equipment Group, Waukesha, Wis., will design, develop, and build a new gaseous-fueled engine for the distributed power generation market.

The Department's Chicago Operations Office will handle the financial assistance awards and project management. ❖

Idaho Lab to help Russia explore biodiversity potential with new center

The Department of Energy's (DOE) Idaho National Engineering and Environmental Laboratory (INEEL) and four Russian biological institutes have announced plans to work with Diversa Corporation to establish a Russian Ecological Biotrade Center. The center, the first of its kind in Russia, will employ former Soviet weapons scientists who will partner with DOE laboratories and U.S. private industry to work on new non-weapons-related research projects to commercialize biomolecular products. The effort is part of the Department's Initiatives for Proliferation Prevention (IPP) program.

"Through the collaboration of scientific institutes in Russia, the Energy Department's national laboratories, and the private sector, we are making great strides to redirect former Soviet weapons expertise towards peaceful activities," said Secretary of Energy Bill Richardson. "The creation of the ecological center is an exceptional opportunity for participants on all sides."

The Russian institutes participating with INEEL include the State Research Center for Applied Microbiology, the All Russian Institute of Phytopathology, the Institute of Biochemistry and Physiology of Microorganisms, and the Research Center of Toxicology and Hygienic Regulation of Biopreparations. DOE will provide $1,000,000 towards this two-year project. Diversa Corporation will provide additional funding under a cooperative research and development agreement.

The goal of the collaborative research is to use biomolecular techniques to evaluate the range, extent, and potential value and diversity of microorganisms found within Russian ecosystems. "It is the goal of this project to identify commercial biomolecular products that will provide revenue to make the ecological center self-sustaining after DOE funding ends," said Bill Toth, Initiatives for Proliferation Prevention program manager for INEEL.

The Department's IPP Biological Program has engaged 20 biological institutes and almost 600 scientists, approved more than 55 projects, and allocated over $12 million for collaboration with former Soviet biological weapons facilities. Projects are selected for their commercial potential and are intended to lead to long-term employment for former Soviet weapons specialists, while also providing U.S. industry participants with new sources of technological innovation. ❖

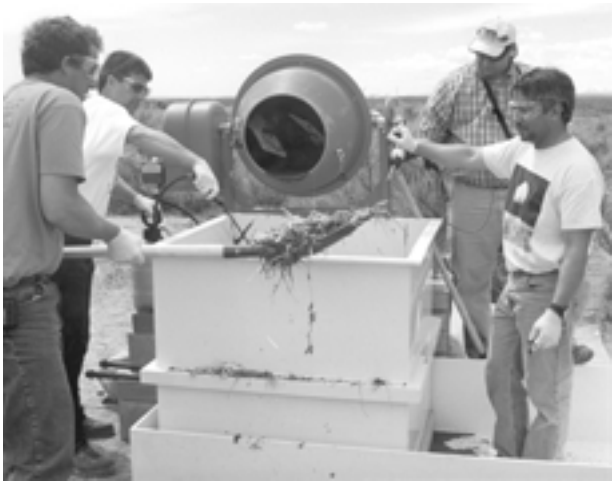
Shaking hands at the agreement signing ceremony in Washington, D.C. are (left) Roman Borovick, Director, Russia Institute of Toxicology and Hygienic Regulation of Biopreparations, and Bill Toth, IPP Program Manager, Idaho National Engineering and Environmental Laboratory. Looking on at far left is Vera Dmietrieva, Executive Director, Ecological Biotrade Center.

Energy, Air Force team for ultra-clean fuels

Department of Energy (DOE) and U.S. Air Force researchers have joined forces to study the sulfur content of jet fuels in an effort they believe eventually will reduce emissions from advanced propulsion systems. Dr. Fred Brown (right), Associate Director, Office of Fuels and Energy Efficiency, National Energy Technology Laboratory (NETL), and Brig. Gen. Paul D. Nielsen, Commander, Air Force Research Laboratory, signed an agreement to collaborate on research, development, and demonstrations related to clean aviation fuels, fuel additives, and lubricants. The five-year, cost-shared effort supports the Department's Ultra Clean Transportation Fuels Initiative managed by NETL.

The DOE initiative seeks to provide the U.S. with affordable, clean transportation fuels from an expanded fossil resource base that includes natural gas, coal, and petroleum. The technologies being pursued, when implemented, will lead to a cleaner environment and more options to lessen the demand for imported oil. ❖

New technology cleans ordnance-contaminated soil



A unique method of remediating soil contaminated with residue from explosives has earned a patent for scientists Francisco Roberto and Corey Radtke at the Department of Energy's Idaho National Engineering and Environmental Laboratory (INEEL).

