

# Virtual

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have been confined to gelatin models, which are not that effective for nonlethal weapons studies.

In that instance, a Virtual Human's application would be similar to ORNL's computer simulations and animations of car crashes. But Easterly believes the eventual uses of a Virtual Human are as undefined now as the Internet's impact was in the early '90s.

"One thing I'd like to do with Virtual Human is provide a focus for development, where we could factor in all of the contributing elements to living. I'm thinking of things like diurnals (day-night cycles) and physiological variations over a lifetime.

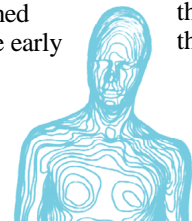
"A personal model could store your medical records—health experiences, CAT scans, information from biomedical sensors. Such a model would allow physicians to scan back and forward to refer to past treatments and how they have worked. One could also factor in genetics. These records could be compressed into a functioning model.

"In 10 to 20 years we might have terabytes of data storage on a three-by-five card," Easterly says, envisioning a computer model of oneself filed away in the doctor's office. Current major undertakings, such as the Human Genome project, could be factored into the Virtual Human.

"The Human Genome project wants to sequence information. The data is all very similar in nature. Our vision is to stimulate the integration of that and similar models that have been or are being developed. A lot of work is being done already, in normal body processes and with diseases like emphysema.

"Western science breaks things down into pieces and studies the fool out of them. We do that well; just look at the journals or a typical dissertation. With the computational toolboxes that are increasingly available to us, I think we have a responsibility to take these pieces and figure out how these models work together."

It will take much planning, work and funding, Easterly acknowledges, before Virtual Human can even crawl. When the model is up and running, however, the benefits will prove invaluable.—B.C. om1



*Eventual uses of the Virtual Human are as undefined now as the Internet's impact was in the early '90s.*

# ORNL people

The Metals and Ceramics Division's **James Klett**, **Tim Burchell** and **Ashok Choudhury** received a technical achievement award from the Inventors Club of America for their evaporatively cooled carbon foam heat exchangers at the club's awards ceremony on October 23.

ORNL had two category winners in this year's Knoxville YWCA Tribute to Women. **Carolyn Campbell**, who was nominated by the Research Reactors Division, received the Volunteer Community Service tribute for her volunteer work in the Family and Community Partnership, the ARC of Tennessee and District Family Support Council. She also chairs the Family Support Council and is a member of Partners in Policymaking, Tennessee Developmental Disabilities Council.

Also receiving a YWCA tribute was the Computational Physics and Engineering Division's **Peggy Emmett**. She leads the Nuclear Code Development group and organized the Greater Knoxville Math/Science Coalition, which sponsors workshops for middle-school-age girls and teachers.

**Lynn Boatner**, ORNL corporate fellow and section head in the Solid State Division, has been named a fellow of the American Ceramic Society. He is also a fellow of the American Physical Society, American Society of Materials (ASM) International, American Association for the Advancement of Science and the Institute of Materials of the United Kingdom.

# A virtual necessity

The Virtual Human will be a massive, but immensely valuable, undertaking

The sky's the limit when you think of useful applications of a "Virtual Human"—a computational model of a human being. Imagine an integrated, functioning simulation of the processes of all the bodily organs, united into a model of a living, breathing person.

Recently ORNL organized a multiagency meeting of leaders to discuss the merits and challenges of the Virtual Human program. The group, which included officials of the National Institutes of Health, DOE, the National Science Foundation, the National Academy of Sciences, the Department of Defense, numerous universities and the private sector, not only concluded that the Virtual Human program was worth doing, but also attached an urgency to the task.

"This could be man's largest and most complex undertaking since World War II," said one attendee.

To temper the enthusiasm, ask this question: Where does one start?

"To build a house, you dig a hole and lay some blocks. To create a virtual human, the issues are far more complex," says the Life Sciences Division's Clay Easterly.

Easterly is spearheading ORNL's drive to

attract interest and funding for a nascent Virtual Human program. Easterly says that ORNL was involved early on in human modeling and is well situated to lead an international effort to create a computerized, Web-based model.

ORNL built "phantoms," physical and mathematical models, shortly after World War II to estimate radiation doses received by survivors of the

*"The time is right for physics and biology to get married."*

Japan atomic bomb blasts. As strides were made in health physics, the phantoms evolved into a "Reference Man" and the mathematical models became more sophisticated and complex.

Easterly believes that ORNL can use its historic expertise to pull an international effort into an integrated human model. The unabated progress of computer technology makes fantastic ideas such as this one seem doable.

"We recently completed a roadmapping

exercise," he says. "We asked what the risk elements are: Do we have sufficient data in open literature? Who are the good players? "Such an exercise would take many years and much money. We can only do elementary judgments, but the responses that we've been getting have been positive. It's a good sign that we're not crazy.

"The time is right for physics and biology to get married," Easterly declares.

