

# REACH



A publication of the U.S. Department of Energy for all Hanford Site employees

## **PNNL science, technology help keep America safe**

Staci Maloof, PNNL

A holographic imaging system that scans people at airports for hidden weapons, a device that looks for threats and contraband in sealed containers and an innovative polymer that helps detect nerve agents are among the many counter-terrorism technologies under development at Pacific Northwest National Laboratory.

### **Acoustic inspection**

The Acoustic Inspection Device, or AID, originally was developed by PNNL for U.S. and Russian chemical weapons treaty verification and for inspection of chemical weapons stockpiles in Iraq after the 1991 Gulf War. A handheld device roughly the size and shape of a large flare gun and containing a sensor head, the AID is tethered to a personal digital assistant and linked to a data library. It can determine the contents of sealed, liquid-filled containers and examine bulk commodities, detecting foreign objects, contraband or hidden explosives. A company in Arlington, Va., is customizing AID for the U. S. Customs Service, and a similar version is being used along borders in Eastern Europe for detecting

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**PNNL scientists have developed a personal security scanner for the Federal Aviation Administration that uses centimeter waves to detect metal and plastic objects hidden on a person.**



**PUMA fibers developed at PNNL detect radionuclides and offer more flexibility than conventional neutron detection technologies.**

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The sensor, which transmits ultrasonic pulses and detects any return echoes, is positioned on the outside wall of a container. As sound waves are transmitted, the return echoes bouncing off the other side of the container are analyzed to identify the characteristics of the contents and compare those features against information in the data library. It can also measure the level of liquid in a container.

### **Airport scanner**

The millimeter wave Holographic Imaging System is an innovative technology originally designed for the Federal Aviation Administration to detect both metallic and nonmetallic items concealed under clothing — items such as plastic or ceramic handguns and knives — as well as more dangerous items such as plastic and liquid explosives.

The system uses millimeter waves that can penetrate clothing but are harmless to people. An array hooked to a transceiver uses centimeter waves to illuminate a person. Those signals penetrate clothing and reflect off the body or items concealed on the body. Another array collects those reflected signals and a computer program reconstructs the data into images of the person.

PNNL has had a holography program in place for nearly 30 years and originally developed nondestructive evaluation technologies for nuclear reactors. In the mid-1980s, the FAA became interested in the potential this technology had for scanning people passing through airports.

### **Radiation detector**

Plutonium Measurement and Analysis, or PUMA, is a revolutionary radiation monitoring system that uses glass fibers to detect the presence of radionuclides such as plutonium. This flexible, lightweight, low-power detection system can be used to monitor an inventory of nuclear materials, and it has significant potential in countering the threat of nuclear terrorism.

The innovative use of glass fibers is a breakthrough in the field of radiation detectors. Glass fibers are more flexible than conventional neutron detection technologies, most of which use rigid helium-filled tubes. PUMA's glass fibers contain lithium-6 atoms and cerium ions that detect the presence of radionuclides. The neutrons react with the lithium isotope to leave an ionization trail through the glass matrix, which results in light emission from the cerium.

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### **On-the-spot warnings**

Rapid detection of biological threats requires more than a detector. BEADS, short for Biodetection Enabling Analyte Delivery System, was created to fill the gap between dirty environmental samples containing potential biothreats and sensitive detectors requiring a purified cell, proteins or DNA.

BEADS isolates bacteria, spores, viruses and their DNA from air, dirt or water samples. The PNNL-developed technology is fully automated so detectors can analyze samples and monitor for threats without requiring a person to manually prepare the samples. Detectors can be deployed as unattended biothreat monitors.

With U.S. Navy funding, BEADS is being developed to monitor for infectious diseases that may threaten military personnel, while the Department of Energy is pursuing BEADS technology for biodetection in homeland defense applications.

### **Sensing nerve agents**

Detecting invisible vapors from chemical agents is important in monitoring the safety of air in buildings or subways and for protecting first responders to terrorist incidents.

Scientists at PNNL have developed a novel polymer material for detecting chemical agent threats. When this polymer is applied to a chemical microsensor, the sensor can detect nerve agents with high sensitivity and reliability. The polymer absorbs nerve-agent molecules from the air so the sensor can detect them.

This technology has been transferred to Microsensor Systems, Inc., for incorporation into a handheld chemical agent detector. PNNL technology has significantly increased that detector's sensitivity to nerve agents such as sarin, resulting in faster response times to lower concentrations of the substances. ♦

# CHG awards construction contracts worth \$107 million

CH2M HILL Hanford Group, Inc. has awarded separate contracts to teams led by Fluor Federal Services, Inc. and Washington Group International to provide construction services for the Department of Energy's Hanford tank farms and infrastructure for a planned tank waste treatment facility.

The contracts, which were awarded through competitive bids, have a total estimated value of \$107 million over a five-year period. CHG is the DOE Office of River Protection prime contractor with responsibility for underground tank waste.

The Fluor Federal Services and Washington Group teams were selected through competitive bidding after CHG sent out a request for proposals last summer. The master contracts call for the companies to compete for the right to do specific projects under individual contract releases. The workscope identified in each contract release will specify the construction services required. These services may include providing construction management, engineering, labor, materials, equipment and other services directed by CHG.

Subcontractors on the Fluor Federal Services team are Science Applications International Corporation and G&C Equipment Corporation.

Subcontractors on the Washington Group team are Federal Engineers and Constructors, George A. Grant, Inc., SMK Construction Companies, EESCO Electric, Cheyenne Construction and Techno General Services.

CH2M HILL Hanford Group president Fran DeLozier said competition for the work will provide the best value for the American taxpayer. "The contract that CH2M HILL Hanford Group signed with the Office of River Protection in January 2001 calls for doing more than \$300 million of work over the next six years that is not in the funding plan," DeLozier said. "To successfully execute this contract, we must find efficiencies and do more work for less, so we will be looking for the best value in all of our contracts." ■



## Picture Pages



**OPERATION THANKS:** (From left) Bill Ferree, director of Fluor Hanford Infrastructure, Fire Chief Don Good and John Wood, Fluor Hanford vice president of Hanford Site Operations, recently handed out turkeys and thanked HSO employees for their accomplishments this year. This photo is of the turkey giveaway at 6290 in the 200 East Area. More than 100 of the turkeys were donated back to the project and distributed to local food banks and needy families in the Tri-Cities and Yakima areas.



