



1998 National Science Bowl® winners

DOE technologies to help fight crime

Federal fleets 'charged' over electric vehicles

National Ignition Facility—one year later

U.S. Department of Energy



Published monthly in Washington, D.C., by the Department of Energy, Office of Public Affairs, for the information of Department employees and affiliates and available to others by paid subscription.

The Secretary of Energy has determined that this periodical is necessary in the transaction of public business as required by law. Use of funds for printing has been approved by the director of the Office of Management and Budget. The content is reprintable without permission and pictures are available for media reproduction upon request.

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SUBSCRIPTION price for 12 issues is \$22 (\$27.50 foreign). Send check, or provide VISA or Mastercard number and expiration date, to: Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954. Credit-card orders can be called in 8 a.m.-4 p.m. ET, 202-512-1800, or faxed to 202-512-2250. Cite "DOE This Month (EINS)."

Circulation Office: 202-586-2050

News Office:
DOE This Month
Office of Public Affairs - PA 40
U.S. Department of Energy
Washington, DC 20585

Internet Address:
doe.thismonth@hq.doe.gov

HQ cc:mail:
THISMONTH,DOE

Deadline for submissions: 15th of every month for the following month.

DOE PA-0021-6
Vol. 21, No. 6

**DOE This Month is printed
on paper containing at least
50 percent recycled materials.**

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On May 19, 1998, Vice President Gore announced that two Department of Energy Memoranda of Understanding will match technologies from DOE national laboratories with the law enforcement experience of the Departments of Justice and Treasury in a new crime-fighting partnership.



One year ago, excavation began on the National Ignition Facility at Lawrence Livermore National Laboratory. Where there once was an empty site, construction on the target chamber and NIF building is steadily progressing.

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Oak Ridge National Laboratory researchers have developed a microsensor with the ability to sniff out mercury, natural gas, carbon monoxide, and other chemicals.



On our cover

Fending off some very tough competitors, Valley High School, West Des Moines, Iowa, emerged victorious on May 4 as the best of 48 regional teams in the Department of Energy's 1998 National Science Bowl®. Valley High faced North Hollywood High School of North Hollywood, California, in the final round, which was co-moderated by Secretary of Energy Federico Peña and Bill Nye, "The Science Guy" on PBS. In the photo are (l-r) Secretary Peña, Margaret Christiansen (team coach); students Chris Rotzien, Mikhail Seregine, Paco Jain, Drew Volker, and Adrienne Clark; and Bill Nye. Valley High School was sponsored in the competition by Ames Laboratory.

For more on the National Science Bowl®, see page 3.

DOE technologies to help fight crime

Gore announces new law enforcement initiative

At a White House event on May 19, Vice President Al Gore announced a new crime-fighting partnership that will match the science and technology expertise of the Department of Energy with the law enforcement experience of the Department of Justice (DOJ) and Treasury.

"If we're going to fight the criminals of the future, we need to develop the crime-fighting tools of the future," Vice President Gore said. "We must put the best possible tools in the hands of our law enforcement community so they can identify, apprehend, and prosecute criminals—swiftly and effectively."

Secretary of Energy Federico Peña guided the Vice President, Treasury Secretary Robert Rubin, and Attorney General Janet Reno through a demonstration of some of

the Department's technologies, including:

- Oak Ridge National Laboratory's image analysis and video enhancement technologies used to isolate the gun flare in a convenience store shooting videotape which resulted in a murder conviction.
- Pacific Northwest National Laboratory's TEAM Leader, a hand-held geographic positioning device that can record video, store voice notes, and help agents visually reconstruct crime scenes.

The Vice President announced that two Department of Energy Memoranda of Understanding were signed with the FBI and with the Bureau of Alcohol, Tobacco, and

Firearms (ATF). Under them, DOE will establish formal working relationships to facilitate the transfer of technology and technical expertise to law enforcement. A Statement of Principles has been prepared among DOE, DOJ, and Treasury to coordinate and facilitate the technical advancement of crime fighting in this country.

In support of the Statement of Principles, DOE has selected for further collaborative development (with the advice of the FBI and ATF) representative technologies from seven DOE national laboratories. These technologies are core DOE competencies that will provide future forensic and crime scene investigation tools as well as examples of actual DOE laboratory technology or expertise being used by law enforcement. ♦

Valley High wins 1998 National Science Bowl®

After a time of one time constant, the current in an RC circuit will be equal to what percent of its initial value? An organism has a diploid chromosome number of 10. A cell, from this organism, in metaphase I of meiosis has how many chromosomes? What is the hexadecimal difference of 3A minus 2B?

These are just some of the questions that Valley High School of West Des Moines, Iowa, had to master in order to become the Department of Energy's 1998 National Science Bowl® champion. Fending off some very tough competitors, Valley High emerged victorious as the best of the 48 regional championship teams, beating North Hollywood High School of North Hollywood California, in the final round by a score of 172-112. As the grand prize winner of the event, Valley High's team will receive an all-expense paid trip to Lindau, Germany, to meet with Nobel Laureates in chemistry this summer. Valley High was sponsored in the competition by Ames Laboratory.

Secretary of Energy Federico Peña co-moderated the final round of the competition on May 4 along with Bill Nye, "The Science Guy" on PBS. Secretary Peña congratulated the winners, noting, "These young people are truly our nation's best and brightest. As we enter the 21st century, I am encouraged to know that the future of our nation lies in the hands of young people like these—young people who recognize that excellence in science and mathematics is the key to unlocking the doors of the next millennium." Secretary Peña also thanked the 5,000 volunteers throughout the Department of Energy complex for making the Science Bowl possible.

The second place team of North Hollywood High School, sponsored by the Los Angeles Department of Water and Power, will spend a week at the Idaho National Engineering and Environmental Laboratory working with DOE scientists and engineers on bioprocessing, laser optics and robotics.

Third place team Montgomery

Blair High School of Silver Spring, Maryland, sponsored by Department of Energy Headquarters, will collaborate with researchers on environmental and renewable energy technologies at the Department's facilities in Colorado, including the National Renewable Energy Laboratory and Rocky Flats Office.

Fourth place winner Fort Collins High School, Colorado, sponsored by Western Area Power Administration, will travel to the Savannah River Site and participate in an archaeological dig, a study of coastal ecosystems, and visits to environmental cleanup sites. ♦

Richardson nominated

On June 18, 1998, President Clinton announced his intent to nominate U.S. Ambassador to the United Nations Bill Richardson as the ninth Secretary of Energy, to succeed Secretary Federico Peña, who is leaving office June 30. The nomination is subject to Senate confirmation. ♦

Secretary Peña proposes relief for nuclear utility contract holders

In a recent meeting with nuclear utility representatives who have contracts for the Department of Energy to begin acceptance of spent nuclear fuel by January 1998, Secretary of Energy Federico Peña proposed a settlement that would modify the utilities' waste disposal contracts with the Department in order to provide an estimated \$2.8 to \$5 billion in financial relief to the utilities to cover spent fuel storage costs.

