



Seeping in Seattle

ORNL building researchers help the Northwest's leading city deal with damage from its dampness

Seattle, Wash., is known as a city that sets national trends. A number of areas—software, strong coffee and grunge rock—come immediately to mind.

Seattle is also known for being wet.

Situated on Puget Sound between the Pacific Northwest coast and the Cascade Mountain range, the city enjoys about 200 cloudy days a year and fewer than 50 with sunshine. Much of the murkiest weather is in the winter months. In fact, some of the first Westerners to complain about the damp in that region of the country were Meriwether Lewis and William Clark, who spent a miserable winter of 1805-'06 on the Oregon coast and set back for home as soon as the weather allowed.

Quarters are more comfortable now. Seattle, one of the nation's fastest-growing areas, favors California-style architecture—stucco walls and few ornamental features. Building-code changes in 1984 resulted in buildings that were more airtight, and thus more energy efficient.

Eventually, it seems, the law of unintended consequences kicked in, aided in large part by poor-quality construction and the advent of new building materials and systems not suitable for Seattle's wet

and mild climate. Tenants, owners of buildings, architects and engineers began to notice mold and decay problems in structures, surfacing mainly in larger, multifamily buildings built after 1984.

Seattle officials, including Michael Aoki-Kramer, a code development analyst, were soon directed to ORNL's Buildings Technology Center. BTC researcher Achilles Karagiozis, himself a native of Vancouver, B.C., took on the project. He applied an innovative moisture engineering systems approach that includes a "mold growth index"—a risk-based approach to help contractors select wall designs that resist moisture and mold problems.

"The city had developed a serious moisture problem in the building envelope designs, principally with mold growing in the walls," says Achilles. "Using ORNL's moisture-engineering analysis to study typical Seattle wall systems, we ranked the performance of 35 wall designs in the city in terms of hygrothermal, or wet, performance—in other words, how the walls handle the movement of heat, air and moisture."

The problems with the rising damp have become so serious and widespread that repair bills are mounting into the millions of dollars. In addition to



Buildings Technology Center researcher Achilles Karagiozis examines mold damage on a Seattle building's roof decking.

structural damage, the damp environments around the walls and bases of the buildings have created ideal environments for molds that can produce allergens and toxins, some of which can make some people very sick.

Achilles notes that the code changes in the eighties
(See SEATTLE, page 6)

It's personal: Safety in our work places depends on how we behave

Continuing with our series of articles by members of the Leadership Team, ESH&Q Director Kelly Beierschmitt offers his perspective on safety at ORNL.

BY KELLY BEIERSCHMITT

Safety is personal. It touches our lives and the lives of those around us. *What if*—we always wore safety goggles when working with hazardous chemicals, or we maintained our work areas as though our mothers were arriving for inspection at any minute, or we read and followed labeling as we would a label on a prescription drug we were providing our children. Not because it was required by procedure but because all of us realize that sometimes bad things happen even to good people. So much of what is "required" in the name of safety recognizes that humans make mistakes—all of us.

Safety is not just what is written in our procedures. It is reflected in the way we behave—what we spend time thinking about and discussing and in the decisions we make daily. Sure, procedures are important and we should celebrate our progress toward making them clearer and more precise (i.e., the Standards-Based Management System), but they alone are not sufficient.

Together, we have made tremendous progress in environment, safety, health and quality over the past year. We have restructured and simplified nearly 30 percent of our entire procedures and policy set. By doing so, we removed an incredible volume of low-value informa-



Kelly Beierschmitt

tion from our directives system. We have also made tremendous gains in reducing staff exposure to hazards in the workplace. I was amazed to learn that we eliminated more than 104,000 kilograms of hazardous waste from our site last year alone. This is roughly twice the volume removed in any one of the previous five years. We have also cleaned up more than 40 percent of all hazardous material storage areas with 5,000 items being made available for use by others. And our safety statistics—the numbers game—continue to show good improvement. In one of our primary safety measures we have realized a 30-percent improvement in a period spanning less than two years.

Yet, I struggle with the fact that we hospitalized three valued staff members with serious work-

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Kelly

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related injuries in a four-week period this fall. Each accident was preventable. For these staff and their families, *safety has become very personal*. As for their peers and managers, many have been asking the question, "What could I have done differently to prevent these accidents?"

I haven't been able to deliver crisp answers. "We should always understand our workplace hazards ... we should seek to understand and follow procedures ... we should always expect things to go wrong and take the necessary precautions ... and when we need help, ask for it." To me these answers just don't seem adequate. I believe the true answers lie somewhere in our cultural behaviors.

We must work to move safety off of the priorities list. Priorities change. We must make it a part of our culture—not one that we write about, but one that visitors observe when they visit our Laboratory. Many companies would say the solution is in the philosophy of Behavior-Based Safety. I am not one who believes in "programs of the week" or "slogan and banner campaigns," so you may not hear me refer to BBS in many future discussions. But I do think it is valuable for me to provide some insight into what BBS means.

BBS is an approach to safety management where staff and managers put tremendous emphasis on instituting the behaviors that produce safe environments. They track and measure those behaviors and work to make them so second nature that no one would ever consider anything less. It becomes ingrained in the culture. Safety glasses in work areas, goggles when working with chemicals, lab coats in all labs, safety shoes and hardhats in all construction areas and well-organized work spaces are just a few examples.