**VAN FOR VETS:** Citing the Veterans Day theme "We Have Not Forgotten," Bechtel donated the final \$2,700 needed by the Tri-Cities Chapter of the Disabled American Veterans to purchase a new 15-passenger van. The much-needed van replaces one used to transport local veterans to and from clinics and hospitals. The donation was highlighted during this year's Veterans Day recognition ceremony at Columbia Basin College. Bechtel's Bob Potter (right) is shown with Fay Lyon and Ruth Hammer of Disabled American Veterans.

# ORP symposium draws Northwest small businesses

More than 950 people attended the River Protection Project Small Business Vendor Symposium at the Trade, Recreation and Agricultural Center in Pasco on Nov. 15. The purpose of the symposium was to help small business owners learn how they can be a part of the River Protection Project.

Bechtel National, Inc., the Department of Energy's prime contractor to build the Waste Treatment Plant, has \$1 billion available for small-business opportunities over the 10-year contract period. CH2M HILL Hanford Group, Inc., DOE's prime tank-farm contractor, has \$41 million available in fiscal year 2002 to subcontract with small businesses. The two contractors joined the Office of River Protection and the Tri-City Industrial Development Council in sponsoring the symposium.

The morning began with introductory remarks from Harry Boston, manager of DOE's Office of River Protection. The symposium featured special speakers Clark Mather, a representative of Sen. Maria Cantwell's office; Joyce Olson, the district director for Congressman Doc Hastings; Richard Hopf and Theresa Speake, directors of the DOE Headquarters Offices of Procurement and Assistance Management and Economic Impact and Diversity, respectively; DOE Richland Operations Office Deputy Manager Mike Schlender; CHG President Fran DeLozier; and BNI Project Manager Ron Naventi.

After the opening remarks, vendors had the opportunity to ask questions of senior ORP, BNI and CHG procurement representatives Mike Barrett, Betty Euteneier and Tony Veirup. An open forum filled the afternoon with prospective vendors who met with all RPP and other Hanford contractor buyers and technical representatives. Also participating were staff members of the Small Business Administration and Washington State University, plus Washington State small business advocates.

"It was probably one of the most useful events we have attended as a company," said James Henderson, account manager for Software Technology Group in Portland. "It was almost overwhelming to have such good information." ■



At the ORP Small Business Vendor Symposium Nov. 15, ORP Manager Harry Boston introduces panel members (from left, seated) Joyce Olson, Clark Mather, Richard Hopf, Theresa Speake, Fran DeLozier, Ron Naventi and Mike Schlender.



CHG President Fran DeLozier greeting a vendor.

# December anniversaries commemorate key dates in Hanford's history

Michele Gerber, FH

This coming Friday, Dec. 7, will mark the 60th anniversary of the attack on Pearl Harbor, the startling event that propelled a divided and ambivalent America into total war. Pearl Harbor presaged the birth of the Hanford Engineer Works, former name of the Hanford Site. It was the very reason our site was created as the mightiest ordnance plant in the World War II United States.

Later this month, on Christmas Day, we will note the 10th anniversary of the official breakup of the Soviet Union, the Cold War adversary that fueled Hanford's production for more than 40 years after World War II ended. Indeed, Hanford might have been decommissioned and shut down in the late 1940s if the Atomic Energy Commission, created in 1947, had not decided that increased production at the site was needed to combat ominous new developments behind the "Iron Curtain."

Awash in memories, we at Hanford in the 21st century cannot help but reflect on who we are today, the way we were and our unique role in American history. Especially in light of the events of Sept. 11, 2001, questions about our legacy and heritage in this old arsenal site beg to be examined. What do we have in common with those Hanford warriors of the 1940s, and how are we different?

## War clouds loom

Before the explosive attack on the U.S. Naval base at Pearl Harbor, Hawaii, on Dec. 7, 1941, the U.S. had witnessed (but largely remained separate from) more than six years of war in other parts of the world.

In October 1935, fascist Italian dictator Benito Mussolini invaded Ethiopia. When the League of Nations (vaguely a predecessor of the United Nations) protested, Italy simply withdrew and formed an alliance called the "Axis" with Nazi Germany.

In the summer of 1936, fascists in Spain revolted against the existing government, initiating the Spanish Civil War. This conflict inspired Ernest Hemingway to write *For Whom the Bell Tolls*, a classic book that warned, in the simple terms of human suffering, that when the bells of fascism tolled the death of a small country, the whole world was at risk. Yet, to many, these events in distant parts of the world were seen as unrelated and irrelevant to life in the United States.

In September 1939, Hitler's armies overran Poland. A year later, Japan, already assaulting China, signed the Tripartite Pact with Germany and Italy, extending the Axis alliance. In June 1940, France fell to Nazi forces, and a year later Hitler turned against its sworn ally and invaded the Soviet Union.



The Hanford Engineer Works Christmas celebration in 1944, three years after Pearl Harbor, occurred as the site rushed to finish construction of plutonium facilities. Less than eight months later, a bomb containing plutonium from Hanford would help end World War II.



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## December anniversaries commemorate key dates in Hanford's history, cont.

These events, together with the “blitzkrieg” (lightning war) over London, generated wary attention and a growing sense of unease in the United States. By October 1941, more than 200 Allied (mostly English) ships had been sunk. That same month, the famous Reuben James became the first American warship to be sent to the bottom by German U-boats while escorting a convoy of the British Royal Navy.

The United States was already helping the Allies with massive materials programs, notably the Destroyers-for-Bases Agreement and the Lend-Lease Act. This country instituted the first peacetime draft in its history in September 1940, and President Franklin Roosevelt declared a state of national emergency in May 1941.