Natural composting methods developed for such contaminated soil leave chunks of TNT larger than two millimeters in size. The INEEL scientists' method uses 10 percent soil and 90 percent compost materials. But, it's the addition of acetone—a main ingredient in fingernail polish remover—to the mix that enables the larger TNT chunks to be remediated, removing the stumbling block to environmental cleanup. The INEEL method allows microorganisms to feed on the nutrients in the compost, breaking down not only the TNT contaminants, but also the acetone, leaving soil safe and non-toxic.

The method was tested for three years in the laboratory, then one year in the field. At left, researchers make a slurry to degrade TNT chunks in field demonstrations of the technology. ❖

Chemical detection system ready for 'big' test

A lightweight, portable chemical vapor detection system developed by the Department of Energy's Sandia National Laboratories is in final preparation for the big test—a field test in 2001 simulating a chemical release. A team of researchers is now completing the laboratory demonstration phase of the system.

The seven-pound, battery-powered sensor, along with its notebook computer, is light enough to be hand-carried into the field where in minutes it can test for and identify 18 different chemical signatures related to nuclear, chemical, and biological weapons of mass destruction.

"The technique is adaptable for a variety of applications ranging from environmental monitoring and remediation to industrial process control and from personal health and safety to law enforcement and drug detection," says Richard Cernosek, Sandia project lead. In the photo, Sandia researchers Graham Yelton (left) and Cernosek (right) watch Alan Staton conduct a laboratory test of the detection system. ❖

Oak Ridge Lab expanding superconductivity research

The Department of Energy's Oak Ridge National Laboratory (ORNL) is entering a new phase of high-temperature superconductivity research with its accelerated coated conductor initiative. Under the initiative, researchers will be better able to create and continuously process superconducting tapes.

"We will be able to expand on our capability to conduct research with U.S. companies...," said Bob Hawsey, ORNL's superconductivity program director. "...they will be able to scale up their research to include reel-to-reel tape handling at our expanded ORNL center."

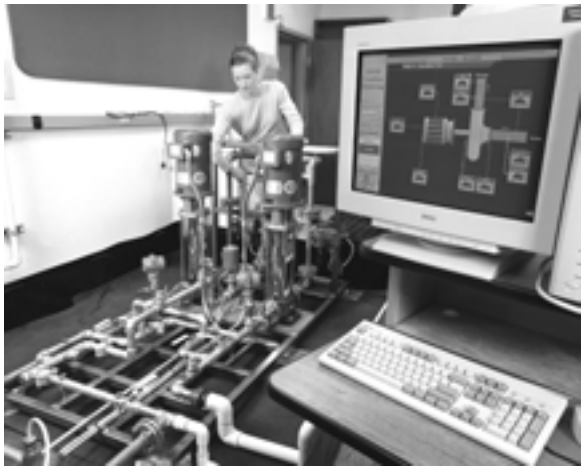
At right, ORNL researcher Eliot Specht checks equipment in the superconductivity center. One type of equipment is in the area of reel-to-reel deposition where a superconductor coating can be placed on the substrate or "template" for the wire. The other equipment can be used to study the tape structure and quality and its performance in a continuous manner without chopping the wire into pieces. ❖

Intelligent system could outsmart nuclear plant failures

An intelligent system developed at the Department of Energy's Pacific Northwest National Laboratory (PNNL) could outsmart problems that lead to expensive emergency shutdowns at nuclear power plants worldwide. The Self-Diagnostic Monitoring System, or SDMS, uses a wireless architecture of software, smart sensors, and data processing to diagnose and predict conditions that may lead to shutdowns.

When fully developed, the system will diagnose and predict potential problems at both the component and systems levels. PNNL engineers built a pilot system (at right) to mimic a nuclear power plant's essential service water loop, in which they will artificially create biofouling, vibration, and other conditions.

The work is supported by the Nuclear Energy Research Initiative (NERI) sponsored by the Department's Office of Nuclear Energy, Science and Technology. The goal of NERI is to address and help overcome the principal technical and scientific issues affecting the future use of nuclear energy in the United States. ❖



Secretary recognizes independent oversight efforts

Secretary of Energy Bill Richardson recently presented a Gold Award for Exemplary Performance to the Office of Independent Oversight and Performance Assurance (OA) and its "extended family" from the Office of the Secretary, the Office of Environment, Safety and Health, the Office of Human Resources Management, and support contractors. The Secretary recognized management and staff for their excellent work in establishing a first-class organization as well as their accomplishments. Since its establishment in May 1999, the office has completed almost 60 assessments of safeguards and security, cyber security, and emergency management programs across the Department of Energy complex, including investigations of the nuclear weapons laboratories.

