Hanford Reach
Hanford Site Employee News
January 6, 2003

WAVES OF CLOUDS? This unusual photo was taken Dec. 17 by Richard D. Adams of the Hanford Fire Department from the 200 Area Central Fire Station. The view is west toward Rattlesnake Mountain at about 4 p.m. The cloud formation was over the top of Rattlesnake Ridge. To see the photo in color, go to the *Hanford Reach* Web site at **www.hanford.gov/reach**.

Battelle gives $1 million to museum, interpretive center

Battelle, operator of the Pacific Northwest National Laboratory, has pledged $1 million toward a local effort to build a new riverfront facility that will incorporate a Hanford Reach National Monument Interpretive Center as well as a greatly expanded museum for the Columbia River Exhibition of History, Science and Technology, or CREHST.

The Battelle gift to CREHST was announced at a Richland ceremony Dec. 6. At the same ceremony, CREHST and the Friends of the Hanford Reach National Monument, a local citizens advisory committee, also announced their intent to join forces to raise $10 million to design and construct the combined museum and interpretive center. The Battelle gift was intended to jump-start the campaign.

The $1 million Battelle gift will be made over five years and will depend on the citizens group and CREHST raising $2 million in matching private funds. The money will provide additional room for CREHST's cultural and historic exhibits in addition to funding the Reach interpretive center. The museum and the friends-of-the-Reach group hope to break ground on the joint facility by January 2004, on a site leased from the City of Richland near Columbia Point.

"An important part of Battelle's culture — and, by extension, PNNL's as well — is active participation in improving the quality of life in the communities where we live and work," said Battelle President and Chief Executive Officer Carl Kohrt. "This joint facility celebrates the history of the Columbia Basin and will attract thousands of tourists to the Tri-Cities. It will be a landmark not only for its content, but also for the collaboration that brought it about. It promises to be a tremendous community resource for Richland."

CREHST traces its beginning back to 1962, when the Atomic Energy Commission, predecessor agency to the Department of Energy, opened a visitors' center in Richland. In 1996, ownership was transferred from DOE to the Environmental Science and Technology Foundation.

"Our region's growth is driving increased interest in cultural activities," said Sandy Matheson, who chairs the board of the foundation. "The generous pledge from Battelle and this joint effort not only reflect this interest, but are great predictors for a successful project." ■

Former PNNL director receives Distinguished Associate Award

Last month, the Department of Energy Headquarters in Washington, D.C., presented Lura Powell, director of Pacific Northwest National Laboratory, with the Distinguished Associate Award. The award recognizes Powell's outstanding performance as PNNL's director and her efforts to lay the groundwork for innovative strategies for 21st-century contracts between DOE and its major multi-program laboratories.

Powell's long history of outstanding service to science and to the nation most recently included her tenure as the PNNL director from March 1, 2000, to Dec. 31, 2002. She previously served as director of the Advanced Technology Program for the National Institute of Standards and Technology in Washington, D.C. She also operated her own technology consulting business.

During her 28-year career at NIST, Powell received the Department of Commerce Gold Medal for her leadership of the Advanced Technology Program and the Silver Medal for building the biotechnology research program.

Under her leadership as PNNL director and a Battelle senior vice president, Battelle's contract with DOE was extended for five years, and the last two annual reviews of the laboratory resulted in "outstanding" ratings. She also enhanced the scientific capability of PNNL recently through the acquisition of two major pieces of equipment — a leading-edge $24 million super-computer and the world's first 900-megahertz wide-bore nuclear magnetic resonance spectrometer. NMR spectrometers allow scientists to determine the three-dimensional structure of molecules, and the new 900-MHz superconducting magnet will enable studies on more complex molecules and collections of cells with greater resolution than was previously possible.

During Powell's tenure, PNNL also forged a broad research alliance with public and private universities in Oregon and is working on nanotechnology projects with the University of Washington. Partnerships were also formed with Washington State University and two institutions in Idaho to develop bioproducts from farm waste.

Powell has been active in many other science, professional and community organizations, serving on a number of advisory boards and committees, including the Biotechnology Research Subcommittee of the President's National Science and Technology Council, where she was responsible for leveraging more than $4 billion in federal biotechnology research.

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Former PNNL director receives Distinguished Associate Award, cont.

She served on the National Institutes of Health's Women's Health Initiative Advisory Committee and led the Board of Overseers of the Center for Advanced Research in Biotechnology. Powell also contributed to the international dialogue on biotechnology by serving on the U.S. delegation of the U.S.-European Commission Task Force on Biotechnology and as vice-chair of the Organization for Economic Cooperation and Development Working Party on Biotechnology.

Powell was also very active in the Tri-Cities community, promoting economic growth and providing leadership in the role of science and technology in the education, work and daily lives of citizens. She served on the board of directors of Kadlec Medical Center, the United Way of Benton and Franklin Counties, and the Tri-City Industrial Development Council. Powell also served on the Junior Achievement of the Greater Tri-Cities Honorary Board.

Powell announced her decision to resign as PNNL director last summer, citing a desire for more time flexibility and a more balanced life. ■

Project will demonstrate solid waste dissolution in tank

The Office of River Protection and tank-farm contractor CH2M HILL Hanford Group have begun a proof-of-concept demonstration of a technology to dissolve deposits of solid radioactive waste in Hanford underground tanks.

The demonstration project is being conducted in Tank U-107, a single-shell tank that had originally contained more than 410,000 gallons of waste, approximately 320,000 of which are in a non-liquid form. About 90,000 gallons of liquid waste have been pumped from the tank since the fall of 2001. Now, CH2M HILL will demonstrate a method for removing the remaining solid waste.