The Secretary stated, "Our pro-

posal responds directly to the costs that will be incurred by utilities from the Department's inability to accept nuclear waste. At the same time, it maintains strong incentives for the Department to make progress on a long-term disposal solution at Yucca Mountain. The utilities can postpone paying a portion of the fees owed to the Nuclear Waste Fund and keep the earnings on the deferred fees. For most utilities, the earnings should be enough to compensate for reason-

able delay costs. This proposal can be implemented quickly; it is simple to administer, and it avoids litigation to determine costs resulting from the delay."

Secretary Peña noted that the proposed settlement would have no adverse impact on either the adequacy of the current disposal fee or the Department's ability to proceed expeditiously with the investigation of the proposed Yucca Mountain repository. ♦

A bright idea—no federal subsidy

Energy efficient, compact fluorescent light bulbs are now available at low rates to multi-family building owners, universities, public housing authorities and other large purchasers—thanks to agreements signed by the Department of Energy with three companies.

The umbrella contracts, brokered by the Department but not involving subsidies, create a volume purchase arrangement to supply compact fluorescent light bulbs (CFLs) that are between 5 and 5.75 inches long and bright

enough to replace 60, 75 and 100 watt incandescent light bulbs. A typical CFL uses one-fourth the energy that an incandescent bulb of equivalent brightness does and lasts eight to 10 times longer.

These CFLs are ideal for exterior and common area lighting in private and public multi-family housing due to the bulbs' efficiency and long life. Most residential light fixtures are designed for screw-in incandescent light bulbs that cannot accommodate longer CFLs. This is one reason why CFLs have been slow to enter the

marketplace. Manufacturers have brought sizes of compact fluorescent light bulbs down, but most of the available products have not been short enough to fit many typical fixtures until now—a bright idea from the Department of Energy.

The Department's Pacific Northwest National Laboratory is administering the program. For more information, visit the program Web site at <http://www.pnl.gov/cfl> or contact Marc LaFrance at DOE, phone: 202-586-8423, e-mail: Marc.LaFrance@ee.doe.gov. ♦

'Feds' get charged up over electric vehicles

The Ford Ranger Electric Vehicle soon will be showing up in more federal fleets because of an innovative new initiative by the Department of Energy and the Potomac Electric Power Company. Under a first-of-its-kind electric vehicle "loaner/lease" plan for federal fleets in the Washington, D.C. area, fleet managers can add an electric Ford Ranger pickup to their fleets at no cost for a one-month evaluation period, after which they will be able to lease vehicles at very competitive rates from PEPCO.

"President Clinton believes that the federal government should lead by example in conserving energy. This initiative's goal is to motivate other federal agencies to incorporate electric-powered vehicles into their fleets," said Secretary of Energy Federico Peña. "We hope to increase from 189 electric-powered vehicles in the federal fleet to 500 over the next 18 months."

PEPCO is administering the program, managing infrastructure installations, and funding up to \$2,000 for the infrastructure necessary to re-

charge each electric Ranger a fleet decides to lease. The Department is leasing the five electric Rangers that will be used in the loaner program and providing up to \$6,669 to any agency that leases a Ranger EV for three years from PEPCO.

Federal agencies, including the Departments of Defense, Interior, Agriculture, Justice, and Transportation, the Environmental Protection Agency, and the General Services Administration, have all indicated interest in the 30-day loan evaluation period. ♦

Academy training specialist receives VP's Hammer Award

Robbie Smith, Senior Training Program Specialist for the DOE Safeguards and Security Central Training Academy in Albuquerque, New Mexico, recently received the Vice President's Hammer Award in the "Partnership/Intergovernmental" category. Smith was recognized in Washington, D.C., at the third annual Government Learning Technology Symposium (GLTS) for her participation on the symposium planning team.

"I'm proud of being a member of the symposium planning team effort," said Smith. "It was a privilege to work with this talented cross-section of professionals from various government agencies, and to be part of something as dynamic and rewarding as the Government Learning Technology Symposium."

"When I presented the first Hammer Award four years ago," the Vice President said, "I had a strong conviction that federal employees were

ready, willing, and able to create a government that works better and costs less."

One thousand Hammer Awards later, reinvention has cut the federal work force by 331,000, eliminated 16,000 pages of obsolete regulations, and saved the taxpayers over \$137 billion.

The GLTS Planning Team received the award in appreciation of its contribution to building a government that "works better and costs less." The team was comprised of representatives from a cross-section of federal agencies, and Lisa Nelson, founder of the symposium in 1996. Team members were recognized for the vision and effort involved in putting together the previous GLTS meetings, as well as this one.

Other members of the planning team were Al Stolpe, Department of Veterans Affairs; Anna Doroshaw, Environmental Protection Agency;

Sara Schick and David Lamp, U.S. Department of Agriculture Graduate School; and Henry "Hank" Payne, Federal Aviation Administration. ♦



The Government Learning Technology Symposium planning team members (l-r): Al Stolpe, Department of Veterans Affairs; Anna Doroshaw, Environmental Protection Agency; Lisa Nelson, EPA; Sara Schick, USDA Graduate School (hair just showing); Robbie Smith, DOE Central Training Academy; David Lamp, USDA Graduate School; and Hank Payne, Federal Aviation Administration.

Breakthrough in alkane activation could lead to clean-burning fuels

The elusive goal of harnessing the vast potential of one of the earth's most plentiful materials is another step closer to realization. Using ultrafast spectroscopic techniques that provide "stop-action" images within a trillionth of a second, scientists at the Department's Lawrence Berkeley National Laboratory have obtained the first detailed picture of an alkane-activation reaction at room temperature.

Alkanes are compounds of carbon and hydrogen atoms held together by single bonds. The simplest and most abundant of these is methane, the primary constituent of natural gas. Chemists have long

theorized about using alkanes as environmentally benign feedstock for clean-burning fuels and a host of petrochemicals, including plastics, solvents, synthetic fibers, and pharmaceutical drugs. The problem has been that the bonds between an alkane's carbon and hydrogen atoms are strong enough to render alkanes generally unreactive.

Although a process was developed to break the bonds, the reaction takes place within 230 nanoseconds (billionths of a second) and, until now, was done in liquefied noble gas solvents under extremely low temperatures.