"We appreciate the Secretary's recognition of our efforts and this compliment to our service as the Department's watchdogs for security and emergency management," said Glenn Podonsky, OA Director. At right, receiving the award from Secretary Richardson are Mike Kilpatrick, Deputy Director, OA, (center) and Glenn Podonsky. ❖

Research DIGEST

An invasion of tree-destroying Asian Long-horned Beetles could be slowed or perhaps stopped with a larvae detection system being developed by researchers at the Department of Energy's **Oak Ridge National Laboratory** (ORNL). In the United States, the beetle's favorite targets are maple, horse chestnut, black locust, elm, birch, willow, and poplar trees. Already, they have infested thousands of trees in New York and Chicago, Ill. The only effective means to eliminate the beetle is to cut infested trees and destroy them by chipping or burning. Visual inspection of crates and trees is difficult and ineffective, so researcher Cyrus Smith of ORNL's Instrumentation and Controls Division and his colleagues are developing a hand-held instrument that distinguishes the vibrations made by the Asian Long-horned Beetle larvae from other insects as they feed on the wood and that identifies the larvae at different stages of maturity. (Frank Juan, 865-576-0885)

The first ultraviolet (UV) solid-state microcavity laser has been demonstrated in prototype by scientists at the Department of Energy's **Sandia National Laboratories** working with colleagues at Brown University. UV VCSELS (vertical-cavity surface-emitting lasers) coated with phosphors can generate the white light most prized for indoor lighting—illumination currently provided by gas-filled fluorescent tubes widely used in offices, schools, factories, and by incandescent bulbs used in most homes. Such solid-state emitters could last five to ten times longer than fluorescent tubes; be far hardier; and, grouped several hundred to a postage-sized chip, would have aesthetic value. Instead of one single tube, the chips could be arranged in configuration on ceiling, wall or furniture. The invention is currently in the laboratory stage. A paper describing the advance is in the Oct. 12, 2000, journal *Electronics Letters*. (Neal Singer, 505-845-7078)

Scientists searching human genome data for genes and the DNA sequences that control them will soon have a valuable new resource courtesy of the Japanese delicacy know as Fugu—the puffer fish. An international consortium, led by the Department of Energy's (DOE) Joint Genome Institute (JGI), is collaborating to sequence the Fugu genome. The Fugu genome contains essentially the same genes and regulatory sequences as the human genome, but it carries them in approximately 400 million bases as compared to the three billion bases that make up human DNA. With less "junk DNA" to sort through, finding genes and controlling sequences in the Fugu genome should be a much easier task. The information can then help identify these same elements in the human genome. The JGI is a consortium of DOE's **Lawrence Berkeley**, **Lawrence Livermore**, and **Los Alamos National Laboratories**. (Lynn Yarris, 510-486-5375) ❖

Plan addresses distributed energy resources

The Department of Energy has released its *Strategic Plan for Distributed Energy Resources*, outlining a national effort to develop clean, reliable and affordable distributed energy technologies over the next 20 years. "This strategic plan provides—for the first time—a framework for integrating the Department's many programs related to distributed energy resources, and for laying the groundwork for a system that will allow industrial, commercial, and residential customers to choose from a diverse array of distributed energy resource products and services," said Under Secretary of Energy Ernest Moniz.

"Distributed energy resources" is a new name for a new era in energy supply, storage, delivery, and use. It means developing a cleaner, more reliable, and affordable U.S. energy resource portfolio to reduce pollution and greenhouse gas emissions, enhance electric grid operations, boost local economic development, and increase energy and economic efficiency.

In the short term, the strategic plan focuses on developing "next generation" distributed energy technologies and addressing the institutional and regulatory barriers that interfere with the development of distributed energy resources. Six areas are outlined in the plan:

- research, development and demonstration (RD&D) investments in distributed natural gas technologies, including advanced turbines and microturbines, fuel cell systems, and natural gas engines;
- RD&D in enabling technologies, including combustion systems, fuel processing, hydrogen energy systems, and materials and manufacturing;
- RD&D in energy generation and delivery systems and architecture for distributed energy resources, including district energy, energy storage, grid interconnection, and superconducting materials;
- activities with RD&D in renewable energy development such as concentrating solar power, geothermal, photovoltaic systems, and wind energy;
- technology transfer partnerships with industry, state agencies, universities, and national laboratories; and
- systems integration, implementation, and outreach activities aimed at such areas as infrastructure, institutional, and regulatory needs; environmental permitting and siting; and tax provisions and utility restructuring.