Behavior is reflected by our personal values. Individual values are critically important to behavior. We all know examples of individuals who place a high value on their personal safety and the safety of their peers. We have also known individuals who seemed to place a low value on their personal safety. One individual's values can influence an entire group's thoughts on safety in both a positive and negative manner. In this sense each individual's behavior has an impact.

We espouse our corporate values throughout policies and procedures, the "motherhood and apple pie" stuff. We have proven that we can train our staff to recite the seven guiding principles and five core functions of Integrated Safety Management. But all too often, as the accidents that were investigated this year proved, our behavior at work does not reflect our espoused values.

ISM is a tremendous framework for safety. It is intended to make safety personal through staff involvement and line management ownership of the ESH&Q program. However, for ISM to work, we must continue to make these espoused values a natural part of doing our work. Our values must be reflected by our behavior.

Basic values are those values broadly held by a group. They guide our personal behavior and influence our individual decisions. Where safety is a basic value, staff understand what is expected of them, the values are ingrained—a natural part of doing the work. We can determine if safety is a basic value by observation. In my experience, individual leaders who hold safety as a strong personal value do more to establish a strong safety culture among their peers than all the policies management can prepare. Basic safety values need *not* be formally identified and documented. However, no company can achieve world-class safety results unless such values are in place.

With these thoughts in mind, a new element is

being added to our improvement agenda for FY 2002. It deals with improving our fundamental operational culture as reflected by our behavior. This agenda item is just now being developed and the actions that will make up this element are in their early stages. We know that management involvement and staff participation in work-place safety are critical. We also know that the sharing of lessons learned among organizations will need

We must work to move safety off of the priorities list. Priorities change. We must make it a part of our culture.

major attention. When we hear of events and share them with others, we learn. We should feel free to report close-call accidents. What we learn from them just might prevent a friend from future injury.

It is a personal goal of mine to better educate our staff and managers concerning the causes of workplace injury and the true costs associated with those accidents. We also know that a revitalized Laboratory will help. Over the course of this year I seek your input. I seek staff participation in developing the new procedures. I seek the support of those "thought leaders" within our Laboratory who can make our espoused values a basic value within our culture. None of us should forget the injuries suffered by our peers.

As you can see, I have no silver bullets, but I do know that without individual leaders throughout the organization making safety personal, we will make very little progress.

Together, we will continue to improve our procedures and tools; we will continue to reduce the hazards in the work place. We in ESH&Q will continue to work to support our Laboratory customers. And over the course of the year, with assistance from a broad cross-section of the Laboratory, I will share a better vision for improving our operational culture.

But, in the end, safety is personal. **ornl**

HFIR phasing in restart

ORNL received federal approval on November 30 to restart the High Flux Isotope Reactor, which has spent the past year in a scheduled shutdown for a number of maintenance and upgrade activities. HFIR now sports a brand-new beryllium reflector, cooling tower and beam tubes for research.

Other improvements in the upgraded HFIR will include the installation of a "cold" neutron source next year. The cold source, one of the world's brightest, will reduce the energy of neutrons, making them more usable for studying molecular-scale structures in materials, chemistry and biology, says Associate Lab Director Jim Roberto.

Once it has resumed operation, HFIR will be one of the most powerful research reactors in the country and, combined with the Spallation Neutron Source, will make ORNL the leading destination for the world's neutron scientists.



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Curtis Boles

A "stoic" Bruce Tomkins of the Chemical Sciences Division receives his annual flu shot from Health Services' Mona Dockery. Actually, the shots don't hurt, and it's a lot better than having the flu, Bruce says.

Lab Notes

What's in a name? Plenty

Bill and Liane Russell had some Mouse House business to attend to on November 13, but they didn't take their usual route to the cracked and peeling facility at Y-12. This time they drove to a patch of parking lot on the west side of ORNL.

There, under a tent, a collection of VIPs and past and present mammalian genetics researchers milled about. They were assembled to break ground on, finally, a new home for ORNL's mutant mouse colony, something that's been on the ORNL wish list for several decades. Soon a state-of-the-art research facility and home for 60,000 clean mice derived from the Lab's invaluable colony will rise in that space.

"Can we do these things?" asked 3rd District Rep. Zach Wamp. "Yes, we can. We've just got to have the guts to go for it."

In this instance, intestinal fortitude resulted in accelerated, full funding for the facility—\$12.4 million that will complete the job.

Ed Cumesty, who represented DOE at the ceremony, said that the Mouse House has "earned its place in the future."

As for the Russells, the Fermi Award-winning couple have earned their place in science history. The new facility will be called, appropriately, the William L. and Liane B. Russell Laboratory for Comparative and Functional Genomics.

Groundwork comes before groundbreaking

Groundbreakings have a symbolic role in new facilities, but any assumption that the work is just beginning would be off the mark. Preparations for the new Mouse House and other facets of the Lab's Modernization Program require hours and hours of often stressful work by the folks in engineering, procurement, legal, facilities and operations and other, myriad behind-the-scenes roles.

That's particularly the case when new ways are being explored, such as in the case of the privately

funded buildings. Even planning for new parking lots and Lab access has required a process that began long ago. And world events made even those initiatives a moving target for planners.