About 100,000 gallons of solid waste, or saltcake, will be dissolved by using gentle sprays of water from a sprinkler assembly. Once in solution, the material will be pumped from single-shell Tank U-107. This task is part of a larger effort to deploy simple, proven methods of retrieving Hanford tank waste.

"This demonstration project is an important step in our efforts to develop technologies and processes that will allow us to accelerate waste retrieval to get the waste out of the tanks, as we partner with our regulators to determine how to close Hanford tanks," said Delmar Noyes, director of ORP's Tank Farms Programs and Projects.

Waste in Hanford's 177 underground tanks is in three forms — liquid, saltcake and sludge. ORP's highest priority is removing the liquid waste from the aging single-shell tanks to prevent further leaks. CH2M HILL has already removed more than 2.7 million gallons of liquid waste and is continuing an aggressive program to transfer about 390,000 gallons of liquid remaining to newer, safer double-shell tanks by October 2004.

The solid waste is also radioactive, and ORP is working with its contractors to develop technologies for its removal. Saltcake, which is the subject of the U-107 demonstration, has the consistency of wet beach sand. The technology being tested involves dissolving the saltcake with gentle sprays of water and pumping it out of the tank until the demonstration is completed. CH2M HILL plans to remove approximately 100,000 gallons of waste in this proof-of-concept demonstration.

When the original equipment was installed in 2001, crews installed sprinkler assemblies in addition to a pumping system. The demonstration project will give tank-farm engineers and DOE managers additional information in several areas.

"In addition to achieving additional risk reduction by removing long-term constituents of concern during pumping operations, this activity will provide input as we move forward to other single-shell tank-waste retrieval projects," explained Joel Eacker, CH2M HILL's vice president of Projects.

The Tri-Party agreement calls for retrieving waste from, and closing, seven Hanford single-shell tanks by 2011. The saltcake dissolution technology is one of the methods being considered for retrieving the waste before the tanks are closed. ■

PMI seeks Project of the Year entries

The Columbia River Basin Chapter of the Project Management Institute invites regional organizations to prepare and submit nomination proposals for candidate projects to enter into the 2003 Project of the Year Award competition. In its ninth consecutive year, the award is intended to recognize, honor, and widely publicize project teams for superior performance and execution of exemplary project management for projects completed in 2002.

Projects of any size, industry type and location are encouraged and eligible for consideration. PMI affiliation is not necessary. The project must be essentially complete at the time of nomination and accepted as complete by the owner or client before the award is given. There can be no restrictions on the use of the submitted information after the final date of submission. Entries are due Feb. 1.

Nominated proposals should demonstrate how the project met or exceeded owner or client needs; met or improved on budget and schedule performance compared with original goals; applied innovative, original or unique project-management techniques; and managed complex or unusual conditions or issues.

The winner of the Columbia River Basin regional competition will advance to the semi-final competition, from which three candidates will compete for the Project Management Institute's Project of the Year Award.

The top selected projects will be honored and the regional winner will be announced at the chapter's annual Project of the Year Award Banquet on March 11 at the Richland Red Lion Hotel. Prior- year winners include the Interim Safe Storage of the Hanford C Reactor in 1999 and the 101-SY Level Rise Project in 2001. Both of these projects were selected as one of three international finalists by PMI. ■

A mock-up pit at HAMMER offered Central Plateau Remediation Project workers a testing and training opportunity on a pumping system that will filter solids and transfer liquid into a tanker truck for disposal.

Nuclear chemical operator Dale Sumsion works with a pumping system that was designed by student intern Jacob Nickoloff, who worked closely with operations and radiological control personnel.

The pump design by intern Jacob Nickoloff, right, met all established criteria in an engineering review. Here, nuclear chemical operator Debby Older helps Nickoloff check the flow.

HAMMER's pit a big hit with Central Plateau workers

Ed Ham, *Fluor Hanford*

A team of workers with Fluor Hanford's Central Plateau Remediation Project found a concrete pit at the Volpentest HAMMER Training and Education Center to be just what they needed for training.

The 7-by-10-by-8-foot pit offered a crew of nuclear chemical operators, pipe-fitters, teamsters, a radiation control technician and a field-work supervisor the chance to mock up a pumping system designed to filter solids and then transfer liquid into a tanker truck for disposal. According to HAMMER program manager Det Wegener, this is the first time this particular pit has been used as a mock-up for a Hanford Site activity.

The 200 Area Facility Disposition Project has more than 200 deactivated facilities. These facilities are kept in a minimum safe surveillance mode until authorized for demolition. Through characterization, various waste streams of both solids and liquids requiring disposal have been identified. Being able to simulate field conditions helps workers to do the job more smoothly. In simulations and tabletop discussions they can work out any roadblocks that may have been overlooked.

Working closely with the operations and radiological control groups, student intern Jacob Nickoloff designed the pumping system. An engineering review determined that the new pumping design met all the established criteria. Then, through hands-on mock-up testing, the newly designed system was put to the test.

The mock-up testing provided an opportunity to operate the pump by circulating water through a manifold equipped with two filters in parallel and a sample valve. When one filter was in operation, the other remained on standby.

This configuration was based on lessons learned from the project team. It's expected to save one shift, or approximately 10 hours of work, that would have been required to change filters. Additionally, this configuration allows for continued operation without interruption when switching filters.

The expected result will be less time in the field, supporting the radiation-exposure principles of ALARA (as low as reasonably achievable). The system flow was measured by an in-line flow meter at approximately 83 gallons per minute, and up to 50 gallons per minute is suitable for most pumping applications.

