



*MINOS experiment
neutrino detector*

Department responds to major Northeast power outage

Rocky Flats free of nuclear weapons-usable material

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

HQ cc:mail:
THISMONTH,DOE

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

DOE PA-0026-9
Vol. 26, No. 9

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

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The 100-foot-long detector consists of 486 massive octagonal planes, lined up like the slices of a loaf of bread. Each plane consists of a sheet of steel about 25 feet high and one inch thick, covered on one side with a layer of scintillating plastic. The planes are numbered 0 through 485, with the last one visible in the photograph.

DOE's Office of Science has provided funding for the MINOS experiment. Other DOE facilities involved in the project are Argonne, Brookhaven, and Lawrence Livermore National Laboratories. (Fermilab photo)

For more on the MINOS project, see page 5. ♦

Huge power outage hits U.S., Canada; DOE responds; joint task force set up

At 4:10 p.m. EDT, Thursday, Aug. 14, 2003, a massive power outage swept through several states in the Northeast and Great Lakes regions of the United States and provinces of eastern Canada. The outage was called the largest power blackout in U.S. history. Emergency response teams at the Federal, state, and local levels went into action immediately to assess the situation and provide assistance. The calm response and resolve of citizens helped to keep a potentially dangerous situation under control.

Upon learning of the power outage, the Department of Energy (DOE) initiated its protocol for contingency situations. DOE worked with appropriate agencies, including the Federal Energy Regulatory Commission (FERC), the Department of Homeland Security, the Federal Emergency Management Agency, and the Nuclear Regulatory Commission (NRC), and with the North American Electric Reliability Council (NERC) to assess the situation. The effort was coordinated by Deputy Secretary of Energy Kyle McSlarrow.

At 11:42 p.m., Secretary of Energy Spencer Abraham signed an emergency order directing the New York and New England Independent System Operators to activate, if necessary, the Cross Sound Cable connecting Shoreham, Long Island, and New Haven, Conn., allowing power to flow between the two states. Activating the 330 megawatt cable would help stabilize voltage between the two states and enable electricity to flow quickly when the generation system became operable.

Secretary Abraham met with New York Governor George Pataki and New Jersey Governor James McGreevy on Aug. 16 in Albany, N.Y., to discuss the power outage. He traveled to Columbus, Ohio, on Aug. 20 to brief Ohio Governor Bob Taft and other state and local officials. Secretary Abraham also appeared on major network and cable news shows in the days following the

power outage to keep the American public informed.

DOE dispatched teams of investigators to the Northeast and Upper Midwest to begin on-site investigations into the cause of the power outage. "Using my authority under the Energy Supply and Environmental Coordination Act and the Federal Energy Administration Act, DOE will immediately begin collecting information and interviewing appropriate individuals—at the utilities, the North American Electric Reliability Council, and the Independent Systems Operators," Secretary Abraham said. "It is important that all parties preserve all relevant data so that it may be made available for review and inspection."

In addition to the DOE investigation, Secretary Abraham and Canadian Minister of Natural Resources Herb Dhaliwal met in Detroit, Mich., on Aug. 20, and finalized the work plan for a United States-Canada Joint Task Force established by President George W. Bush and Prime Minister Jean Chrétien on Aug. 15. The task force is charged with identifying the causes of the power outage and making recommendations on preventing future outages.

The task force is jointly chaired by Secretary Abraham and Minister Dhaliwal. The U.S. members include Secretary of Homeland Security Tom Ridge, FERC Chairman Pat Wood, and NRC Chairman Nils J. Diaz. The Canadian members are Deputy Prime Minister John Manley; Kenneth Vollman, Chairman, National Energy Board;



Secretary Abraham answers a reporter's question about the North American blackout at a press conference on Aug. 19, 2003, at Department of Energy Headquarters, Washington, D.C.

and Linda J. Keen, President and CEO, Canadian Nuclear Safety Commission. Managing the task force are James Glotfelty on behalf of DOE and Dr. Nawal Kamel on behalf of Natural Resources Canada.

Three working groups addressing electric system, security, and nuclear issues will support the task force. Working group members were appointed Aug. 27. In addition, NERC and affected Independent System Operators and utilities agreed that their investigations will supplement and contribute to the work of the task force.

"We owe our citizens an explanation of this incident and an assurance that steps will be taken to address the cause," Secretary Abraham said. "We are determined to finish this investigation in a timely manner, but we will not compromise quality for speed. Our investigation will be thorough and objective."

Additional information on the power outage and investigation is available on the main DOE home page, <http://www.energy.gov>, and under "Press Room." ❖

Nuclear material detection equipment to be installed at Europe's busiest seaport

The United States and The Netherlands have agreed to work together in the war on terrorism by installing large-scale and sophisticated equipment at the Port of Rotterdam, Europe's busiest seaport, to detect hidden shipments of nuclear and other radioactive materials. The cooperative agreement was signed in Rotterdam, The Netherlands, on Aug. 13, 2003, by Secretary of Energy Spencer Abraham and Dutch State Secretary of Finance Joop Wijn.

"Terrorist groups and rogue nations trying to smuggle components for nuclear weapons is a serious threat that must be addressed," Secretary Abraham said during a tour of the port's cargo facilities. "Installing sophisticated radiation-detection devices here, and at other key shipping centers around the world, is a major step forward in preventing the trafficking of these dangerous materials."

One of the world's largest seaports, Rotterdam handles more than 300 million metric tons of cargo annually. Thousands of commercial ships traveling between Asia, Europe, Africa, the Americas, and the Middle East pass

through Rotterdam's vast maze of docks and container facilities.

Rotterdam will be one of the first sites for the new security system in Europe. The specialized radiation-detection technology was developed by DOE laboratories as part of the overall U.S. nuclear security program to guard against proliferation of weapons materials. DOE plans to work with other international ports in the near future.

The U.S.-Netherlands agreement is under the Department of Energy's (DOE) Megaports Initiative, which is part of the U.S. "Second Line of Defense" program intended to identify and intercept illegal shipments of weapons materials. The effort complements the Department of Homeland Security's Container Security Initiative, in which Customs and Border Protection agents partner with countries operating major shipping ports to help safeguard the international supply chain. The United States, in its "First Line of Defense" operation, has been working with governments in other countries to locate and secure nuclear and radioactive materials.

"Ultimately, we hope that the Megaports Initiative will further our international nonproliferation and anti-terrorist efforts and provide officials with useful evidence for prosecution of terrorists and smugglers," Secretary Abraham said. "The United States is gratified to have a close partnership with The Netherlands in this important operation in the fight against terrorism."