The strategic plan is available on the Internet at **http://www.eren.doe.gov/der**. ❖

Mobile power system design saves money

Environmental monitoring of the 1,375 square miles of desert at the Department of Energy's (DOE) Nevada Test Site can be a challenge, especially with its limited access to electrical power. For several years, the DOE Nevada Operations Office has used stand-alone photovoltaic solar power to provide the constant electrical input required by monitoring systems at about 12 remote locations on the site.

"The typical system supplied a constant 700 watts, 24 hours a day and served in the field very well," said Nevada Operations project engineer Earl Hodge. "Still, there were two areas where we thought improvements could be made: the initial cost (about $60,000) and the expense and difficulty of moving the systems from one site to another."

A team led by Hodge and composed of DOE technical staff, Bechtel Nevada, and the Corporation for Solar Technology and Renewable Resources (CSTRR)—a DOE grant-funded nonprofit corporation—joined with the Energy Research Center of the University of Nevada Las Vegas (UNLV) to explore the possibilities.

UNLV researchers developed a smaller, more efficient motor and air pump, reducing the power requirements by approximately one half. The team then incorporated a new state-of-the-art microprocessor-based charge controller and data logging unit to manage diverse real-world seasonal conditions. CSTRR contracted with Direct Power and Water of Albuquerque, N.M., to build a prototype unit.

Earl Hodge, Nevada Operations Office, and the redesigned mobile photovoltaic system.

Initial tests of the combined redesign confirmed a 50 percent savings in both size and cost of the system. An unexpected benefit has been enhanced operational flexibility. Two persons with a pickup truck can deliver the system, unload, set up, and start the power production and monitoring process.

"This is a highly reliable and environmentally friendly system that can be used anywhere remote off-grid power is needed," said Hodge. "We hope it may be useful to other DOE offices and Federal agencies with remote operations." ❖

NEW Publications

Energy Information Administration reports: ***The Changing Structure of the Electric Power Industry 2000: An Update*** (DOE/EIA-0562-00) reports that electricity competition has gained momentum and that as of July 2000, 24 states and the District of Columbia had approved the introduction of retail competition for electricity. ***Emissions of Greenhouse Gases in the United States 1999*** (DOE/EIA-0573-99) indicates that estimated emissions of carbon dioxide in the United States and its territories, which account for over 80 percent of total U.S. greenhouse gas emissions, increased by 1.3 percent in 1999. Available from the U.S. Government Printing Office, 202-512-1800; the National Energy Information Center, EI-30, Room 1E-238 Forrestal Building, USDOE, Washington, DC 20585; 202-586-8800; and at **http://www.eia.doe.gov**.

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ORISE Catalog of Education and Training Programs describes the programs that the Oak Ridge Institute for Science and Education manages for the Department of Energy and other Federal agencies. Programs are divided into four major sections—faculty, postgraduate, graduate and undergraduate, and other courses and training. Each program listing includes a brief description, eligibility requirements, disciplines, locations, application deadlines, benefits, and contact information. Available at **http://www.orau.gov/orise/educ.htm**.

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Office of Inspector General reports: ***Federal Energy Regulatory Commission's Dam Safety Program*** (DOE/IG-0486); ***The Restructure of Security Services by the Oak Ridge Operations Office*** (DOE/IG-0487); ***Hanford Site Radiation and Hazardous Waste Training*** (WR-B-00-06); ***Vehicle Use at Lawrence Livermore National Laboratory*** (WR-B-00-07). Available from the U.S. Department of Energy, IG Reports Request Line, 202-586-2744; or at **http://www.ig.doe.gov/**. ❖

Radiological team works 'behind the scenes'

While many of us watched the recent Olympic Games in Australia in the safety of our homes, a Department of Energy (DOE) team was on the job in Sydney providing behind-the-scenes support to emergency response and security forces. The Department deployed its Nuclear Radiological Advisory Team (NRAT) to support the Australian Joint Incident Response Unit for the security of the Olympics and the follow-on Paralympics, which ended Oct. 29, 2000. The team is under the jurisdiction of the Department's Office of Security and Emergency Operations.

NRAT regularly is assigned to events like the Olympics. The eight-member team is composed of hand-picked and specially trained scientists and radiological experts who provide limited scientific and technical capability on the scene. Based at the Remote Sensing Laboratory's operations facility at Andrews Air Force Base, Md., NRAT primarily serves in an advisory role to host country officials and as a direct line to DOE Headquarters' Emergency Operations Center.

