ornl reporter

UT-BATTELLE

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Growing green

Fitting for an energy lab, ORNL's new facilities will have environmentally friendly features

ORNL's building campaign has a green aspect to it, and it's not just UT-Battelle green. Environmentally friendly technologies are being used in the construction of the new buildings and ancillary projects tied to the Lab's modernization campaign.

"Sustainable-design criteria are being incorporated into the new facilities' designs whenever feasible," says Tim Myrick, who heads the new facilities drive. "In fact, the Lab is subjecting the building designs to an environmental yardstick for new construction, called Leadership in Energy and Environmental Design."

The LEED criteria have been developed by the U.S. Green Buildings Council, a building industry coalition that promotes environmentally responsible building technologies. LEED evaluates environmental performance from a "whole-building" perspective over a commercial building's life cycle, providing a standard for what constitutes a "green" building. ORNL is taking the system a step further, adjusting the LEED criteria to the needs of a research facility.

Paula Logan of Engineering is watching over the ORNL building program from an environmental standpoint, reviewing the projects independently and putting together an overall sustainable design approach.

"DOE set a goal for us," explains Paula. "We attain points on our sustainable design efforts. We have taken the LEED rating system and others and, in the meantime, we're developing our own sustainable rating tool for research facilities, called ORNL SMART (for Sustainable Measures and Rating Tool). LEED is more for commercial buildings, so we're tuning the SMART model to apply to a research facility using LEED and several other models."

The modernized east campus, as it will appear, will include as many environmentally friendly features as is feasible. The privately funded facility is at left, the state-funded facility is at right and the federally funded research support building is at lower center. The existing Building 4500-North is at the top of the photo.

ORNL started out on the right foot by selecting construction sites that were already developed, such as the late, lamented east parking lot. For the new east campus, hardly a drop of chlorophyll has been shed, save for some ornamental trees. (More about trees later.)

"Site selection is a big part of the criteria, such as building in so-called 'brown fields,'" says Paula. "We are taking sustainable credit for choosing previously developed sites instead of plowing up new, undisturbed land. One of our goals has been reduced site disturbance—leaving as much green space as we can."

For instance, the private facilities' heating, ventilation and air-conditioning systems will use

(See GREEN, page 4)

TTED takes new approaches to speed the path to the marketplace

ORNL Reporter's *latest in its series of articles by Leadership Team members is from Jan Haerer, director of the Office of Technology Transfer and Economic Development.*

BY JAN HAERER

Among ORNL's many strengths is its intellectual property. At any one time the Lab has about 1100 pieces of intellectual property in a dynamic population of new and expiring patents. That population is always changing—with the times.

Intellectual property—predominately patents, copyrights and trademarks—is a stimulus for good things for ORNL, including new company growth and formation and research investment in the Laboratory. Correspondingly, UT-Battelle's approach to the management of intellectual property is much more strategic than we've seen in the past at ORNL.

The Office of Technology Transfer and Economic Development's work isn't just about licensing technologies; royalties never generate enough revenue on their own. Instead, ORNL's IP strategy is to smooth a new technology's path to the commercial marketplace. Besides the eventual profits from the sales, if these licenses turn into cooperative R&D agreements or Work for Others projects, we've helped build the base at the Laboratory.

Jan Haerer

In fact, this strategy has already shown good results. With the new focus, we took a stagnant investment in the Lab's intellectual property, initially sacrificed some of the royalties, but increased the royalty-income base at the Lab from approximately $16 million in 1999 to more than $32 million in 2001, an economic year that was dampened significantly by the events of September 11. Still, we've more than doubled that intellectual-property-derived base.

Our tech transfer organization has really responded to this new approach. Change, they say, can bring out the best or worst in people—in this case it has brought out the best. Our tech transfer staff have rallied behind this new approach to make it a success. They have taken a personal interest in it.

We also have a good partner with DOE. We have a very open relationship—one that's built trust between us. That is very important because the field of intellectual property is rife with pitfalls. If I see a problem, such as a potential conflict of interest, I bring it up. I request internal audits on a regular basis. I believe that issues should be managed in the sunshine. Conflict of interest, for example, is one of the most common issues we have to deal with. To

(See HAERER, page 5)

Speaking out at ORNL

New Concerns Program encourages working through issues within line organizations

What's on your mind, Bunkie?

If it's a practice or policy that you think should be improved, modified or terminated, you can turn to the ORNL Concerns Program, which is now part of the Laboratory's Standards-Based Management System (SBMS).

This successor to the old ORNL Employee Concerns/Response Program is designed to assist Laboratory staff, subcontractors and guests in raising and resolving concerns. A concern can deal with safety, health, the environment, waste, fraud, abuse, misconduct, harassment, unfair treatment or anything else with the potential for adverse effects on staff, visitors, the public, property, the environment or the mission of the Laboratory.

The Concerns Program is administered by the Diversity Programs Office. The SBMS subject area for the new program describes how staff can submit concerns and how those concerns will be addressed. Generally speaking, the Diversity Programs Office determines the appropriate process for resolving a concern and facilitates resolution of the concern.

As documented in the Concerns Program, staff are encouraged to work within their line organization toward resolving concerns. The line manager is often the "first responder," and many concerns can be quickly and effectively handled at that level, particularly with the assistance available from Human Resources managers and other support organizations.