So when the new buildings start coming out of the ground, think of the folks who've laid the gruelling groundwork, and hope they have a restful and peaceful holiday with the rest of us.

A biothreat perspective

Energy S&T Division researcher Tanya Kuritz shared some of her knowledge with a crowd at Maryville College last month on a subject most of them had heard a lot about and wanted to know more. Tanya gave the audience, which included several local civic leaders, a valuable perspective on the threat of anthrax and other biological weapons.

That threat, despite what one might come to believe from watching too much TV, is fairly remote, largely thanks to the difficulty of "weaponizing" germs. Smallpox, for instance, is extremely difficult to weaponize because the virus dies almost as soon as it's exposed to air. "It's very hard to do," Tanya said. "The former Soviet Union had thousands and thousands of scientists working for many years to weaponize many strains of different species. They succeeded on two."

The current anthrax attacks, she said, appear to be the crude work of a nonprofessional. As for the public threat, she says the odds of contracting anthrax are four times less than winning the Florida jackpot. No one bolted for the state line to buy lottery tickets, and Tanya joined a panel of state and local figures that included a representative from the state's Homeland Security Office.

For those seeking preventative measures, Tanya recommended an effective barrier against anthrax or other infections: Wash your hands thoroughly and often with warm, soapy water.

A long driveway has its advantages

Public access to Bethel Valley Road ends on December 18. What that means for Lab and other DOE employees is a stop at a checkpoint before proceeding down Bethel Valley Road to the work place. To the public, it means they won't have access to a five-mile stretch into the Lab unless they have business or have planned a visit.

Lab officials have put in place the most effective way to enhance security in the face of the possibility of a terrorist attack, which is much different from the Cold War scenario of past decades. Security officials must now contend with truck bombs and other surreptitious incursions.

"We're essentially lengthening our driveway to provide more response time in the event someone

seeks to threaten our facilities," Lab Director Bill Madia says.

Bethel Valley Road is a DOE-owned and maintained route that's been open to the public mainly as a courtesy. ORNL ended commercial truck traffic on the route in October, a move that pleased many. The more comprehensive closure only affects a segment of the road nearest the Lab; the section that serves Clark Center Park and Bethel Valley Industrial Park remains open to the public.

Arrangements for exceptions such as spouse pickups and vendor deliveries have been made. Tours, including the public tour program, are expected to resume this spring as usual. If you're expecting a visitor, inform Visitor Services, as usual, and be familiar with the Nonemployee Processing, or NEP, system. The access controls will be "indefinite" in duration; world events will likely determine just how long that will be.

Parking: New spaces for new places

By the time the next *Reporter* comes out (our next issue will be in February), construction on the three new privately funded buildings may have begun. That means a good portion of the east parking lot could be gone. But new parking spaces will also be in place, as *Reporter* described in the October and previous issues.

The new access controls on Bethel Valley Road have allowed the parking planners to revive, to a great degree, their original plans to open the ORNL campus to parking, which will help compensate for spaces lost to new construction. New spaces include the expanded flagpole lot, now complete, and expanded and improved lots to the southeast, off White Oak Avenue where the "6026" trailers were until recently parked. A shuttle service, should it be needed, is also being considered.

Progress with the Lab's building campaign will mean new routines for many. Tim Myrick, whose modernization project duties have included parking, says parking arrangements will be fine-tuned as time goes along. "User feedback on how this is working will help us arrive at the right solution," says Tim.

Reported by Bill Cabage



Bill Madia (left) and Bill Russell chat at the Mouse House groundbreaking as Liane Russell gets it on tape.

Jim Richmond



The expanded and improved flagpole lot is one of the projects that will ease the Lab's parking crunch.

Awards Night 2001

Awards Night 2001, held November 30, had a new element this year—suspense. In many categories, Awards Night attendees were category finalists who did not know who the individual or team winners were until they were announced from the podium. For everyone, being at Awards Night represents a triumph. Following are the winning individual and team categories, followed by the finalists in those categories. Congratulations to all.

Community Service Awards

Community volunteerism for individual contributions inside ORNL

Teresa D. Ferguson. For her outstanding contributions to promoting values and diversity within the ORNL community

Finalist

Lynn D. Duncan. For consistent leadership in numerous ORNL challenges, motivated by genuine concern for others

Community volunteerism for team contributions inside ORNL

Roger Jones, Lonna Cotter, Kahra G. Gilley, Nancy E. Holcombe, C. Renae Humphrey, Greg Irby, Deborah Jenkins, Timothy K. Jones, Keith S. Joy, Beverly S. Mathis, Betsy A. Riley, Patricia Scofield, Janie Sharp, Diana L. Tucker, Ron Walli and Lora M. Wolfe. For leadership through serving as team captains in support of activities to raise awareness and money for the Juvenile Diabetes Research Foundation

Good samaritan

Claudia A. Walls. For serving as a child advocate in her community and as an advocate for the rights of the disabled through the East Tennessee Regional Human Rights Committee

Finalists

Loretta Simpson. For exhibiting a compassionate spirit and reacting to the needs of people by leading and coordinating Spallation Neutron Source Project community initiatives

Ramie Wilkerson. For her unselfish and compassionate, long-term commitment and kindness to a child in need