A new collaboration between

Robert Bergman, a chemist in Berkeley Lab's Chemical Sciences Division, and Charles Harris and Heinz Frei of the Lab's Physical Biosciences Division made it possible for the scientists to directly establish the time-scale for alkane bond activation in a room-temperature solution.

"We now have a detailed picture of the activation reaction," Bergman says. "Structures of all the intermediates involved have been identified and assigned, and energy barriers for each reaction step, from solvation to formation of the final alkyl hydride product, have been estimated." ♦

Women in the workforce



Members of the Women's Review Executive Committee are (seated, l-r) P.A. Moore, Stanford Linear Accelerator Center; Karen Wieda, Pacific Northwest National Laboratory; (standing, l-r) Wendee Brunish, Los Alamos National Laboratory; Kim Magrini, National Renewable Energy Laboratory; and Eileen Vergino, Lawrence Livermore National Laboratory. Not pictured is Mille Perry, Federal Energy Technology Center.

What will the future workforce look like? Certainly, it will include more women in nontraditional jobs. To help facilitate that process, a group of women met for the annual Review of Laboratory Programs for Women in Washington, D.C. in April.

After a summary of past accomplishments and a look at recent statistical and comparative data, the group had intensive discussions with a goal to identify a top priority for emphasis the coming year. The agreed-on priority was that women should have access to and opportunity for positions of responsibility in mission-critical roles. This priority, with supporting data and suggestions for implementation, will be presented to Laboratory Directors at an upcoming meeting by the Women's Review Chair, Wendee Brunish (LANL).

During a reception for the members of the Review, Martha Krebs, Director of Energy Research, recognized three laboratories for their contributions to improving the status of women. Argonne was recognized for its technical women's symposium; Pacific Northwest, for its education programs; and Lawrence Livermore, for its children's center. ❖

Hanford Safety Expo 1998 a huge success

Over 12,000 people attended a highly successful Hanford Safety Exposition at the Trade Recreation Agricultural Center in Pasco, Washington, May 13-14, 1998. The conference, which was organized and operated by employees at the Richland Operations Office and Hanford contractors, attracted the public, families of employees, subcontractors, and vendors.

More than 200 booths were set up for visits by conference attendees. The booths displayed the various programs at Hanford and some of their associated safety equipment. Students and others looked in awe as employees donned Level A "space suits" in a demonstration of how they use protective clothing when they are doing contamination work. Boy Scouts and other groups of students talked to workers about how they did their jobs.

The Hanford Safety Expo '98 was exceptionally well received by Tri-Citians. In fact, over 1,000 local students were brought to the event by their respective schools for a field trip. "We were very pleased to see students with this level of enthusiasm about our conference. We believe they walked away with a better understanding of the complex cleanup mission and why it is essential that employees have the proper equipment, training, and procedures to do the job safely," Hanford employees agreed. ❖



Melvin Lakes of Waste Management Hanford watches as his children Shaniae, Shanice, and Shakeen learn to operate a model crane at the Hanford Safety Expo 1998.

United States and Russia join forces to increase Russian nuclear material security

The United States and the Russian Ministry of Atomic Energy (MINATOM) recently announced the completion of upgrades at four Russian facilities that will help to secure and control nuclear materials, reducing the worldwide risk of nuclear proliferation. Under Secretary Ernest Moniz and Director of Nonproliferation and National Security Rose Gottemoeller joined MINATOM officials at commissioning ceremonies for the new security systems at four sites in Russia.

The Department of Energy is installing advanced U.S. material protection technology to increase security at these sensitive sites in conjunction with the Russian Federation. Physical protection devices, such as motion detectors, cameras, and vibration sensors have been placed in rooms containing weapons-grade material. Vibration sensors, placed on doors and walls, are necessary to prevent a determined thief from breaking into a room using a drill or heavy-duty saw. Doors and windows

were hardened to delay intruders, and sensors and cameras were added to thwart theft or diversion of nuclear materials.

"We look forward to building upon this important success in future cooperation between our governments to ensure that all weapons-usable material in both of our countries remains out of reach of terrorists and rogue states," said Under Secretary Ernest Moniz. "These upgrades significantly reduce the risk of unauthorized use, theft, or diversion." ♦

BNL opens new cutting-edge chemistry facility to catch reactions in action

A new "chemical camera" that can catch a glimpse of chemical reactions lasting only a few trillionths of a second is now up and running at the Department's Brookhaven National Laboratory. Called LEAF, for Laser-Electron Accelerator Facility, the apparatus will give chemists from Brookhaven and collaborating institutions a unique view of the reactions that govern processes in the human body, the environment and

industry. The \$2 million facility is the first of its kind in the world.

LEAF will allow scientists to follow extremely fast chemical reactions by using the laser flash to "freeze frame" the reaction in progress. A sequence of frames can be assembled to construct a "movie" of the reaction. The high intensity of the beam will also make it possible to study reactions involving supercritical liquid water and carbon

dioxide that may one day be used as nonpolluting alternatives to chemical solvents.

"Just as we all use cameras to capture the events of our lives, chemists will use this facility as a camera to capture the reactions that make our lives possible," said Brookhaven Director John Marburger. "It will let them add more snapshots to the album of human knowledge." ♦

DOE wins White House environmental award

Every year, the White House presents "Closing the Circle Awards" to federal agencies and individuals who have demonstrated outstanding achievement in federal acquisition, recycling, and waste and pollution prevention. This year 315 nominations were received from the federal community. Only 18 winners were selected, and the Department of Energy was among them.

Arnold M. Edelman of the Department's Office of Energy Re-

search received an individual award for his initiative to develop a Materials Exchange Web Site that facilitates the complex-wide reuse of unneeded items. While many Departmental facilities have their own materials exchange systems, the web site is the first of its kind to link 13 sites into one easily accessible clearinghouse for items that are not covered under the excess property system.

In less than a year, the web site already contains over 4,000 search-

able items. Examples of recent exchanges include information on recycling mercury, reusing activated carbon, reuse of waste containers and boxes, and opportunities to reuse or recycle film and styrofoam.

The Richland Operations Office also received an Honorable Mention for its efforts to "Close the Circle" by promoting the purchase of environmentally sound products at the Pacific Northwest National Laboratory. ♦

National Ignition Facility—one year later



In late June 1997, excavation began on the National Ignition Facility (NIF) located at Lawrence Livermore National Laboratory. As the photo shows, the view today is very different from the empty site of a year ago, with the circular construction of the target chamber and the beginnings of the actual NIF building. The \$1.2 billion facility, housing a 192-beam laser, will eventually rise to seven stories at its highest point and stretch the length of two football fields. Conventional construction should be completed by July 2001.