At the March 2003 International Atomic Energy Agency conference on the security of radioactive sources, Secretary Abraham unveiled the Radiological Security Partnership, a three-prong approach to addressing the potential threats of radioactive sources. The first prong involves helping countries expand their efforts to track and secure inventories of high-risk radioactive sources. The second element focuses on international cooperation for practical advice and assistance in bringing these sources under control. The third prong expands the focus on major transit and shipping hubs. The radiation monitoring equipment at Rotterdam will play a key role in the effectiveness of this partnership. ❖

Italy to join international hydrogen partnership

Following an Aug. 5, 2003, meeting in Rome, Italy, with Minister of Productive Activities Antonio Marzano, Secretary of Energy Spencer Abraham announced that Italy intends to join the International Partnership for the Hydrogen Economy (IPHE). Italy is one of the core countries that support the IPHE; several other countries also have shown interest. The Government of Italy has a well developed research and development program addressing hydrogen and fuel cell technology applications in the transportation and electric utility sectors.

"We are pleased to learn of Italy's decision to join the partnership for hydrogen and fuel cell technology research, development, and demon-

stration activities," Secretary Abraham said. "International cooperation is key to achieving hydrogen and fuel cell program goals such as those President Bush stated in his recent State of the Union address."

Secretary Abraham proposed the International Partnership for the Hydrogen Economy in his remarks to the International Energy Agency Ministerial Meeting in Paris, France, in April 2003. The partnership will establish cooperative and collaborative efforts in hydrogen production, storage, transport, and end-use technologies; common codes and standards for hydrogen fuel utilization; and the sharing of information necessary to develop a hydrogen fueling infrastructure. Secretary

Abraham will host a Ministerial Meeting of the IPHE in the U.S. this fall.

Secretary Abraham was traveling in Europe to meet with government officials in several countries regarding international energy issues. On Aug. 12, he toured Daimler Chrysler's fuel cell research facility in Kirchheim/Teck-Nabern, southern Germany. "I'm pleased to visit Nabern, which is in the forefront with its cutting edge hydrogen fuel cell research technologies," Secretary Abraham said. "I believe our work on hydrogen in the United States, Germany, and elsewhere is perhaps the most significant endeavor the energy sector will see in our lifetimes." ❖

MINOS neutrino detector begins data-taking

Scientists of the Main Injector Neutrino Oscillation Search (MINOS) collaboration at the Department of Energy's (DOE) Fermi National Accelerator Laboratory (Fermilab) in Batavia, Ill., announced on Aug. 14, 2003, the official start of data-taking with the project's 6,000-ton "far" detector. The MINOS detector, located deep in a historic iron mine in northern Minnesota, will be used to explore the phenomenon of neutrino mass.

After four years of mining and construction, workers finished building the first of two detectors of the MINOS particle physics experiment in July 2003, ahead of the scheduled April 2004 completion date. Technicians will complete the assembly of a "near" detector, smaller in size than the far detector, at Fermilab in August 2004.

"This is an important milestone in the worldwide quest to develop neutrino science," said Dr. Raymond L. Orbach, Director of DOE's Office of Science. "The MINOS detector in

Soudan, Minn., together with the new Fermilab neutrino beam line, will provide a detailed look at the secrets behind neutrino oscillations. It will complement the large-scale neutrino projects in Japan, Canada, and Europe."

The 100-foot-long detector consists of 486 massive octagonal planes, lined up like the slices of a loaf of bread. Each plane consists of a sheet of steel about 25 feet high and one inch thick, covered on one side with a layer of scintillating plastic. To construct the detector, technicians had to transport all detector components in small sections via a narrow mine shaft and assemble them underground.

At present, the new detector is recording cosmic ray showers penetrating the earth. The data will provide first tests of matter-antimatter symmetry in neutrino processes. The experiment will enter its next phase in early 2005 when construction of

the Fermilab neutrino beam line is complete. Scientists will use the far detector to "catch" neutrinos created at Fermilab's Main Injector accelerator. The neutrinos will travel 450 miles straight through the earth from Fermilab to Soudan—no tunnel needed. The detector will allow scientists to directly study the oscillation of muon neutrinos into electron or tau neutrinos under laboratory conditions.

Funding for the MINOS experiment has come from DOE's Office of Science, the National Science Foundation, the British Particle Physics and Astronomy Research Council, the State of Minnesota, and the University of Minnesota. More than 200 scientists from Brazil, France, Greece, Russia, the United Kingdom, and the United States are involved in the project. Other DOE facilities involved in the project are Argonne, Brookhaven, and Lawrence Livermore National Laboratories. ❖

Longsworth sworn in to NNSA post

On July 30, 2003, Secretary of Energy Spencer Abraham administered the oath of office to Paul M. Longsworth as Deputy Administrator for Defense Nuclear Nonproliferation in the Department of Energy's (DOE) National Nuclear Security Administration (NNSA). Longsworth was nominated by President Bush for the position on April 25 and confirmed by the United States Senate on July 21.

"Paul Longsworth has done an excellent job as a senior advisor in the critical areas of national security and nonproliferation. He brings leadership and experience to a vital position that has many nonproliferation initiatives worldwide which are important to the security of our nation," Secretary Abraham said following the ceremony.

"I am honored to be given the chance to work with the men and women of NNSA's nonproliferation program," Longsworth said. "I can think of no organization that is better



Secretary Abraham (left) swears in Paul Longsworth as NNSA Deputy Administrator for Defense Nuclear Nonproliferation.

prepared to address the threats posed by the proliferation of weapons of mass destruction than the Office of Defense Nuclear Nonproliferation."

Longsworth has over 17 years experience in national security, nuclear, and environmental issues, having served in the Executive and

Legislative Branches of the Federal Government and in the private sector. Most recently, he served as the senior policy advisor to Secretary Abraham for national security and the former Soviet Union. Longsworth previously served as a professional staff member

on the Senate Armed Services Committee, where he was responsible for defense nuclear matters. He also has worked for the Senate Environment and Public Works Committee, the Center for Strategic and International Studies, and DOE's Office of Science and Technology. ❖

First EM small business workshop attracts crowd

Assistant Secretary for Environmental Management Jessie Roberson and the Office of Environmental Management (EM) hosted EM's first Small Business Workshop in Nashville, Tenn., July 15-16, 2003. The workshop focused on establishing a mutual understanding of the barriers small business firms face in competing for contracts to further EM goals of accelerating cleanup and reducing costs at Department of Energy (DOE) sites.

Over 400 people from 31 states and the United Kingdom were in attendance. The workshop featured a forum for open discussion, where attendees were invited to provide input on such topics as contract financing, bonding, reducing procurement process complexities and costs, teaming arrangements, and small business size standards. A summary of the issues and proposed solutions will be posted on the EM Small Business Website, <http://www.em.doe.gov/emsb>.

Representatives from EM provided an overview of and answered questions related to six upcoming EM small business opportunities. The questions and answers will be posted on the above website so that companies unable to attend the

workshop will have access to the information. One of the upcoming contract opportunities—dealing with environmental remediation, deactivation, demolition and removal services—was highlighted at a pre-solicitation conference held in conjunction with the workshop.