Community volunteerism for individual contributions outside ORNL

Tim Myrick. For his exemplary financial and personal commitment to Habitat for Humanity of Anderson County, Aid to Distressed Families of Appalachian Counties and Team UT-Battelle

Finalists

John Norman. For his long history of active leadership and dedication to his community through donation of his time, energy, money and professional expertise in support of science education, youth sports and charitable activities

Jim Rivers. For personifying the UT-Battelle commitment to Excellence in Community Service through his longtime, valuable service to and

involvement in the Coalfield community

Community volunteerism for team contributions outside ORNL

Brenda Hackworth, Keiji Asano, Gary L. Bell, Jeffrey E. Christian, Larry DeLoach, Roberta S. Grafton, Van B. Graves, James M. Hackworth, Jr., Bryan C. Hathorn, Joe Horton, Rebecca B. Kendall, Deborah W. Knox, Anthony R. Medley, Dan O'Connor, Harry Quarles, Jim Rivers, Cyrus M. Smith, Becky J. Verastegui and Mary Beth Watt. For expertly coordinating ORNL staff in an extremely ambitious initiative to build a Habitat for Humanity house and, in the process, helping to launch Team UT-Battelle

Community leadership

Ellen D. Smith. For sustained commitment to and leadership of the city of Oak Ridge in addressing important environmental issues, including legacy contamination, geologic hazards in limestone areas and greenways

Finalists

Po-Yung Lu. For outstanding leadership of the 2000 and 2001 Asian Pacific Heritage Month celebrations for DOE/ORO, contractors and the Oak Ridge community

Elizabeth Peelle. For a lifetime of achievement in community leadership and for her philosophy of putting words into action

Science communicator

Arpad A. Vass. For important contributions of his time and effort to demonstrate the relevance of his research in the area of forensics, especially the Time-Since-Death Project, to a worldwide public through magazines, newspapers and news production companies

Finalists

Glenn O. Allgood. For effectively communicating, to an international public, ORNL's leadership in the R&D areas of smart sensors, wireless sensors and prognostics and health assessment for industry

Richard A. Lowden. For his widespread and intelligent dissemination, to government and to a national audience, of information leading to an understanding of non-lead ammunition science and technology developed at ORNL

Patricia Dreyer Parr. For her commitment and innovative approaches to communicating the ecological significance of the Oak Ridge Reservation to the general public

Laboratory Operations Awards

Administrative Support - exempt payroll

Brenda W. Campbell. For outstanding support of the Organizational Review Task Force committee's two models of ORNL's organizational structure

Finalists

Walter Koncinski. For his pivotal role in gaining national recognition for ORNL's technology transfer successes through the R&D 100 Awards program

Patrick N. Rader. For exceptional service in providing financial management to the Engineering Technology Division

Administrative support, nonexempt payroll

Donna L. Moates. For sustained contributions to the Chemical Technology Division's Finance Office

Finalists
Vivian Gail Beyersdorf. For creative contributions to reshaping and managing ORNL's Study Center, a key educational science program for area students, that made possible more than \$270,000 in savings

Brenda Darlene Hickman. For her excellent administrative service to both ORNL and the Metals and Ceramics Division

Bargaining unit support by a team

Jeff Patty and Jack Crawford, Jr. For excellence in millwright support and ALARA work practices at the Radiochemical Engineering Development Center

Operations support by a team
Tim Myrick, Jon Bartlett, George Clark, Keith J. Dempsey, Tom Etheridge, Mahendra Lakumb, Steven L. Laman, Anthony R. Medley, Carlo D. Melbihess, Dell Morgan, Melessa W. Ogan, Nicole E. Porter, Crystal A. Schrof and David D. Skipper.

For transforming the UT-Battelle Leadership Team's vision for modernization of ORNL into a DOE-approved master plan that is now being executed on a scale and accelerated schedule that are the envy of the rest of the DOE complex

Environment, safety, health and quality

Sandra B. Kennedy. For promoting excellence in environment, safety, health and quality in the Physics Division and at ORNL

Finalists

Mike Harrington. For excellence in developing meaningful, useful safety documentation for the Spallation Neutron Source

John Norman. For exemplary performance and contributions to cost avoidance in support of environmental safety and health initiatives within the Chemical Technology Division

Secretarial support

Kathy Rosenbalm. For unparalleled administrative competence, strong leadership and an unfailingly cheerful attitude in her role as the Spallation Neutron Source Project's executive secretary

Finalists

Gil Farrell. For her demonstration of the highest quality of work and dedication to the success of the High Flux Isotope Reactor

Sandy Lowe. For her outstanding accomplishments in secretarial support, particularly those associated with the DOE Report on Research Opportunities in Nanoscale Science and the Nanoscale Science Research Center

Administrative and operational leadership by a front-line manager

Ronald A. Crone. For innovations and development of an exceptional maintenance and operations program in the Research Reactors Division

Finalists

Charmaine J. Foltz. For her leadership in the ORNL Animal Care program, resulting in continued accreditation and in the development of criteria for a new animal facility

Edward B. Harris. For his leadership in transforming the Work For Others Office to provide guidance and service “better, cheaper and faster”

Administrative and operation leadership by a middle manager

Suzanne A. Herron. For her outstanding leadership in developing and managing an effective project controls organization in the Spallation Neutron Source Project