Still, many Americans believed that the conflicts then boiling in the world were simply extensions of the power-brokering and territorial struggles that had plagued Europe, Africa and Asia for millennia. A well-organized “America First Committee” held huge rallies in Madison Square Garden and elsewhere, arguing sincerely that it wasn't in America's best interests to send U.S. citizens to help one dictator, tribal king or warlord oppose another. This “great debate” raged until the very morning of Dec. 7, 1941, when America Firsters, along with all others, witnessed the Pearl Harbor attack and abruptly joined other Americans in waging the war now thrust upon them.

### End of innocence

Until that fateful Sunday morning, Americans merely watched the world, mesmerized by flickering newsreels narrated in stentorian voices and flourishing phrases. Teenagers and young men, soon to become the heroes of the “greatest generation,” tell me they often laughed uproariously during the newsreels showing Hitler speaking to German crowds. Not understanding the horrific and racist German words, they saw only a smallish man with a funny mustache gesticulating wildly and working himself into a frenzy. He seemed like a buffoon, and they laughed because they did not know he was about to change their lives.

People in 1941 got married, went to movies that included “Citizen Kane” (the year's favorite), danced to Benny Goodman and Glenn Miller and shopped for Christmas up to and including the abnormally balmy Dec. 6.

The next morning everything changed, as innocence and isolationism ended; hurt and the instinct to defend one's home took over. Along Battleship Row just off of Ford Island inside snug and lovely Pearl Harbor, a few miles west of Honolulu, more than half of the entire U.S. Naval force was destroyed in less than three hours.

The Arizona was hit worst of all. Early in the attack, it received a blast through the starboard side that went straight into the magazines and aviation gasoline. Flames shot more than 400 feet into the air, and the ship went down within minutes, killing 1,177 men (almost half of the total number who died at Pearl that day).

After the West Virginia sank, several men aboard were trapped in the forward pump room, where they lived until nearly Christmas. Despite rescue attempts, they could not be reached. Amidst the other burning ships, many died of burns and blast effects (mostly concussions), some drowned, and some who survived got so much oil in their eyes that they could not see for days. In all, 2,403 Americans died, 1,178 were wounded, and 347 planes were destroyed or disabled.

The U.S. response was swift — a declaration of war the next day, and President Roosevelt's resonant phrase that the date was “a day that will live in infamy.” Germany and Italy, through the Axis agreement,

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## December anniversaries commemorate key dates in Hanford's history, cont. (2)

pledged mutual aid to Japan, and declared war on the United States on Dec. 11. Our own alliance with England, and theirs with Australia and several British colonies, brought in much of the rest of the world. Norway, Denmark, the Netherlands, Belgium, Austria, Czechoslovakia and much of the rest of Europe had already been conquered by the Nazis.

### America responds

In America, young men left their homes the very afternoon of Dec. 7 to enlist in the armed forces, standing in huge lines that snaked around many city blocks. They simply never went back to school. During this incredibly tragic time, they weren't home to open Christmas presents already purchased before the bombing, and some never came back to open them at all. Women joined the services to work as nurses, stenographers and cooks, or they wrapped bandages and collected scrap cans and other items to aid the war effort. Everyone experienced shortages.

But for those people in late 1941, the news got steadily worse. The attack on Pearl Harbor was just the opening salvo in a coordinated series of blows by the Japanese. The U.S. Army base at Clark Field in the Philippines was attacked on the same day as Pearl Harbor, with half of the Air Corps equipment there demolished. Guam was attacked and conquered on Dec. 10, Wake Island on Dec. 23.

On Dec. 22, Japanese forces landed both north and south of the Philippine capital of Manila, at Lingayen and Luzon respectively. They began simultaneous marches to the capital and took Manila on Jan. 2, 1942. U.S. General Douglas MacArthur withdrew his troops far to the south, to a narrow peninsula along Manila Bay called Bataan. American troops held out there, starving and unreinforced, until they surrendered in early April. They walked for many days in a horrific parade known as the "Bataan Death March" to prison camps in the Philippines, where many stayed for almost three years.

One of these soldiers, a Prosser resident, later wrote his story in a heartwrenching book called *1051*, named for his prisoner-of-war number. (Millard Hileman's book, self-published in 1992, is available at local bookstores and libraries. In the book, Hileman tells dramatically how the atomic bomb made from Hanford plutonium saved his life in 1945.)

British Singapore fell to the Japanese on Feb. 15, 1942, along with Burma on Feb. 27 and Java in the "Dutch East Indies" on March 9. In less than six months, the Japanese had seized more than a million square miles of land and come to dominate nearly the entire western half of the Pacific Ocean. More than 150 million people had been subjugated. Most of this happened in just the time that has elapsed since this year's Sept. 11 terrorist attacks.

The Allies didn't get a major victory in the Pacific until the Battle of Midway, an island just northwest of Hawaii, in June 1942. The battle cost the lives of 307 Americans, 150 planes, a destroyer and an aircraft carrier. From that point forward, the Allies began an arduous trek lasting more than three years to reclaim from Japan the Pacific territories taken so quickly.

### Hanford's role

Ironically, in the same month the Japanese attacked Pearl Harbor, the Uranium Committee of the federal Office of Scientific Research and Development (OSRD) decided to sponsor an intensive research project on

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## December anniversaries commemorate key dates in Hanford's history, cont. (3)

plutonium. This strange new substance had been isolated for the first time just nine months earlier in a University of California laboratory by Professor Glenn Seaborg. The OSRD placed the research contract with the University of Chicago's Metallurgical Laboratory.

From then on, the war proceeded on two tracks. The military track was reported in headlines around the world. The scientific track was conducted entirely in secret.

In the same month as the Battle of Midway, the Army Corps of Engineers formed the Manhattan Engineer District to construct industrial-size plants to manufacture the plutonium and uranium being investigated by Met Lab scientists.

Six months later, just as the nostalgic wartime song "White Christmas" was topping the charts, Colonel Franklin T. Matthias and two engineering scouts from the DuPont Corporation visited the future Hanford Site. On the evening of December 31, 1942, Matthias reported to General Leslie Groves, chief of the Manhattan Project, that the Hanford region was "ideal in virtually all respects" in terms of the criteria defined for the plutonium production site.