EM is working with the Office of Procurement and Assistance Management in the Office of Management, Budget and Evaluation (ME) and the Office of Small and Disadvantaged Business Utilization in the Office of Economic Impact and Diversity to address issues raised at the workshop and develop an action plan to implement recommendations. The resulting changes are expected to remove many of the barriers identified at the workshop; most can be accomplished through modifications to administrative processes within DOE.



Several firms participate in a session of the first Office of Environmental Management Small Business Workshop.

EM and ME will work with the Small Business Administration to clarify requirements and coordinate changes needed to increase contracting opportunities for small business firms.

EM plans to use a phased approach to adopt recommendations made at the workshop, with the ultimate goal of reflecting these changes in future contract solicitations. The EM Small Business Website will continue to be a source of information on EM's progress in addressing barriers and continuing efforts to expand small business contracting opportunities. ❖

DOE sites to receive energy awareness materials

The Department of Energy (DOE) is observing October as Energy Awareness Month (EAM) and has selected "Energy Efficiency – Good for You, Good for the Country" as its overall theme. DOE employees and other Federal agencies are encouraged to promote the message that individuals can help increase our national energy supply and improve energy security through efficiency.

The "You Have the Power" campaign coordinated by the Federal Energy Management Program (FEMP) in DOE's Office of Energy Efficiency and Renewable Energy (EERE) has produced a 2003

Energy Awareness Month poster and outreach materials. The poster carries the campaign theme and shows that with the Federal Government leading by example, energy efficient technologies will become as familiar to the American public as the flag, apple pie, or baseball.

Copies of the poster and other handout materials will be distributed by FEMP to Federal agencies; DOE field offices, laboratories, and regional offices; and state energy offices the week of Sept. 8. The materials can be used during the October observance and throughout the year to spread awareness about energy efficiency. The package will

include the large and small EAM poster, light switch covers, a newly designed thermostat card and small sticker, and monitor calendars. Quantities will vary depending on the recipient—agency coordinator, standard site, or smaller site. CD ROMs with the EAM poster and other artwork are available.

Limited extra quantities will be available; contact the EERE Clearinghouse, 1-800-363-3732, or visit <http://www.eere.energy.gov/femp/ordermaterials.html#awareness>. For more information on EAM, DOE and Federal offices may contact Annie Haskins, FEMP, 202-586-4536, or your site coordinator. ❖

Rocky Flats facility now free of nuclear weapons-usable material

The final shipment of nuclear weapons-usable material has left the Department of Energy's (DOE) Rocky Flats facility in Colorado. This major milestone in cleanup of the complex was completed a full 12 years ahead of schedule.

"The hard work of all those involved in the Rocky Flats cleanup has helped beat target dates for key milestones, and maintained the commitment to the American people of this country to shut down and clean up this facility," Secretary of Energy Spencer Abraham said. "This removal of the weapons-usable material is a historic event, demonstrating what can be accomplished when DOE and its host communities work together."

Linton Brooks, Under Secretary for Nuclear Security and Administrator, National Nuclear Security Administration (NNSA), represented DOE at the event marking the final shipment. NNSA played a key role in ensuring the weapons-usable

material was removed from Rocky Flats safely and securely.

"This accomplishment is probably the most important milestone of the Rocky Flats Closure Project to date," said Gene Schmitt, DOE Rocky Flats Site Manager. "It also saves close to \$2 million in security costs each month that can be applied directly to accomplishing more cleanup work."

"With the plutonium removed from Rocky Flats, we will focus our resources on the final demolition of the site," said Alan Parker, President and CEO, Kaiser-Hill, the company in charge of the environmental cleanup operation. "This accomplishment will enable easier access to the former production buildings allowing faster and safer cleanup."

The Rocky Flats Plant operated for more than 40 years. The plant was responsible for the fabrication of all the plutonium triggers currently at use in the nation's nuclear weapons stockpile. Because of Rocky Flats'

mission, several of the facilities once were considered the country's most dangerous places to work. President George H.W. Bush targeted the Rocky Flats facility for shutdown in 1992. In the mid 1990's, the goal was set to remove nuclear weapons material from the site by 2015.

A daunting task was the removal of more than 12 metric tons of plutonium, the demolition of hundreds of aging and contaminated buildings, and the disposal of thousands of tons of radioactive and hazardous waste materials. To date, the closure project is more than halfway complete.

Early forecasts estimated that it would take more than 60 years and \$37 billion to complete cleanup and closure. The site now is scheduled to be cleaned and closed in 2006 at an estimated cost of \$7 billion. When work is complete, the site will become a National Wildlife Refuge under the management of the U.S. Fish and Wildlife Service. ❖

Pollution sleuths use environmental forensics

Michael Abbott, an atmospheric scientist at the Department of Energy's Idaho National Engineering and Environmental Laboratory (INEEL), is developing a method of analysis that will decipher the complexity of atmospheric contamination, allowing him to connect downwind air pollution to its source. The method also identifies multiple sources of contamination and how they contribute to the mix.

Today's standard uses an estimation of air pollutants contributed by something such as an industrial processing plant. These models estimate the amounts of pollutants coming from chimneys and then apply historical measurements of winds and turbulence. The models estimate where the pollutants will travel and the dilution that occurs.

"Current air dispersion models take a remarkably crude approach to simulating the complex atmospheric

interactions going on," Abbott says. "We need better tools to understand what contamination sources need to be controlled. We've got to look at the bigger picture, at the cumulative, multi-source contributions of regional industrial areas and not just individual businesses to be able to understand and control air pollution."

His approach starts with measuring the contamination that really does exist at the downwind locations of interest. Abbott uses statistical software to identify unique combinations of air pollutants that characterize the different natural and manmade emissions. The program then uses these profiles to predict how much each source contributed at the measurement location.

Abbott and INEEL statistician Jeff Einerson are finishing up a three-year study of trace element contaminants in southeastern Idaho. They sampled snow through three winters

and identified more than 39 trace elements and nine common ions that were used to develop regional source profiles for five major industrial/residential areas.

With the regional source emission signature defined, Abbott is able to determine how much downwind contamination comes from each regional source area. "Think of this as environmental forensics," he says.

The real challenge, though, is to be able to reliably predict, based on these measurements, how much individual sources are contributing to contamination levels. Experimenting with different statistical software packages, Abbott is honing in on the statistical method or methods that produce the best predictions. More information about the research is available at <http://www.inel.gov/env-energyscience/mercury/>. ❖

Materials technologies licensed to Oak Ridge company



A license agreement for two microwave material processing technologies that will save energy and improve product quality has been signed by BWXT Y-12 and MS Technology Inc., Oak Ridge, Tenn. Both technologies were developed at the Y-12 National Security Complex, a facility of the Department of Energy's National Nuclear Security Administration (NNSA).