Finalists

Barry A. Berven. For his leadership skills in developing new funding initiatives, developing new facilities and managing the orderly transition of research from the Y-12 to the ORNL site

John C. Sinclair III. For personal efforts in leading Building 3019 and the High Flux Isotope Reactor through extremely challenging operational readiness reviews

Science and Technology Awards

Technical support by a team

Gene Barker, Melissa A. Beckmann, Debra J. S. Carpenter, Kay Houser, Kristen A. Kerber, Darla Miller, Irina L. Pinn and Sarah G. Shinpock. For rallying in a crisis to solve a variety of problems in record time and provide the technical expertise to support a \$12.7 million funding opportunity from the National Institutes of Health for ORNL and the Tennessee Mouse Genome Consortium

R&D leadership by a front-line manager

Douglas H. Lowndes. For his innovative leadership in the development of nanoscale science

research and capabilities at ORNL.

Finalists

James F. Lyon. For his leadership in developing a novel concept for a fusion plasma device, the quasi-poloidal stellarator

William J. Reich. For his leadership role in transitioning the DOE/NN-50 U.S./Russian Transportation Security Project from Sandia National Laboratories to ORNL

R&D leadership by a middle manager

Stephen G. Hildebrand. For his exemplary leadership of the Environmental Sciences Division in establishing new scientific endeavors and excellence in operations, including ESH&Q, work force diversity and fiscal growth

Finalists

Dabney Johnson. For her outstanding management of the Life Sciences Division’s Mammalian Genetics and Genomics Section, resulting in major successes in securing DOE and National Institutes of Health funding

Marion M. White. For her outstanding contributions toward making the Spallation Neutron Source the first large-scale superconducting proton accelerator in the world

Early career award for engineering accomplishment

Warren Everett Dixon. For innovative advancements in the application of energy-based analysis for stabilizing nonlinear engineering systems and for exceptional early career achievements in robotics research and engineering

Finalists

Michael A. Guillorn. For his development of foundational nanostructure processing techniques and methods

Jan Kosny. For his outstanding contributions to the

Energy Division’s Building Thermal Envelopes Systems and Materials program

Engineering development by a team

Jim Hardy, Philip R. Bingham, Matt Chidley, Timothy F. Gee, James S. Goddard, Gregory R. Hanson, Kathy W. Hylton, Karen Moore, Jeffery R. Price, Chuck Schaich, C. E. Thomas, Jr., Kenneth W. Tobin, John C. Turner, Edgar Voelkl and G. R. Wetherington, Jr. For overcoming significant challenges in a very short time to produce the first-of-a-kind, direct-to-digital holographic prototype wafer defect detection system

Distinguished engineer

Kenneth W. Tobin. For establishing an internationally recognized program in computer vision technologies applied to industrial inspection, semiconductor metrology and yield management

Finalists

Calvin M. Hopper. For sustained and dedicated leadership in developing guidance, tools and innovative concepts to further the discipline of nuclear criticality safety

Bradley E. Nelson. For developing, analyzing and evaluating novel magnetic fusion concepts

Early career award for scientific accomplishment

Jizhong Zhou. For his innovative scientific leadership in microbial ecology and pioneering efforts in applications of genomic/molecular technologies to environmental studies

Finalists

Ian M. Anderson. For his outstanding contributions to the science of electron microscopy and the development of electron beam microanalysis techniques for materials research

Mark D. Lumsden. For the discovery and understanding of a new phenomenon in magnetism, an exotic field-induced spin reorientation transition not previously observed

Scientific research by a team

Steven Paul Hirshman, David Alban, Donald B. Batchelor, Lee A. Berry, M. J. Cole, Amanda J. Deisher, G. Y. Fu, James F. Lyon, William H. Miner, Peter K. Mioduszewski, Donald A. Monticello, Bradley E. Nelson, David A. Rasmussen, Raul Sánchez, Donald A. Spong, Dennis J. Strickler, Prashant M. Valanju, Andrew S. Ware and David E. Williamson. For research on the physics of plasma confinement in three-dimensional systems, leading to the development of the quasi-poloidal stellarator concept

Distinguished scientist

Herb Mook. For outstanding scientific leadership and pioneering experiments in the application of neutron scattering to materials research

Finalists

David L. Greene. For his seminal interdisciplinary research in engineering, statistics and the social sciences, directed toward informing public policy on transportation-related energy use and environmental impacts

Steve Lindberg. For his pioneering science in the measurement and understanding of biogeochemical cycles and his mentoring of new scientists through collaboration

Director’s Awards

Outstanding team accomplishment

(Chosen from among team award winners in all categories) Gene Barker, Melissa A. Beckmann, Debra J. S. Carpenter, Kay Houser, Kristen A. Kerber, Darla Miller, Irina L. Pinn and Sarah G. Shinpock. For support of ORNL’s efforts toward National Institutes of Health funding and the Tennessee Mouse Genome Consortium

Outstanding individual accomplishment in community service

Tim Myrick. For his exemplary financial and personal commitment

Outstanding individual accomplishment in Laboratory operations

Ronald A. Crone. For his work in the Research Reactors Division

Outstanding individual accomplishment in science and technology

Herb Mook. For outstanding scientific leadership and pioneering experiments in the application of neutron scattering to materials research



Myrick



Mook



Crone



The team of Barker, Beckmann, Carpenter, Houser, Kerber, Miller, Pinn and Shinpock

Photos by
Curtis Boles

Seattle

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set ventilation requirements that called for at least eight hours of “fresh”—damp—air to be put into the buildings each day. The code changes also boosted insulation ratings from R-11 to R-19.