The mock-up helped successfully identify ways to improve the instructions for operation of the system. It helped identify system leaks requiring repair, and provided hands-on experience for workers in a realistic field setting. ■

Central Plateau completes first post-VPP-star self-assessment

Marilyn Hodgson, *Fluor Hanford*

The Central Plateau Remediation Project's first self-assessment since being awarded Voluntary Protection Program "star" status was a success. The self-assessment and resulting report to the Department of Energy are annual requirements for preserving an organization's star status.

The self-assessment found eleven noteworthy practices and nine opportunities for improvement. The improvement opportunities have been presented to the project's senior management and the Safety Improvement Planning task team for inclusion in the 2003 Safety Improvement Plan.

The 12-person self-assessment team was made up of four non-Central-Plateau members and eight members of various groups within the project. Six had previous experience in the VPP assessment process and a few had attended DOE Voluntary Protection Program Safety and Health Program Assessment training. One member had been a part of a DOE Headquarters on-site review team.

The team used a process developed by the Hanford VPP Champions team in 2002. More than 85 formal interviews were conducted in just two days. Team members also performed facility inspections, document reviews and informal interviews to gather information.

Workers safely weld the shield plug onto a cask containing spent nuclear fuel before it is shipped from the 324 Building. During the self-assessment, employees of the Central Plateau Remediation Project indicated that workplace safety had not declined since the October 2001 DOE-VPP on-site review.

The response from employees revealed that workplace safety has not declined since the October 2001 DOE-VPP on-site review. While most areas remained positive and steady, a few specific areas had improved during the past year. In light of the transition of workscope and personnel into the project during the year, this is considered an excellent accomplishment.

The average numerical score derived by using established evaluation criteria for 32 subject areas is 8.5 out of a possible 10. The entire self-assessment report is available on the Central Plateau Remediation Project Web site at **http://apweb02.rl.gov/phmc/cprp/index.cfm? PageNum=58**. ■

'Pole' says VPP is effective

On the way to a Voluntary Protection Program self-assessment interviews at the 3769 Building, interviewer Souix Williams noticed that an electrical pole was leaning dramatically toward the river. She reported it to the manager of the building as a possible safety threat. The building manager reported it to the area building administrator, who in turn got in touch with the landlord organization. Within a few short days, Electrical Utilities personnel had inspected the pole and found it had rotted.

The proper equipment was quickly brought in to remove the rotting pole and replace it with a new one. "This is a *great* example of what the Voluntary Protection Program is all about," said Rich Kobelski, VPP assessment coordinator. ■

PFP nuclear chemical operators use a glovebox to stabilize plutonium-bearing residues.

Sand, slag and crucible residues are shown here before and after grinding. Operators needed to crush some of the chunks before final repackaging.

Plutonium-bearing 'sand, slag and crucible' repackaging completed at Plutonium Finishing Plant

Michele Gerber, *Fluor Hanford*

Last month, the Plutonium Finishing Plant staff completed repacking a large collection of plutonium-bearing residues known as SS&C (sand, slag and crucible).

Crucibles made of magnesium oxide were the forming structures in which plutonium fluoride was fired to produce plutonium metal during the weapons-production era at Hanford. The crucibles were broken to remove the plutonium metal units (known as "buttons"). "Slag" is the solid residue that was left clinging to the crucible fragments after they were broken. And excess magnesium-oxide powder from the firing of the plutonium fluoride is known as "sand." The SS&C material now awaits final characterization and shipment to permanent disposal off the site.

The completion of SS&C repackaging, finished nearly six months ahead of schedule, is an important step toward PFP's most urgent goal of stabilizing all 17.8 metric tons of plutonium-bearing product items and leftovers by February 2004. SS&C materials constitute about two-thirds (by bulk) of a large and diverse group of plutonium-bearing materials known as residues. Processing of a smaller group of residues known as "group 1 alloys" was completed at nearly the same time.

"We have a dedicated and talented team here at PFP, including all of the technical, operations, and support-and-administrative staff," said Fluor Hanford Residues Stabilization manager Brian Skeels. "Together, we work every day to respond to programmatic and physical issues to keep the residues-processing operation moving at a consistent speed with a high regard for quality and safety. As we continually beat our schedules, we all see obvious safety and cost benefits to the work we do. There is a tremendous feeling of accomplishment in this steady top-to-bottom effort."

Ten-month project

The SS&C repackaging work, which took place in about 10 months during 2002, processed more than 1,400

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Plutonium-bearing 'sand, slag and crucible' repackaging completed at PFP, cont.

cans of materials into just under 800 new billet cans. The new containers were placed inside thick vented-and-filtered plastic bags, measured to determine plutonium content and then placed inside special 55-gallon drums known as pipe overpack containers, or POCs. As such, they are destined for disposal as transuranic waste at the Department of Energy's Waste Isolation Pilot Plant in New Mexico. Shipments to WIPP are expected to begin in 2004.

The stainless-steel-lined POCs hold one to four billet cans and have secondary HEPA (high-efficiency particulate air) filtration in addition to the HEPA filtration of the bags themselves. The SS&C repackaging work involved handling a bulk weight of about 2,500 kilograms of plutonium-bearing materials, including more than 40 kilograms of plutonium.

The process of transferring the SS&C material from the old can to the new billet can was accomplished in a glovebox in the main PFP facility. Workers inspected the materials in the old cans for prohibited items and removed any materials not acceptable under WIPP criteria. Larger chunks of SS&C material were sorted in a sieve and then crushed so that each piece was no larger than an eighth of an inch in diameter. Crushing was necessary to ensure accurate measurement for plutonium content.

Once the billet can was closed and brought outside the glovebox, it was assayed (i.e., analyzed to determine its contents) for accountability purposes using a Segmented Gamma Scanning Assay System. Workers then maximized the load in each POC based on plutonium content, and placed the vented bags containing the billet cans inside the POCs.