The processes that allow us to live can be expressed succinctly in terms of science, Easterly says. For instance, the transfer of oxygen from the air to the bloodstream through the lungs, propelled by the beating heart, is "not super hard" to describe in terms of physics and chemistry.

"On the other hand, modeling the liver would be very difficult. The liver is a big, motionless chemical plant," he says.

ORNL's Virtual Human work has been supported initially by internal program development and LDRD funding and, to a smaller extent, by the U.S. Marine Corps, which is interested in computational models for the development of nonlethal weapons. Tests of kinetic weapons being developed

(See VIRTUAL, back page)



# Lab's battle against rising costs is a war on many fronts

ORNL's efforts to control the rising costs of doing business have been like putting out a brush fire during a dry spell. Once a blaze is snuffed out in one area, other hot spots erupt down the line.

The Lab has been holding that line against assorted budgetary flareups during a time of changes that are having their own impacts on the financial burden. It's important to note, says acting Chief Finance Officer John Hickey, that rising business costs can't be attributed to any one thing.

Several factors are responsible, he says—some voluntary, some not. "We're faced with an essentially flat to slightly declining budget along with many

new cost challenges that will influence our internal rate structure through higher costs," says Hickey. "These FY 2000 challenges are going to impact our overhead budget, and we're looking for ways to mitigate that. But many of these costs are one-time events attributed to the changes the Lab is currently undergoing, or else investments in the Lab's future."

Those investments are the result of carefully considered decisions by the Lab's Executive Committee. Nevertheless, they are affecting the Lab's overhead rate, which could exceed an earlier targeted 39 percent. Those "challenges," as Hickey terms them, are

- An increase in Laboratory Directed R&D funding by \$1.7 million over FY 1999. Still, ORNL's level of funding for LDRD remains below a level that would be affected by Congressionally imposed restrictions.
- Transition costs. This is an additional cost

of about \$2.5 million that the Lab will incur under terms of the M&O contract to help bring the UT-Battelle team on board.

- Splitting systems currently shared by ORNL and Y-12. This includes travel, telecommunications, payroll and other non-SAP systems. That cost is estimated to be \$2.1 million in FY 2000.
- The cost of putting facilities that ORNL has vacated at the Y-12 Plant in a stand-by condition. As people and programs move out, there are costs associated with leaving facilities at Y-12 in order.
- Additional funding for technology transfer. In a change from previous policy directed by the Executive Committee, royalty funds from licensing Lab technologies are going to be used to fund other projects. Beginning in FY 2000, therefore, the Office of Technology Transfer will be supported by overhead.
- In a very specific case, ORNL has been

(See MONEY, page 2)



# Money

Continued from page 1

directed by DOE to increase its fire protection staffing.

It all adds up to about \$9 million in increased costs. That comes in the face of a flat budget and one other significant factor: increased payroll costs.

Under ORNL's new salary program, many Lab R&D salaries were increased in an effort to bring pay back up to market-competitive levels. The raises were designed as—and have been hailed as—a move to retain valued employees with skills in high demand.

However, some program managers are saying the pay increases, while nice, are hurting their ability to perform research. Money for facilities and equipment is being used instead for paychecks.

Compensation Manager Fred Shull says it's inaccurate to attribute any resulting higher overhead and fringe rates solely to the pay increases.

"We laid the groundwork to fund these increases over the past three years. We identified the costs and realized cost savings to offset those increases. But other things have happened at the Lab, such as the increased investment in LDRD and transition costs, that have increased our overall costs," Shull says.

"You could make the point that if we hadn't raised salaries, we'd still have the money we saved. But what would we have gained if at the same time we were losing our talented R&D staff? The real assets of ORNL are our people—not real estate, inventories or other such things. So we can and should think of

these salary adjustments as a 'business' investment, and we should look to realize an appropriate return on that investment."

Similarly, the extra funds for LDRD can be seen as an investment in the Lab's future—and a pretty good one. Johnnie Cannon, who heads the Office of Planning and Special Projects, says the Lab's Director's R&D Fund realizes an approximate three-to-one payback in new programs. "For seed money, it's more like five to one, and there are other benefits such as R&D 100 awards, refereed journal articles, and inventions that sometimes lead to licensees and royalties," Cannon says.

If ORNL hadn't responded in force to a directive by former Energy Secretary Hazel O'Leary in 1995 to pair down costs, ORNL's financial challenge would be much more daunting. In her Strategic Realignment Initiative, O'Leary told the Labs to reduce their operating costs by billions of dollars over a period of five years. ORNL's target was to save \$90 million over five years.

*"The real assets of ORNL are our people—not real estate, inventories or other such things. So we can and should think of these salary adjustments as a 'business' investment."*

"We did it in four," says Hickey. "We did things we otherwise couldn't have done without those savings and efficiencies. They covered earlier investments in LDRD, paid for SAP and funded new program development and salary adjustments."