Upon completion, NIF will be a multipurpose research facility with defense and civilian applications such as fusion-energy research and astrophysics. The facility will play a vital role in DOE's science-based stockpile stewardship and management program to maintain the safety and reliability of the U.S. nuclear weapons stockpile through sophisticated laboratory experiments and advanced computations and without underground testing. ❖

Argonne simplifies cleaning industrial waste streams

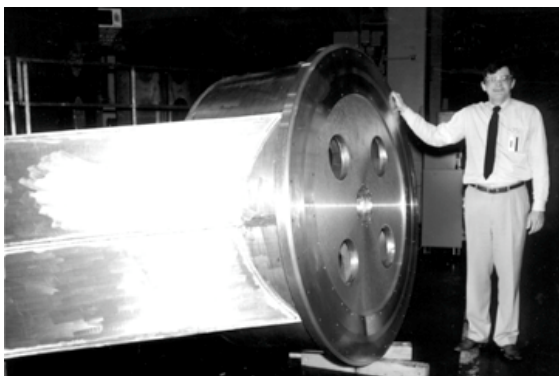


A simplified approach to removing metals and radionuclides from waste or process streams has been developed by Argonne National Laboratory chemist Luis Nuñez.

Small magnetic particles, coated with a chemical solvent containing an extractant that selectively attracts specific metals, are poured into a process or waste solution, where the coating extracts the metals. Magnets then are used to remove the magnetic particles and accompanying metals from the solution. The metals can be stripped from the particles, allowing both the metals and the particles to be recovered, while the process solution can be recycled to the plant.

This is an in-tank or near-tank process that is simple, compact, low cost, and low maintenance. It could be applied in recovery, recycling, and waste minimization activities in industries such as environmental and mining/metallurgy. In a demonstration by Nuñez at left, the specially treated particles are attracted to the magnet, allowing waste metals to be recovered and recycled. Argonne has patented the new technology. ❖

Oak Ridge assists university with telescope construction



The Oak Ridge Centers for Manufacturing Technology at the Oak Ridge Y-12 Plant have completed production of primary structural parts, including the base, fork, and azimuth and altitude drive wheels, for a new two-meter, automated spectroscopic telescope that is expected to make Tennessee State University in Nashville a leader in automatic robotic telescopes.

The Oak Ridge facility was selected by Tennessee State because of its ability to accommodate large-size components and precision manufacturing capabilities. The telescope base is over 7 feet wide and weighs 3,300 pounds; the fork, nearly 7 feet tall, 11 feet wide, and 3,100 pounds. At left, Dr. Joel Eaton of Tennessee State stands beside a portion of the telescope built at Oak Ridge. ❖

'Ranger' device stars in Iraqi palace inspections

A Los Alamos National Laboratory device that can sniff out and identify radioactive materials was used to inspect Iraqi presidential palaces by a United Nations Special Commission team seeking evidence of nuclear, chemical, and biological weapons. "Ranger," shown at right in use by an inspector at one of the palaces, is a hand-held, real-time radiation sensor that helps locate radioactive materials and identify the isotopic source of the radiation.

During the inspection, the Ranger device discovered a slightly radioactive thorium alloy in helicopter rotors, but no suspicious materials. Officials familiar with the Special Commission work said inspectors were enthusiastic about Ranger's usefulness in clarifying otherwise uncertain detections of radioactive materials.

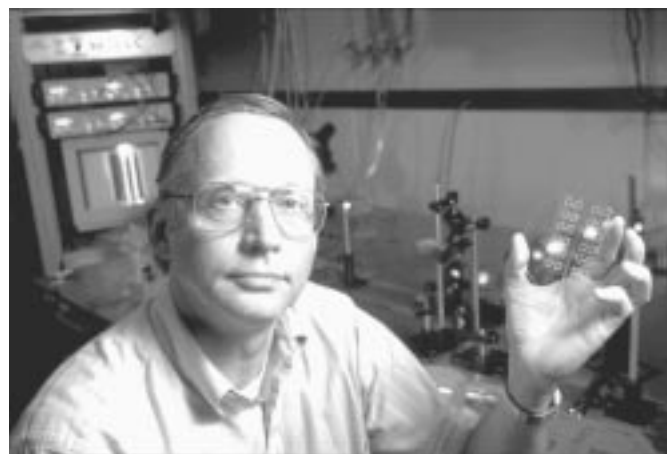
Los Alamos has transferred the technology to the private sector, and the IAEA in Vienna, Austria has already ordered one commercial unit. ♦



New DNA sequencing technique gives quick analysis

Richard Mathies of Lawrence Berkeley National Laboratory's Physical Biosciences Division, and his colleagues, with support from the Department's Office of Energy Research, have developed a new DNA sequencing device that can analyze 96 samples in under eight minutes—50 to 100 times faster than conventional methods.

The "microplate analyzer," held by Mathies at right, is a glass wafer smaller than a tea cup's saucer with microchannels or grooves engraved in the glass. Over this layer another glass wafer is tightly sealed. Holes in the lid allow DNA samples to be introduced for analysis and viewing with a laser-microscope detection system. Mathies hopes soon to substitute a miniaturized electrochemical detector built right into the microplate to create an entire "lab on a chip." ♦



Soft-sided containers tested for Idaho cleanup

Soft-sided containers, being loaded with construction debris in the photo, are undergoing testing to replace rigid containers for many disposal activities at the Idaho National Engineering and Environmental Laboratory. The containers were used successfully earlier this year to handle and dispose of approximately 1,984 cubic feet (238,100 pounds) of low-level radiologically contaminated soil and debris from the laboratory's Idaho Nuclear Technology and Engineering Center. This was the first use of the containers in the DOE complex.