In March 1943, as construction began at Hanford, the Allies inflicted heavy losses on the Japanese in the Battle of the Bismarck Sea. In Europe, Allied bombing of the Ruhr Valley began.

Parallels continued on the two war fronts — the battlefield and the home front of science and secrecy. Each had its milestones, its discomforts, examples of extraordinary personal dedication, near-misses and vast unknowns. And through all the trials on both war fronts, people on the ragged end of exhaustion encouraged each other with the slogan "Remember Pearl Harbor." Signs at HEW carried these words. Whether shouted on the battlefield or spoken softly with a nudge and a meaningful glance, these words inspired a whole nation of people and bound them together in a common cause.

### Americans together

When I was in high school, we were called to assembly every "Pearl Harbor Day" to listen to fathers who were World War II veterans (as most were). That was less than 25 years after Pearl Harbor. Today, to high school students and to many of us, that war seems as much in the past as the American Revolution.

Until this past Sept. 11, the World War II figures portrayed in "Pearl Harbor," "Saving Private Ryan," "The Thin Red Line" and other popular movies, or in Tom Brokaw's books about "the greatest generation," seemed at once distant, ordinary and larger-than-life. In photos of World War II Hanford, we see serious-looking men with slicked-back hair and bulky clothes. We see squat-looking vehicles with huge rolling fenders and "bug-eye" headlights. In the context of our world of microchips and palm-sized computers, we have questioned many of the decisions made at the wartime Hanford Engineer Works.

On Sept. 11, however, we learned in an instant that we are bound together — that we felt that same shock, ache and immediate impulse to defend our country as Americans did in 1941. We were just as unprepared for

**CREHST**  
**to commemorate Pearl Harbor**  
*Hear Pearl Harbor survivors  
and their spouses share  
their memories*  
Friday, Dec. 7, 11 a.m. to 1 p.m.  
The Columbia River Exhibition of  
History, Science and Technology  
95 Lee Blvd., Richland  
Adults \$350, seniors \$2.75,  
students \$2.50. No charge for  
CREHST members.

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## December anniversaries commemorate key dates in Hanford's history, cont. (4)

war, but as a nation we are going to the caves of Afghanistan as Americans went to the caves of Iwo Jima and Okinawa to seek justice for our dead. Vulgar songs and needlessly violent games suddenly seem just that: vulgar and needless. We are inspired to be our most decent, generous and selfless.

We lost twice as many Americans on Sept. 11 as died at Pearl Harbor. We lost as many Americans that day as in the entire American Revolution. We have also seen how good causes and good ideas can be hijacked in repulsive ways. Just as the good and decent religion of Islam has been hijacked by a few to "justify" terrorism, so the Japanese of the 1940s carried out their rapacious plunders of Pacific territories under the egalitarian slogan, "Asia for the Asians." As did the Americans of 1941, we have learned firsthand that evil, fear and heartache exist not just in the recesses of history.

### Cold War heritage

Less obvious than the straightforward victory Hanford helped to achieve in World War II is the role the site played in winning the Cold War. Hanford produced more than half of the total U.S. supply of weapons-grade plutonium during the Cold War. During the Cold War production years, 1947-1988, the Hanford region sometimes expanded so rapidly and monumentally that the impacts of growth were painful. Other times, cyclical federal decisions contracted the region's economy. Whether boom or bust, every citizen living here felt the impacts.

When the economy of the Soviet Union could not withstand the costs of the long years of weapons production, it collapsed, and the government followed suit in 1991. After these momentous events, Americans and former Soviets have embarked on a series of weapons cuts, cooperative agreements for converting weapons reactors to power plants, and pacts to finance and build spent fuel storage facilities in Russia. The first Russians ever to enter Hanford's Plutonium Finishing Plant toured in July 1994, and many mutual visits have occurred at weapons sites since then. In today's war on terrorism, Russian cooperation is vital and welcome.

Surely these are immensely positive signs, and we at Hanford can be proud that we did so much for our nation in the 20th century. As we face the enormous new challenges of the 21st century, let's draw upon our heritage of strength and sacrifice to guide us. ■



Before the Cold War ended, Hanford workers could not have imagined that Russian government representatives would one day visit Hanford. Author Michele Gerber, left, visits with Russian energy official Nikolai Egorov through an interpreter in 1994.

# CHG tank project runner-up in international competition

Geoff Tyree, CHG

CH2M HILL Hanford Group's work to solve problems with Hanford's once-infamous Tank SY-101 was recognized as a runner-up in the Project Management Institute's international project-of-the-year competition in November. The top award went to the Mozal Smelter Project in Mozambique, in southern Africa.

The two runner-up projects for this year's award were the SY-101 Surface Level Rise Remediation Project by CHG, sponsored by the PMI Columbia River Basin Chapter, and the Conway Bypass Project by Fluor Daniel, sponsored by the PMI Palmetto Chapter.

CHG was named as a runner-up for its work to address concerns over the buildup and occasional release of a flammable combination of gases and a growing waste crust in double-shell Tank SY-101, once known as Hanford's "burping" tank. The DOE Office of River Protection and CHG resolved the safety issues over the last two years by diluting and removing more than 520,000 gallons of waste from the tank.

Solving those problems led to the tank's removal in January from the now-closed Wyden congressional safety watch list, which required DOE to watchdog the most dangerous of Hanford's 177 radioactive waste tanks. After rigorous safety reviews by DOE, the regulators and CHG, Tank SY-101 is back in service and is expected to receive its first waste transfer in the coming year.

The PMI international competition was the final phase of a three-tier evaluation and selection process. The Columbia River Basin Chapter of PMI honored CHG in March of this year as regional Project of the Year for the SY-101 effort.

The Project of the Year Award recognizes project teams for superior performance in project management. This year's international award winner, the Mozal Smelter Project, involved the construction and commissioning of a 250,000- tons-per-year aluminum smelter.

Last year's winner was the Trojan Reactor Vessel and Internals Removal Project by Portland General Electric. ■

## Food drive opens this week

Employees of site contractors, the Department of Energy and the Hanford Atomic Metal Trades Council are joining with others for the 16th annual Hanford Community Food Drive. Their goal is to fill local food banks in time for the December holidays.