Points of contact for staff questions

- Immediate supervisors
- Diversity Programs office, 576-2432
- ORNL ombudsman, 576-7802

On the Web:

Concerns program: eshtraining.ornl.gov/sbms/sbmsearch/subjarea/cp/cp_sa.cfm

Standards-Based Management System: eshtraining.ornl.gov/sbms/

ORNL Director Bill Madia notes, "As a Laboratory, we're committed to encouraging free and open reporting of concerns without fear of retribution or retaliation. This commitment is reflected in my R2A2s —I'm responsible for ensuring an open and supportive work environment for Laboratory staff, and this responsibility flows downward through the entire organization."

R2A2s are the roles, responsibilities, accountabilities and authorities spelled out under SBMS. Bill also says, "We can't fix problems that we don't know about, so I strongly encourage all staff members, as well as all subcontractors and guests, to discuss concerns with their supervisors or other ORNL managers as appropriate."

Under some circumstances, however, you may feel the need to have your issue addressed outside your line organization. Then the Concerns Program offers another path to resolution.

In general, a staff member who reports a concern can expect a response within 30 days. Throughout the Concerns Program process, confidentiality is preserved "to the maximum degree possible." Concerns can even be submitted anonymously, although no direct response can be provided in such cases.

Functional responsibility for the Concerns Program rests with the Human Resources and Diversity Programs Directorate. HRDP Director Darryl Boykins says, "A primary goal of the directorate is to ensure that employees, guests, and visitors have a means to raise concerns and have them effectively addressed. The Concerns Program is a vehicle to ensure that issues are raised, to assist and complement management and support organizations in responding to concerns and, as necessary, to provide an alternative means to address issues."

In short, according to Darryl, "the Concerns Program gives all of us at ORNL a clear and straightforward process to resolve concerns and enhance the quality of work life at ORNL."

So if there's something on your mind, speak out. It's the squeaky wheel that gets the grease—and makes things run more smoothly as a result.

—Bonnie Nestor ornl

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Curtis Boles

Dirk Van Hoesen of Environmental Protection and Waste Services Division and Karen Billingsley, a subcontractor for AIMSI, recently took a helicopter ride to get aerial shots for a project on the Oak Ridge Reservation.

ORNL people

Yoon-Ho Kim of the Computer Science and Mathematics Division has received honorable mention in the Association of Korean Physicists in America's Outstanding Young Researcher Awards. Kim, one of only four honorees in the 2002 program, was cited for his work in the field of quantum optics.

The Physics Division's **Terry Clayton Awes** has been elected a fellow of the American Physical Society.

The Engineering S&T Division's **Vince Mei** has been elected a fellow of the American Society of Mechanical Engineers.

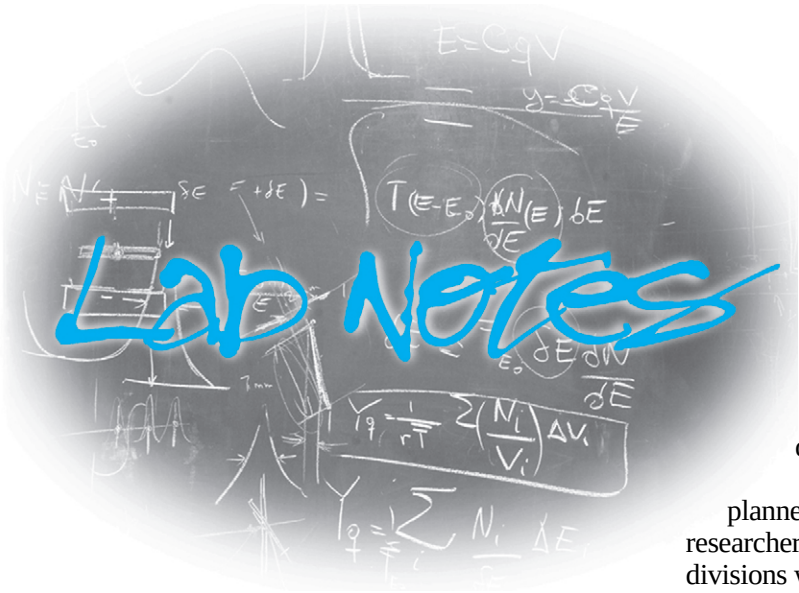
A team that includes **Glen Harrison, Michael Hilliard, Cheng Liu** and **Rekha Pillai,** representing ESTD and the Computational Sciences and Engineering Division, has received an Association of American Geographers award for its analysis of the defense distribution center supply chain. Colleagues from the Defense Logistics Agency and the University of Tennessee were also cited.

The International Association for Energy Economics has selected a 1999 article in *The Energy Journal,* co-authored by ESTD's **David Greene,** as "best article." David is in the Transportation Policy and Planning group.

The National Urban League has honored **Ella Dubose** of Human Resources and Diversity Programs for her work in its Black Executive Exchange program. Ella's Five-Year Milestone award recognizes her efforts on behalf of college students who have participated in the exchange program.

ESTD's **Frank Southworth** has been appointed to a three-year term on the Transportation Research Board's committee on Travel Behavior and Values.

The Chemical Sciences Division's **Phil Britt** has been invited to serve on the editorial board of *Fuel,* the leading European fuel science journal.



Lab in a bubble

We can skip some of the details because the story has been been covered nearly everywhere else: The journal *Science* published a paper in March on sonoluminescence research by the Engineering S&T Division's Rusi Taleyarkhan and others. The peer-reviewed article reports the production of tritium and neutrons from the implosion of bubbles in a container of deuterated acetone, an effect that the research team interpreted as signs of a possible fusion process.