The technologies involve melting and casting metals and separating adhesively bonded components using microwave energy. Compared with conventional techniques, advantages of the technologies include reduced energy consumption, improved metal cleanliness and productivity, improved safety, smaller equipment size and infrastructure, and reduced wastewater treatment needs for production and operations.

In the photograph, Dennis Ruddy (left), President and General Manager, BWXT Y-12, and Harbans Singla, President, MS Technology Inc., sign the agreement. The license agreement "shares the technological expertise of Y-12 and will generate jobs and provide a growth path for Tennessee's economy," said William Brumley, NNSA Y-12 Site Manager. ❖

Student goes from Science Bowl participant to SRS intern



Gwen Woods is not your typical 19-year-old. The rising sophomore at the Colorado School of Mines in Golden spent her summer interning at the Department of Energy's (DOE) Savannah River Site (SRS) in Aiken, S.C. While interning isn't unusual, Woods is the first student to be part of a DOE National Science Bowl® team that toured SRS one summer and then decided to work at the Site the next summer.

Last year, Woods and her fellow second-place team members selected SRS as the place they wanted to visit and work with top scientists and engineers. "When I toured Savannah River in the summer of 2002, I was really impressed with the professionalism of the workers," she said. "I got a real sense of community, even though SRS is such a large site."

Woods is majoring in mathematics and engineering with an environmental specialty. Her tasks this year included data collection and analysis, computer programming, equipment testing, and soil sieving. "It's been a good experience to have," Woods said. ❖

Magwood visits Idaho Lab, meets staff and community



William Magwood IV, Director, Office of Nuclear, Energy, Science and Technology (NE), visited the Department of Energy's (DOE) Idaho National Engineering and Environmental Laboratory (INEEL), Aug. 7-8, 2003. His visit included discussions with DOE-NE and contractor officials, presentations to Federal employees and INEEL and Argonne National Laboratory-West (ANL-W) scientists and engineers, and meetings with Idaho State University officials and members of the Shoshone-Bannock Tribes' Fort Hall Business Council.

Other stops included a research project poster session presented by 22 students in the INEEL and ANL-W Nuclear Energy Student Fellowship Program. Shown here, Magwood (left) and Nathanael Hudson, a Georgia Institute of Technology nuclear engineer Ph.D., discuss his research in spectrum generation in pebble bed modular reactors. In all, 45 students and university faculty participated in nuclear energy fellowships this year.

Magwood took time out for a softball game between his office and the Shoshone-Bannock Tribes. After a valiant effort, the DOE team was defeated by a score of 9-6. ❖

City of Chicago honors Argonne for employee development

Emphasis on employee learning and development has earned the Department of Energy's Argonne National Laboratory a 2003 Workforce Chicago 2.0 Award. Argonne was one of two award recipients selected from 30 nominees from Chicago, Ill., area businesses, civic organizations, trade associations, and workforce practitioners. Harvey Drucker, Associate Laboratory Director for Energy and Environmental Science and Technology (left) accepted the award from Chicago Mayor Richard Daley.

The award selection criteria includes the integration of employee development strategies into an organization's goals and operation, the commitment to investing in and depth of employee training and development and the extent to which initiatives reach employees, and the effectiveness and efficiency of an organization's learning activities. "Lab management views employee training and development as a means of attracting and retaining good people, and we work hard to do an effective job," said John Hyzer, Argonne Assistant Director for Human Resources. ❖



Hanford completes major plutonium cleanup campaign

Workers at the Department of Energy's (DOE) Hanford Site, at right, have finished packaging more than 6,000 pounds of plutonium residues into more than 1,200 specially designed drums for shipment to DOE's Waste Isolation Pilot Plant in New Mexico for permanent disposal. The residues—the second of three major categories of plutonium materials at Hanford's Plutonium Finishing Plant (PFP)—are the byproduct of more than 40 years of processing plutonium for the U.S. weapons program. The plant stopped producing plutonium in 1990.

"Completing the plutonium residues is a big deal," said Briant Charboneau, PFP project manager for DOE's Richland Operations Office. "It's a major risk reduction activity, allows us to move waste off the Hanford Site for disposal, and puts us on the brink of completing stabilization and packaging of all plutonium materials at the Plutonium Finishing Plant."

Hanford finished stabilizing and packaging plutonium solutions, the first category of materials, in July 2002. The third category, plutonium solids, will be completed in 2004. ❖



WOW – check out LANL's new diversity calendar

The Diversity Office at the Department of Energy's Los Alamos National Laboratory (LANL) has developed a state-of-the-art online tool to help promote diversity awareness in the workplace. The Weaving Our Worlds (WOW) Diversity Calendar contains more than 800 observances, including cultural, religious, and historical events. The calendar employs multimedia (images, sound, video) to help employees learn about the cultures, practices, heroes, historical events, and foods important to those they work with.

At right, Lisa Gutierrez, LANL Diversity Director, points to one of her favorite features in the calendar developed by Laurie Quon (seated). "Understanding each other fosters cooperation, teamwork, and better working relationships," Gutierrez says. "The WOW calendar addresses a number of areas but specifically focuses on providing diversity education and awareness. This tool should be on every manager's desktop to help them promote diversity in the workplace."

The WOW calendar is available on the LANL Diversity Office website, <http://www.lanl.gov/orgs/dvo/>. ❖



NNSA program prevents proliferation, assists U.S. businesses

Through the support of the Initiatives for Proliferation Prevention (IPP), a program managed by the Department of Energy's (DOE) National Nuclear Security Administration (NNSA), a number of U.S. small businesses have mitigated the high costs and risks of research and development. This has resulted in the introduction of new technologies into the marketplace and the advancement of NNSA's mission of nonproliferation.

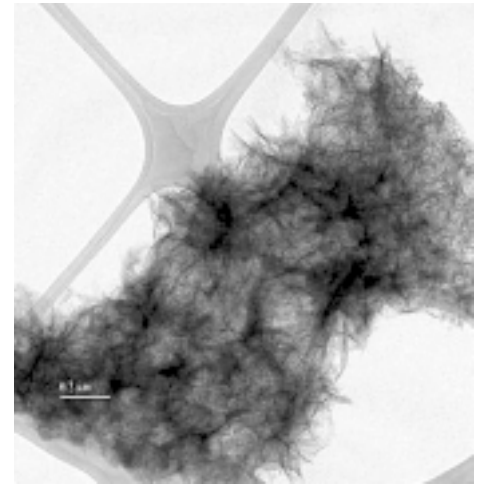
One such technology is nano-alumina fibers, an important breakthrough in filtering. Argonide Nanomaterials developed nano-alumina fibers through a joint effort involving DOE's National Renewable Energy Laboratory (NREL) and two Russian research institutes—the Design Technology Center in Tomsk and VECTOR State Research Center for Virology and Biotechnology in Novosibirsk.