In terms of cost of doing business, Hickey says ORNL is in the middle of the DOE laboratory pack. "We're not the most expensive, and we're not the cheapest," he says. "But we realize that getting our cost of doing business down and keeping it down is important to the Lab's ability to perform research and attract new programs. We in the finance arena are committed to this goal."

Last month's cancellation of a pension fund transfer was another setback in rolling back those costs. The move, which would have paid for retiree medical benefits with a portion of the pension fund surplus, as opposed to funding the account with Laboratory program money, would have reduced the Lab's fringe rate by nearly three points. But news of the plan resulted in an outcry, and Energy Secretary Richardson cancelled the transfer, calling it poorly communicated.

It was one more "challenge" to keeping down the Lab's cost of doing business.—B.C. [ornl](#)

## As transition rolls out, meet with UT-Battelle, but coordinate with DOE

Transition is a topic on the minds of many. The official start of the transition activities between LMER and the University of Tennessee-Battelle team is set for February 1, culminating with LMER's handing over of the reins on April 1. In the meantime, teams have been appointed on all sides to study the myriad issues that go along with changing management and operation contractors.

The UT-Battelle team will occupy temporary quarters in—and savor the uniquely ORNL experience of—the Quonset hut-styled Building 2001, most recently home to the SAP implementation's Delta team.

December and January could very well see a lull in terms of transition activities, says Tom Etheridge, who is leading the LMER side of the transition project. Nevertheless, Lab folks are anxious to get to know the players on the UT-Battelle team and obtain answers to the inevitable questions arising about changes that run the gamut from organization charts to benefits.

Deputy Director Richard Genung encourages ORNL staff to meet with the UT-Battelle team. However, he reminds staff that such formal meetings should be coordinated first by UT-Battelle with Martha Kass, the DOE transition manager, who will coordinate with Etheridge, the LMER transition manager. Any decisions should also be handled through the formal transition management process.

Says Genung: "Our goals in working with DOE and UT-Battelle during this transition are to

- continue to safely and efficiently perform work,
- achieve an orderly transition,
- minimize the effect to employees and ongoing activities and
- minimize the total cost of transition."

Questions about meetings or other transition subjects can be addressed to Tom Etheridge, 574-0115, or Martha Kass, 576-0717.

Meanwhile, members of the transition teams from LMER, ORO, and UT-Battelle can be viewed on ORNL's internal Web site at [www-internal.ornl.gov/ornlhome/transition\\_team\\_news/trans\\_teams.htm](http://www-internal.ornl.gov/ornlhome/transition_team_news/trans_teams.htm).—B.C. [ornl](#)

# Retiree happenings

by Virginia Donahoe, Retirees' Association president, 576-1786

## The Holidays

One worthy group that always starts anew at the beginning of the year is the Holiday Bureau of Anderson County. We all remember Jim Bowers, our retiree who headed the bureau for years; today the officer is another retiree, also well known, Don Kelsheimer, with a board of directors that includes Jim Bowers.

Last year they were very successful, serving more than 1600 Anderson County residents with toys and food baskets. Today they are in need of good, repairable toys for ages 5 through 14. Toys can be dropped off at the Holiday Bureau, located at 728-B Emory Valley Road. For additional information, call 483-7831.

## Computer help for students

Some local students attend a club meeting at the Robertsville Baptist Church on each Wednesday from 1 to 3:30 p.m., where they are helped with their homework.

The church has three computers available for students to use, but the students need some basic instructions. Elena Borela is asking for a retiree or retirees who would introduce these students to the first step for learning to use a computer. Call Elena at 483-1553 if you are willing to help.

## Annual travel meeting

Our annual travel meeting with Larry Phillips and Ruth Jobe will be held at 7 p.m., Friday, January 7, at the Oak Ridge Senior Center. We are sure Y2K will not interfere with this important meeting. Mark your calendar now and we will see you there.

## Oak Ridge Community Christmas Party

The Oak Ridge community Christmas Party will be held Sunday, December 19 from 2 to 6 p.m. in the auditorium and cafeteria of the Oak Ridge High School. "Riders of the Silver Screen's" Marshall Andy Smalls will be the singing star and master of ceremonies for the activities.

Our retirees will be at the entrance to give numbered tickets to each person as they arrive. Half of each ticket will be placed in a box for a prize drawing. Dances, face painting for children, contests, games, and singing will fill the afternoon. It's important for our Oak Ridge retirees to volunteer to work this event. Call our office with your choice of face-painting or any other specific assignment, or assist as needed with games and contests.

The free Community Christmas Party is sponsored by Oak Ridge stores and firms. Several retail establishments participate with decorated cakes, potted flowers and other gifts. Oliver's Catering Service will provide food and drinks.

## An important question

What will the solution be to continuing our Retirees Organization beginning with Jan. 1, 2000? Who would be willing to share the responsibility of meeting the column deadline? Please offer your suggestions.