Wishing to see further measurements, Deputy Director for Science and Technology Lee Riedinger last summer asked the Physics Division's Dan Shapira and former Fusion Energy Division Director Mike Saltmarsh, two researchers well versed in neutron detection techniques, to work with Rusi. They said they could not verify that a fusion process occurred.

As the "bubble fusion" paper's publication neared, Lee and other Lab officials braced themselves for comparisons with the "cold fusion" uproar of more than a decade ago. The paper delivered, even before it was officially released: One nuclear physics professor remarked to the *Washington Post* that the words "fusion" and "tabletop" created a reactive response all their own, thanks to the widely discredited and lampooned 1989 cold-fusion announcement.

Underneath headline bites such as "star in a jar," most of the science news media, to their credit, avoided knee-jerk cold fusion comparisons. (If the implosion effect were fusion, Lee notes, it would be "hot" fusion and, unlike cold fusion, explainable with known physics principles.) Much of the coverage focused on the debate the paper stirred within the scientific community and even within ORNL. A reoccurring theme was that the research described interesting phenomena that need to be better understood.

"The Lab is committed to doing measurements that would settle whether fusion is occurring with the bubble collapse," Lee says. "ORNL's advantage is that Rusi has been able to grow these big bubbles—that's a unique technology—and everyone respects the tritium data. It's the neutron signal that is in debate."

Follow-up ORNL experiments are planned for this summer, with Rusi and researchers from Physics and probably other divisions working together to see if the results can be resolved. Lee, who bore the brunt of media calls after the story broke, observes that, regardless of who is ultimately right about bubble fusion, such debates should be considered scientifically healthy and productive.

SNS scores a "heavy lift"

Former supervisors in California describe Manny Ringer as always ready to help someone who needs a lift. So Manny headed out to Oak Ridge in March to help the Spallation Neutron Source construction project with some of its lifting.

Manny is a crane, specifically a Manitowoc 4600 Ringer Heavy-Lift Crane. Standing 14 stories tall and weighing 1,000 tons, Manny has been a landmark at Lawrence Livermore National Laboratory's National Ignition Facility Project, where it's been used for heavy jobs that have included more than 250 power lifts with its 320-foot boom. The crane has also been something of a media darling there—always managing to get in pictures of the ongoing project. Before NIF, the giant crane, purchased in 1983, was used at the Nevada Test Site.

With the NIF lifts completed, Livermore has passed the crane on to the SNS project *gratis* except for shipping costs. Moving the big machine required more than 60 truckloads, including nearly a dozen nine-axle trailers.

LLNL's big crane moves to Chestnut Ridge.

Livermore rigging engineer John Reed, who managed Manny and prepped him for his major lifts at NIF, says, "Just a few percent of mobile cranes of Manny's generation worldwide have his reach and capacity. He's big, he's powerful, he's safe."

Besides getting used to the new scenery on Chestnut Ridge, Manny is also going to have to become accustomed to a new nickname from the SNS folks—"Big Bertha."

Changing scenes on Bethel Valley Road

Construction on the two new Bethel Valley Road entrances—one east, one west—is expected to wrap up in early May. By then commuters and protective force officers will have permanent portals through which to enter and leave the Lab area after making do with temporary facilities since late October, when trucks were banned from the road. The road was closed to the public in December.

For a little while...

A detour around the east portal site gave commuters a taste of Old Bethel Valley Road, the curvier, original route to ORNL. The detour, which also provides a closer look at the water of Rogers Quarry, has helped speed the construction project by diverting traffic from Bethel Valley Road.

Look for even more attention being paid to the main thoroughfare into the Lab. During a February safety awareness session with managers, Lab Director Bill Madia asked them to meet with their groups to discuss their safety concerns.

The top concern: speeding on Bethel Valley Road. The second most cited concern was traffic safety inside and around the campus. Lab officials intend to respond to those concerns with measures that could include traffic enforcement by the state highway patrol.

Fresh eyes for textbooks

Saying that Columbus sailed the ocean blue in 1942 or that salt is sodium chlorine are common and understandable enough mistakes, but not for a textbook. Surveys have noted such errors in public school textbooks. Now ORNL physicists, chemists and biologists have volunteered to fact-check Tennessee textbooks before they hit the classrooms.

"The intent is that we would provide some help in checking for accuracy of equations, mathematics and concepts," Lee Riedinger told reporters. High-school teachers will continue to review the books for content, presentation and value in the classroom.

Community Outreach Manager Brenda Hackworth approached ORNL's Leadership Action Consortium to recruit reviewers. ORLAC, which recently refocused its mission and changed its name to Developing Leaders Through Action, or the DeLTA Network, will look over proposed textbooks this summer.

We'll be reviewing six texts in chemistry, physics and biology," Dan says. "We have 12 volunteers for physics and eight for chemistry. Biology just popped up recently and we'll need more reviewers for that one."

Lab volunteers will thus play a role in the quality of education for state students. As any newsletter editor will tell you, it never hurts to have another set of eyes to look a publication over before press tim.

Reported by Bill Cabage

Green

Continued from page 1

no ozone-damaging chlorofluorocarbon coolants. The Lab is taking that a step further by also eschewing the use of hydrochlorofluorocarbons, which, although less stable and not as damaging to the upper atmosphere as CFCs, still have a potential climate-change impact.

Cooling costs in the new buildings should be reduced through the use of "cool roofs," recommended by ORNL's Building Technology Center. "A cool roof is a highly reflective roof that reflects the sun's heat on those hot summer afternoons, reducing cooling loads," says the BTC's Jeff Christian. Overall, ORNL has set out to better the American Society for Heating, Refrigeration and Air-Conditioning Engineers energy-efficiency standards by 20 percent.