Marketed under Argonide's brand-name NanoCeram®, nano-alumina fibers remove impurities from water at flow rates over 200 times faster than current technologies. NanoCeram filters can remove 99.9999 percent of biological contaminants, as well as dissolved heavy metals such as lead, mercury, and uranium, from

water solutions. Potential applications for this technology include testing for and removing biological and chemical agents from water and filtering water for home consumption. Initial market estimates place the value of NanoCeram at over \$10 million per year.

Another successfully commercialized technology is the DRWiN™ (Dynamically Reconfigurable Wireless Networks) Electronically Scanning Antenna. Developed by Paratek Microwave, Inc., in conjunction with NREL and the Electrotechnical Institute in St. Petersburg, Russia, this technology represents the first low-cost, electronic scanning antenna system that can increase the capacity, data rates, and reliability of wireless networks. Potential applications range from local area networks to cellular telephone systems. Market estimates project \$53 million in sales for this technology through 2005.

The development of these two technologies marks further success for the IPP program. Established in 1994, the program engages former Soviet weapons scientists in peaceful, commercially sustainable pursuits by matching U.S. companies with former Soviet weapons institutes to develop commercial technologies. U.S. companies participate in IPP through the



Nano-alumina fibers as viewed through an electron microscope.

U.S. Industry Coalition (USIC), a non-profit industry association with over 150 members, two-thirds of which are small businesses.

To promote technology commercialization under the IPP program, USIC is producing a major technology exhibition and conference in Philadelphia, Pa., Nov. 5-6, 2003. The conference, sponsored by NNSA, will highlight innovative technologies from Russia, Ukraine, and Kazakhstan. For more information and to register, visit <http://www.partnershipsforprosperity.net>. ❖

COMING Events

November

4-6 Sixth Annual Joint Energy Facility Contractors Group (EFCOG)/Department of Energy (DOE) Chemical Management Workshop, DOE Headquarters Forrestal Building, Washington, D.C. Sponsored by DOE's Chemical Safety Topical Committee, Office of Environment, Safety and Health. Open discussion will focus on critical chemical management and chemical hazard control issues, including beryllium, faced by line managers, facility engineers,

and safety and health professionals. For more information, visit http://www.eh.doe.gov/web/chem_safety/ws2003/ or contact Gail Kleiner, 301-903-5601 or Gail.Kleiner@eh.doe.gov.

17-19 Clean Coal and Power Conference, Washington, D.C. Cosponsored by the Department of Energy's (DOE) Office of Fossil Energy (FE), the Center for Energy and Economic Development, and others. The sig-

nificance of coal as a viable energy source to meet the growing global energy demand will be explored. The conference is being held in conjunction with the Second Joint U.S.-People's Republic of China (PRC) Conference on Clean Energy, an activity of a joint protocol agreement entered into by FE and PRC's Ministry of Science and Technology. Additional information is available at <http://fossil.energy.gov/news/events/cleancoal/index.html>. ❖

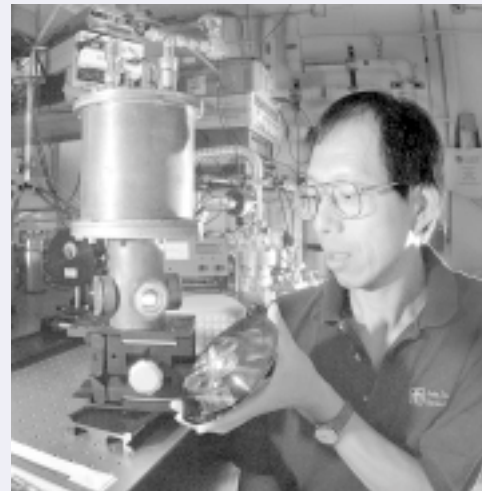
Research DIGEST

When neurobiologists at the University of Washington (UW) in Seattle became interested in equipping moths with portable computers, they enlisted the Department of Energy's **Kansas City Plant**, a National Nuclear Security Administration facility, to help make it possible. The UW scientists are using computer electronics to probe the neural basis of behavior. Plant engineers are designing a computer chip so small and lightweight—less than a gram—that it can be implanted on a moth without restricting its flight. Not your typical moth will tote this miniature computer in flight. It's the *Manduca hawk* moth, a relatively large species whose size and characteristics make it invaluable for scientific research ranging from behavioral studies to biochemical and genetic processes. The research goal is broader than just studying insect flight. The research could be applied to studies of the human neuromuscular system and perhaps even be used in the making of advanced bio-inspired machines. (Wess Hudelson, 816-997-5071)



A new catalyst that achieves complete conversion of reactants to products and that easily can be recovered and reused with no waste has been developed by chemists at the Department of Energy's **Brookhaven National Laboratory** (BNL). The catalyst, described in the July 31, 2003, issue of *Nature*, eliminates the need for using solvents in an important step in the synthesis of many organic compounds, such as pharmaceutical agents and agricultural products. "Avoiding the use of solvents is an important way to prevent waste in chemical manufacturing processes," says BNL chemist Morris Bullock, who led the research. The new catalyst achieves that goal in two ways. First, as a homogeneous catalyst, it dissolves in the reactants. Second, it precipitates as a solid at the end of the reaction. (Karen McNulty Walsh, 631-344-8350)

Researcher Shawn Lin of the Department of Energy's Sandia National Laboratories inspects an iridescent disk that contains approximately 1,000 tungsten photonic lattices. Sandia researchers have shown that filaments fabricated of tungsten lattices emit remarkably more energy than solid tungsten filaments in certain bands of near-infrared wavelengths when heated. This greater output offers the possibility of a superior energy source to supercharge hybrid electric cars, electric equipment on boats, and industrial waste-heat-driven electrical generators. The lattices' energy emissions put more energy into wavelengths used by photovoltaic cells that change light into electricity to run engines. Additional information is available at <http://www.sandia.gov/news-center/news-releases/2003/other/planck-lin.html>.



Scientists at the Department of Energy's **Lawrence Berkeley and Lawrence Livermore National Laboratories**, working with an international team of researchers, have determined that human-induced changes in ozone and well-mixed greenhouse gases are the primary drivers of recent changes in the height of the tropopause. The tropopause is the boundary between the lowest layer of the atmosphere—the turbulently mixed troposphere—and the more stable stratosphere. Earlier research has shown that increases in the height of the tropopause over the past two decades are directly linked to stratospheric ozone depletion and increased greenhouse gases. The new research attempts to understand how different mechanisms affect atmospheric temperatures, and hence tropopause height. Using climate models, the research indicates that 80 percent of the roughly 200-meter increase in tropopause height from 1979 to 1999 is directly linked to human activities. It is the first study to show that a model-predicted

"fingerprint" of tropopause height change can be identified in observations. The paper describing this work appears in the July 25, 2003, edition of *Science* magazine. (Gordon Yano, 925-423-3117)



The Department of Energy's **Los Alamos National Laboratory** (LANL) has released new maps of likely sites of water on the planet Mars. The maps detail the distribution of water-equivalent hydrogen as revealed by LANL-developed instruments aboard the National Aeronautics and Space Administration's (NASA) Mars Odyssey spacecraft. For more than a year, the LANL neutron spectrometer has been carefully mapping the hydrogen content of the planet's surface by measuring changes in neutrons given off by soil, an indicator of hydrogen likely in the form of water-ice. The new color maps are available at <http://www.lanl.gov/worldview/news/photos/mars.shtml>. (Nancy Ambrosiano, 505-667-0471) ❖

Students, professors on the 'FaST' track

This summer, 23 teams of college students and their professors had the opportunity to work on cutting-edge research using advanced technologies and instrumentation at five Department of Energy (DOE) national laboratories. The teams, comprised of one faculty member and two or three undergraduate students, participated in an innovative national program called Faculty and Student Teams (FaST).