## Volunteer tax assistance

If you would like to provide free assistance to older citizens for the upcoming tax season, volunteer your services to the AARP Tax-Aide Program. As a volunteer, you will receive comprehensive training in cooperation with the IRS and also will be reimbursed for out-of-pocket expenses. Call Ward Foster (one of our ORNL retirees) at 483-3423 to indicate your interest and to receive further information.

## ORNL retirees' breakfast

A breakfast will be held for all ORNL retirees on the first Wednesday each month at Shoney's on I-40. Call Ed Cunningham, 690-1476, for more details. Mark the date and plan to be there.

## Oak Ridge Senior Center

Our Senior Center opened November 1 at the new location on Emory Valley Road in space that formerly was occupied by Daniel Arthur. Janice Thomas, recreation supervisor, and Perry Mason, recreation coordinator, will continue to schedule the activities. We assume the exercise classes, bridge groups, the bingo fun night and other activities will continue on the same schedule. The pool tables provide fellowship and entertainment for both men and women.

## Friends of the Aged

Blessed are they who understand  
My faltering step and shaking hand.  
Blessed are they who seem to know  
That my eyes are dim and wits are slow.  
Blessed are they who looked away  
When I spilled the coffee at the table today.  
Blessed are they who looked away  
You told me that story twice today.  
Blessed are they who know the ways  
To bring back memories of yesterdays.

From *The Log*

# Deaths

Thomas C. Andrews died on November 17. He worked in the Plant and Equipment Division's Research and Facility Services Area 1.



T.C. Andrews

## Your benefits

### Changes in Service Awards program begin in January

Beginning with the January 2000 services awards, all employee service awards will be shipped directly to the employee's supervisor for presentation. The order forms that are mailed to the employee's home have been revised to collect the supervisor's name and work mailing address. (The grandfather clock will still be shipped directly to the employee's home mailing address).

Each award will be accompanied by a presentation box that contains a personalized (with name and years of service) recognition certificate and a lapel pin with the appropriate number of years of service.

ORNL's participation in the Lockheed Martin service award program will end when the LMER contract expires on March 31. Contact OneCall (574-1500 or 1-877-To-1Call) or Josten's (1-800-582-0918) regarding questions about service awards.

### No retirement estimates during holidays

Because of Y2K-related issues, the program that calculates retirement estimates will be shut down in mid-December. Benefit Plans estimates the program should be back in action after the holidays.

Retirement estimates now are done through the OneCall service center (574-1500), making a trip to the Benefit Plans offices unnecessary. Call between the hours of 7 a.m. and 5 p.m., or on the Internet, go to the Benefit Plans home page and make the request to the service center. If you have any questions about retirement estimates or any other Benefit Plans program, call OneCall.

### LM scholarship program ends at ORNL

Children of LMER employees will not be eligible for the Class of 2001 Lockheed Martin scholarship program. That's because LMER will no longer be the contractor by the time the scholarships are awarded next spring.

Scholarships that have been awarded to previous classes will be honored for the full commitment. Human Resources and ORNL Reporter will pass along information on any succeeding scholarship programs if and as they emerge from the transition process.

### Correction to SAR

In last month's Benefit Plans summary annual report, under "savings programs," the figure 419,432,226.00 should have read \$19,432,226.00 and the figure \$1,124,951.00 should have read \$1,124,951,970.00.

### No service anniversaries

*ORNL Reporter* didn't get the usual list of service anniversaries for December. We'll catch up with them next issue.



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Jim Richmond

The Solid State Division's Ivan Dunbar, a U.S. Navy veteran, was one of the Lab's veterans who wore their uniforms to work on Veterans Day.

## New, improved

### ORNL's Values Committee chalks up an admirable year of achievement, service

This holiday season ORNL employees can help a needy child have a better Christmas through a Web-based, virtual "Angel Tree." The Web site features a Christmas tree with ornaments. By clicking on an ornament, employees can view a child's wish list for Christmas.

By the end of the Angel Tree's first day on the Web, most of the 65 ornaments had been selected. ORNL Values Committee members, who created the site, responded by adding more children.

That's the kind of year it's been for the

Values Committee. What was once a somewhat moribund

which committee leaders attribute to the group's growing list of accomplishments, programs and activities. In addition to the aforementioned Angel Tree, 1999's list includes the following.

- The committee cosponsored a Veterans Day ceremony that included the Karns High School Band, William Blount High School Color Guard and an attention-getting flyover by the 134th Air Refueling Group of the Tennessee Air National Guard. The band and Lab veterans paraded to the cafeteria, where the veterans, many dressed in uniform, ate for half price.
- Canned drink tabs were collected for the Ronald McDonald House in Nashville for an employee's terminally ill child.
- ORNL held its first-ever Values Awareness Day on April 29. Values Committee

Last month the Values Committee, working with the Office of Workforce Diversity, organized a Veterans Day observance that included a flyover by the Tennessee Air National Guard, the Karns High School Band and a color guard from William Blount High School. In similar fashion, the revamped committee made things happen all year long.