One of the original stated objectives of the modernization campaign has been to reduce the Lab's facilities costs by getting out of expensive old buildings and into more efficient new facilities. Coupled with that is ORNL's agreement with the Tennessee Valley Authority to use as much wind-generated "green" power as TVA can supply—less than half of one percent of the Lab's overall need. ORNL's new buildings will use less power, and the power they do use will be generated with as little environmental impact as is feasible.

Some of the green technologies are aimed as much at creature comforts as they are at environmental friendliness. All paints, sealants and coatings used in the facilities will be of the low-volatile-organic-compound variety—in other words, not as stinky. Indoor air will be continuously monitored. "Indoor environmental quality as a whole figures prominently in the LEED criteria, up to 20 percent," says Paula.

Using "brown fields" for construction sites: Hardly a drop of chlorophyll has been shed.

Water consumption in the buildings will be minimized by the use of low-flow technologies in fixtures. Meanwhile, rainwater will be collected and recycled for use on the landscaping outside.

Even on the outside, the rainwater-fed landscaping plays a role in creating a greener, and nicer, facility. "Reduced-heat islands will be established in outside areas; that is, in so many years 30 percent of these areas will be shaded," Paula says. Look for a lot of trees to be planted at ORNL in the next few years.

Recycling will figure highly in the new buildings, which will have collection centers. Recycling is already being practiced with the new facilities' construction. "At least half of construction waste, including all of the old pavement that is ground and sucked up from the east parking lot, will be used by the contractor as aggregate, or rock fill, for various purposes," Paula says. "That waste is thereby diverted from landfills." She adds that at least 20 percent of materials used in the construction will be local or regional materials—from within a 500-mile radius—which reduces transportation costs.

Follow-up on building performance is part of the plan. "For the new private-sector buildings we are also requiring that they be operated to obtain a DOE-EPA Energy Star rating, which means we have not only built them to be energy efficient, but that we are operating them the way they were designed," says Tim. "If you don't maintain the systems and control the operations, you can actually be more inefficient than the baseline."

Back outside, starry nights have just about become a thing of the past in urban and suburban areas, but new outdoor lighting designs that keep more of the light pointed down may help remedy that. ORNL is installing light pollution-reducing lighting in the new parking lots and in other areas. In fact, the new parking lot designs have incorporated several environmentally friendly technologies.

"Pervious" asphalt, unlike the usual blacktop, lets rainwater soak through. Parking lot storm runoff has been a common source of regulatory headaches at ORNL. The new parking lots in the east side's 6026 area have sections of this new asphalt, which lets the runoff pass into the ground instead of flooding into streams. The blacktop functioned well during last month's gullywashers.

The new lots also have a bioretention basin to catch other water runoff and let the oil, particulates and other gunk from hundreds of cars settle out before it returns to the groundwater.

Even the bumper stops in the new lots are environmentally friendly. They are made of recycled plastic. "We have way too much plastic waste in the ecosystem," says Paula.—*B.C.* ornl

Part of the deal: Out of the old

ORNL's modernization campaign isn't just about putting up new buildings. Some old ones are going to disappear by the end of this summer.

Three buildings slated for the wrecking ball are Building 6003 in the Physics area and buildings 2506 and 2013 in the central section of the campus.

Building 6003 is not a particularly old building by Lab standards. It was built in the 1970s from a modular design, and in a hurry. It has not held up well—some of its office residents describe it as "smelly" and in otherwise dilapidated condition.

Building 3550's "flaky" exterior

Building 2506 is located on the corner of Central Aveune and Third Street, just across the way from the ORNL Cafeteria. The '40s-era wood structure's latest occupant was the ORNL Physical Therapy Clinic, which has already moved to new space on Building 4500-South's ground floor across from the fitness center. Building 2013 is another wood structure in the 2000 area of Central Avenue that is close to half a century old.

There will be more. "The modernization team is in the process of vacating and shutting down 11 facilities, including Building 3550 (the wooden Research Laboratory Annex on Central) and the Building 2001 Quonset hut (the former 'winter palace')," says Facilities and Operations' Carlo Melbihess. Also gone are 13 office trailers.

"You can't build the new without getting out of the old, and we have targeted 1.8 million square feet of space to vacate during the first five years of modernization," Carlo says. "This year alone, we'll be vacating more than 300,000 square feet."

Direct-To-Digital Holography wins national FLC award

The team of Philip Bingham, Larry Baylor, Matt Chidley, Jim Goddard, Jim Hardy, Greg Hanson, Kathy Hylton, Jeff Price, Dave Rasmussen, Chuck Schaich, John Simpson, Ken Tobin and John Turner has won a 2002 Federal Laboratory Consortium Award for Excellence in Technology Transfer for "Direct-to-Digital Holography for High-Speed, High Resolution Defect Inspection."

The system can rapidly measure precise surfaces and can be used in semiconductor wafer inspection to detect anomalies after fabrication.

The holography team was cited earlier among three southeast regional FLC awards won by ORNL research teams. The two other regional winners were Ying Xu and Dong Xu of the Life Sciences Division, for "PROSPECT: Protein Structure Prediction and Evaluation Computer Toolkit" and Mitchel Doktycz of Life Sciences for "Hybrid Valve Technology for Liquid Handling and Dual-Manifold System for Arraying Biomolecules."