Donations of non-perishable foods are needed and will be collected in boxes to be distributed this week. Donations will be picked up from the collection boxes the week of Dec. 17 in order to be distributed to local food banks by Dec. 20. ■



# Nanotechnology a tiny world of mystery and possibility

Scientists in the classic sci-fi movie “Fantastic Voyage” were miniaturized and traveled through the bloodstream to destroy a life-threatening blood clot in a human’s brain. While miniaturizing humans is likely to remain the stuff of science fiction, using tiny molecules to prevent blood clots in humans and eat away cholesterol deposits is a real possibility. So says Paul Burrows, manager of the Pacific Northwest National Laboratory’s Nanoscience and Nanotechnology Initiative.

“Nanoscience and nanotechnology bring a new dimension to advancing medicine, solving environmental problems and reaching new heights in technical achievements,” Burrows said.

At the next Community Science and Technology Seminar Series on Wednesday, Dec. 5, Burrows will take the audience on a fantastic voyage through the world of the very small and describe a few of the many possibilities of this revolutionary science. His presentation, “Big Possibilities from Tiny Technologies,” will be at the Columbia Basin Advanced Technology Center on the Columbia Basin College Pasco campus starting at 7 p.m. Wednesday. The presentation, sponsored by PNNL and CBC, is free and open to the public.

Burrows is an internationally recognized expert in the science and technology of organic semiconductors, a type of material that potentially can transform the world of electronic circuit and video display technology. He is fascinated with what may be the ultimate in electronic miniaturization — functional circuits based on single molecules. This interest has broadened into the study of a wide range of organic thin-film and bulk materials for optoelectronic applications.

“Nanotechnology is the first major change in manufacturing philosophy since the Stone Age,” Burrows said. For more than two million years, the idea in manufacturing has been to take lumps of a material and whittle them down to build the desired object. While the tools have changed from granite axes to silicon microchips, top-down manufacturing still dominates. “Nanotechnology turns that view upside down,” he said. “Nanotechnology is designing at the molecular level and building these molecules into useful tools from the bottom up.



Burrows

“The ability to precisely combine and manipulate single atoms and molecules presents tremendous opportunities to address a wide range of society’s critical challenges,” Burrows said. “We are contributing scientific and technical resources to the nation’s knowledge and understanding of the phenomena that occur at the nanoscale. For example, we’re growing nanoscale magnetic semiconducting oxides that could be used in future-generation computing systems.”

Researchers also are studying materials on the nanoscale to see how they can be manipulated and how they might be useful. In biological applications, studies are being conducted to understand the properties of individual biomolecules and their functions in living cells. And, using leading-edge equipment at the William R. Wiley Environmental Molecular Sciences Laboratory, scientists and engineers are designing, creating and testing nanoscale systems.

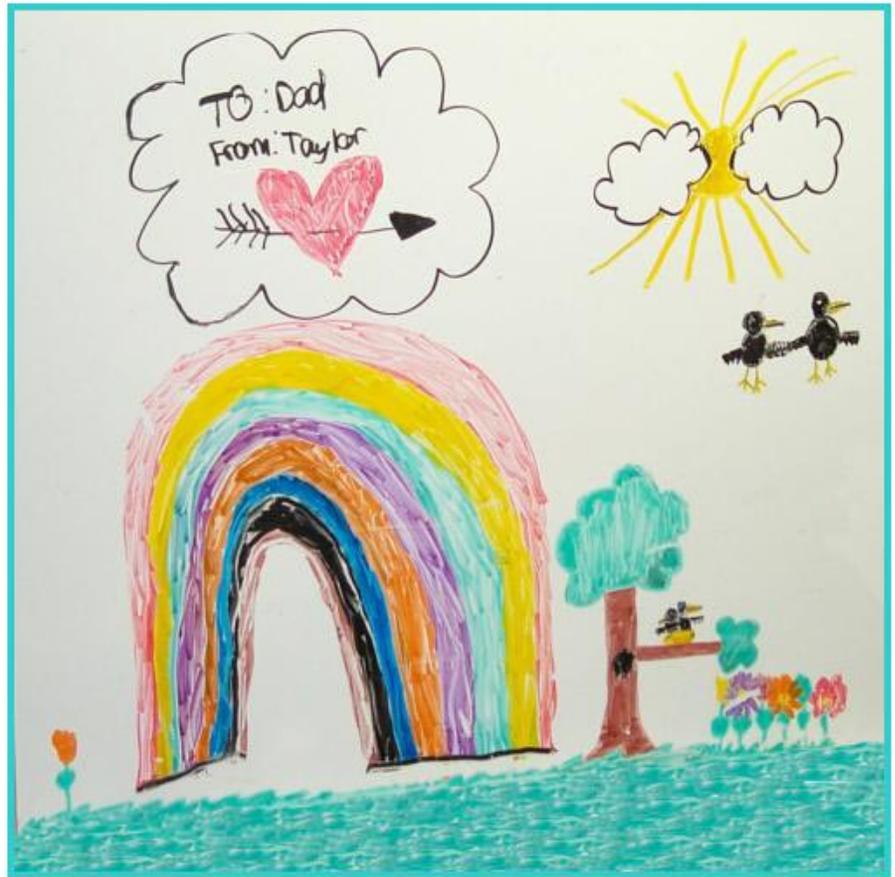
Burrows earned a doctorate in physics from Queen Mary College at the University of London. He was a research scholar at Princeton from 1995 to 2000, after which he joined PNNL. He previously held research positions at the University of Southern California and the Riken Institute for Physical and Chemical Research in Saitama, Japan. ■

# Shadow program results in safety poster

Eight-year-old Taylor Saueressig spent time last spring at the Waste Encapsulation and Storage Facility on a shadow program with her dad Paul, who is the operations and maintenance manager at WESF. While her dad was in a meeting that day, Taylor spent the time doing this 3-foot-square drawing on his white board. There were so many compliments on the drawing that Paul left it on his board for several months.

