



**Pacific Northwest
National Laboratory**
Operated by Battelle for the
U.S. Department of Energy

Sharing the Excitement of Science

Breakthrough
Science and
Technology for
the Northwest

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Laboratory receives third 'Outstanding' rating

For the third consecutive year, Battelle received the highest possible rating for its operation of Pacific Northwest National Laboratory from the Department of Energy's Richland Operations Office (DOE-RL). The "Outstanding" rating was based on Battelle's performance in three main areas—scientific and technical excellence, operational excellence, and leadership and management.

"Since 1965, PNNL has used experience, innovation and forward thinking to create one of the premier multi-purpose national laboratories in the nation," said Keith Klein, manager of DOE-RL. "Whether it's leading-edge molecular and cellular biology research, earth systems science or computer science and information technology, PNNL continues to prove itself as a leader in basic science and quality research and development."

Simplifying process to speed plutonium stabilization

Finding a way to accomplish the same goal with fewer steps will save time and millions of dollars on a project that involves stabilizing plutonium at the Department of Energy's Hanford site.

Polycubes fabricated in the 1960s by combining plutonium oxide and polystyrene have begun deteriorating, posing storage challenges and potential environmental risks. Collaboration between Pacific Northwest National Laboratory and Fluor Hanford, which operates Hanford's Plutonium Finishing Plant where the cubes are stored, showed that the cubes could be stabilized using existing muffle furnaces at the plant.

This determination allows a costly and complicated middle step to be eliminated. The simplified process is expected to cut one year off the work schedule and save up to \$5 million. Stabilizing the 1,600 polycubes, which were used to test criticality geometries in the handling and processing of spent fuel, will begin in May.

Available technologies only a click away

Industries ready to add a solution to an environmental challenge or a process for creating advanced materials to their shopping cart can take a look at this updated online list of Pacific Northwest National Laboratory's technologies available for licensing or commercialization. Featuring technologies in areas such as advanced materials, chemicals, consumer products, energy and transportation, environment, food and agriculture, instrumentation and methods, nuclear and radiation, medical and information technologies, this site is helping make potential partners aware of opportunities to transfer technologies developed at the Laboratory to

the private sector. Check it out at <http://www.pnl.gov/hightechcomm/index.htm>.



Available Technologies

January/February 2001

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Researchers studying how wild fires affect climate



As a key participant in DOE's Atmospheric Radiation Measurement (ARM) program, researchers at Pacific Northwest National Laboratory are analyzing data collected at a climate observatory in northcentral Oklahoma following the recent fires in Los Alamos, New Mexico. The unique measurement capability of ARM's Cloud and Radiation Testbed (CART) site is providing critical information for studying the effect of forest fires on the energy budget at the surface and how biomass burning affects climate change.

The CART site collected data as smoke from the wildfires blew over its ground-based and state-of-the-art remote sensors. Of particular interest is information from sensors called lidars—laser-based remote sensors that operate in a manner similar to radar. Measurements taken with these devices help determine the properties of aerosols aloft in their ambient environment. Initial analysis showed two aerosol layers, with dust in the lower layer and smoke particles in the upper layer. Events such as the recent fires provide excellent case studies and comparison with “normal” conditions at the CART site.

PNNL receives DOE Energy 100 and Energy@23 awards

The top 100 scientific and technological accomplishments of the Department of Energy between 1977 and 2000 selected by a panel of citizen judges included five technologies developed at Pacific Northwest National Laboratory. Winners were based on their consumer orientation and their ability to save money and improve the quality of life.

- **Capillary Zone Electrophoresis Mass Spectrometry** has provided an improved ability to analyze and characterize biological samples, paving the way for medical advances. It now is used routinely in biotechnology, biological research and in a range of clinical applications and is licensed to six companies.

- **MECcheck:** PNNL turned the complex requirements of the Council of American Building Official's Model Energy Code (MEC) into a simple, yet comprehensive set of tools called *MECcheck*. Distributed to more than 25,000 users and supported by a hotline, a web site and training, *MECcheck* has influenced state adoption of the code and has been written into some states' code language.

- **ASHRAE/IESNA Standard 90.1-1999** represents the most significant new commercial building energy standard in a decade. Completed in 1999, it could lead to cost savings of \$20 billion due to increased energy efficiency as well as a decrease in greenhouse gas emissions.

- **Wide Area Measurement System (WAMS)**, a project launched by DOE in 1995, focuses on determining the information needs of the emerging power system and developing guidelines for deploying technology to meet those needs. Resulting technologies have been instrumental in maintaining the reliability of the electrical infrastructure even during deregulation and growing demand. This collaborative effort includes PNNL, the Bonneville Power Administration, Electric Power Research Institute, Western Area Power Administration, the U.S. Bureau of Reclamation and several universities.



- The judges also gave special recognition to 23 technologies selected from the list of 100 that ranked the highest for their contributions to U.S. competitiveness in the global marketplace and potential for future growth. Included in these Energy@23 awards was a PNNL-developed **process to make ultrapure yttrium-90, an important medical isotope, from the fission byproduct Strontium-90**. Yttrium-90 has been demonstrated to be highly effective for treating advanced cases of lymphoma, leukemia and solid tumors of the breast, brain and other organs.



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