FLC awards recognize laboratory employees' outstanding work in transferring a technology developed by a federal laboratory to the commercial marketplace. ornl

ORNL's environmental research contributes to spent-fuel solutions

Many nuclear power plant utilities are currently storing their spent nuclear fuel rods on site in pools of water. That practice has been cited by officials as a security concern—some of these pools are housed in buildings that could be penetrated by airplanes as a result of an accident or deliberate terrorist action, causing a release of radioactivity. At other reactors, spent-fuel pools are located within the reactor containment, or the spent fuel is stored in dry storage casks, so it is less of a security risk.

ORNL researchers led by the Environmental Sciences Division's Greg Zimmerman and Lance McCold are working on one temporary solution to the spent-fuel problem—the Skull Valley Project. A consortium of eight nuclear companies, including nuclear power utilities, has applied for a Nuclear Regulatory Commission license to operate an interim spent-fuel storage facility. The small Skull Valley Band of Goshute Indians has agreed to allow the storage of up to 40,000 tons of spent fuel in concrete-and-steel casks on hundreds of concrete pads on their Utah reservation. These radioactive wastes may be stored there for up to 40 years until they are moved to a permanent repository.

The ORNL team has prepared an environmental impact statement (EIS) for the NRC on the Skull Valley project. The NRC has also prepared a safety evaluation report.

"This private facility some 25 miles south of Interstate 80 could provide valuable interim spent fuel storage for the nation until a permanent repository is ready," Lance says.

ORNL has also played a role in the analysis of U.S. efforts to develop a permanent repository for the spent fuel that might be temporarily stored at Skull Valley. For several years an ORNL team coordinated by ESD's Ellen Smith conducted technical peer reviews of the information, analyses and discussions included in the EIS for the proposed geologic repository at the Yucca Mountain site in Nevada. Placement of spent nuclear fuel and high-level waste glass in a mined facility deep below the ground at that site is intended to both virtually eliminate the potential for sabotage or diversion and protect the material from release by flowing water or other natural phenomena.

As part of DOE's effort to ensure that the EIS deals honestly and accurately with the myriad technical issues surrounding the proposal, ORNL experts in a variety of disciplines considered external comments and critiques on diverse topics, including transportation safety, risks from groundwater transport over 10,000 years, effects of repository construction on the endangered desert tortoise, and potential effects of the repository on Nevada's tourism economy.

"Our recommendations to DOE were intended to enhance the technical and legal defensibility of the environmental assessment of the repository proposal," Ellen says. "We asked ourselves if the document covers the issues; if the information and analyses were complete and technically appropriate; and if the document communicates honest, accurate and understandable information, because one purpose of an EIS is to help the lay public understand the proposal and its impacts. When we found a problem, we recommended specific improvements."

The EIS was made public in February when President Bush announced that he would recommend going forward with the repository.

"The EIS compares the impacts of the repository with the impacts of leaving waste in technologically advanced dry storage at the reactor sites," Ellen says. "The potential impacts of a terrorist attack are many times greater for waste at reactor sites than for waste in the repository. A geologic repository is almost completely invulnerable to a wide range of threats. Furthermore, analyses show that risks from shipping solid spent nuclear fuel to a repository are much lower than many people think."—*Carolyn Krause* ornl

Haerer

Continued from page 1

better address these issues, both our office and DOE have committed to developing a computer-based training manual on conflict of interest.

In another example of working with DOE, last year we set out to streamline the CRADA and WFO processes. Teams from procurement, tech transfer and DOE worked together to reduce processing times by more than a third. The faster we do contracts, the faster we can make money and grow the Lab's base. ORO's Jim Reafsnyder and the Site Office's Phil Carpenter have been very supportive, and I'm very pleased with this relationship.

A very important aspect of our tech transfer program is the benefit it brings to the economy, including the local economy. UT-Battelle has spun off 27 companies from ORNL technologies. Of those, 16 are in Tennessee. We have more company starts in the wings, and we're working with local organizations—including Nine Counties One Vision, the Knoxville Area Chamber Partnership, the East Tennessee Economic Development Agency, the Governor's Biotechnology Task Force and Tech 2020—to create more.

It's time to start thinking about Tennessee. When you consider what the Lab has to offer in uniqueness and capabilities, we are poised to stand strong if we can rally the right kinds of support. The partnerships I just mentioned represent strength, but we have a lot to overcome, particularly in terms of attracting venture capital. Fortunately, investments are starting to come into the area, and keeping the momentum going will be crucial.

The Center for Entrepreneurial Growth that UT-Battelle created jointly with Tech 2020 is a good example of things we have done to maintain that momentum. UT-Battelle seeds the center with $200,000 annually with the mission to provide prospective Lab spin-offs with intellectual, technical, managerial and financial resources to help make their businesses go. It's not enough to spin off companies and say, "Have a nice life." We need to nurture them.

It's time to start thinking about Tennessee. Investments are starting to come into the area, and keeping the momentum going will be crucial.

We're currently proposing another new approach, called contractor-funded tech transfer, that allows the contractor to directly fund research. In effect, UT-Battelle could directly invest in a commercializable technology. Under this plan, the research is not solely dependent upon government funding, but it grows the Lab's base and helps the researchers take the technology to the next level.

The result is a much faster return on investment, from which UT-Battelle would get 49 percent and ORNL would receive 51 percent of the profits derived from the commercialization of the technology. In other words, if a company is created, prospers and is sold for $50 million, ORNL could get more than $25 million.