One container has the volume capacity of 260 cubic feet and can hold up to 20,000 pounds. Because soft-sided containers are safe and use space more efficiently, future settling and sinking problems in disposal areas could be reduced. ♦



Research DIGEST

Brookhaven National Laboratory researchers are using x-rays and ultraviolet light at the laboratory's National Synchrotron Light Source to examine the effects of sulfur on the structural, electronic, and chemical properties of metal and oxide catalysts. These catalysts are important to oil refining and reducing harmful emissions in motor vehicles, but minute quantities of sulfur can deactivate them. The researchers hope to use the knowledge gained from the experiments to design catalysts that are sulfur-resistant and/or remove sulfur from crude oil. This could result in significant savings for industry and help the environment, as sulfur oxide pollutants during the burning of fuel would be reduced or eliminated. (Diane Greenberg, 516-344-2345)

Scientists at **Lawrence Berkeley National Laboratory** successfully marked selected Internet traffic for priority service over unmarked, lower-priority traffic in a recent cross-country demonstration. This is a key milestone in the development of a broad set of capabilities called "Differentiated Services" which are required for the Internet to be able to give different levels of service on demand to network customers. Two video streams were sent over the Internet on an intentionally congested path from Berkeley to **Argonne National Laboratory**. The priority-marked stream moved at eight frames per second, while the standard version transmitted just one frame per second. Achieving this improved level of service is essential to the work of the Department as reliable connections allow researchers to make effective use of the scientific facilities at various sites across the country. (Jon Bashor, 510-486-5849)

With a little help from science, carbon dioxide could soon provide consumers with a new, environmentally friendly option for cleaning clothes. As part of a recent agree-



'Nose on a chip'

Oak Ridge National Laboratory researchers have developed a microsensor with the ability to sniff out mercury, natural gas, carbon monoxide, and other chemicals. The "nose on a chip" consists of an array of tiny sensors on one integrated circuit and electronics on another. By selectively coating the microcantilever arrays with appropriate chemicals, the chip can be customized to detect virtually any chemical or biological species. Developers say a single chip could detect thousands of chemicals. Major advantages include its low cost, instant results, and capability to be customized with little or no modification. (Frank Juan, 423-576-0885)

ment between **Pacific Northwest National Laboratory** and MiCELL Technologies, Inc., a North Carolina firm providing unique cleaning and coating solutions, the laboratory will provide MiCELL with research, development and engineering support focused on carbon dioxide chemistry and processes. The technology, when combined with detergents developed by MiCELL, boosts the cleaning power of compressed carbon dioxide, which has a density like water, a viscosity similar to gas, and the ability to reach places water and chemical solvents can't. MiCELL expects to use the technology in a new garment cleaning system that replaces conventional, solvent-based cleaning with processes that use no water and employ no toxic substances. (Tim Ledbetter, 509-375-5953)

New solar cells that provide as much as 50 percent more power for satellites are orbiting Earth, helping flash back telephone and television signals. These cells are based on the two-junction, gallium indium phosphide on gallium arsenide designs developed at the **National Renewable Energy Laboratory**. TECSTAR Inc., a leading solar-cell manufacturer in City of Industry, Calif., is the first company to license two U.S. patents covering this particular technology from NREL for space use. More power from solar cells means that satellites can carry more communications links, experiments, or other projects. With capacity as much as doubled, each satellite and its services can be more economical and offer a greater return to satellite customers. (Patrick Summers, 303-275-4050) ♦

Medical isotopes reduce health care costs

For many years, the Department of Energy has developed and produced medical isotopes that have important applications in the diagnosis and treatment of disease. Now, recent studies have shown that these isotopes are not only life-savers, they are cost-savers, too.

A recent study found that isotopes produced by the Department save hundreds of millions of dollars in medical costs by helping to reduce the number of admissions to hospitals and by shortening hospital stays. For example, an estimated 40 percent of patients admitted to hospital coronary care units in the United States eventually are found

not, in fact, to have had a heart attack. In the past, such patients were admitted to the hospital for several days of observation before this diagnosis could be made.

Now, by using nuclear diagnostic procedures that employ radioisotopes such as thallium-201, physicians can determine whether a patient with chest pain is actually having a heart attack. As a result, physicians can more accurately evaluate a patient's condition and need for hospitalization. Thallium-201 is produced from thallium-203, an isotope supplied by the Department's Oak Ridge National Laboratory.

Medical isotopes also help in the early diagnosis and treatment of diseases such as arthritis, heart disease and cancer. When a disease is diagnosed and treated at an early stage, the odds increase that the treatment will be successful and less costly.

The Office of Nuclear Energy, Science and Technology manages the isotope program, which uses reactors, accelerators and material stockpiles at five national laboratories to obtain the necessary isotopes. For additional information, please visit the Isotope Program's Internet site at <http://www.ne.doe.gov>. ❖

INEEL's disappearing act

In a unique facility at the Department's Idaho National Engineering and Environmental Laboratory, things often vanish right before your very eyes.

The visible can be made invisible to understand how gas flows through a turbine, how a chemical or biological agent might move through a building, how air cools a truck engine compartment or how nuclear fuel elements can be safely handled and stored.

In the INEEL's Matched-Index-of-

Refraction flow system, the largest such facility in the world, scientists and engineers can accurately determine flows of fluid within and around complex objects by using transparent models. A transparent model of the item being investigated is immersed in a transparent fluid. The temperature of the fluid is then adjusted until the speed of light through the model and the fluid is the same and light rays are not bent.

One way scientists are putting

the facility to work is through a cooperative program between the State of Idaho and the Department of Energy to develop fundamental knowledge of the mass transfer and flow phenomena important in drying and passivation of spent nuclear fuel.

But complex flows in many experiments might benefit from use of the facility, such as engine compartments, electronic assemblies, combined internal and external automotive configurations or chemical food processing equipment. ❖

NEW Publications

Office of the Inspector General reports: ***Audit Report, The U.S. Department of Energy's Solar Enterprise Zone*** (DOE/IG-0420); ***Audit Report, Personal Property at the Oak Ridge Operations Office and the Office of Scientific and Technical Information*** (ER-B-98-07); ***Report on Inspection Regarding Small Business Contracting Statistics Reporting and Presentation*** (INS-O-98-02). Available

from the U.S. Department of Energy, Office of Scientific and Technical Information, P.O. Box 62, Oak Ridge, TN 37831; or at <http://www.hr.doe.gov/ig/mainhome.htm>.

From the Energy Information Administration: ***Commercial Nuclear Fuel from U.S. and Russian Surplus Defense Inventories: Materials, Policies, and Market Effects*** (DOE/EIA-0619) reports that nuclear materials de-

clared as surplus to defense programs could supply about 20 percent of the world's commercial nuclear fuel by 2001, compared to less than 5 percent in 1997. Available from the U.S. Government Printing Office, 202-512-1800; EIA's National Energy Information Center (NEIC), Room 1F-048, Forrestal Building, Washington, DC 20585, 202-586-8800; and at <http://www.eia.doe.gov>. ❖

Education NOTES

Since the beginning of this year, the Department's **Ohio Field Office**, located at the Mound Facility in Miamisburg, Ohio, has distributed approximately \$250,000 worth of excess computers, technical equipment, and furniture to schools, local nonprofit organizations, and local government. Sinclair Community College in Dayton received a fire suppression system to be used as an instructional model at the college's new Fire Science School. Many area elementary, middle, and high schools have received computers, file cabinets, and office furniture. Mound, a former nuclear weapons facility, is scheduled for cleanup and the eventual transition to the Miamisburg community for reuse.