Jim Richmond

movement is now changing the minds of many who were skeptical that an employee values program could make a difference.

The resurgence began last year, says Frank Kolski of the Plant and Equipment Division. The Values Committee reorganized in October 1998; Kolski now shares the load with two co-chairs: the Energy Division's Teresa Ferguson and the Office of Radiation Protection's Debbie Knox.

The committee also created subcommittees, appointed chairmen to lead them and mounted a campaign to have a representative from each division.

"That's been the best thing in the world for this committee," Kolski says. "It's been a shot of enthusiasm and energy that's put the Values Committee back in the forefront, where it needs to be."

ORNL's Executive Committee has renewed and increased its support to the committee,

members and management greeted employees at the portals with fliers of the day's events and distributed ORNL pins. The cafeteria, where "value" meals and free ice cream were available, rang with entertainment. There was also a well-attended showcase of employees' talents at Wigner Auditorium.

- Twenty-five employees participated in a Trash Bash—a roadside cleanup of Highway 95—on May 20.
- Employees have been invited to donate their safety bucks for items going to charity organizations; an idea born in the Energy Division. About 3,300 have been collected.
- Close to 300 employees received Values awards at each of two ceremonies, including one on Values Awareness Day. The awards include the Most Value-Able Player, World-Class Team Work, and a new award, the Good Samaritan Award. The Values

Awards have proven a very popular outlet for employees to express to colleagues their gratitude for good performance and selfless contribution.

- The committee also has a couple of year-round projects. Used greeting card covers are sent to the St. Jude Children's Ranch in Utah for homeless and abused children. Those children recycle the cards to raise money for the operation of the ranch.
  - The other ongoing program—eyeglass recycling through the Lions Club—has provided approximately 10,000 pairs of otherwise unused glasses to people who otherwise could not afford them. Eyeglass drops are located throughout the Lab.
- The ORNL Values Committee, which also teamed with the Laboratory Advocacy Group and ORNL's Leadership Action Consortium during the past year, figures to be in the thick of the changes the year 2000 will bring. If you want to know more about the Values Committee or even get involved, check out their new and improved Website at [www-internal.ornl.gov/values/values\\_homepage.html](http://www-internal.ornl.gov/values/values_homepage.html).—B.C.

## Good cheer

The holidays often bring out the best in people, and this year's been no exception around the Lab.

ORNL's Protective Force presented a check for \$1,300 to Knox Area Rescue Ministries, the result of the force's annual Feed the Hungry Thanksgiving Campaign.

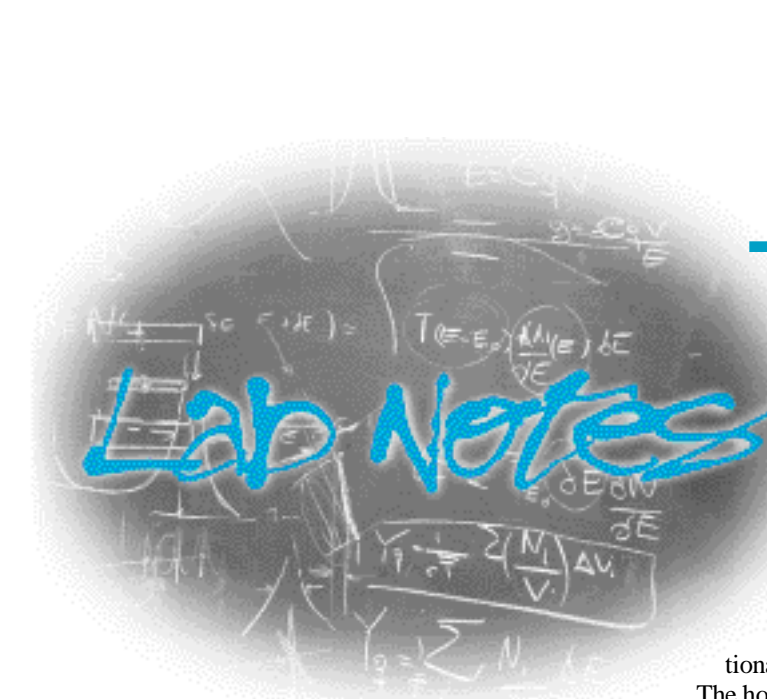
Monroe Free, director of the ministries, came to ORNL for the November 19 morning roll-call to receive the check. "He was truly blown away," says Ray Hubbs. "We will be able to feed more than 1,000 people during the Thanksgiving holidays."

Protective Force supervisors matched the first \$100 raised. The force's new contractor, Wackenhut Services, Inc., pledged \$100.

The Office of Radiation Protection conducted a food drive that was, they say, "an incredible success" thanks to contributions by ORNL staff, who placed food items in barrels located around the Lab.