It is not a totally new idea: Pacific Northwest has such an arrangement with Battelle, which, at $11 million, is PNNL's largest industrial investor. One of contractor-funded tech transfer's best attributes is that it's transparent to the researcher, who is working as usual for his or her funder. It's a unique way to expand the Lab's base and work in strategic areas—and to accelerate the government's efforts. If we can apply the best minds of industry, government and universities to a promising new technology—nanotechnology, for instance—that technology's time to the marketplace can be reduced significantly through these innovative new commercialization pathways.

It's important that we seize our intellectual properties and use them for the benefit of the Laboratory. If we are open to the possibilities, we begin a valuable learning process that helps DOE realize its economic and energy security goals.

And, at the same time, ORNL can come out way ahead. ornl

ISSM: Safeguards and security should be applied to the work place

ORNL staff members think about some aspects of safeguards and security every day. Since last December, employees have become accustomed to routinely presenting a badge to protective force members at one of the new Lab entrances on Bethel Valley Road. Also, after the proximity security system was installed in many Lab buildings last year, most employees now access buildings with their prox cards. Before that, access to the Lab was gained either by presenting a badge to a protective force member at a fence portal or by sweeping a DOE badge through a rotogate card reader.

A majority of ORNL staff members use computers in their daily work, and all of them have password access to their ORNL computing accounts. Stringent rules and responsibilities come with having a password—employees with passwords have agreed to those rules and almost universally observe them.

One of ORNL's most valuable assets is the knowledge that the Lab generates. Knowledge in the form of proprietary information is critical to the partners who do research with the Lab. Those who deal with proprietary information know the rules and procedures for guarding it. Failure to do so could mean billions of dollars in lost revenue and lost jobs for the U.S. economy.

DOE has recognized the importance of safeguards and security at the national laboratories with an initiative called Integrated Safeguards and Security Management, or ISSM. Patterned after the Integrated Safety Management program, ISSM asks employees to consider safeguards and security issues in planning for all their work-related activities.

Applications of safeguards and security measures to tasks may be more obvious in some instances than others. The ISSM initiative asks each employee to consider, on the front end of a job, what security aspects are present in the performance of a task or what could arise during the task.

Several labs, particularly those under the National Nuclear Security Administration, have already completed ISSM initiatives following nationally prominent issues with the handling of classified information. ORNL's entry into ISSM is particularly well timed, coming just after a major shift in security strategy at the Lab and a general awakening to security concerns following the events of September 11.

To shepherd the ISSM effort at ORNL, initiative coordinator Bill Rich has formed a multidisciplinary ISSM Working Group, which recently conducted an employee survey to assess the current status of safeguards and security integration within ORNL. The results of this voluntary survey, in which nearly 600 Laboratory employees participated, are being used to direct the focus of an initial ISSM training effort that will be initiated later this spring.

Bill believes that the results of the employee survey are cause for concern. "They are indicative that much needs to be accomplished in fully integrating ISSM into the ORNL work culture," he says. For instance,

- Only 41 percent of survey respondents feel the safeguards and security standards and requirements have been identified and clearly communicated to the ORNL staff.
- Only 49 percent believe that information security requirements, such as guidelines related to the protection of classified and/or unclassified sensitive data, have been clearly communicated to the staff.
- Only 42 percent indicate they know how to provide feedback on safeguards and security controls applied at ORNL.
- 51 percent of respondents see a real need for more information on security risks and threats.
- Only 46 percent indicate that they personally feel more responsible for security, even after the events of September 11.
- And, most significantly, after September 11, only 59 percent of the respondents now feel secure in the workplace.

"The ISSM response is to roll out a strategy for keeping ORNL staff abreast of ISSM goals and objectives and the organizational support structure established to support the initiative," Bill says. "The guiding principle and core-function strategies are fairly simple and, again, closely patterned after Integrated Safety Management." They are

Define safeguards and security requirements in the scope of work and how they are to be implemented,

Identify and analyze the safeguards and security risks/threats associated with the work,

Develop and implement appropriate safeguards and security controls,

Perform the work within the safeguards and security controls and

Assess and provide feedback on adequacy of controls and continually improve safeguards and security management.

In the weeks and months ahead, watch for programs and tools to help you plan safeguards and security more completely into your daily routine.

According to Bill, informational tools such as the ORNL ISSM program description document within SBMS, an ISSM Website, an initial Web-based ISSM training program and the use of ISSM-specific promotional materials have been prepared or are being prepared to increase awareness and to help staff members feel better informed.

Finally, the working group is designing an ORNL ISSM awards and recognition program to recognize staff members who make significant contributions to safeguards and security at ORNL; appropriate mechanisms to facilitate effective ISSM performance measurement, self-assessment, and continuous improvement; and a tool to ensure opportunities for employee feedback on the ISSM initiative.

"Expect to hear more about ISSM at ORNL and keep your eyes peeled for the ISSM Uncle Sam poster now being displayed throughout the Laboratory," Bill says. The poster features the two key messages of ISSM:

"*You* are the key to ensuring effective security," and

"Our mission success depends on quality work done securely."—*B.C.*

Osteoporosis screening offered

Health Services Division is offering screening for osteoporosis, a disease in which bones become fragile and more likely to break. Often there are no signs or symptoms until a fracture occurs.

Lifestyle, medical and genetic risk factors include being female, a family history of osteoporosis, cigarette smoking, inactivity, a diet low in calcium, being post-menopausal, low testosterone levels in men, being thin or having a small frame, use of certain medications such as corticosteroids and anti-convulsants, excessive use of alcohol and anorexia nervosa or bulimia

If you are interested in having an osteoporosis screening, call Merendia in the Health Services Division (574-7434). The test only involves placing a bare heel into an Achilles Express machine.