“There is no question that bringing in outside air is good for the internal environment. But, depending on how you supply the air, internal pressures are formed that in some instances, while it’s good for the occupants, cause additional harm to walls,” he says.

Exacerbating the problem was a growing population density—more people in less space—and a preference of those inhabitants for the California style—flat roofs and sheer stucco walls with few overhangs that shed water. Stucco in a dry climate is one thing, but any roofer will tell you that water will get in anywhere it can, and the same is true for walls, particularly in wind-driven rain, says BTC Group Leader Andre Desjarlais.

“The designs increased the amount of water on the walls,” Andre says. “Insulation makes the outside of a wall cold. Water condenses on it. In the past, when

buildings were leakier, the moving air had a drying effect. Restrict that flow, and with hot air inside and cold outside, you have convection transports, and the moisture finds a cold surface and condenses.”

The airtight designs, complete with polyethylene barriers and with a different stucco mix that is also less porous, give the moisture nowhere to go. The water is stored and eventually gets into the walls.

Achilles, Andre and Seattle officials surveyed 74 structures built between 1984 and 1998. They estimated \$100 million in repair costs to fix just those buildings, which represented only six percent of Seattle’s multifamily structures built between 1984 and 1998. Figure in all the multifamily buildings with moisture damage problems, and repair costs could total into the billions of dollars.

The BTC team is taking a “holistic approach” to the problem—a trademark of ORNL’s research into complex systems such as building design.

“We take the whole building system into account—energy, air and moisture,” Achilles says. “This includes the heating, ventilation and air-conditioning system; the washer and dryer; the shower; or anything that creates an internal load. Then we take data from the mold expert models and build that data into a mold-growth model that takes into account variables such as weather.”

The ORNL approach promotes designs that have the maximum drying performance. That means getting rid of polyethylene moisture barriers that create sauna-like situations inside the walls. Recommended instead are two layers of building paper to which the stucco is applied, which creates drainage

and air channels for ventilation to help the wall to breathe and dry out.

“Mold is the biggest item in the building envelope design. Once it gets established it is almost impossible to get rid of,” says Achilles.

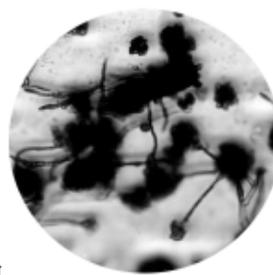
“The best way to prevent it is to develop systems that prevent moisture

Such building systems might include desiccant dehumidifying systems, polyethylene barriers with “smart retarders” that allow a selective flow of vapor at different relative humidities, and gutter systems that channel water away from buildings.

Achilles also points out that crawl spaces under houses are particularly nasty places for mold, and concrete pads that structures are built upon should be properly drained.

The BTC hopes to convince building materials manufacturers to submit building materials for hygrothermal testing at the user center. There is also a free downloadable computer program for builders to use.

In the meantime, Seattle’s weather isn’t expected to get any drier. Although the city receives a fairly normal amount of rainfall compared with other cities, in the past few decades the weather’s been rainier. Other places with similar moisture problems



This moisture damage inside a stucco wall is typical of the problems that have beset many newer buildings in Seattle, in many cases also bringing on problems with mold (upper left).

include cities in British Columbia, Minnesota and Texas.

ORNL’s moisture-engineered wall systems will be one of a number of BTC systems and standards that will help builders and tenants of the future balance their energy efficiency goals with the durability and quality of their buildings.—B.C. [ornl](#)

Moisture damage to Seattle’s multifamily buildings could cost billions to repair.

ORNL scores high in EM science project grants

ORNL has landed more than one-fourth of the latest round of Environmental Management science funding allotted by DOE. The Lab also proposed about one-third of the projects that were funded.

ORNL’s funding for the series of three-year projects amounts to just over \$11 million.

The EM projects include deactivation and decommissioning, or D&D, research projects and high-level waste research projects aimed at solving some of the nation’s most complex environmental cleanup challenges.

“I’m dancing and turning cartwheels. What a credit to our scientists!” says an elated Environmental Technology Program Director Cindy Kendrick. She estimated that ORNL received 28 percent of the funds. Of 13 D&D projects funded by DOE, seven are ORNL projects; of 32 high-level waste projects, eight are ORNL projects.

“We are delighted to have this opportunity to apply ORNL expertise and resources, in partnership with other research institutions, to solving the tough environmental cleanup problems of the Department,” Cindy says.

DOE’s EM projects covered in the announcement involve 21 universities, eight DOE labs, one other government institution and a private firm. “The projects outlined are designed to apply advanced scientific research and initiatives to make significant

strides in nuclear waste cleanup efforts at various DOE sites,” Energy Secretary Spencer Abraham said. “The success of these programs and the success of the Department’s Environmental Management Science program will be measured in actual cleanup results, and we expect these programs to deliver.”

ORNL’s D&D projects funded include collaborations with Washington University, Louisiana Tech University, Tulane University and the University of California. They include research into the areas of laser ablation, nanoparticle formation and analysis and sensors as applied to characterization, D&D and robotic-system advances.