The WESF safety council saw an opportunity to use the drawing to promote safety. A photo was taken of Taylor's drawing. Patti Brinkerhoff, the WESF radiological control secretary, digitally enhanced the photo and made up the poster.

A slogan contest was developed for the drawing, with the winner to be selected by safety council members. Bobbi Anderson and Fen Simmons submitted the winning slogan, "Don't let an unsafe act take the color out of your rainbow." Bobbi is the material coordinator and Fen is the environmental compliance officer at WESF. ■



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**DON'T LET AN UNSAFE ACT TAKE THE  
COLOR OUT OF YOUR RAINBOW.**

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**WESF SAFETY POSTER**

# Regular Features



## LETTERS

Employees are invited to write letters of general interest on work-related topics. Anonymous letters will not be printed. We reserve the right to edit letters or not to accept letters for publication. Send your letters to the *Reach*, B3-30, or to \*Hanford Reach on e-mail. Letters are limited to 300 words, and must include your name, company, work group and location. Opinions expressed are those of the author and not of DOE-RL, ORP or their contractors.

## CLASSES



### Painless Punctuation Session offered Dec. 11

A few openings are available in the Painless Punctuation information session scheduled for 7:30 to 11:30 a.m. on Tuesday, Dec. 11, in classroom 12 of the Administration Building at the Volpentest HAMMER Training and Education Center. You'll learn must-know punctuation rules to avoid common mistakes as well as tips for editing your own and others' writing. Columbia Basin College faculty from the Skills Enhancement Lab will present the session. There is no charge for the session. Call Kathy Dechter at 376-3250 to reserve your spot.

Another helpful service, available at no charge through the Skills Lab, is the assessment of your basic reading, math, writing and grammar skills. You can sign up for a two-hour standardized survey of adult basic skills. After the survey is scored, you can schedule a follow-up private conference with a CBC faculty member to discuss your results and learn how to boost your skills — either by using the Skills Lab or on your own. All information is kept confidential, but you must make an appointment for this service in advance.

Two other informational sessions planned for this fiscal year are "Goof-Proofing Your Grammar" and "Successful Spelling." For more information, call Kathy Dechter at 376-3250. ♦

### Donation confusion

The Tri-Cities Day's Pay for USA organization is raising funds to replace one of nearly 90 emergency vehicles destroyed in the Sept. 11 attack on New York City.

Selected Hanford contractors including Bechtel Hanford, Bechtel National, CH2M HILL Hanford, Inc. and Eberline Services Hanford have offered payroll deduction for employees to give a day's pay. Fluor Hanford and CH2M HILL Hanford Group didn't participate in employee payroll deductions, but are encouraging employees to give a day's pay.

Recently Fluor offered a similar day's pay payroll deduction with matching funds, but the donations went to other charities including the Red Cross. There has been confusion for Fluor Hanford employees who believed their donation was going to Day's Pay for USA. If you are a Fluor employee who had a day's pay deduction, please be aware that the money did not go to the local Day's Pay for USA organization.

But it's not too late to give a day's pay. Make your check out to TCFA Day's Pay for USA and mail it to me at B4-39. A commemorative certificate will be sent to all who give.

**Lori Weidner**

*Fluor Federal Services*

**Editors' note:** Fluor Hanford also offered its employees the opportunity to cash out Personal Time Bank (PTB) time so they might donate the money to the Day's Pay for USA or other Sept. 11 relief agencies. ♦

*Features continued on next page*



# Regular Features

## CALENDAR

### Electronic Standards Database demonstration

On Wednesday, Dec. 5, the Hanford Technical Library and Information Handling Services are teaming up to provide IHS Standards database training to engineering personnel in three different locations around the Hanford Site. The following demonstrations will cover accessing the full text of most ANSI standards and all ACI, ASTM, IEEE, ASHRAE and ASME standards including the ASME Boiler and Pressure Vessel Code:

- 9 to 10 a.m. for CH2M HILL Hanford Group employees at 2750-E Building, room B103 in the 200 East Area.
- 12 to 1 p.m. for Pacific Northwest National Laboratory, Department of Energy, Fluor Hanford, Fluor Federal Services and CHG employees at the Consolidated Information Center, Hanford Technical Library, Room 101R.
- 3 to 4 p.m. for Fluor Hanford and Fluor Federal Services employees (PNNL, DOE, and CHG employees are also welcome) at 2420 Stevens Center, conference room 153.

All of these demonstrations are free of charge and no reservations are required. For more information, contact Karen Buxton at the Hanford Technical Library at 372-7451 or karen.buxton@pnl.gov.

### Give blood Dec. 10, 13, 14

The American Red Cross will hold blood drives in room 142 of the Federal Building on Dec. 10 from 10 a.m. to 3 p.m., and in the 200 East Area on Dec. 13 and 14. The 200 East Area drive will be held from 9:30 a.m. to 2:30 p.m. both days in room G-110 of the 2704-HV Building. Walk-ins are welcome, but you can make an appointment by calling (800) 787-9691.

### AQP to Tour local automotive facility Dec. 11

The local chapter of the Association for Quality and Participation will hold its Dec. 11 meeting at Motoring Services at 8920 W. Victoria (off Gage) in Kennewick. Owner Brian Johnson will provide a history of the company and share his strategies for quality and success. Motoring Services was a

recipient of the 2000 Washington State Quality Award, and the Small Business Administration named Brian Johnson Small Business Person of the Year for 2001. Networking and a light dinner are at 6 p.m., and the program begins at 6:45. The cost is \$8 for AQP and American Society for Quality members and \$10 for non-members. Make your reservation by Dec. 6. Call 547-6548 or register through the chapter's Web site at <http://www.3-cities.com/~gates/AQPQuest.htm>.