The team has the capability to conduct nuclear and radiological searches and on-scene identification of radiological sources to help determine a course of action for rendering a terrorist nuclear or radiological device safe. Strong, secure communications include the capability to send and receive digital imagery. NRAT is trained and equipped to operate under all environmental extremes ranging from arctic to tropical environments.

NRAT is led by a Senior Energy Official (SEO) who has the authority to take whatever action he deems appropriate on-scene and to call in additional reinforcements from the Department's other emergency response assets. The team acts as DOE's forward command and control for incident resolution and keeps the Secretary of Energy and other top officials apprised of the crisis and all actions being taken to resolve it.

While deployed, team members are typically divided into two units of four, rotating their 24-hour-a-day alert responsibility into 12-hour shifts. "It gets pretty old after a week or so," says Jay Cook, the SEO in Sydney. "You arrive early to get your turnover briefing and leave late 13 hours later after providing an updated turnover briefing to the guys you relieved who are now back to relieve you." Cook, an SEO veteran of numerous worldwide NRAT deployments, credits his team with "never complaining, no matter what the living conditions or work demands. It's all about silent professionalism." ❖

On-line property sales test a success

The Department of Energy (DOE) is exploring the use of the Internet as a channel for the sale of surplus property at its facilities. During the past year, work has been ongoing with the Department's Savannah River Site and the Idaho National Environmental and Engineering Laboratory (INEEL) to test the viability of using commercial and private Internet sites.

INEEL is developing an in-house Internet application with enhanced transmission security features that may prove advantageous in the Department's sales activities. Savannah River recently completed a six-month pilot program using two commercially available Internet sites. Preliminary data indicates the Savannah River experiment with commercial sites was successful and presents advantages over the traditional on-site auctions conducted at DOE field and area offices.

For example, the sales of many types of property generated better returns with less administrative effort. Historically, DOE has recovered approximately 3 to 5 percent returns for similar items. During the pilot, the typical return was in the 10 to 12 percent range of the original acquisition value, with many items sold at a recovery value of 25 to 30 percent. In one bulk metal sale of nickel pellets, the Department realized a return of about 170 percent. In addition to the increased sales proceeds, the Internet allowed access to a worldwide market to find buyers for property, including property that due to a lack of local demand would have been shipped to a landfill.

Savannah River reported early in the pilot that questions regarding sales were received from locations far and wide. All equipment and materials released for sale were carefully screened by the Department. Strict procedures were required to address export control and nonproliferation. Shipping and handling costs limited the interest from foreign purchasers; but in the United States, equipment and materials were sold to purchasers in most of the lower 48 states, with many purchases made by West Coast and Midwest sources. More than 90 percent of the items listed were sold via the Internet sites; the remaining items subsequently were sold in local site auctions.

Given the success of the pilot, the Department encourages all its field offices and sites to examine the potential benefits of the Internet as a property sales mechanism. While Savannah River had a positive experience with Internet sales sites, other offices should conduct market research and set local selection criteria. For additional information or questions, contact Stephen J. Michelsen, Office of Contract and Resource Management, MA-53, 202-586-1368. ❖

Education NOTES

The Department of Energy has established the **Glenn T. Seaborg Fellowship in Nuclear History** that will focus on the atomic age, from its birth to the present. The fellowship provides an opportunity for college students to spend a year in Washington, D.C., helping the Department write the definitive history of this era. Dr. Seaborg, who died last year, was a Manhattan Project pioneer, Nobel Laureate, Chairman of the Atomic Energy Commission, presidential advisor, University of California-Berkeley chancellor, and respected science educator. The one-academic-year Seaborg Fellowship is open to all recent American History majors currently enrolled in a doctorate program in the United States. Fellows will receive a stipend and reimbursement for round-trip transportation between Washington, D.C., and their home or campus. For more information, contact Skip Gosling, Chief Historian, MA-712, USDOE, Washington, DC 20585, or e-mail at skip.gosling@hq.doe.gov.

College students from across the country recently gathered at the Department of Energy's **Argonne National Laboratory** (ANL) to present their research findings to their peers and scientific staff at the 11th annual Argonne Symposium for Undergraduates in Science, Engineering and Mathematics. The conference was divided into several concurrent sessions devoted to particular research disciplines, including analytical chemistry, astrophysics and geophysics, biochemistry, computer science, condensed matter physics, engineering, environmental science, genetics, inorganic and organic chemistry, mathematics, molecular biology, nuclear and atomic physics, and spectroscopy. More than 150 students made oral presentations, giving Argonne researchers an opportunity to identify potential summer interns. The conference was sponsored by ANL, the Illinois Alliance for Minority Participation, Argonne's Women in Science and Technology, and Sigma Xi.