The high-level waste proposals include collaborations with Pacific Northwest National Laboratory; the Savannah River Technology Center; Penn State University; the University of North Texas; the universities of Tennessee, Alabama, Mississippi and California; and Tufts University. Subject areas in the HLW research include various areas of waste characterization, separation and extraction toward development of technologies to characterize, retrieve and treat waste concentrates and dispose of radioactive waste stored in underground storage tanks at DOE facilities.

Cindy credits the Lab’s success with this round of the EMSP to those who prepared and reviewed the proposals. “In terms of numbers of awards, this has been our best EMSP year yet,” she says.—B.C. [ornl](#)

Compensation plan for 2002 moves toward market-competitive goals

ORNL's Compensation Increase Plan for 2002 has been approved by DOE's Oak Ridge Office. Salary increases for salaried, non-bargaining-unit staff will be effective in January 2002.

Highlights of the 2002 salary program, outlined recently by ORNL Compensation Manager Mike Willard, include

- a 15-month merit program;
- completion of a three-year plan to adjust the salaries of ORNL's research and development staff to the external market;
- targeted adjustments for some nonexempt and exempt non-R&D staff whose salaries were also lagging the external market; and
- continuation of ORNL's current variable-pay programs.

In recognizing both the change of the annual focal date for 2002 salary increases from October 2001 to January 2002 and the resulting extension of the FY 2001 performance review period from 12 to 15 months, the 2002 CIP will actually represent a 15-month salary program, says Mike. For example, an employee who receives a five-percent merit increase in January 2002 would have received a four-percent increase (approximate annualized amount) under a regular 12-month program, assuming all other considerations are the same (i.e., no difference in performance rating, current salary, reference pay zone, etc.).

According to Mike, "It is important to recognize that salary increases are based upon performance and the value of employee contributions and, as a result, vary from individual to individual." Factors considered by managers in the determination of individual salary increases include an employee's performance rating for the completed review period, present salary in relation to the market average (reference pay zone) for comparable jobs in the

external market, salary relationship among peers, and overall value of contributions to the organization.

To determine the market averages, or reference pay zones, for all salaried jobs, ORNL participates in annual salary surveys that provide comparisons of Lab salaries with those for comparable positions in local, regional and national markets, as appropriate. Compensation Specialist Doug Fore says, "The data from these surveys, along with the Laboratory's financial plan, are major considerations in the development of the annual CIP that we present to the DOE to request salary structure changes and salary increase funds. Overall, the Laboratory's objective is to keep its pay structures and average salaries aligned with the appropriate external markets."

Salary survey data and market benchmarking were the basis of the original FY 2000 three-year plan for market equity adjustments for ORNL's R&D staff. "Based on market projections, we should effectively close the gap between ORNL's average R&D staff salaries and the market after implementing the January 2002 salary increase program," says Doug.

Human Resources and Diversity Programs Director Darryl Boykins adds, "We are committed to maintaining a market-competitive compensation program and this year's plan will support the Lab's achieving that objective. To sustain our capabilities to provide highest-value research and technology to our customers, we will continue to develop solutions which address the need to pay competitive salaries while aggressively managing the cost of doing business."

Annual performance review meetings between ORNL staff and their managers to discuss the assessment of their performance and accomplishments against their results plans should be completed by the end of January. Managers frequently use this same meeting to discuss and agree upon their

employees' results plans and objectives for the next review period.

In late December or by mid-January, each employee will receive a Compensation Change Document, commonly referred to as a "white card," from his or her immediate manager. An example of a white card, with an explanation of the information it includes, can be found on the Compensation home page on ORNL's internal Web, at home.ornl.gov/divisions/human_resources/compensation. [ornl](#)

Service Anniversaries

December

30 years: Mary J. Ruppe, Communications & Community Outreach

25 years: William A. Brookshire and James D. Howard, Facilities Management; James B. Clendenen, Environmental Technology Programs; Terry L. Collins, SNS Accelerator Systems; Richard C. Goldfinger, Computational Sciences & Engineering; Ann J. Luffman, Office of Technology Transfer; Charles A. Maxwell and Rupert G. Smith, Craft Resources; Joanne O. Ramey, Solid State

20 years: Bryan L. Broadhead, Nuclear Science & Technology; Gwo-Liang Chen, Life Sciences; Glenn M. Cross, Integrated Operations Support; Brenda A. Johnson, Business & Information Services Dir.; Stephen Spooner, Solid State

CIGNA deductible changes effective January 1

For CIGNA participants, effective Jan. 1, 2002, the out-of-network deductible under the CIGNA plan increases from 0.75 percent (three-fourths of a percent) of pay to one percent of pay, and the deductible for prescription drugs filled at a retail pharmacy will increase from \$50 to \$100 annually for both the CIGNA and indemnity plans. These changes were among those benefit plan changes communicated earlier in the year. Call OneCall, 574-1500, with questions about benefits delivery.

Called up for military duty?

The events of Sept. 11 have resulted in a call-up of military reservists and National Guard units. If you are called up for military duty, including full-time active duty, Human Resources asks that you notify your supervisor and then contact an HR manager at 574-4433.

Lab employees continue holiday giving

The holidays have elicited the usual wave of generosity of spirit at ORNL. Among the successes have been a Thanksgiving food drive and an angel tree.