The FaST program, now in its second year, is jointly sponsored by DOE's Office of Science and the National Science Foundation. The goals of the program are to foster institutional collaboration between college faculty members and scientists at Office of Science national laboratories and provide hands-on research experiences for students and encourage them to pursue careers in science and technology, engineering, and mathematics.

North Carolina Agricultural and Technical State University, Greensboro, N.C., was one of six teams located at Argonne National Laboratory in Illinois. The team investigated the application of bead array technology and the Argonne acrylamide biochip for viral and bacterial identification and the study of patterns of viral infection in various plant hosts.

Brookhaven National Laboratory in New York hosted one team this summer. The Department of

Chemistry at Brooklyn College of the City University of New York studied radiation-induced reactions in ionic liquids with scientist James Wishart. "In addition to its immediate value to the students, this experience also has allowed Dr. Wishart and me to plan a longer-term collaboration," said team leader Mark Kobrak.

Three FaST teams worked at Oak Ridge National Laboratory in Tennessee. One team, with students from the University of Texas – El Paso and El Paso Community College, studied quantitative characterizations for Friction Stir Welds. "This experience has changed the degree program I will pursue when I return to school," said James Leathers. "I am now planning to pursue a Master's Degree in Physics. If that is not a true testament to the impact of the FaST program, then what is?"

Lawrence Berkeley National Laboratory in California hosted seven teams. One team, from Contra Costa College, San Pablo, Calif., and Mission Community College, Santa Clara, Calif., worked to design and test a high-performance computing cluster, linking together several computer



Faculty member Shahzad Akbar (left) and undergraduate Feleshia Ballou of Virginia State University, participants in the FaST program at Oak Ridge National Laboratory, get hands-on experience with equipment not available at their university.

systems to create a high-performance system for use in training undergraduate students to be part of the information technology workforce.

The University of Arizona was one of six teams at Pacific Northwest National Laboratory in Washington. The team studied methods of stabilizing wastes containing toxic metals to prevent uncontrolled release into the environment from landfills or long-term storage facilities.

On-line application for the summer 2004 FaST program opens Oct. 15, 2003. More information on the program, including eligibility criteria, is available at <http://www.scied.science.doe.gov/scied/fast/about.html>. ❖

NEW ON THE *Internet*

Sharing best practices

The Department of Energy's (DOE) Office of Fossil Energy (FE) has developed a database that contains best environment, security, safety, and health practices from FE and other DOE field sites. The practices are applicable to a wide range of facilities, from research and development laboratories to oil and gas production and storage operations. Access to the

database is through FE's Office of Environment, Security, Safety and Health (FE-7) intranet site, <http://esh.fe.doe.gov/>. The database is routinely updated and visitors to the site can contribute their best practices online. Visitors also may subscribe to a best practices e-letter that notifies subscribers of updates in the database and provides news on related topics.

The database has searchable categories such as title, year, applicable site, and function area, including training, environment, safety and health management systems, energy management, security, quality assurance, performance, reporting systems, and emergency operations. For more information, visit the site or contact Craig Zamuda, Director, FE-7, 202-586-6367. ❖

DOE labs conduct summer science programs

When asked what they did this summer, some students and teachers can say they had the opportunity to talk to and work with scientists during science programs at Department of Energy (DOE) laboratories.

Here's an example of some of the programs conducted this summer.

Eight undergraduate college students had an opportunity to intern at Argonne National Laboratory (ANL) in Illinois for 10 weeks as participants in the Pre-Service Teacher (PST) program, sponsored by DOE's Office of Science and the National Science Foundation. Through this program, students majoring in K-12 education in the areas of science, math, and technology work closely with laboratory scientists on projects in their chosen field and learn how to transfer their scientific training into lesson plans and activities.

ANL also held a week-long Nanoscience Research Summer School in August. The school was conducted jointly by the Division of Educational Programs and the Argonne Center for Nanoscale Materials. The school was open to all graduate students majoring in physics, biology, materials science,

or a related engineering field at any United States university.

In July, Lawrence Livermore National Laboratory (LLNL) in California presented a new four-week lecture series, "Sizzlin' Summer Science." The free science lectures by LLNL scientists were geared to middle and high school students and became a total family experience. Featured topics covered cutting-edge LLNL technology, interactive demonstrations, and basic science concepts.

Oak Ridge National Laboratory (ORNL) in Tennessee participated in the DOE Community College Institute program, which is sponsored by DOE's Office of Science and administered by the Oak Ridge Institute for Science and Education. Mark Bennett, Jefferson Community College, Louisville, Ky., and Carl Eng, Suffolk County Community College, Long Island, N.Y., worked together as interns for 10 weeks at the National Transportation Research Center. The two students, who became good friends, helped design a tool that will more efficiently test spark plugs for automotive engines.

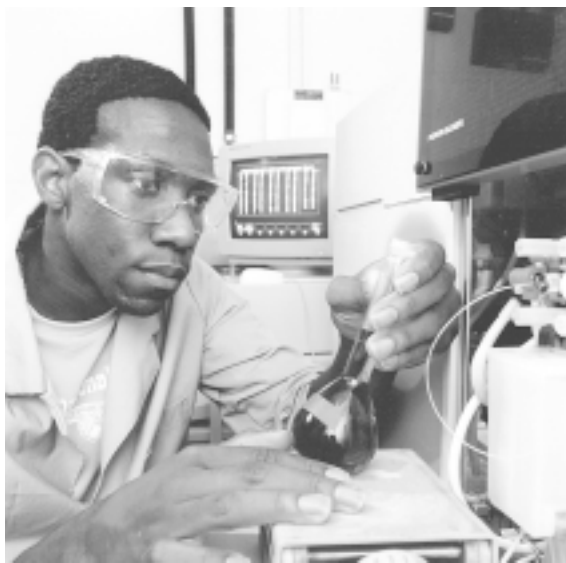
Thomas Jefferson National Accelerator Facility (Jefferson Lab), Newport News, Va., held its fourth annual P.E.S.T. (Physics Enrichment for Science Teachers) program,



L-r, middle school science teachers Joan Ammon from New Jersey; Lisa Bolin, Minnesota; and Sue Covert, Virginia, take part in a magnetism experiment during Jefferson Lab's P.E.S.T. program.