A five-year $35 million grant has been provided by the Department of Energy (DOE) to Florida International University (FIU) to **research, develop and demonstrate innovative environmental cleanup technologies**. The university will provide an additional $13 million for the research. FIU, in partnership with the Department, created the Hemispheric Center for Environmental Technology in 1995. That year the center received its first grant of $22 million from DOE and, since that time, has completed over 80 research and development projects. DOE facilities at Oak Ridge, Tenn., Richland, Wash., and the Savannah River Site in South Carolina have benefitted from research projects developed by the center. Under the new grant, the university will continue to act as a test bed for environmental technology while serving as a primary science center for minority students. Of the more than 32,000 degree seeking students enrolled, 52 percent are Hispanic and 14 percent are African American. ❖

Students meet Einstein in Oak Ridge

More than 2,000 kindergarten through 12th grade students from middle and east Tennessee recently visited Oak Ridge Associated Universities (ORAU) to learn more about Albert Einstein through a one-man show performed by Bill Landry, producer of the "Heartland Series" on WBIR-TV Channel 10. Landry brought Einstein to life on stage through a theatrical presentation about his life, philosophies, and work.

The 50-minute play highlighted some of the major scientific works and ideas of Einstein through a biographical character study. Dressed in full makeup and costume, and speaking with a German accent, Landry shared some of the events of the physicist's life. Following the presentation, Landry removed the wig and makeup to answer questions and talk about Einstein with the audience.

Landry, who has a background in theater, wrote the show in the late 1970s while he was an employee at the American Museum of Science and Energy in Oak Ridge. Since its first performance in 1977, the play has been presented in 38 states and two provinces of Canada. When Einstein was named "Person of the Century" by *Time* magazine this year, ORAU decided to bring back the show for students, the public, and employees. ❖

Andersonville Elementary School fourth-grade students (l-r) Bonnie Morton, Silas Fritts, Kayla DeMarcus, Cody Demarcus, and Steven Dority talk with Bill Landry as Albert Einstein.

People IN ENERGY

Patricia Worthington recently was appointed Director, Office of Environment, Safety and Health (ES&H) Evaluations, Office of Oversight, within the Office of Environment, Safety and Health at Department of Energy (DOE) Headquarters. The Office of ES&H Evaluations conducts independent safety management evaluations and assessments of Department and contractor operations. Most recently, Worthington has been Acting Director of the office and the DOE team leader on the Department's Gaseous Diffusion Plant investigations for the past 15 months.

J. V. Martinez, currently Science Advisor and formerly a program manager in the Department of Energy's Office of Science, has received an Outstanding Service Award from the Division of Atomic, Molecular and Optical Physics of the American Physical Society. He was recognized for his 25 years of dedicated service to the advancement of United States atomic science. In 1994, Martinez was named the Hispanic Federal Employee of the Year by the Office of Personnel Management.

Kathryn McCarthy, Manager of the Nuclear Engineering Design and Research Department at the Department of Energy's Idaho National Engineering and Environmental Laboratory, is the recipient of the 2000 American Nuclear Society (ANS) Women's Achievement Award. The award recognizes outstanding personal dedication and technical achievement by a woman in the fields of nuclear engineering, research, and education. McCarthy is the current Chair of the ANS Fusion Energy Division.

Robert C. Wunderlich has been named Argonne Group Manager at the Department of Energy's Chicago Operations Office. He is the senior DOE Chicago official with day-to-day responsibility for the Department's Argonne National Laboratory and the line manager directly responsible for the performance of the laboratory. Wunderlich has been with the Chicago Operations Office since 1981 and has served in a number of key positions, including Acting Group Manager of the Argonne and Fermi Groups.

Creighton Wirick, an oceanographer at the Department of Energy's Brookhaven National Laboratory (BNL), has been named chair of the laboratory's Environmental Sciences (ES) Department. Most recently, Wirick served as acting chair of BNL's Department of Applied Science and interim chair of the ES Department. Wirick joined BNL in 1976 and held various management positions, including head of the Oceanographic and Atmospheric Sciences Division from 1993 to 1997.

Secretary of Energy Bill Richardson has named **Marvin E. Gunn, Jr.** to be the new Manager of the Department of Energy's Chicago Operations Office following the retirement of current Manager **Robert L. San Martin** on Dec. 16. Gunn has been Deputy Manager of Chicago Operations since April 1999. Previously, Gunn was Director, Office of Management and Operations in the Department's Office of Energy Efficiency and Renewable Energy (EE). From 1992 to 1994, he served as Director, Office of Energy Management in EE's Office of Utility Technologies.