The configuration of the SS&C material means that a small portion remains to be measured before permanent disposal, using more sensitive and complex assay devices known as calorimeters. This equipment is now being qualified and readied for use.

Work went smoothly

For the most part, the SS&C repackaging work went smoothly, according to Skeels, especially after millwright Terry Brown made improvements to the crusher, reducing the frequency of breakdowns. The SS&C crew of eight or nine people per shift could load between one and two POCs per day. "An old can could come out of the vault for processing in the morning and be packed out in a POC by the end of the swing shift," Skeels said. The work progressed faster than thermal stabilization work, as no furnace processing was involved.

As soon as the SS&C work was completed, Skeels' residues team began grinding and repackaging another large portion of residues known as OX/MOX (plutonium oxides and mixed oxides). OX/MOX processing is scheduled to be completed next November. The Residues Sub-Project is one of three major sub-projects remaining in PFP's plutonium stabilization endeavor. The Thermal Stabilization Sub-Project under Rob Cantwell began stabilizing tiny, plutonium-laced cubes of polystyrene known as polycubes last July, and is expected to complete that work in March. Cantwell's team will then begin stabilizing chlorides, and the team members expect to finish in early 2004.

Stabilization and canning of plutonium metals, led by Rob Gregory, was completed in September 2001, and Gregory's team is working to complete the canning of plutonium oxides by early 2004. The metals and oxides are being double-welded into new stainless steel "3013" cans — containers meeting stringent new specifications of the Department of Energy's Standard 3013. PFP workers completed a major effort to stabilize 4,500 liters of plutonium-bearing solutions in July 2002.

According to George Jackson, Fluor Hanford vice president of the Nuclear Material Stabilization Project, the next major tasks at the PFP complex include cleaning out plutonium that's been "held up" in old equipment, size-reducing and removing old equipment and deactivating the 60 structures in the compound by September 2006. ■

Spent Nuclear Fuel basket fabrication completed

Michele Gerber, *Fluor Hanford*

Fluor Hanford machinist George Shockley works at a lathe for the Basket Fabrication Project.

In mid-December, workers finished manufacturing all of the 2,209 copper and steel baskets needed to hold irradiated fuel assemblies for the Spent Nuclear Fuel Project. A joint project team made up of Fluor Hanford SNF Project personnel, quality control inspectors with the Environment, Safety, Health and Quality Assurance organization, and Hanford Site Operations planners, machinists, welders, sheet-metal workers, teamsters, and tool and material coordinators finished the baskets ahead of schedule and under budget.

Fluor Hanford HSO director John Wood called it a remarkable achievement. “I’m extremely proud of the way the team delivered a quality product under budget and ahead of schedule,” Wood said, “proving just how good they are. Besides that, they’re a great group of folks to be around. It’s been a tremendous project!”

As part of a vigorous quality-assurance basket verification effort, Fluor Hanford Quality Control inspector Mike Wingfield measures a basket that will be used to hold spent nuclear fuel.

The unique team, formed in 1998, met every one of 16 interim milestones early, and reduced the unit cost per basket continually throughout the life of the project. While the first production-size batch of baskets fabricated in 1999 cost $11,300 per unit, the cost of the final production lot came in at just $8,819 per basket — a decrease of approximately 22 percent. In fiscal year 2002, the basket project returned more than $3 million of its allocated budget for use in other cleanup work. At its peak, the project manufactured nearly six baskets per day.

The baskets, each weighing between 230 and 625 pounds, are about 2 feet tall and 22 inches in diameter. In total, they contain more than 1.1 million pounds of material and more than 3 miles of welding.

To manufacture the baskets, workers had to fabricate and assemble nearly 46,000 components, and they did so with less than a quarter of one percent (0.22 percent) of the parts being scrapped resulting from quality issues. Because the nuclear fuel they will hold is expected to go to a national repository, the baskets were inspected for adherence to the stringent quality-assurance standards of the Office of Civilian Radioactive Waste Management.

Workers praised

At a December celebration luncheon in the 328 Shop Building where the baskets were manufactured, Norm Boyter, Fluor Hanford vice president for the SNF Project, praised the fabrication endeavor. “Thank goodness you were here, and that you did such an excellent job,” Boyter said. “We at the SNF Project need your products, we’re using them, and you’ve always given us superb service. Thanks for a terrific job.”

Rich Slocum, HSO deputy and senior director, pointed to a key lesson that he said everyone should take away from the project. “It was essentially managed by the workers,” Slocum said, “and it shows that you can achieve excellence by listening to the people doing the work.”

Mike Butterworth, manager of Site Fabrication Services, called the baskets project a “signature success in reverse engineering” — in other words, letting the workers take the lead. “Stop for a minute and savor your success,”

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Spent Nuclear Fuel basket fabrication completed, cont.

he told the workers. “It took every single person here to make this effort work. We decided early in the process that everyone who was going to touch the baskets process or have a vote in it in any way needed to be in the same location and to function as a team. We did that, and now we can see the impressive results. You could not possibly have done better, and I congratulate each of you.”

Rex Ozment, now-retired shop supervisor for most of the project, likened it to a canoe. “There’s no such thing as the management end of the canoe sinking or the worker end sinking. If one sinks, the other does also, so it’s essential to work together.”

On-site production

In 1997, when the SNF Project was determining its procurement strategy for the many unique pieces and types of equipment it would need, there was much discussion of how, where and by whom the baskets would be fabricated. Off-site fabrication was considered.

A 1998 pre-production test run of 30 baskets by Site Fabrication Services came in over budget and with quality shortcomings. However, Fluor Hanford held a series of value-engineering sessions with workers and eliminated 75 redundant or overlapping procedures. It also identified 62 cost-avoidance items and prescribed changes to the shop and equipment layout to streamline the work processes.