Three truck loads of food were collected for 24 families from Campbell, Knox, Anderson and Roane counties. Leftover funds were donated to the Knox Area Rescue Ministries.

Finally, ORNL's Advocacy Group has done their part to keep the holiday spirit alive by illuminating the "Tree of Life," the Norway spruce they placed at the Lab's main entrance last April. The official lighting of the tree was set for December 2. Happy holidays.



### Strategic plan: Clear "line of sight"

The Office of Planning and Special Projects has a limited number of printed copies of the 1999 Strategic Plan. The plan includes descriptions of ORNL's programmatic directions and efforts in new program development. Included are four of ORNL's major "Laboratory thrust" initiatives: Neutron science, including ORNL's role in SNS and the HFIR upgrade; complex biological systems, including work in functional genomics and structural biology; high-performance computing; and energy and environment, a new initiative.

Some might ask: Why have a strategic plan when a contract transition is imminent?

OPSP's Johnnie Cannon explains that a good strategic plan for the Lab is a requirement that goes beyond contract issues. And besides, this year's strategic plan was done a bit differently.

"What we've tried to do is provide a line of sight for staff members so they will be able to link their assignments to where the Lab's thrusts are. A past criticism of the strategic plan is that it's viewed as a top-level document very few people know about or participate in creating. This year we used a process that involved a good cross-section of the Lab in putting it together."

Cannon emphasizes that the four Laboratory thrust initiatives are designed to enhance the Lab's capabilities to do leading-edge R&D.

"I think we've made major strides to provide a line of sight," Cannon says.

The strategic plan is also on the Web at [www.ornl.gov/inst\\_plan/STRATEGIC\\_PLAN/title99sp.html](http://www.ornl.gov/inst_plan/STRATEGIC_PLAN/title99sp.html).

### Three to grow

Three ORNL technologies, and the researchers responsible for them, have recently been named to lists of superlatives.

Amit Goyal, a researcher in the Superconductivity Technology Program has been named by the *MIT Technology Review* as one of the "top 100 innovators for the next millennium."

The MIT award recognizes those with potential to make significant technological innovations in the coming century. Goyal's

Oak Ridge National Laboratory

contributions relate to his work and inventions in the area of high-temperature superconductors, specifically the biaxially textured superconductors that enabled Goyal and his co-workers to fabricate a superconducting wire. Such wires can carry up to 100 times more electric current than conventional copper or aluminum wires.

The honor is one of several for Goyal during 1999, including an R&D 100 Award from *R&D Magazine* and an American Museum of Science and Energy Tribute to Tennessee Technology Award. He also is ORNL's Awards Night Inventor of the Year.

Tuan Vo-Dinh received a nice surprise at this year's R&D 100 banquet, at which ORNL had eight winners. In addition to receiving an R&D 100 award, the Multifunctional Biochip, submitted by Vo-Dinh, Alan Wintenberg, Nance Ericson, J.P. Alarie, Gordon Miller, Mino Askari and Narayan Isola, also received the R&D 100 Editors' Award for Most Promising New Technology.

"It was quite a nice surprise for our team," said Vo-Dinh, of the Life Sciences Division.

*R&D Magazine* also provided a nice surprise to the Chemical and Analytical Sciences Division's Mike Ramsey. In the September issue, the magazine named his "Lab on a Chip" technology as one of the 40 R&D 100 winners that have made the biggest impact on society and technology. These 40 winners, selected to commemorate the magazine's 40th anniversary, are a little more

than one percent of the total number of R&D 100 winners of all time.

Lab-on-a-Chip is in company with such other technologies as Polacolor film by Polaroid, the IBM System 360 computer, liquid crystal displays, the Teller-Matic automatic teller machine, Nicoderm and the ATSC digital TV standard.

### Ethics: A high note

ORNL Ethics Officer Steve Stow has the results from this fall's Lockheed Martin ethics survey, and things look better. "The results show rather consistent improvement over the last two years in many areas," he says; "for instance, in questions dealing with management communication we have improved by several percentage points when compared with the corporation.

"However, there is still a strong feeling that senior management needs a stronger commitment to proper business conduct, a view shared across the entire corporation."

The six core values (honesty, integrity, respect, trust, responsibility and citizenship) all score more favorably compared with 1997, with regard to how frequently ORNL staff feel these values are honored on a daily basis.

"I feel that we owe ourselves a pat on the back for improvements that seem to have been achieved since the last survey," Stow says. "While they are not enormous, the changes are in the right direction and hopefully represent a movement that can be maintained as we change contractors. It's unfortunate that we may not have a similar survey in two years so that we can continue to track progress."

Reported by Bill Cabage



Curtis Boles

The ORNL's firefighters recently did live fire training on dealing with propane tank fires. The training covered the hazards of storing and using propane and how to handle fires. Two instructors from the Oak Ridge Fire Department—Mike Collins and Steve Payne—were on hand. One is shouting instructions in the photo, which looks real enough to us.