Richard Kendall has been named the first Chief Information Officer at the Department of Energy's Los Alamos National Laboratory (LANL). In his new position, Kendall will develop, promote, and help direct an integrated vision for information management across the laboratory. Most recently, Kendall was program manager for technical cyber security in LANL's former Computing, Information and Communications Division.

Nuclear engineer **James Allen Bucholz** of the Computational Physics and Engineering Division at the Department of Energy's Oak Ridge National Laboratory has been named to the Bulgarian Nuclear Society. His nomination marks the first time a non-Bulgarian scientist or engineer has been elected to membership in the society. Bucholz currently is on assignment to the Spallation Neutron Source project.

Thomas Zacharia has been appointed Deputy Associate Laboratory Director for High Performance Computing at the Department of Energy's Oak Ridge National Laboratory (ORNL). He will lead the development and implementation of the laboratory's high performance computing strategy. Zacharia will continue to serve as Director of ORNL's Computer Science and Mathematics Division and will direct the Center for Computational Sciences.

Michael Williams, Head of the Engineering and Technical Infrastructure Department at the Department of Energy's Princeton Plasma Physics Laboratory (PPPL), is the recipient of the year 2000 Outstanding Achievement Award from the American Nuclear Society's Fusion Energy Division. The award recognizes Williams' longstanding research and leadership in the Poloidal Divertor Experiment, Tokamak Fusion Test Reactor, and National Spherical Torus Experiment projects at PPPL. ❖

Milestones

YEARS OF SERVICE

December 2000

Headquarters

Chief Financial Officer - Kim M. Davis (25 years). **EIA** - Thomas Swann, Jr. (30), Audrey E. J. Corley (25). **Energy Efficiency** - Sadie F. Johnson (35), Noel K. Cole (25), Sigmund Gronich (25), John R. Sullivan (25). **Envir. Management** - Louise I. Turner (30), Sally A. Robison (25). **FERC** - Janet M. Dubbert (30), David I. Harfeld (30), Eddie Lee (30).

Fossil Energy - Xavier J. Puslowski (40), Phoebe Hamill (30), Debra J. Littleton (25). **General Counsel** - Patricia D. Graham (25), William R. Moser (25). **Inspector General** - Marlene L. Major (30). **Management & Administration** - James J. Cavanagh (30), Edward T. Lovett (30), Brenda L. Mackall (25).

NNSA - John S. Boyd (30), Fred E. Witmer (30), Linda S. Atwell (25), Gordon Szeto (25). **Science** - Judy A. Ranels (35), Brenda G. Harrison (30), F. Sutton Kay (30). **Security & Emergency Operations** - Johnny W. Giffin (30), Peter C. Stang (30), Michael W. Boblitt (25), Thomas M. Rowlett (25).

Field

Albany Research Center - Jeffrey S. Hansen (30). **Albuquerque/NNSA** - H. Alan Wells (35), Frederick Haynie, Jr. (30), Jose A. Mora (30), Gordon D. Besson (25), Ernest Moquino (25). **Chicago** - Edwina B. Washington (25). **Golden** - Jerry L. Zimmer (30). **Idaho** - Sandra M. Hart (35). **Naval Petroleum Reserves CO, UT, WY** - Mary J. Boulanger (25).

NETL - Jerry J. Foster (30), Shelby E. Rogers (25), Karl T. Schroeder (25), Karl E. Stoeckle (25), Bruce R. Utz (25). **Nevada** - Charles G. Morgan (25). **Nevada/NNSA** - Douglas M. Hafen (30), Loretta J. Helling (25). **Oak Ridge** - Shirley E. Kates (40), Jerry M. Conley (25). **Oakland/NNSA** - Virginia T. Reams (25). **Ohio** - G. Glenn Griffiths (30).

Richland - Ellen J. Olsen (25). **Savannah River** - Marrine F. O'Conner (30). **Savannah River/NNSA** - Wayne D. Leslie (30). **Schenectady Naval Reactors/NNSA** - Michael D. Nolan (30). **Southwestern Power** - Jake W. Gage (25). **Western Area Power** - Twyla M. Folk (30), Dennis F. Tipton (30), Arlene J. Amundson (25), William A. Beenau (25).

Bonneville Power - Arthur A. Baribeault (35), Gary A. Parks (35), Raymond Scott (35), Barry W. Boman (30), Lauri J. Croff (30), Robert G. Goodpaster (30), Gary W. Grove (30), Leroy A. Klatt (30), Daniel D. Orme (30), Margaret A. Rhine (30), Robert H. Wanke (30), Barbara I. Wilwers (30), David R. Askren (25), Gary M. Kunz (25), Randy M. Maitland (25), Michael D. Matthews (25), Leonard W. Morales (25), Wade N. Myers (25), M. Victoria Nuci (25), Martin W. Oakland (25).