All participants in the baskets project were collocated in the 328 Shop Building, along with leased computer-numeric-controlled lathes and milling machines and some machinery from the 200 West Area shops. By the time the newly organized team delivered the first production run of 60 baskets in late 1999, the quality was excellent and costs had dropped substantially.

“In a nutshell, it was a team effort,” said HSO welder Dave Bushey in a November 2002 gathering to discuss the project. “The only thing I regret is that now we’re going to lose the team.”

“There was an open book at all times to improve the product,” said machinist Floyd Mohr. “If we had an idea, management listened.”

Denny DeVine, team lead for baskets and Multi-Canister Overpacks, said the main reason for the project’s success was that craft workers “took ownership” of the project schedule. “They were totally involved as I built the construction cost estimate and schedule,” he said. “Making milestone dates throughout the project’s 39-month life was just as important to them as it was to me.”

“Pull together a dedicated team, choose well and get them all involved early” was the formula for success, according to Rich Bilskis, MCO/Baskets project manager. “This will have a major impact on how business is done.”

Quality Control inspector Mike Wingfield summed up the baskets endeavor succinctly: “I have been an inspector for over 25 years on nine nuclear plants and two DOE sites, and have never seen a more well-organized and self-disciplined organization in my career. This wasn’t a result of management’s oversight — just the opposite. It was management letting the workers do their jobs and treating them with respect.”

Also participating in the basket-fabrication endeavor were personnel with Fluor Federal Services, Lockheed Martin Information Technology, former site contractor DynCorp Tri-Cities Services, and off-site vendors including Duke Engineering, ARES Corp. and Mid-Columbia Engineering. ■

PNNL expands blood serum protein library

Staci Maloof, *Pacific Northwest National Laboratory*

Using liquid chromatography and mass spectrometry instrumentation, scientists at Pacific Northwest National Laboratory identified and characterized nearly twice as many proteins in blood serum than previously noted, which provides a greater library of proteins to study for potential use in diagnosing disease.

In a significant scientific advance, researchers at the Department of Energy's Pacific Northwest National Laboratory have identified or confirmed 490 proteins in human blood serum — nearly doubling the number of known serum proteins, according to a paper accepted for publication in the December issue of *Molecular and Cellular Proteomics*, a new journal distributed by the American Society for Biochemistry and Molecular Biology.

"We have performed the most extensive identification of proteins in serum to date," said Joel Pounds, corresponding author and a PNNL staff scientist. "We studied blood serum because it holds clues to all the major processes in our bodies. We need to know what proteins exist in that serum to know how they might be used to predict disease susceptibility, monitor disease progression or diagnose disease."

These clues include proteins that "leak" from dead and dying cells, and proteins secreted into blood or released from tumors. Identifying these proteins allows scientists to conduct additional studies to define each protein's functional role in cells and the body.

The scientific community has studied plasma, the parent component to serum, for more than a hundred years. Recent studies have primarily used a technique called two-dimensional gel electrophoresis to study proteins found in plasma, yet this method is limited in its ability to identify proteins that exist in small amounts, known as low-abundance proteins, and is labor-intensive. The identification of low-abundance proteins is important, as many of these proteins often function as "messengers" that inform cells to turn signaling pathways on or off. Such functions are central to cell death or disease development.

"After a long period of slow progress, research on the plasma proteome has begun a period of explosive growth attributable to new multidimensional fractionation methods," said N. Leigh Anderson, founder and chief executive officer of the Plasma Proteome Institute. "PNNL's work is an important early demonstration of the power of these methods, and suggests that hundreds, if not thousands, of new candidate markers will be found."

Studying the proteome of blood serum was a natural fit for scientists at PNNL, which has a strong proteomics capability. A proteome is the collection of proteins expressed by a cell under a specific set of conditions at a certain time. Through its Biomolecular Systems Initiative, the laboratory is supporting multidisciplinary research in systems biology. Scientists have developed unique technologies that allow for more thorough analysis of proteins and have studied the proteome of ovarian cancer as well as other disease states.

Pounds and his team, which included lead author and post-doctoral researcher Joshua Adkins, used chromatography and mass spectrometry instead of the more traditional 2-D gel electrophoresis to identify proteins, including low-abundance proteins not previously identified in serum and proteins with an unknown function. Their overall analysis was conducted on a single human blood serum sample from a healthy anonymous female donor.

Most serum protein consists of a few very abundant proteins. One of the current challenges in the field is that the presence of abundant proteins obscures the measurement of many low-abundance proteins, and that removal of these abundant proteins may result in the simultaneous removal of low-abundance proteins. Here,

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PNNL expands blood serum protein library, cont.

Pounds and his team kept those abundant proteins but simplified the mass spectrometry by fractionating the peptides according to charge state.

Once fractionated to allow for the analysis of lower-abundance proteins, the samples were analyzed using a mass spectrometer that had been programmed to concentrate on specific ranges of peptide size during several analyses, thereby providing a more complete analysis of the proteome. The researchers employed powerful mass spectrometers housed in the William R. Wiley Environmental Molecular Sciences Laboratory, a DOE national user facility located at PNNL.

The sample preparation and analysis approach allowed PNNL scientists to expand the range of proteins that could be identified. For example, prostate-specific antigen (PSA) was identified in the sample using this approach. The reference value for PSA is in extremely low abundance in women, along the order of less than 1 picogram per milliliter. Detecting its presence provided a control to learn how well PNNL's approach identified low-abundance proteins.

"With this study, we have taken a large step toward defining the protein composition of serum," Pounds said. "But many more steps and technological improvements are needed to move beyond these 490 proteins to the thousands of proteins that may be present in blood serum."