July 7-31. The program is designed to further the knowledge of middle-school science teachers by providing them with a mini course in basic physics—material and information they might not have seen in years or, depending on their studies in college, may never have received at all. This year's program drew 21 people, mostly teachers from the local Virginia area, and also from Minnesota, Kentucky, and New Jersey. P.E.S.T. participants receive a stipend and earn 65 participation hours toward teacher relicensure or recertification. They also can earn three graduate credit hours toward a master's degree at the University of Virginia.

Jefferson Lab conducted a "Young PhDs (Persons Having Dreams) in Physics" camp in July for 10 students in grades 6 to 8. The program is designed to give rising students exposure to science through hands-on experiments and the opportunity to talk with scientists and engineers and visit their work areas. The three-day program is sponsored by Cooperating Hampton Roads Organization for Minorities in Engineering (CHROME). ❖



Argonne National Laboratory summer intern Jamaris Ealy, a senior in education and mathematics at the University of Illinois at Chicago, examines a flask at the flame atomic absorption spectrum.

People IN ENERGY

Rod K. Quinn has been named Associate Laboratory Director for the Environmental Technology Directorate at the Department of Energy's (DOE) Pacific Northwest National Laboratory (PNNL), a position he held in an interim capacity. Quinn will manage more than \$140 million in environmentally focused projects and oversee about 750 employees. Previously, he was Director of the Process Science and Engineering Division. Before joining PNNL in 1991, Quinn held research and management positions at DOE's Los Alamos and Sandia National Laboratories.



Dr. Edward Teller, Director Emeritus of the Department of Energy's Lawrence Livermore National Laboratory, is one of this year's 11 recipients of the prestigious Presidential Medal of Freedom, the nation's highest civil honor. President George W. Bush presented the awards on July 23, 2003, at a special ceremony at the White House. Dr. Teller's daughter Wendy accepted the award on behalf of her father, who is 95. Also in attendance was grandson Eric Teller.

Shirley Kendall is the new Diversity Manager at the Department of Energy's Brookhaven National Laboratory (BNL). Her responsibilities include implementing BNL's affirmative action and equal employment opportunity programs and serving as coordinator of the laboratory's Women's Program Advisory Committee. Most recently, Kendall was Diversity Coordinator for the City of Rochester, N.Y. Previously, she was Director of Diversity Planning and Compliance for Independent Media Sales and Services in New York City.



Steven J. Michelsen, Director, Office of Resource Management, Office of Procurement and Assistance Management, at Department of Energy Headquarters, is the recipient of the 2003 Jack Griffiths Property Person of the Year Award presented by the National Property Management Association. Michelsen was recognized for his lifetime contributions to the profession of Federal and contractor property management and leadership in the development of national standards for property asset management.

Dr. Ken Crase, Radiological Protection Services at the Department of Energy's Savannah River Site, has been selected as a Fellow of the Health Physics Society. Crase is the fourth Site employee to receive this honor in the Society's 48-year history and is the only active Site employee to hold this designation.

Paul F. Becher, a corporate fellow and research group leader in the Metals and Ceramics Division at the Department of Energy's Oak Ridge National Laboratory has been named to the National Materials Advisory Board of the National Research Council of the National Academies. The board is the principal source of objective, independent, and informed scientific, technological, and policy assessments of materials, processes, and applications used by industry, government agencies, and universities.



Laurance J. Suter, Leader, Hohlräum Dynamics Group, A/X Division, at the Department of Energy's Lawrence Livermore National Laboratory, has been awarded the 2003 Edward Teller Medal by the American Nuclear Society. Suter was recognized "for his seminal work on almost all aspects of laser hohlraum physics." Hohlräume are the tiny gold containers that hold a laser target as intense X-rays heat it during inertial confinement fusion experiments.

Sudarsanam Suresh Babu, a senior researcher in the Metals and Ceramics Division at the Department of Energy's Oak Ridge National Laboratory has received an award from The Welding Institute of the United Kingdom. The award is presented to a person under 40 years old who is deemed to have made the most significant contribution to the advancement of welding technology during the preceding five years. Babu's research focuses on welding metallurgy, phase transformations in steel, aluminum alloys and nickel-based super alloys.



Carolyn E. Zerkle is the new Principal Deputy Associate Director for Administration at the Department of Energy's Los Alamos National Laboratory (LANL). The directorate includes business and financial management, human resources, information management, and communications functions within LANL. Most recently, Zerkle served as Acting Deputy Associate Director in the Operations directorate.

Engineer **Robert Simmons** of the Department of Energy's Princeton Plasma Physics Laboratory (PPPL) has been elected a Fellow of the American Society of Mechanical Engineers International. Simmons is the Systems Engineering Support Manager at PPPL for the National Compact Stellarator Experiment.

Kibbee D. Streetman of the Technical Computing organization for BWXT Y-12 in Oak Ridge, Tenn., is the 2003 recipient of the Department of Energy's (DOE) Charlene Douglass Memorial Award for his "outstanding contributions in the national interest in the field of information systems and cyber security." The award was presented at the 25th DOE Computer Security Group Training Conference. ❖

Milestones

YEARS OF SERVICE

September 2003

Headquarters

Chief Information Officer – Angela M. Powers (30 years), Stanley P. Wujcik (30). **Congressional & Intergovernmental** – Frederick L. Tathwell (30). **EIA** – Linda M. Bromley (30), Elizabeth M. Jenkins (30), Mary E. Carlson (25), Donna R. Guerrina (25), Gerald E. Peabody (25).

Energy Efficiency & Renewable Energy – Dan W. Deaton (40), Christopher B. Bordeaux (30), Lorraine L. Cox (25), Margaret A. Podolak (25). **Environment, Safety & Health** – John F. Ahearne (40), Richard H. Lasky (30), Emile I. Boulos (25).

Environmental Management – Barry R. Clark (25). **FERC** – Robert K. Arvedlund (35), Mary L. Lewis (35), Bonnie A. Dodson (30), Richard R. Hoffmann (30), George Shriver III (30), Thomas A. Celentano (25), David M. Gallo (25), Quentin A. Lawson (25), Ralph E. Leslie (25), Selma S. Lynch (25), Michael McGehee (25), Laura K. Sheppard (25), Charles B. Spencer, Jr. (25).

General Counsel – Harold L. Halpern (40), Claude F. Barnes (30), Steven E. Ferguson (30), Jean S. Stucky (25).

Independent Oversight & Performance Assurance – Patricia R. Worthington (30), Bradley A. Peterson (25). **Management, Budget & Evaluation** – Robert Prushinski (35), Shirley Campbell-Grizzel (25), Ellen M. Colligan (25), Cheri D. Dent (25), Douglas A. Kennedy (25).