RETIREMENTS

October 2000

Headquarters

Security & Emergency Operations - Mortimer I. Kay (22 years).

Field

Savannah River - Jere B. Dumas (20). **Western Area Power** - Richard E. Rogers (12), D. David Vietti (20).

November 2000

Headquarters

Inspector General - James D. Swank (17).

Field

Albuquerque - Justine L. Wolters (15). **Savannah River** - Beverly J. Torres (12). ❖

NEW ON THE Internet

New looks, new sites

The Internet site of the Department of Energy's (DOE) Western Area Power Administration is sporting a new look, organization, navigation, and content, designed to help customers and stakeholders find specific information quickly. Mousing over the main links on the left side of the main page brings up a list of specific topics meaningful to customers, including regional offices, events, power marketing information, offices and functions, industry links, a news desk and media center, and energy services. The address is **http://www.wapa.gov**.

The Department's Golden Field Office has a new Web site and address, **http://www.golden.doe.gov**. Updates to the site include easier navigation, detailed information on solicitations, and updated project information. Other categories include news and events and a reading room.

The Office of the Assistant Secretary for International Affairs (IA) has established a Web site, **http://www.osti.gov/international**. The new site features international speeches by the Secretary of Energy, the Assistant Secretary, and other IA officials; a searchable international agreements database which provides signed PDF copies of all DOE international bilateral and multilateral agreements; an international agreements handbook, and links to various international Web sites, both internal and external to the Department.

Check out these sites and DOE's home page at **http://www.energy.gov**. ❖

December 2000

AROUND DOE

Grants support advanced nuclear medicine research

The first nine research grants have been awarded under the Advanced Nuclear Medicine Initiative (ANMI) sponsored by the Department of Energy's Office of Nuclear Energy, Science, and Technology (NE). The grants represent the first steps in reestablishing the Department's support of basic research advances in nuclear medicine. The ANMI targets developments and supports research that has the potential for widespread impact in medical treatments, such as new uses of radioactive isotopes for the diagnosis and treatment of life-threatening diseases.

More than 60 grant proposals were received in response to a national solicitation. The proposals were peer-reviewed under the auspices of the Department's Nuclear Energy Research Advisory Committee. The first award winners include universities, medical research centers, national laboratories, and industry. Additional information on the award winners is available at **http://www.nuclear.gov/isotope/anmi2000awards.html**.

The ANMI also provides support for a focused program to develop graduate and post-graduate academic curricula in nuclear medicine. Applications for the Nuclear Medicine Education Awards are being solicited from U.S. colleges and universities with nuclear medicine programs or options.

Oil research program gains elevated status

The Department of Energy's (DOE) primary field office for petroleum technology in Tulsa, Okla., will become part of the DOE national laboratory complex as an arm of the National Energy Technology Laboratory (NETL) located in Morgantown, W.Va, and Pittsburgh, Pa. NETL is the Department's primary fossil fuel research center.

"This action creates a much tighter linkage between our petroleum technology program and our laboratory research structure," said Secretary of Energy Bill Richardson. "It will strengthen collaboration in several important research areas."

Previously, the National Petroleum Technology Office operated as a separate part of the Department's Office of Fossil Energy. The 26-employee office will remain in Tulsa and will continue as the lead site for coordinating DOE's oil technology program.

Department's work/life program earns award

On Nov. 14, 2000, the Department of Energy's (DOE) comprehensive and innovative quality of work/life program received a Director's Award for Outstanding Work/Life Programs from the Office of Personnel Management (OPM). The Department, one of five Federal agencies to receive the award this year, was distinguished as being on the leading edge in implementing programs for the Federal Government.

Improving the quality of employee work lives—safety, health, civility, and feeling of well-being in the workplace—has been one of Secretary of Energy Bill Richardson's top priorities. Several Department efforts were recognized by OPM, including: a Workplace Improvement Network (WIN) to gather, cultivate, research, and recommend new initiatives that can help make DOE a better place to work; appointment of a Senior Policy Advisor for Workforce Issues; nine child care centers nationwide which are fully accredited or in the process of obtaining accreditation; expansion of telework through a newly launched "DOE-Flex" program; high employee participation in alternative work schedules and leave sharing programs; and health and wellness programs that include physical fitness facilities, medical staffs, industrial hygienists, seminars, and immunizations. ❖

United States
Department of Energy (PA-40)
Washington, DC 20585

Official Business