## Integrated Safety Management workshop

For Integrated Safety Management to succeed, workers must be involved

Until the work force becomes directly involved in Integrated Safety Management, it won't happen.

That was the overriding theme to last month's national Integrated Safety Management workshop, held in Knoxville and hosted by DOE's Oak Ridge contractors, including ORNL. Several of the speakers emphasized a similar mantra: Making safety part of the job, at the activity level, is the key to attaining the goal of ISM.

Managers and workers from throughout the DOE complex convened in Knoxville for the workshop, one of a series that came at a strategic point in time: ISMS is targeted to be implemented in the workplace by September 2000, which is not much time to institute a culture change in how on-the-job safety is perceived and accomplished.

The timing of the workshop might have been the reason that turnout for the conference exceeded estimates, says organizer Dennie Parzyck of ORNL. Around 300 were expected to come. The workshop actually drew nearly double that.

Most significantly, Parzyck pointed out that labor was represented by as many as 150 attendees. Speakers from labor included John Meese, president of the AFL-CIO's Metal Trades Department, and Atomic Trades and Labor Council President Carl Scarbrough.

For labor and management alike, full ISM implementation in the workplace is a goal not yet realized. "We have a long way to go," said ORO Manager Leah Dever, who said that recent setbacks, including safety and security issues at Y-12, "have made us more determined to make ISM a reality."

Another DOE manager, Beverly Cook, of the Idaho Operations Office, described how her early training as a hot-cell operator, where it was "easy to get in an unrecoverable situation," taught her the value of careful job planning, hazard evaluation, involvement of everyone in development of procedures and hardware, execution of the job and of feedback.

"It sounded a lot like ISM," she said. "It's expensive; can we afford it? A well-planned job is a cost savings to everyone. We can't afford not to do it."

Joe DiNunno, a member of the Defense Nuclear Facilities Safety Board, told the gathering that effective implementation of ISM remains the great challenge. "Paper won't do it," he said. "We've been good at devising programs that sound real good."

The keys to successful implementation, he said, are support from upper and middle management levels and worker levels alike. But he warned: "Any serious incident could nullify our gains. What happens in one place affects attitudes toward the whole DOE complex."

The Office of Science's associate director for Laboratory Operations and ES&H, Milt Johnson, recalled an incident in his career that drilled, literally, the importance of worker involvement at the earliest stages. After an electrician drilled into a pipe that was to have carried radioactive tritium (but luckily hadn't), stunned managers, who had believed they were running a very tight and careful operation, went to workers to find out how it could have happened.

"They told us they were under pressure to get the job done," he said. "We told them, 'you have the right to protect yourself and us.'"

"If we don't make ISM a part of how we think, it'll be just another thing that passed on."

ORNL's role in the workshop was prominent. Parzyck and staff members involved in the Lab's ISMS implementation efforts handled many of the organizational facets of the workshop. The Lab's Jeff Hill and David Barncord, who are the ATLC reps in the Office of Safety and Health Protection, participated in a breakout session, moderated by ORNL's ATLC Vice President Ed Mee, on identifying and controlling hazards in an R&D workplace.

The AFL-CIO's Meese described how worker involvement in a European shipyard—one of the most hazardous types of workplaces there is—practically eradicated accidents. The incentive-based program depended on close participation by the unions.

"Why involve the union? Because employees feel more comfortable talking to their union reps," Meese said.

"Union isn't a dirty word. If we don't work with the



Photos by Jim Richmond

The ISM Workshop was marked by a sizable attendance by labor, including the Plant and Equipment Division's David White (right), talking with P&E's Jerry L. Foster of the Technical Training department.

employees, it ain't gonna happen."

Meese said the team-based system reduced accidents by 75 percent and pared lost-workday cases down to one-eighth the previous rate. Housekeeping figured highly in the success. Because many job accidents were attributed to slip, slide and fall injuries, a cleanup campaign aimed at eliminating clutter in turn eliminated those types of accidents.

"The shipyards are immaculate," Meese said.

Bill Madia, who will assume the directorship of ORNL on April 1, described the concept of "simultaneous excellence" to a lunch crowd. Simply put, it means that government, private and academic labs share a common core philosophy for success: a commitment to excellence across the board in science and technology, operations and ES&H, and community service.

Speaking only one week before the announcement of the permanent closing of the High Flux Beam Reactor at Brookhaven, Madia commented, "We see what happened at Brookhaven. We lost the balance of simultaneous excellence. This year it's been counterintelligence. Science has suffered; it has impaired our ability to interact with foreign nationals."

Madia also noted a comment by Motorola's Bob Galvin, a familiar name around ORNL. After worrying about the length of time it was taking to drive ISM "down into the system," Madia asked Galvin about the pace of culture change at Motorola, often considered a hallmark of success.

Galvin told him that after eight years, Motorola "was just about hitting it."

It takes about a year to effect a culture change in a particular organization level, Madia said. "As it gets down to a particular organization, people realize they are accountable and demand support. That's what you want."