Service Anniversaries

April

30 years: Elizabeth Peelle, Environmental Sciences

25 years: Mary S. Browning, Tony Hall, Larry R. Roach, Craft Resources; Randy W. Burnett and Ken Guymon, Facilities Management; Peggy G. Fowler, Business & Information Services Dir.; Gary A. Johnson, SNS Accelerator Systems; Anna L. Martin, Contracts; Nellie R. McFalls, Logistical Services; Marsha P. McGinnis, James O. Nations, Jr., and Stephen N. Storch, Nuclear Science & Technology; Judy C. Neeley, Communications & Community Outreach Dir.; Mark J. Rennich, SNS Experimental Facilities; Larry M. Rosenbaum, Networking & Computing Technologies; Billy J. Vitatoe, Quality Services

20 years: David T. Bell, Environmental Sciences; Eraina G. Elliott, Fusion Energy; Curtis A. Maples, Metals & Ceramics; Carol T. Rice, Contracts

Veterans mark 40 years of Oak Ridge Isochronous Cyclotron science

The Physics Division hosted a gathering of past and present ORNL staff at the Lab on March 18 to mark the 40th anniversary of the Oak Ridge Isochronous Cyclotron's first circulating ion beam. Old-timers recollected some of the ups and downs of the ORIC saga, which has endured twice the facility's original 20-year life expectancy.

Similar to Enrico Fermi's famous notation in the Graphite Reactor logbook 20 years earlier, the ORIC's log shows, on March 17, 1962, "Good operation! Looks very hopeful," referring to a milestone 8 MeV proton beam which would be circulated to extraction radius the next day.

Originally conceived to generate protons for research, ORIC has been reconfigured over the years to produce other light-ion beams, heavy-ion beams, and to serve as an energy booster for the tandem accelerator that is housed in the landmark tower. ORIC now serves as the light-ion driver accelerator for the production of radioactive ion beams at the Holifield Radioactive Ion Beam Facility.

Alan Tatum, the celebration organizer and one of the more youthful observants, said that "ORIC still operates today because of the ingenuity, dedication, and skill of literally hundreds of people during the past 40 years." Physics Division Director Fred Bertrand described the ORIC as "a cat with nine lives."

The ORIC is a variable-energy, multiparticle accelerator, and one of the first isochronous cyclotrons ever produced. Isochronism refers to the constant orbit frequency of circulating ions obtained by radially increasing the magnetic field to compensate for relativistic increases in ion mass. It was considered a major breakthrough in accelerators.

As often is the case at anniversary events, recollections leaned away from technical topics. ORIC, judging from the comments of the veterans, has been a ticklish beast at times—given to late-night technical challenges, smoking components, assorted other mechanical problems and funding ups and downs.

Curtis Boles

ORIC veteran Ed Hudson displays a scale model of a prototype magnet he helped make, similar to one used on the ORIC.

Retired electrical engineer Sig Mosko, who began working on the ORIC project in 1958 and is still involved today as a consultant, chronicled the many phases of ORIC's life, both "the good times and the bad." He described many times when they thought ORIC was on its last leg, but somehow the staff kept it going. Mosko observed that he is extremely impressed with how well ORIC is running today.

Robert Brown, a retired instrumentation and controls supervisor, recalled that researchers were constantly trying to cadge more from the cyclotron, to the consternation of the operators. Former ORIC operator Clint Haley also noted that ORIC pushed the limits. The staff was constantly making improvements and experimenting with new technologies. Since ORIC operated around the clock, there were periodic wee-hour calls from the operators to the facility managers and chief engineers such as Mosko, Dick Lord, Ed Hudson, and chief operator Charlie Viar, who would work the operators through the problems. "At 3 a.m. the world is out there somewhere, but it's not where you're at," noted Haley.

Despite its challenges, ORIC has enjoyed four decades of successes. Projects over the years included work with NASA on radiation exposure effects. ORIC at times hosted monkeys, pigs and mice. At least one pig briefly ran loose in the hallways, said Viar.

Retired Lab associate director Jim Ball, who was a top ORIC manager during its early days, pointed out that the ORIC was one of the early user facilities. The old Atomic Energy Commission was initially opposed to the idea, he said, but agreed to 10 percent of ORIC time going to visiting users. Guests also gained time on the ORIC through Lab collaborations, he said.

ORIC's construction was a feat in itself. The famous, massive C-109 doors, which shield the cyclotron area from the staff, were the largest the supplying safe company had ever made. "And they said they'd never do it again," Ball said. A turret to revolve one of ORIC's experimental devices, the Broad Range Spectrograph, came from a decommissioned destroyer.

Some parts of ORIC are already in the history books. A "cold cathode" ion source fabricated by Ed Hudson and Merrit Mallory is in the Smithsonian Institution along with other pieces. It was the first cold cathode heavy ion source used in an isochronous cyclotron. "We did some very interesting things for the first time," Mallory, who helped organize the event, said.

ORNL Director Emeritus Alvin Weinberg saw ORIC come on line during his watch. He noted at the celebration that Oak Ridge physics in the early days was essentially divided between the Lab's neutron physics and Y-12's calutron physics. "Certain tensions" inevitably arose, he said, but they were essentially quelled when the two were merged into the Lab's Electronuclear Division under Robert Livingston.

March 18's observation, coming a few weeks after Livingston's death, was dedicated to him. Weinberg recalled, before an audience that included Livingston's family members, that Livingston's mentor, physicist E.O. Lawrence, believed that all physicists were "adequately smart." Success, Lawrence would say, was a mark of character.