With the help of **Sandia National Laboratories** in Albuquerque, 12 New Mexico teachers and their students have exchanged e-mails, goodwill packages, and occasional video conference greetings with school children in Snezhinsk, Russia, throughout the past school

year. Located in the southern Urals, 800 miles southeast of Moscow, Snezhinsk is formerly one of the Soviet Union's secret "closed" cities, home of the nuclear weapons design laboratory known as Chelyabinsk-70. Sandia coordinated the program with the help of volunteer efforts of laboratory employees who travel regularly to and from Snezhinsk to work with scientists.

After years of development and testing in high schools across the United States, a new wall chart that graphically illustrates fundamental principles, recent discoveries, and future directions in nuclear science is available to teachers. The central image of the four-color chart, a project spearheaded by scientists in the **Lawrence Berkeley National Laboratory Nuclear Science Division**, illustrates the basic structure of the nucleus—protons, neutrons, and their quark constituents—bound by the strong interaction and surrounded by an electromagnetic field. A chart of the nuclides is in-

cluded. The wall chart and guide can be ordered from Science Kit, 777 East Park Drive, Tonawanda, New York 14150, phone 800-828-7777. To view the chart on Internet, the address is <http://pdg.lbl.gov/cpep.html>.

Two years ago, the first computer NetDay in California joined 20,000 volunteers, parents, and teachers in wiring thousands of California schools for Internet access. Since then, about 20 **Oakland Operations Office** volunteers have worked weekends in support of NetDay activities. Results of the volunteer effort include wiring 86 classrooms, two libraries, four computer labs, and 36 work stations; donating 300 used computers to California schools; and installing computer cable in three additional elementary schools. Volunteer Dennis Hong also provided technical support to the April 1998 White House interactive online conference connecting 700 of America's poorest schools to the Internet.



On May 9, Oakland Operations Office and Lawrence Livermore National Laboratory volunteers conducted the 9th Annual Math Challenge for Bay Area high schools. The Math Challenge consisted of a one-hour written test, a team problem, and a lecture demonstration on "Puzzles and Perceptions." The winning schools were presented with a plaque and the students on the winning teams each received \$75 book certificates redeemable at Bay Area bookstores. Pictured with the school plaques are students from Saratoga High School (first place), Albany High School (second), and Lincoln High School (third).



Diane Carroll, Head of the Science Education Program at Princeton Plasma Physics Laboratory, demonstrates to students the effects of magnetic fields on plasma in an uncoated fluorescent light bulb. More than 125 students from area schools in Princeton, New Jersey, participated in hands-on science demonstrations and toured an experimental fusion device during Pollution Prevention Awareness Day activities at the laboratory in April.

Clay Ogilvie honored by Idaho Governor

Clay Ogilvie, an emergency management program administrator with the Department of Energy Idaho Operations Office, recently received a letter of commendation from Idaho Governor Phil Batt for his help to Idaho citizens in the aftermath of the Snake River flooding in southeast Idaho last spring.

Ogilvie spent the weeks after the floods working with the Red Cross, Eastern Idaho Special Services Agency, the Salvation Army and

other nonprofit organizations to coordinate assistance for families—from providing heavy equipment to scheduling mental counseling. He worked 14-hour days for three weeks straight, then put in 20-25 hours a week for eight weeks.

"I was able to put in those many hours through the generosity of DOE Idaho and its commitment to support the local community in times of need," Ogilvie said. ♦



Holocaust Day remembers victims

On April 30, 1998, the Department of Energy Diversity Council commemorated one of the most significant events in the moral history of mankind—the Holocaust.

Secretary of Energy Federico Peña, speaking to an overflow crowd in the Forrestal Building auditorium, emphasized the importance of the day for remembering the victims of the Holocaust, but also for reminding employees of what can happen to civilized people when bigotry, hatred, and

indifference reign. The Secretary's message was echoed by others throughout the day, including Warren Clayman, Diversity Council Chairman and moderator for the event.

Keynote speaker Nesse Godin, a survivor of the Holocaust, moved the audience by sharing her experiences. The service also featured songs and cantorial selections by Gustav Goldberger, a Department employee and himself a survivor. P'nina Plofkin provided piano

accompaniment and Elgie Holstein, the Department's Chief of Staff, officiated at the lighting of memorial candles, each of which symbolized one million victims.

The day concluded with a film, "Auschwitz, If You Cried, You Died," which chronicles the journey of two Holocaust survivors as they revisit the Auschwitz Concentration Camp, and a presentation from Lynn Williams of the U.S. Holocaust Memorial Museum, who spoke about Holocaust education for the community. ♦

COMING Events

August

4-6 1st Federal Standards Workshop, "Standards Management—A World of Change and Opportunities," Washington, D.C. Hosted by DOE and co-sponsored with the National Institute of Standards and Technology, Environmental Protection Agency, National Aeronautics and Space Administration, Food and Drug Administration, and the RMS Partnership. For conference information, contact Amy Bush, Oak Ridge National Labora-

tory, 423-576-2395, az3@ornl.gov, or Lori Lane, ORNL, 423-574-7886, lj8@ornl.gov. Or visit the Technical Standards Program Internet site at <http://apollo.osti.gov/html/techstds/techstds.html>.

October

4-8 BioEnergy '98, "Expanding Bioenergy Partnerships," Madison, Wisconsin; a biennial conference and trade show that brings together partners and stakeholders in the biomass

energy industry and presents up-to-date information on technology. Co-sponsored by DOE's Office of Energy Efficiency and Renewable Energy, the Wisconsin Energy Bureau, National BioEnergy Industries Association, and others and hosted by the Great Lakes Regional Biomass Energy Program. For conference information, contact Fred Kuzel, Great Lakes, 312-407-0177, or visit the Internet site at <http://www.cglg.org/bioenergy98>. ♦

People IN ENERGY

Lynn A. Boatner, a section head in the Solid State Division, Oak Ridge National Laboratory, recently was elected a Corresponding Member of the Mexican Academy of Sciences. Boatner will collaborate with Mexican scientists for the further development of science in Mexico. The academy, established in 1959, is a not-for-profit, non-government association whose objective is to promote science research in Mexico, as well as to support communication and interaction between scientists.