Pounds' paper is available online at **http://www.mcponline.org/cgi/reprint/M200066-MCP200v1.pdf**. ■

PNNL celebrates 'triple crown' of operations

Pacific Northwest National Laboratory has been recognized for its commitment to safe and effective operations with ISO 14001 certification. ISO is a standard developed by the International Standards Organization for the standardization of environmental management systems.

The Laboratory adds this honor to two additional environment, safety and health achievements — implementation of Integrated Safety Management in 1998 and the Voluntary Protection Program "gold star" status in 2001. PNNL is the first Department of Energy Office of Science laboratory to attain these "triple crown" accomplishments in ES&H.

In recognition of the accomplishments, a celebration was held in the Battelle Auditorium on Dec. 9. Roby Enge, director of PNNL's Environment, Safety, Health and Quality Directorate, said that safe, effective operations not only protect staff members and the public, but also are key in supporting the delivery of breakthrough science and technology. Enge attributed the triple-crown success to a great partnership between PNNL and the local DOE Office of the Associate Manager for Science and Technology (AMT), excellent leadership by laboratory director Lura Powell (see story, page 1) and the associate lab directors, and outstanding support from management and staff.

"I would like to challenge the lab once again," he emphasized. "The triple crown is not an end, but a beginning. We have the opportunity to make similar strides in quality, and to not just maintain but improve on our safety and environmental record." ■

HEHF offers smoking cessation classes

If quitting smoking is one of your New Year's resolutions, you may be interested in signing up for a smoking-cessation program for Hanford Site employees with Department of Energy security badges. The Hanford Environmental Health Foundation is sponsoring the free, four-class series to be held Jan. 20, 23, 27 and 30 from 3:30 to 5 p.m. at the Federal Building in Richland. John Evans of the American Cancer Society will conduct the series.

According to the Centers for Disease Control and the American Heart Association, more than 400,000 Americans die each year from smoking cigarettes. In addition, smoking-related illnesses in the United States cost more than $50 billion annually. Since 1965, the number of adult smokers has decreased significantly. However, the decline has leveled off, and the number of teenage smokers reached an astounding 4.1 million in 2000. Smoking-cessation classes have been very successful in helping people to quit and stay away from smoking.

Interested site employees need to obtain permission from their managers to attend the classes during working hours. To register, call HEHF Health Education Services at 373-3729 or send an e-mail message to *HEHF Health Education Services. For more information about the classes, contact Carol Powe of Fluor Hanford at 376-8886 or Judi Staley of HEHF at 372-0097. ■

Regular Features

NEWSBRIEFS

PTB Transfer approved for Sumsion

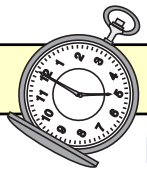
Diane Sumsion, a nuclear chemical operator in the Nuclear Material Stabilization Project, has been approved to receive personal-time-bank-transferred hours. Sumsion needs to care for her mother who is critically ill. Fluor Project Hanford team employees who wish to transfer PTB hours to Sumsion can do so by completing a PTB/Vacation Transfer Request form (Site Form A-6002-807) and sending it to Don Buechler, Fluor Hanford Industrial Relations, at S2-43. Time must be transferred in one-hour increments.

Public meetings feature 'the state of Hanford'

A series of regional public meetings in January will feature Washington State Department of Ecology director Tom Fitzsimmons, U.S. Environmental Protection Agency Region 10 administrator Mike Gearheard, Department of Energy Richland Operations manager Keith Klein and DOE Office of River Protection manager Roy Schepens to discuss the state of the Hanford Site. The meeting in the Tri-Cities area will begin at 6:30 p.m. at the Benton PUD auditorium in Kennewick on Wednesday, Jan. 29.

Agency officials, public interest groups, Hanford Advisory Board representatives and the public will discuss cleanup goals and challenges for the upcoming year. Other meeting locations and dates are: Woodland Park Zoo in Seattle, Jan. 8; Best Western Inn in Hood River, Jan. 15; and Oregon Museum of Science and Industry in Portland, Jan. 22.

For more information, call the toll-free Hanford Hotline at (800) 321-2008 or visit **http://www.ecy.wa.gov/programs/nwp/SOSpg.htm**. ✦



RETIREMENTS

Norris Johnson retirement celebration set for Jan. 10

After more than 43 years at Hanford, Norris Johnson is retiring. You're invited to stop by The Towne Crier at 1319 George Washington Way on Jan. 10 at 3:30 p.m. and celebrate this momentous occasion with him. ✦

CLASSES

Counterintelligence seminars offered by PNNL

On January 28 and 29, the Pacific Northwest National Laboratory Office of Counterintelligence will present mini-seminars sponsored by the Department of Energy Headquarters Office of Counterintelligence. These counterintelligence seminars are available to all employees. Space is limited and will be on a first-come-first-served basis. Security clearances are not required for these seminars. All of the following classes will be held in Room 1077 of the Environmental Molecular Sciences Laboratory:

- **Counterintelligence for Managers (CNA110)** — Tuesday, Jan. 28, 9-11 a.m. The audience for this seminar includes managers and supervisors.
- **The Foreign Intelligence Threat (CNA150)** — Tuesday, Jan. 28, 1-5 p.m. The audience for this seminar includes scientists and engineers traveling to sensitive countries or hosting foreign visitors, and counterintelligence and security professionals.
- **Espionage Recruitment and Human Vulnerabilities (CNA153)** — Wednesday, Jan. 29, 8 a.m.-12 p.m. The audience for this seminar includes all cleared and uncleared DOE employees and contractors for whom counterintelligence awareness is a requirement.
- **The Technical Collection Threat to Travelers (CNA154)** — Wednesday, Jan. 29, 1-5 p.m. The audience for this seminar includes DOE personnel who have ongoing or frequent contact with foreign nationals, particularly those from sensitive countries.