(See ISM, page 5)

## Guilt- and gas-free

An ESD researcher reports on a unique car rental experience and road test

BY JONATHAN SCURLOCK

I have been to the future, and driven the car of tomorrow.

And it's a lot of fun!

Swooping around Los Angeles' spaghetti-shaped freeways in total silence, feeling like a character in a science fiction TV show, I was greatly impressed by the ride and performance of General Motors' totally electric EV-1.

Designed for today's drivers, the EV-1 is nevertheless forward looking, since this automobile produces absolutely no pollution at the source. (We'll overlook the power plants that actually produce the electricity for the moment.) Think about it: A guilt-free Mustang for the Millennium.

I had half a day to kill in Los Angeles, so I had planned to visit friends in San Pedro, a suburb about 30 miles south of the city center. I was pleased to find out that alternative-fuel vehicles (electric and natural gas-powered cars) are available from EV Rentals at the airport. Personal service was the order of the day—I went straight to the front of the line and was given a 15-minute briefing on how to operate the car, how to optimize battery life (basically a light right foot—the EV-1 is more than fast enough) and where to find public charging stations.

The EV-1 has a thoroughly futuristic Jetsons-like interior—digital instruments, a "joystick" transmission shifter and a deep curving windshield—unlike the more conventional electric vehicles which were also available in the parking lot (you can rent an all-electric Toyota RAV-4, a Honda

EV-plus or a Ford Ranger pickup). Pulling out onto the San Diego Freeway and dropping a dance music tape into the stereo, I felt a broad grin spread across my face—I hadn't had this much fun in a rental car for years. Shutting off the music for a moment, the silence was eerie—just a slight whine and the tires rumbling over the pavement.

The range of the Mk I EV-1 is claimed to be 90 miles, but EV Rentals find the majority of their heavy-footed clients get about 55 miles at best on a full charge. I didn't do badly, returning the car with about 40 miles still to go after a round trip of some 60 miles, and only about 45 minutes spent plugged in to the public charging station in San Pedro.

Watching the on-board power gauge, it was not hard to drive economically, using the EV-1's coast-down regenerative braking whenever possible. The new Mk II EV-1 (soon to be available for rental, also) has nickel-metal-hydride batteries instead of the conventional lead-acid type and should be capable of nearly 100 miles between charges in the hands of renters. Best of all, the EV-1 costs no more than a regular mid-sized car to rent, and you don't have to find a gas station on the way back to the airport.

For anyone travelling to L.A. for business or pleasure, I thoroughly recommend the experience. Perhaps ORNL should be thinking about getting some EVs

of its own for evaluation under Tennessee conditions.

Contributor Jonathan Scurlock, a researcher in the Environmental Sciences Division, rode his bike to work last Earth Day.



Jonathan Scurlock gasses up ... er, charges up ... his rented EV-1.

## ISM

Continued from page 4

"Until you get a worker directly involved in the program, it won't happen."

Nevertheless, ORNL's target date for completion of Phase II of ISM implementation, when the work force should be familiar with and operating under the tenets of Integrated Safety Management, is this February. The entire DOE complex is slated to be on board by next September.

However, it is workers' acceptance, familiarity and use of ISM practices, not the date, that's really important, and the evolution of that safety culture will occur throughout the years.

ORNL's Ed Mee says the job isn't done. "ORNL has made tremendous progress, but we still have a lot to do to get the ISM message down into the ranks."—B.C. [encl](#)

## Life Sciences, Engineering, Engineering Technology divisions take Director's Awards

This year's Director's Awards for Excellence winners were named in a special Management Forum on November 9. ORNL Director Al Trivelpiece presents these awards annually to superlative divisions in research and development; operations and support; and environment, safety and health.

"These awards of excellence recognize the very best efforts of our Laboratory to accomplish the work that needs to be done in an effective, efficient and most professional way," said Trivelpiece. "The divisions that have earned these awards have done so through a truly team-wide effort, including many individuals who have worked hard for a common goal."

Awards were presented to the Life Sciences Division, Engineering Division and Engineering Technology Division.

The Life Sciences Division received the Award of Excellence in Research and

Development "for substantial and significant advancements of the state of science in functional genomics, bioinformatics, structural molecular biology and computational biology methods."

The Engineering Division won the Award of Excellence in Operations and Support "for exceeding expectations in reducing cost for engineering services, for constructive collaboration with other ORNL organizations and for providing new and innovative options for accomplishment of work."

The Award of Excellence in Environment, Safety and Health was presented to the Engineering and Technology Division "for leadership and programmatic improvement in environment, safety and health and for demonstrated leadership in implementation of ORNL's Integrated Safety Management Program." [encl](#)



Conferring at a luncheon head table were the DNFSB's Joe Di Nunno, ORNL's Dennie Parzyck, UT-Battelle's Bill Madia and Office of Science's Milt Johnson.