Secretary of Energy Federico Peña has named **Gregory P. Rudy** as Manager of the Savannah River Operations Office, with responsibility for operations at the Savannah River Site. Rudy was appointed Deputy Manager at Savannah River in January 1997 and served as Acting Manager since October 1997. He began his DOE career in 1977 on the staff of Admiral Hyman Rickover, Director of the Naval Nuclear Propulsion Program, and has held a number of positions since, including Acting Director of the Office of Fissile Materials Disposition.

John C. Nemeth has been named Vice President for Partnership Development at Oak Ridge Associated Universities, which manages and operates the Oak Ridge Institute for Science and Education for the Department. Nemeth will be in charge of promoting collaborative partnerships with universities, federal laboratories, and industry to advance science, education, and technology.



Ronald F. Green has been named President and Chief Executive Officer of Fluor Daniel Hanford, Inc. He succeeds **Hank Hatch** who resigned to accept a position on the East Coast. Green, a long-time Fluor employee, has held numerous management-level positions during his 16-year tenure with the company. Most recently, he was President of Fluor Daniel Power Operating Company.

Ladonna Foster (top), a contract specialist in the Procurement Services Division, Idaho Operations Office, and **Jane Welch**, manager of Research and Engineering Laboratories for Lockheed Martin Idaho Technologies Company, have received the 1998 Idaho National Engineering and Environmental Laboratory Woman of the Year Award. The award is presented annually to an outstanding woman for significant contribution to the workplace and the community. This is the first year two women were selected for the award.



Secretary of Energy Federico Peña has appointed **Martha A. Madden** as Special Assistant to the Director, Office of Civilian Radioactive Waste Management. Madden will be liaison with key external technical organizations and provide policy analysis for the Department. Previously, she was Clinical Associate Professor at Tulane University Medical Center in the School of Public Health and Tropical Medicine, Department of Environmental Sciences.

Omesh Chopra, a metallurgist in the Energy Technology Division, Argonne National Laboratory, has been named a Senior Scientist at the laboratory. During his career at Argonne, Chopra has conducted research on structural materials used in different energy production systems, including nuclear reactors. His current research focuses on steels that are used in piping and pressure vessels of light-water reactors.



Douglas Balcomb, a senior engineer at the National Renewable Energy Laboratory, is the recipient of the 1998 Lifetime Achievement Award from the Passive and Low-Energy Architecture (PLEA) network. He was recognized for over 20 years of

contribution to literature in the field of passive solar, low-energy building design. Balcomb is the principal developer of the Energy-10 computer software package, which makes it easier for architects and engineers to design and build energy efficient residential and commercial buildings.

Don Correll, a long-time manager in Lawrence Livermore National Laboratory's Laser Program, has been appointed director of the laboratory's Science and Technology Education Program. In his new position, Correll will lead Livermore's effort to provide research opportunities for students and teachers, develop new curriculum in areas central to the laboratory's mission, expand the use of Internet, and increase science literacy through educational outreach.

Dana K. Krupa, a senior staff engineer in the Office of Weapons Surety, Office of Defense Programs, graduated in June from the Naval War College in Newport, Rhode Island, earning a master's degree in National Security and Strategic Studies. Krupa was selected as the Department's representative at the College of Naval Warfare for the 1997-1998 academic year, following a competitive nomination and selection process for the Department's biennial slot.



Brian J. Boyle has been named Associate Director of Strategic Planning at Pacific Northwest National Laboratory. He will be responsible for expanding the laboratory's participation in natural resource management issues in the Northwest. Boyle was Commissioner of Public Lands for the State of Washington from 1981 to 1993.

Robert Mesmer, section head of Oak Ridge National Laboratory's Chemical and Analytical Sciences Division, has been named a Fellow of the American Association for the Advancement of Science, in recognition of his contribution to science, temperature chemistry, and thermodynamics of aqueous electrolyte solutions.

Brookhaven National Laboratory Senior Chemist **Charles Springer** has been named a Fellow of the International Society for Magnetic Resonance in Medicine, in recognition of his scientific work in the field and service to the Society. ♦

Milestones

YEARS OF SERVICE

June 1998

Headquarters

Chief Financial Officer - Barry C. Uhlig (30 years), Doreen V. Danner (25), Deborah S. Pegnato (25). **Congressional/Intergovernmental** - Philip Mandel (30). **Defense Programs** - Sandra M. Gangawere (30), Michael P. Nightingale (25). **EIA** - Linda L. Cook (35), Noel C. Balthasar (30), George D. Butler (30), Stephen F. Durbin (30). **Energy Efficiency/Renewable** - Mattie K. Hill (35), Marvin E. Gunn, Jr. (25), Victor P. Petrolati (25), William L. Siegel (25).

Energy Research - Sue J. Davis (25), Debra G. Frame (25), Cathy A. Hanlin (25), Margaret V. Marrow (25), Albert L. Opdenaker III (25), Brenda L. Smith (25), Chalmers Wilson III (25). **Envir. Management** - Larry G. Blalock (30), Linda D. Everhart (30), Michael H. Kleinrock (30), Joel L. Kristal (30), Virgil W. Lowery III (30), James A. Turi (30), Kristine Morris (25), Linda K. Pate (25), Gale Turi (25).

Envir., Safety & Health - Susan R. Whitmore (30), Eugenia L. Boyle (25), Joseph E. Fitzgerald, Jr. (25), Harry J. Pettengill (25). **FERC** - John R. Paquin (30), Takeshi Yamashita (30), Thomas V. Bahumian (25), Earl S. Douglas (25), Brian A. Holmes (25), Carlton L. Jackson (25), Robert M. Lippert (25), Jonathan D. Ogur (25), Maxine E. Tapscott (25). **Fossil Energy** - Jean L. Lerch (35), Randolph Pennington (30), John M. Panek (25), Gail W. Stern (25).

General Counsel - Paul W. Lewis (30), David R. Hughes (25), Jo Ann Williams (25). **Human Resources** - Donald P. Frizzell (35), Bonita S. Agee (30), Mary Jo Edwards (30), Stephen D. Mournighan (30), Patricia A. Cooper (25), Edward R. Simpson (25), Craig S. Wisooker (25). **Inspector General** - Gregory H. Friedman (30), Rodney J. McKim (30), Stanley R. Sulak (30), Freeman M. Young (25).

Materials Disposition - William J. Danker, Jr. (30), John D. Nulton (30). **National Security** - Brian M. Shea (35), Roger K. Heusser (30), Brenda K. Swiger (25), Deborah A. Wilson (25). **Nuclear Energy** - Peggy A. Coates (30), James J. Hannigan (30), Thomas N. Rodeheaver (30), Richard R. Furlong (25). **Policy/International** - Paul F. Carrier (25), Donald K. Richardson (25). **Radioactive Waste** - James H. Carlson (30).