For more information, contact Jack Slicks, senior counterintelligence officer in the PNNL Office of Counterintelligence, at 372-6822, or Cheryl Barthuly, counterintelligence administrator, at 372-6014. Make your reservation by calling Cheryl Barthuly or sending an e-mail message to Cheryl.Barthuly@pnl.gov no later then Jan. 23.

Classes continued on next page.

CLASSES continued

PROTRAIN offers the following software classes:

- **Network Security Administration** — Jan. 13-17
- **Network Defense and Countermeasures** — March 17-21
- **Primavera Project Planning**
  P-3 601 — Jan. 20-22
  P-3 602 — Jan. 23
  P-3 603 — Jan. 24
  P-3 604 — March 19
- **Microsoft Project 2000** (Only $199 per day)
  Level 1 — Jan. 27
  Level 2 — Jan. 28
- **Crystal Reports 8**
  Introduction — Feb. 5; March 10
  Advanced — Feb. 6; March 11
- **Microsoft Access 2000**
  Level 1 – Jan. 13
  Level 2 – Jan. 14
  Level 3 — Jan. 24

Office XP classes are now available. For more information or to register, call 375-0414.

CALENDAR

Hanford Technical Library offers informational sessions this week

Proposal writers and budget-minded researchers will want to attend the demonstration on Tuesday, Jan. 7, 12-1 p.m. in the Wenatchee Room of the ETB on the Pacific Northwest National Laboratory campus. At this session you will learn to find and download full-text journal articles and technical reports, check out books and obtain technical reports from the Hanford Technical Library without leaving your office. You will also find out about resources for assembling a customer assessment and a competitive analysis using full-text databases and Web sites. Contact Karen Buxton at 372-7451 or at karen.buxton@pnl.gov for more information.

You can take a tour of the library and find out what services are available to you in the library and on your desktop on Thursday, Jan. 9, 8:15-9:15 a.m. in the library lobby of the Consolidated Information Center Building on the Washington State University campus in Richland. Contact Cheryl Wiborg at 372-7432 or at cheryl.wiborg@ pnl.gov for more information.

NMA meets Jan. 8

The Jan. 8 dinner meeting of the Hanford Chapter of the National Management Association at the Red Lion Hotel in Richland will feature creative leadership trainer Marshall Monroe speaking on "Innovation Excellence and Creative Communication." A mini-seminar entitled "Tips on Building an Effective Presentation: The First Steps" will be held at 5 p.m., or attendees may choose to participate in the social hour. The business meeting starts at 6, and dinner will be at 7. There is no charge for chapter members; the cost for guests is $20. Make your reservation by calling Lisa Hart at 376-3484 by Jan. 6.

Science anxiety and gender discussion at Jan. 10 presentation

The Society of Women Engineers; the Math, Engineering, Science Association; and the American Association of University Women will host a presentation, "Science Anxiety and Gender: 25 Years of Research," by Jeffry Mallow of Loyola University at 5 p.m. on Jan. 10 at the East Auditorium, Washington State University Tri-Cities Campus, 2710 University Drive in Richland. A reception will follow at 6 p.m. in the Commons. The event is free and open to the public. Learn more about the Society of Women Engineers and engineering at **www.swe.org**.

Calendar continued on next page.

CALENDAR continued

Adoption orientation offered Jan. 14

The Catholic Family and Child Services Office, a United Way Agency, will hold an adoption orientation on Tuesday, Jan. 14, from 7 to 8:30 p.m. at 2139 Van Geisen in Richland. This program will present an overview of adoption in Washington state. Attendees will learn about domestic infant, international, and special-needs adoptions, and tax credits available to those adopting. There is no admission charge for the orientation, but you must make a reservation to attend. Call Sandy at 946-4645 or Lin at (800) 246-2962 to make your reservation.

Increase your persuasive power at AQP and ASQ meeting Jan. 14

"Principled Persuasion" is the topic of the Jan. 14 Association for Quality and Participation and American Society for Quality dinner meeting at the Richland Shilo Inn. Presenters Larry Birckhead and Rick Martinez of Peak Performance Systems will share strategies and skills that will enable you to increase your persuasive power. Check-in and networking start at 5:30 p.m., the dinner is at 6 and the presentation is at 7. The cost is $16 for AQP and ASQ members, $18 for non-members, or $5 for the presentation only. Make your reservations by Jan. 9 by calling 547-6548, sending an e-mail message to gates@3-cities. com, or registering via the AQP chapter's Web site at **http://www.3-cities.com /~gates/AQPQuest.htm**. Click on "What's Next" for additional information about the program, speakers and a dinner menu.

Donate blood in January

The American Red Cross will hold a blood drive on Jan. 28 at the Lockheed Martin Information Technology office at 2261 Stevens Dr. The Bloodmobile will be parked outside the building. To schedule an appointment, contact Kelly Layfield at 376-6785. ❖