### NMA meeting scheduled for Dec. 12

The Hanford Chapter of the National Management Association's Dec. 12 meeting at the Red Lion Hotel in Richland will feature Dave Riddle, a former Hanford employee who is currently executive director of the Tri-Cities Chaplaincy. The social hour begins at 5 p.m. and the business meeting starts at 5:45. There is no charge for chapter members. The cost for guests is \$20. Call Lisa Hart at 376-3484 to make a reservation. ♦



## SHOEMOBILE

### 300 Area

*along fence east of Wisconsin Street*

Dec. 3	2 to 5 p.m.	BC Sales
Dec. 20	12 to 4 p.m.	Sound Safety

### 100K

*parking lot south of MO-401*

Dec. 4	7 to 10 a.m.	BC Sales
Dec. 17	1 to 4 p.m.	Sound Safety
Dec. 19	7 to 8 a.m.	Iron Age

### 200 East Area

*gravel parking lot northeast of 2101-M*

Dec. 4	11 a.m. to 1 p.m.	BC Sales
Dec. 19	7 to 11 a.m.	Sound Safety
Dec. 19	9 a.m. to 12:30 p.m.	Iron Age

### 200 West Area

*parking lot east of MO-281*

Dec. 4	2 to 5 p.m.	BC Sales
Dec. 19	12 to 4 p.m.	Sound Safety
Dec. 19	1 to 2:30 p.m.	Iron Age

*Features continued on next page*

# Regular Features



**H**.anford **E**.mployee **R**.ecreation **O**.rganization

**PLEASE MAIL YOUR TICKET REQUESTS TO THE APPROPRIATE LISTED TICKET SELLER** — It saves the ticket sellers' time and your tickets will be sent to you the same day.

**HRA** — Questions about the Hanford Recreation Association should be directed to Denise Prior at 376-2258.

**HERO POLICY FOR NSF CHECKS** — Associated non-sufficient fund bank fees will be passed on to check issuers. HERO will not absorb the cost.

**YAKIMA AREA REPRESENTATIVE** — Area representative is needed for Yakima. If you are interested, if your company is part of the Fluor Project Hanford team and if you have your manager's approval, e-mail Phyllis Roha.

**HOLIDAY GREETING-CARD CATALOGS** — Now available through Employee Printing Services. Books can be checked out from Marvene McChesney (T4-61) or Jan Dickinson (H2-23).

**DISCOUNTED MOVIE TICKETS** — Make excellent stocking stuffers! Limit now 10 per purchase. Carmike tickets are \$4.50 each with restrictions applying only to Sony DDS movies. Regal tickets are \$5 each and applicable restrictions are identified in the *Tri-City Herald* with a star. Yakima Mercy tickets are \$5 each with no restrictions. For Regal or Carmike tickets, send checks made payable to "HERO" to Linda Meigs (H3-12), Linda Sheehan (T4-40), Nancy Zeuge (X3-74), Michelle Brown-Palmore (A7-51) or Patti Boothe (T6-04). For Yakima Mercy tickets, send checks to Flu Garza (T4-01) or Nancy Zeuge (X3-74).

**ENTERTAINMENT BOOKS** — Are now available for \$30. Great savings with up to 50 percent off and buy-one-get-one-free offers. These books are good for the Inland Northwest area, including Spokane, Coeur d' Alene, Sandpoint, Tri-Cities and Moscow-Pullman. Send your check payable to HERO to Marvene McChesney (T4-61). There is a limited supply of books. Sales will end Dec. 13.

**TRI-CITY AMERICANS HOCKEY** — Tri-City Americans hockey vouchers are now available! This voucher is redeemable for tickets to any home game during the regulation season. Prices are \$10 for adults, \$8 for youth (13 to 17 years), and \$6 for children (4 to 12 years). Children 3 and under are free. Vouchers are good through March 2002. Contact Linda Meigs (H3-12) for tickets and more information

**SKI BLUEWOOD** — Save \$3 on lift tickets. Adult tickets are \$26, student tickets are \$22 (must present a valid A.S.B. card when exchanging the certificate for a lift ticket), child and senior tickets are \$19 (children are in first through eighth grades and seniors are 65 years and older). Preschoolers receive free lift tickets at Bluewood. Lift certificates are to be redeemed at the information desk or ticket window on the mountain for a lift ticket on the day they are to be used. Certificates are not redeemable for currency and are non-refundable. These lift certificates are not valid for the end-of-season "bash." For more information, contact Tricia Poland (T5-04).

**HERO SPONSORS FLUOR PROJECT HANFORD TEAM CHRISTMAS PARTY** — Dec. 22 at the Richland Tower Inn. Cost is \$20 pp. A buffet dinner, dancing and door prizes are featured. We are limited to 150 tickets, so buy early. Tickets will go on sale Nov. 12. Ticket sellers are Linda Meigs (2435), Emilia Salinas (2704-HV), Nancy Zeuge (100K), Sheila Kirk (M0-720 – West) and Cheri McGee (400/600). Nancie Simon and Denise Prior are co-chairs. More information will follow.

## UPCOMING TRIPS

- **Bellevue Square Shopping Trip** — Dec. 7 (an "off" Friday). Join us on this one-day shopping trip to the Bellevue Square Shopping Mall. Snacks and beverages will be provided on the relaxing bus trip. The bus will depart the Federal Building parking lot promptly at 7 a.m. Price is \$25 per person. Make your check payable to HERO, and mail it to Denise Prior (L6-81).
- **Leavenworth Bus Trip** — Last call! Join us for the tree lighting in Leavenworth on Dec. 8. The buses will leave the Federal Building parking lot at 7 a.m. and return after the tree lighting. Snacks, drinks and a movie will be provided. A \$27 per person non-refundable deposit is due to reserve your spot. Seating is limited, so reserve your space now. Make checks payable to HERO and mail to Marvene McChesney (T4-61).
- **Cariboo Spa Spoiler in Canada** — Feb. 12-17. What an unforgettable Valentine's present for that special someone! Package includes round-trip airfare from Pasco

*Continued on next page*



## H.E.R.O., cont.

to Vancouver, overnight stay in Vancouver the night before we board the train and when coming home. Includes transfer to train station, round trip on board the "Cariboo Prospector" train from North Vancouver to 100 Mile House. Transfer from the station to The Hills Health Ranch, one full massage, three nights accommodations at The Hills, pass to exercise classes, guided hikes, indoor swimming pool and all meals. This time of year there are also cross-country skiing and sleigh rides. The Hills also has other things to spoil you for additional prices. \$814 per person, \$50 per-person deposit is due to hold your spot. Then payment in full is due the middle of December. E-mail Sheila Kirk for more information.