Field

Albuquerque - Ralph Levine (30), Barbara E. Smith (30), Bruce G. Twining (30), J. Alan Yeazel (30), Stephen E. Bacon (25), Robert C. Braden, Jr. (25), Gloria J. Chavez (25), Anthony Greco (25), Charles S. Przybylek (25), Margaret S. White (25). **Chicago** - Eloise P. Fisher (35), Elaine M. Kocolowski (30), James R. Bieschke (25), Timothy J. Drawbridge (25), Ruth K. Salach (25), Martin W. Straka (25).

Federal ETC - Jerry G. Craig (30), Fred W. Harke (30), James A. Marsh (30), Douglas J. Deak (25), Debra A. Duncan (25), James J. Grabulis (25), Deborah A. Lowanse (25). **Idaho** - Katherine Blackburn (30), Peter J. Dirkmaat (30), Gary E. Grothaus (30). **Nevada** - Mitchell P. Kunich (30), Gary B. Snodgrass (25). **Oak Ridge** - Edward G. Cumesty (30), Jacqueline P. Hinton (25), J. Dale Jackson (25), John A. Meredith (25), Anthony L. Watkins (25).

Oakland - Sheryl J. Boutte (25). **Ohio** - Sandra E. Cramer (25). **Richland** - William A. White (35), Brenda J. Joy (25), Clifford B. Sieling (25). **Rocky Flats** - Gary N. Huffman (25), Willard K. Johnson (25). **Savannah River** - Alfred C. Garrett (30), Thomas F. Heenan (30), Phillip R. Washer (30), Charles E. Messick (25), John R. Pescosolido (25). **Schenectady Naval Reactors** - Ronald R. Uhrich (35).

Southwestern Power - Harold R. Lewis (35). **Western Area Power** - Roy E.

Watson (35), Daniel Weidinger (35), Robert G. Gray (30), Anthony J. Lucero (30), Dennis O. Coleman (25), Susan L. Dietrich (25), Rodney R. Freeman (25), Gary A. Loers (25), John A. Randall (25), Walter L. Schmuhl (25), Paul J. Stuart (25).

Bonneville Power - Paul L. Wilson (35), Craig A. Crichton (30), Annie A. Eissler (30), Robert G. Ellingwood (30), David L. Gilman (30), Lynn A. Kerzman (30), Jerry J. Liebrecht (30), David M. Mattson (30), Pamela C. Odam (30), William H. Ostrander (25), Ruth B. Bennett (25), Thomas E. Caine (25), Robert H. Dickhoff (25), Andrew E. Ekman (25), Patri A. Frahler (25), Lloyd A. Hill (25), Michael D. Kluth (25), Denis M. Sjoquist (25), Rick D. Stone (25), Roberta S. Vogt (25), John F. White, Jr. (25), Edward R. Woessner (25).

RETIREMENTS

April 1998

Headquarters

Energy Research - David L. Hendrie (17 years). **Radioactive Waste** - Eileen F. Hiler (22).

Field

Albuquerque - Aubrey A. Nichols (37). **Bonneville Power** - Richard H. Bunch (34), Steven P. Rice (29). **Federal ETC** - Kay Downey-Clarke (20). **Pittsburgh Naval Reactors** - Carol A. Davis (40). **Savannah River** - Vivian C. Nandras (20). **Western Area Power** - Phillip M. House (35), Neale D. Sikveland (28).

May 1998

Headquarters

Energy Efficiency/Renewable - Gladystine M. Smith (32), Linda J. Yacks (13). **FERC** - James C. New (30).

Field

Bonneville Power - Jack B. Hamil (32), Mary J. Lange (26), Ralph Y. Shuping, Jr. (33). **Western Area Power** - Floyd W. Greenway (30), Ronald J. Thornton (26).

Importance of nation's oil reserve reaffirmed

On May 14, 1998, Secretary of Energy Federico Peña released the United States Statement of Policy on the Strategic Petroleum Reserve. "This is an unequivocal statement that the Strategic Petroleum Reserve is a vital instrument of both energy security and foreign policy. It commits the Administration to work with Congress to ensure that inventory levels are maintained to provide the required degree of security," Secretary Peña said.

The policy statement was prepared following a notice issued by the Department of Energy last spring that asked for public comments on the need for, appropriate use of, and operation of the reserve. The response overwhelmingly endorsed a continuing federal commitment to a government-owned and controlled, centrally located emergency oil stockpile.

The statement emphasizes the U.S. is prepared to use the reserve if the nation is threatened by a severe oil interruption, reaffirms the U.S. commitment to work with International Energy Agency member nations in the event of an interruption, and calls for periodic reviews of the size of the reserve.

The complete policy statement can be found on the Office of Fossil Energy Web Site at http://www.fe.doe.gov/spr/spr_policy.html.

June 1998

AROUND DOE

Bids sought to dispose of surplus plutonium

The Department of Energy issued a Request for Proposals (RFP) on May 19, 1998, inviting the private sector to provide mixed oxide (MOX) fuel fabrication and reactor irradiation services. The proposed use of MOX fuel is part of the hybrid strategy announced in January 1997 to dispose of surplus weapons-usable plutonium by potentially burning MOX fuel in existing commercial light water reactors and/or immobilization with high-level waste.

The RFP contemplates a contract between the Department and an industry consortium with individual members responsible for construction and operation of the fuel fabrication facility and modification and operation of the reactors to use the fuel.

The deadline for proposals is August 14, 1998. The solicitation is available on the Chicago Operations Office Web Site at <http://www.ch.doe.gov>.

'Greening' of parks will save taxpayers money

An ambitious program to make several of the country's most popular national parks even greener will save taxpayers money while highlighting the benefits of low-energy, passive solar building designs. The Department's National Renewable Energy Laboratory is helping the National Park Service design and build energy-efficient visitor centers and other park facilities that will save millions of dollars in construction and maintenance costs.

Zion National Park in southwest Utah is the latest park that will feature a comprehensive use of sustainable technologies and practices. With the assistance of NREL and the Department's Exemplary Buildings Program, the park's new Visitor Transit Center will be a showcase for energy-efficient, climate sensitive building technology. The building will use at least 70 percent less energy and will save the Park Service about \$14,000 a year in energy costs. All designs and improvements are consistent with National Park Service guidelines.

The Exemplary Buildings Program also has assisted with the design and construction of passive solar employee housing at the Grand Canyon and Yosemite National Parks. Additional energy-smart, buildings are planned. ❖

**United States
Department of Energy (PA-40)
Washington, D.C. 20585**

Official Business