NNSA – Christine R. Campbell (30), Samuel L. Giles, Jr. (30), Angela E. Padilla (30), Joanne Parker (30), Charles H. Davis, Jr. (25), Kenneth B. Willmott (25), Joanne W. Wolfe (25).

Nuclear Energy – Mary F. McKnight (30). **Policy & International** – Mark D. Friedrichs (30). **Security** – Paul R. Laplante (30), Eileen L. Beaulieu (25).

Field

Albuquerque – Patricia Tafoya (35).

Chicago – Sara J. Brunson (30), Robin L. Roskopf (25), Christopher D. Swierczek (25), Anna M. Voeks (25).

Idaho – W. Darrell Lewis (30).

Kansas City Site/NNSA – Kenneth W. Roggenkamp, Jr. (25). **NETL** – William J. Gwilliam (30), Theodore A. Jordan (30), Ralph A. Carabetta (25), Teresa W. Jones (25), Deborah J. Matetic (25), Robert R. Romanosky, Jr. (25), Anthony M. Zammerilli (25). **Nevada Site/NNSA** – John K. Robertson (30).

NNSA Service Center – James K. Efishoff (30), Donna M. Sosa (30), Jerry F. Bledsoe (25), Richard A. Kendall (25).

Oak Ridge – Sharon C. Moore (25).

Oakland/NNSA – Michael E. Lopez (30), Ross M. Champion (25). **Ohio** – Linda J. Ketchum (25). **Pantex Site/NNSA** – Kenneth D. Meyers (30).

Richland – John E. Cavanaugh, Jr. (30), Robert N. Reid (30). **Savannah River** – Willard R. Lyde (30). **Western Area Power** – Robert B. Grundborg (30), Edwin D. Halland (30), James C. Vacca (30), Susan H. Clark (25), M. Joyce Slawson (25), Glen F. Wickland (25).

Bonneville Power – Ronnie E. Gabbard (40), Phyllis M. Dowty (35), Paul V. Laxson (35), Gene L. Mackay (35), Robert W. Scherschel (35), Sherri J. Buel (30), John M. Hyde (30), Scott A. Lawson (30), Larry K. Massey (30),

Roger E. Seifert (30), William L. Thomas (30), Laura G. Young (30), Jon M. Bartkowski (25), Michael J. Bell (25), Kevin E. Carman (25), Kevin R. Carr (25), Glen E. Eastman (25), John M. Haner (25), Theresa L. Harty (25), Mary K. Kerr (25), Karen S. Graves Pynch (25), Douglas G. Welch (25), James A. Zinn (25).

RETIREMENTS

July 2003

Headquarters

NNSA – Roberto Perrill (13 years).

Field

Bonneville Power – Vern W. Cimmery (33), Marcelino M. Estimada (34).

August 2003

Headquarters

FERC – Karen L. Schaeffer (25). **NNSA** – Arthur E. Tryon (33). **Security** – Mary C. Shannahan (32).

Field

Bonneville Power – Gene H. Hoffman (26), Robin I. Long (20), Mary G. McCarthy (23), Garry W. Peterson (37), Ann M. Sturm (27), Barbara L. Zufelt (33). **NETL** – Douglas C. Chitester (28), William K. Dulin (36), Gary F. McDaniel (38), Carroll E. Utt (32). **Western Area Power** – Roger W. Armstrong (20), Gary M. Himmelberg (33). ❖

NEW Publications

Office of Inspector General (IG) reports: **Disposal of Remote-Handled Transuranic Waste at the Waste Isolation Pilot Plant** (DOE/IG-0613); **National Nuclear Security Administration's Planning, Programming, Budgeting, and Evaluation Process** (DOE/IG-0614); **Oversight of Shock**

Sensitive Chemicals at the Department's Ames Laboratory (DOE/IG-0615); **Reconfiguration of the Kansas City Plant** (DOE/IG-0616). The reports are available from the U.S. Department of Energy, IG Reports Request Line, 202-586-2744, or at <http://www.ig.doe.gov>. ❖

West Virginia site chosen for CO₂ research project

Drilling is underway on a 10,000-foot well at the American Electric Power (AEP) Mountaineer Plant in New Haven, W.Va., to evaluate underground rock layers as part of a Department of Energy (DOE) carbon sequestration research project. Sequestration, the capture and storage of carbon dioxide produced by burning fossil fuels, is one of several climate change mitigation technologies currently being studied by DOE.

Mountaineer was chosen as the test site for the project in part due to its location in the Ohio River Valley, which is home to many fossil fuel-fired electricity generation plants and thought to be geologically ideal for carbon sequestration. The 18-month study will determine whether the geology near the plant is suitable for injection of carbon dioxide deep into the earth, where it can be absorbed and permanently captured. A seismic survey conducted prior to drilling will further assist researchers in determining if the geography will support carbon sequestration.

The study is part of a \$4.2 million carbon sequestration research project funded primarily by DOE's Office of Fossil Energy and led by Battelle Laboratories. The project is managed by DOE's National Energy Technology Laboratory.

September 2003

AROUND DOE

DOE, Kentucky agree on Paducah accelerated cleanup

A Letter of Intent has been signed by the Department of Energy (DOE) and the State of Kentucky to enter into an agreement to accelerate cleanup at the Paducah Gaseous Diffusion Plant. The parties will work to complete cleanup activities by 2019 and have identified strategic initiatives to accelerate this date. The U.S. Environmental Protection Agency's agreement and cooperation will be sought with respect to implementing the letter.

The Letter of Intent was developed under DOE's Environmental Cleanup Reform Initiative. Initiatives for accelerating cleanup at Paducah include groundwater source term removal contributing to off-site contamination, decontamination and decommissioning of inactive facilities, investigation and any necessary mitigating actions at on-site burial grounds, and characterization and removal of contaminated soils at the plant.

Savannah River advances 'weapons into plowshares'

A new era of converting "weapons into plowshares" began in July 2003 when the first shipment of low-enriched uranium (LEU) was sent from the Department of Energy's (DOE) Savannah River Site in South Carolina to Nuclear Fuel Services, Erwin, Tenn., where it will be prepared for fabrication into fuel for use in Tennessee Valley Authority (TVA) nuclear reactors. This is a major milestone in the Highly Enriched Uranium (HEU) Blend Down Program, managed by the National Nuclear Security Administration.

At the end of the Cold War, more than 33 metric tons of HEU, a weapons-usable form of uranium, were left over in various stages of Savannah River's nuclear materials production cycle. In 1997, DOE signed a Memorandum of Understanding with TVA to investigate the commercial and technical viability of converting HEU into civilian reactor fuel.

The HEU Blend Down Program takes Savannah River's HEU and blends it with natural uranium supplied by TVA to make LEU. Considerable facility construction and modification was undertaken at Savannah River to be able to purify and blend down the uranium and prepare the material for shipment. The blending down and shipments will continue through 2007. ❖

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

Official Business