• **Cruise the Pacific Northwest Memorial Day Weekend** — A cruise on the spectacular Radiance of the Seas from the Royal Caribbean Line will take you from Seattle to Vancouver (Canada), then to Victoria and return to Seattle. A great way to sample cruising if you've never cruised, or to just have a perfect getaway over Memorial Day weekend, no vacation time needed! Boards in Seattle on Friday afternoon, May 24, and arrives back in Seattle Monday, May 27, around 8 a.m. Rates start at

around \$356 per person, based on double occupancy, plus \$89 port charge and \$22 tax. Deposits of \$150 are due seven days after cabin confirmation with final payment due April 5, 2002. E-mail Linda Meigs for details and to reserve your space!

• **Cruise the Caribbean** — March 17-24. Travel to Ft. Lauderdale, Princess Cays (private island), Grand Cayman, Costa Maya and Cozumel, with two days sailing in between. The cost is \$1,242 ppdo inside stateroom; \$1,349 ocean view and \$1,549 with balcony. Includes port charges, transfers and airfare from Seattle. The prices may even be lower and cabins may be upgraded. \$250 deposit is due Dec. 15 and you can use a credit card. E-mail Nancie Simon if you are interested. ♦

		<p>Distribution questions: call the Mailroom, 375-5170</p> <p>See the <i>Hanford Reach</i> on the Web at: <a href="http://www.Hanford.gov/reach/index.html">www.Hanford.gov/reach/index.html</a></p>
<p><b>Keith Klein, Manager</b> DOE Richland Operations Office</p>	<p><b>Harry Boston, Manager</b> DOE Office of River Protection</p>	
<p><b>DOE Richland Operations Office</b> Guy Schein, A7-75, 376-0413, fax 376-1563</p>	<p>The <i>Hanford Reach</i> is published weekly for all employees of the U.S. Department of Energy's Hanford Site.</p>	
<p><b>DOE Office of River Protection</b> Diane Stock, H6-60, 376-4751, fax 372-1215</p>	<p><b>Deadline is 10 a.m. Thursday, 10 days prior to Monday publication. All articles are subject to editing. Consult with the Reach staff before ordering photos. Contact the editors by phone, fax, site mail or e-mail.</b></p>	
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<p><b>Bechtel National, Inc.</b> John Britton, 371-3677</p>		
<p><b>CH2M HILL Hanford Group</b> Ace Etheridge, H7-04, 376-2710, fax 373-0944</p>		
<p><b>Hanford Environmental Health Foundation</b> Jon Davidson, H1-52, 376-4414, fax 372-3139</p>		
<p><b>Pacific Northwest National Laboratory</b> Katie Larson, K1-55, 375-3698, fax 375-2221</p>		

## Regular Features

# This is last week of HEHF flu shot clinics

### Flu Shot Schedule

Area	Date	Time	Building	Room
Battelle	Dec. 3	9 a.m.- 3 p.m.	Battelle Auditorium	Lobby
Bechtel	Dec. 4	9 a.m. - 1 p.m.	Bechtel Building, 3350 G.W. Way	Assembly Room
Stevens Center	Dec. 5	9 a.m.- 3 p.m.	2440 Stevens	Conference Room 1200
Federal Building	Dec. 6	9 a.m.- 2 p.m.	825 Jadwin	Auditorium

### NEWSBRIEFS



## Security precautions increased in 100K Area

As of December 1, 2001, Hanford Patrol has instituted 100 percent badge checks and random vehicle searches at the main entrance to the 100K Area. All vehicles entering the 100K Area are now required to stop at this checkpoint. Please drive carefully, and be mindful of the signs, including speed limit signs, posted on the roadway into 100K Area.

All vehicles authorized to enter the 100K Area inner security compound will continue to be searched by Hanford Patrol at the compound vehicle gate.



### VAN POOLS

#### KENNEWICK

Vanpool No.146 to 200E, 8x9s, 7 a.m. to 4:30 p.m. Starts at Chuck E Cheese's with one stop at the Federal Building. Drops off at 2750, WESF and nearby facilities. Contact **Jim Brockus** at 372-2939 or by e-mail. 12/3

#### RICHLAND

Riders and backup drivers are needed for 8x9s shift, 7 a.m. to 4:30 p.m. Seek comfort with nine to 10 riders and one driver maximum. Van will start at Park 'n Ride on Van Giesen. Stops at 222-S, WSCF, 2704-HV and others along the way. Contact **Patti Boothe** at 373-5637 or **Steve Boothe** at 376-6812. 12/3

Vanpool No. 182, 8x9, 7 a.m.-4:30 p.m., is looking for two riders. Leaves the 2440 Stevens Building at 6:15 a.m. and will drop off at the 2750-E, 2704-HV buildings and anywhere in between. Call **Rick Janecke** at 376-3677 or **Vickie Alexander** at 373-0484. 12/3

Vanpool No. 117 has openings available for 8x9 riders to locations inside the 200W perimeter fence. Originates near Vacuum City, 1019 Wright Avenue. The 200W stops include 217-W (Fab Shops), MO-412, MO-278/MO-279/MO-287, MO-556 near the Powerhouse intersection and 272-WA/MO-720/MO-281 near CWC (due west of PFP). Contact **Gary Bush** at 372-2531 or via e-mail. 11/12

Vanpool No. 216 needs a rider and/or back-up driver. 8x9s, 7 a.m. to 4:30 p.m. This is a door-to-door vanpool. That's right, we pick you up at your home! Starts on the 500 block of Douglass Avenue, to the 100 block of Goethals, travels to Duportail, along Cottonwood Drive, over to Wright, Thayer, Van Geisen and North George Washington Way. Drops off at MO-286, 274-E, 2750-E and 2704-HV. Contact **Rich Bowen** at 373-5359. 11/12

#### SUNNYSIDE

Vanpool driver wanted. Van begins in Sunnyside, stops at 275-W/Shop in 200W and at 2750-E in 200E. Contact **Lola Webb** at 373-1241. 12/3 ♦