SHOEMOBILE

300 Area

along fence east of Wisconsin Street

Jan. 7	12 to 4 p.m.	Sound Safety
Jan. 13	2 to 5 p.m.	BC Sales

100K Area

parking lot south of MO-401

Jan. 14	7 to 10 a.m.	BC Sales

200 East Area

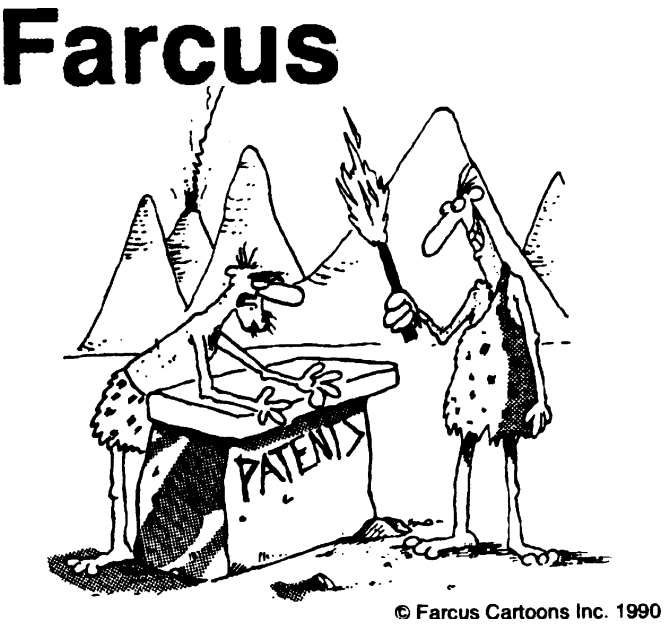
northeast gravel parking lot of 2101-M

Jan. 8	7 a.m. to 12 p.m.	Sound Safety
Jan. 14	11 a.m. to 1 p.m.	BC Sales

200 West Area

parking lot east of MO-281

Jan. 8	1 to 4 p.m.	Sound Safety
Jan. 14	2 to 5 p.m.	BC Sales



So. . . what else does it do?

Features continued on next page.

EMPLOYEE ACTIVITIES

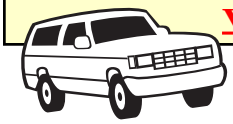
Tickets to musical, Sonics games available

The Waste Treatment Plant Employee Activity Association has tickets to a musical in Spokane and Seattle Sonics home games. Contact Jamie Chase at 371-3777 for more information and to buy tickets, which are available to all readers of the *Reach*.

Tickets to the Saturday, Feb. 22 , 2 p.m. performance of the Broadway show "Bring in Da Music, Bring in Da Funk" are available for $55 per person. The cost includes bus transportation and your ticket in the level-one seating area. The bus will leave the Tri-Cities at 10:30 a.m. After the show there will be time for you to have dinner before returning to the Tri Cities. The show stars Savion Glover and features the sounds of tap, hip-hop, blues and percussion to chronicle the history of "da beat." Tickets are available on a first-come-first-served basis and are nonrefundable.

Tickets to two Sonics games are available with bus transportation to Key Arena in Seattle. The Sonics play the Sacramento Kings on Thursday, Jan. 30 (this trip would require you to leave work early) and the Memphis Grizzlies on Friday, March 28 (this is a Friday off). The cost is $65 for tickets to each game. Seats are located in the mid-100-level seating.

VANPOOLS



Vanpool ads are run for two weeks. Ads must be resubmitted to run in subsequent issues of the *Hanford Reach*. The deadline for submission is Thursday, 10 days prior to publication.

Day and Zimmermann Protection Technology Hanford reminds employees to wear their badges. Vanpool and carpool drivers are responsible for ensuring their passengers are badged. If a passenger forgets his or her security badge, access is denied at the barricade. The individual is required to go to a badging station for a temporary badge or go home to retrieve the badge. For more information visit the Safeguards and Security Web page at **http://apweb02.rl.gov/phmc/sas**.

KENNEWICK

Seeking rider for vanpool from Richland Wye to 200W. Low fare, comfortable ride, 8x9 shift. Start anytime. Call **Fred Sargent** at 373-2106. 12/30

Rider looking for vanpool that picks up in the vicinity of Gage Blvd in Kennewick (Albertson's, Richland Wye Park 'n Ride) and travels to 200E near the 2751-E Building. Call **Sharon** at 373-1958. 12/30

RICHLAND

Vanpool No. 183 is seeking riders and backup drivers from Richland Wye to 100K, 8x9, 7 a.m. to 4:30 p.m. Leaves the Richland Wye Park 'n Ride and makes one stop at the West Richland Bypass Highway exit. Drops off at 100K central parking lot by MO-500. Contact **Amy Hay** 373-9962. 1/6

Seeking drivers and riders for a new vanpool to 2751-E area south parking lot, 8x9 shift. Starting point is Richland Wye Park 'n Ride across from Ben Franklin Transit. Leaves Richland Wye at 6:10 a.m. and arrives 2751-E area south parking lot at 6:55 a.m. Leaves 2751-E area south parking lot at 4:30 p.m. and arrives at Richland Wye at 5:20. Interested parties call **Debbie L. Thomas** at 376-1308. 1/6

Vanpool No.198 has openings for 8x9s riders to K Basins. Departs at 6:05 a.m. from the Park 'n Ride across from the Ben Franklin bus lot and stops at the Uptown in Richland at 6:12 a.m. Call **Margaret Cato** at 373-1315 for more information. 12/30

8x9 vanpool to 200E needs a rider. Rate as low as $33.50 per month. Leaves former Hanford bus lot (across from 2440 Stevens) at 6:25 a.m. and drops off at 2750-E and MO-276 (behind 2750-E). Arrives at bus lot at 5 p.m. on Mondays through Thursdays and at 4 p.m. on Fridays worked. Contact **Dave Hedengren** at 373-5094. 12/30

Van No. 195 has openings for 8x9 riders to 200E. Picks up in Richland between 6 and 6:15 a.m. Pickup points are near the Timbers apartments, Saint and George Washington Way, the 7-Eleven on George Washington Way and near the Stevens Center. Drop-off points include 274-AW, 2750-E and 2704-HV. Call to see if we can include you on our route. Contact **Patricia Kabage** at 372-0036 or (541) 990-0057. 12/30