The Values Committee's food drive, coordinated by Jerry Gray of the Operational Safety Services Division, collected 108 boxes of nonperishable food items and \$550, which went to the First Cumberland Presbyterian Church and to the Salvation Army in Oak Ridge.

The church delivered turkeys and the food items to many needy families in the area. The delivery to the Salvation Army alleviated a shortage of food that was causing them to have to turn people away.

Values' Cathy Cheverton reports that this year's angel tree provided gifts for 181 children from 10 surrounding counties and organizations and contributed \$445 in cash donations. "This has been a tremendous project and we want to thank everyone

for helping to ensure these children have a much happier holiday season," says Cathy.

The Spallation Neutron Source has again organized an angel tree and food basket collection for area needy families. Some of the baskets come decorated, including one that was even lit.

Team UT-Battelle will be seeking volunteers for the Oak Ridge Community Playhouse for the rest of its production season. The playhouse needs help primarily with stagecraft—lighting, set design and other behind-the-scenes tasks. If you'd like to help the playhouse, call Bob Wham, 576-7783.

Team UT-Battelle is there to boost employees' volunteerism on projects outside the Lab. If you have a community cause or activity that you think Team UT-Battelle can help support with volunteer or organizational assistance, call Brenda Hackworth, 574-4160. [ornl](#)

'Technically right': For Norbert Holtkamp, the SNS is the place to be

Ask Norbert Holtkamp why he's at ORNL, and he'll likely give you a reason similar to the one Willie Sutton gave for robbing banks.

Willie said, "Because that's where the money is." Norbert might tell you, "Because that's where the Spallation Neutron Source is."

Norbert came to Oak Ridge in February from Fermilab, where he worked for more than two years. During that time, the native of Germany served on some of the SNS project's many review committees, struck up some good relationships and received an offer from soon-to-retire Bob Kustom and Ed Temple to come and work on the project himself. As is typical with the SNS project, things happened fast; by April he was directing the project's Accelerator Systems Division.

"The SNS provides an opportunity to do something that hadn't been done—build a large-scale accelerator facility with a collaboration of laboratories," Norbert says. "People have to learn to work together, and that was the steepest part of the learning curve, too. But it's the wave of the future for these large projects."

The SNS job offer created a challenge for Norbert. A paper he had published at Fermilab—the subject was neutrino production using a muon storage ring—had gained much attention. He was also entertaining the possibility of working on a project in Amman, Jordan, to construct a synchrotron light source (SESAME)—a project involving several Middle Eastern countries. He had several options and all of them were attractive.

The clincher for Norbert may have been the SNS project's superconducting linear accelerator. Early designs favored a more conventional "linac." However, advances in superconducting technology and advantages—which include reduced power

consumption, a shorter linac and an enhanced upgrade potential—led to the decision to add Jefferson Lab to the collaboration. The SNS's proton linac draws upon much of Jeff Lab's experience with its electron linac.

"I thought it was the right way to go," he says, "technically right, in that it's better to build the first high-powered superconducting proton linac. That was a very large attraction to me; I always wanted to do it, and it was a project I could identify myself with."

Norbert comes from a high-energy physics background, with experience at the Stanford Linear Accelerator Center and Germany's Deutsches-Elektronen-Synchrotron, or DESY (pronounced "daisy"), as well as the two and a half years at Fermilab.

"High-energy accelerator physics is an extremely valuable education. People in high-energy physics are driven to have the highest energy possible, the highest luminosity and therefore the most acceleration per unit cost," he says. "That naturally causes people to work very hard on how to get as much out of the design as possible, and that drives a lot of innovation."

In fact, he points out that lessons learned on the SNS will very likely be applied to the Next Big Thing, which could turn out to be a fourth-generation



Norbert Holtkamp

light source driven by a superconducting linac, a relativistic ion accelerator or a linear collider, one of his former research areas. He says the latter will likely be two superconducting linacs, each 100 times as long as the SNS's linac, pointing extremely high-energy, nanometer-sized beams directly at each other. It's an awesome idea, espoused in a recent High-Energy Physics Advisory Panel report, and it's meant for equally awesome science. Such a project will undoubtedly build on the experience and collaboration skills that the SNS has pioneered.

The SNS facility will involve top-shelf technology, Norbert says. The 1.4-megawatt proton beam comes with a level of beam control "two orders of magnitude" more complicated than anything attempted so far. And yet it's also being designed to be a stable and reliable producer of neutron beams. So how much technical risk is involved?

"The biggest challenge is in the superconducting linac," he says. "It's a technology that's not been used for that kind of beam. But the payoff will be tremendous—a potential power increase by a factor of two that will cost less to build and less to power."

Norbert's Accelerator Systems Division has the job of pulling together the systems built by the different labs and getting them installed in working order. "It's an assembly of a very interesting group of people. They are from Oak Ridge, the partner DOE laboratories and international labs—highly motivated and, in many cases very young, people," he says.

These scientists, like Norbert, have come to the SNS because it is cutting edge.

"The SNS is America's most prestigious project," he says. "It's the dream of my life—being in charge of building a large accelerator project. If any other large-scale accelerator project is built during my career, the SNS will be the model for it."—B.C. [ornl](#)

ornl reporter

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