"Bob was a person of great character," Weinberg said. "He lived in a way that Ernest O. Lawrence thought successful people lived, and followed that model."—*B.C.* ornl

Changes in FSA, long-term, service award programs announced; new phone info number

ORNL Employee Benefits has announced several changes related to the benefits program for ORNL employees. They involve flexible spending accounts and long-term care, the service award program and a new information phone number for certain Benefits programs.

The administration of the flexible spending accounts and long-term care plans transferred to ORNL Employee Benefits from BWXT Y-12, effective April 1. There will be no changes to the features of these plans with the transition and no action is required from employees.

A new service-award program also was implemented April 1. Under the new program, employees will receive a debit gift card from American Express and will be able to purchase a service award of their choice from a merchant that accepts American Express, including on-line and catalog purchases. The new program is available *only* for company service anniversaries that occur on or after April 1, 2002. The debit gift cards are not taxable to employees, but employees who receive a gift card, by IRS guidance, must purchase "tangible personal property" rather than services, tickets, etc. The current catalog program through Jostens is still available to employees who had anniversaries before April 1, 2002, and who have not yet selected a service award.

Employees who had anniversaries before April 1, 2002, but who have not yet ordered an award are encouraged to order an award soon since the arrangement with Jostens will be ending—awards under the new program cannot be substituted for an award under the current catalog program.

ORNL Employee Benefits has established a new Benefits phone number—574-7474—for ORNL employees to call with questions about the following four benefit plans that are being administered by ORNL Employee Benefits: service award program, employee assistance program, flexible spending accounts, and long-term care. Assistance with all other benefit plans may be obtained by calling the One Call Service Center, 574-1500.

More information regarding these changes will be available on the Benefits Web page soon. Other ongoing benefits activities will be announced in the upcoming months. ornl

Lab staff called to help local Red Cross acquire disaster-relief van

You've seen it on the news: A twister has reduced a neighborhood to toothpicks, with homeless survivors thankful to be left alive, even if with little else. More often than not, a Red Cross van is providing them with meals and other necessities during those first crucial days of recovery.

ORNL employees will soon have the opportunity to contribute to a valuable and badly needed resource for when the region's people are in need. A campaign is now under way to purchase a new disaster-relief van for the Appalachian Chapter of the Red Cross, located in Oak Ridge.

These vans are typically dispatched to the scenes of various disasters to help stricken communities distribute food, clothing or other necessities at the site. ORNL's Modernization Coordinator Tim Myrick initiated the drive to obtain a van for Anderson County after seeing the need during past volunteer relief efforts.

He has already enlisted the support of several local companies, including UT-Battelle. ORNL employees, however, will also have a chance to pitch in on acquiring the van, which fully equipped is going to cost around $65,000. Tim is challenging ORNL employees to give, with a promise that he will personally match contributions up to $20,000.

"I've worked relief for Hurricane Hugo, Tennessee tornadoes and Alabama floods, mostly through church-related efforts," says Tim. "As part of those efforts, I routinely interacted with the Red Cross teams doing disaster coordination and food service. There were always several Red Cross disaster relief vans on site doing great work. The Knoxville office has one that's 10 years old, but our local Red Cross chapter does not."

Tim says the vans are versatile enough to be used for whatever tasks may be at hand—from feeding the hungry to distributing medical supplies, clothing or shelter.

Tim emphasizes that the Appalachian Chapter's van would be mainly for the needs of the surrounding community. "It would give us a local resource the Red Cross otherwise wouldn't be able to assign to this area," says Tim.

For instance, had it been available when March flooding struck nearby counties, the local Red Cross would have been better able to assist those who were affected. The relief vans, however, can also converge on more distant disasters, including, for example, New York City after September 11 or the disaster scenes Tim has worked.

A Red Cross relief van is often a sole symbol of hope in a scene of otherwise utter devastation.

"I'd like to challenge ORNL staff members and UT-Battelle to join in supporting the disaster relief van as a community project," says Tim. "The actual proposal has two components—buying the van and also staffing it. This would be another opportunity for our Lab retirees to serve the community, and we'll be reaching out to them."

The Red Cross capital campaign for the van will start this month. Donors will receive a t-shirt with a 9/11 theme or other items. Local DOE contractors who have committed to the emergency relief van project are UT-Battelle, BXWT/Y-12, Bechtel Jacobs, SAIC and Duke Engineering and Services. But those corporate contributions will likely leave a portion of the cost to be raised elsewhere.

Tim is aiming for a roll-out ceremony of the Red Cross' new van next September 11, the anniversary of the New York, Washington, D.C. and Pennsylvania tragedies.

The community-at-large role in acquiring and staffing the van will likely be noted on the vehicle itself. "My intention is to have something nice, like 'Help from your friends in Oak Ridge,' or something like that, to go on it too," Tim says.—*B.C.* orn!

Genome info Web site is tops

The Human Genome Project Information Web site has been named to the Medical Internet Hall of Fame by the peer-reviewed *MD net guide*. The HGPI site was recognized from among hundreds of other sites for its "comprehensiveness, ease of use, and visual design, as well as the overall quality of the medical content." The Web site authors are Life Sciences Division's Bioinformation Systems group staffers Betty Mansfield, Anne Adamson, Jennifer Bownas, Denise Casey, Sheryl Martin, Marissa Mills, Judy Wyrick, and Laura Yust. See their work at www.ornl.gov/hgmis.

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Inside