Sandia experiments with new reactor prove that spent nuclear fuel is less reactive than fresh fuel

Result could mean significant savings in the eventual safe transport, storage, disposal of nuclear waste

NEW REACTOR — Sandia researcher Gary Harms conducts experiments with a new Sandia-built reactor that are paving the way toward possible changes in regulations on transport and storage of nuclear waste. (Photo by Randy Montoya)

By Chris Burroughs

Recent experiments by Gary Harms (6423) and his team using a new Sandia-built reactor in Tech Area 5 are providing benchmarks showing that spent nuclear fuel — uranium that has been used as fuel at a nuclear power plant — is considerably less reactive than the original fresh fuel. This could mean significant savings in the eventual safe transport, storage, and disposal of nuclear waste.

"The conservative view has always been to treat spent fuel like it just came out of the factory with its full reactivity," Gary, project lead, says. "This results in the numbers of canisters required in the handling of spent nuclear fuel to be conservatively high, driving up shipping and storage costs."

The more realistic view is that as nuclear fuel is burned, the reactivity of the fuel decreases due to the consumption of some of the uranium and to the accumulation of fission product poisons. Accounting for this reactivity decrease, called burnup credit, would allow for the spent nuclear fuel to be safely packed in more dense arrays for transportation, storage, and disposal than would be possible if the composition changes were ignored.

"Allowing such burnup credit would result in significant cost savings in the handling of spent

(Continued on page 4)

Sandia LabNews

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Sandia National Laboratories

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VP Al Romig talks about what's hot in science

VP 1000 Al Romig talks about what's hot in the Science & Technology SMU, in Larry Perrine's story on **pages 6-7**. Al says Sandia's science and technology (S&T) program is "not your father's S&T."

Red Storm rising: Sandia/Cray team to create 40 teraOPS supercomputer

Labs, DOE, NNSA announce $90 million pact with Cray Inc.

MAKING THE ANNOUNCEMENT at Sandia last week that the Labs has teamed with Cray Inc. to develop and deliver Red Storm are from left Sandia President C. Paul Robinson; Sen. Pete Dominici; Linton Brooks, acting administrator, NNSA; and Jim Rottsolk, Cray Chairman and CEO. (Photo by Randy Montoya)

By Neal Singer

An announcement at Sandia — long awaited by the nation's defense labs and computer industry — confirmed last week that Sandia has teamed with Cray Inc. to develop and deliver Red Storm, a massively parallel supercomputer theoretically capable of reaching a peak performance of 40 trillion calculations (teraOPS) per second.

The agreement was formally announced at a Sandia-hosted news conference Oct. 21 at the new International Programs Building east of the Eubank gate. Speaking were Sen. Pete Domenici, R-N.M.; Linton Brooks, acting administrator of the National Nuclear Security Administration; Bill Reed, acting director of NNSA's Advanced Simulation and Computing Program; Jim Rottsolk, president and CEO of Cray Inc.; and Tom Hunter, Senior VP of defense programs at Sandia. Sandia President C. Paul Robinson made the opening remarks and introductions.

Said Tom, "It's wonderful to see a vision become reality."

Sandia reported in June that Cray had been selected for the award, subject to successful contract negotiations.

The machine's speed is based partly on its expected ability to deliver two calculations per clock cycle rather than one, which would total to 20 teraOPS. The new Red Storm architecture also relies upon a very high performance, specially designed 3-D mesh interconnect and Advanced Micro Devices' (AMD) Opteron processors.

Custom aspects of the machine are a departure from recent trends in supercomputing architec-

(Continued on page 4)

Instant Shooter ID kit developed at Sandia helps solve five real crimes, including four murders

By John German

In Nassau County, homicide detectives had a hunch. They wiped the back seat of a car with a swab, then doused the swab with a clear liquid chemical.

The blue specks that appeared on the swab seconds later gave investigators an important new piece of information: The person who killed the couple in the front seat had fired the gun from the back seat, not from the street as one witness had reported.

When faced with the new evidence, the witness confessed to committing the murders himself.

The case in September was the most recent of five crimes solved by police departments using, as part of each investigation, a new product called the Instant Shooter ID Kit® created by Law Enforcement Technologies (LET), Inc., of Colorado

(Continued on page 5)

What's What

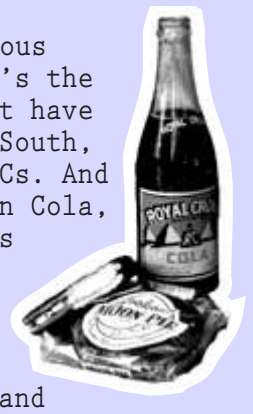
Want to save a tree — maybe a small one? Or at least a couple of branches? If those paper pay stubs that show up every couple of weeks in your office mailbox — or the mailbox at home — just pile up in a file folder or drawer, or just collect dust on a desk, maybe you don't really need 'em. And if you don't need 'em, there's no reason to print 'em. If that's the situation, there's an easy solution. Just go to the TechWeb homepage <http://www-irn.sandia.gov> and click on My Benefits (the button at the top of the page). Enter your username and Kerberos password and when you're in, click on Direct Deposit, then on Pay Statement Print Option, then check the box at Suppress Direct Deposit Advice Print and click on Save. If you ever need a printed version, go to the homepage and after clicking on My Benefits and logging on, click on Last Pay Statement and print it.

* * *

We all know Sandia's a fascinating place to work — the exotic research, pride of contributing to national security, interesting colleagues, and all that. But our locations provide us with some unusual moments unlikely to be found in most other research environments.

Last week, for example, a Sandian driving on Tonopah Test Range hit a wild horse; the same day, a rattlesnake was spotted and captured in Tech Area 4 at the New Mexico site; and the next day another rattlesnake was spotted and bagged at nearly the same place. The rattlers were luckier than the horse; it was killed in the collision, but both (maybe the same one, just fond of TA4?) snakes were taken to a remote part of the lab site and released.

* * *



You may not be aware of it, but this is an auspicious year, particularly if you have a Southern connection. It's the 100th anniversary year of Moon Pies. Of course, you don't have to be a Southerner to like them, but if you're from the South, you've probably taken some ribbing about Moon Pies and RCs. And if you don't know about RCs, that's short for Royal Crown Cola, which is always paired with Moon Pies as the Southerner's snack of choice.

Now, if you aren't from the South and haven't ever had one, a Moon Pie is a blob of marshmallow crème sandwiched between round graham crackers and the whole thing encased in chocolate. One of those and an RC cola and you suddenly appreciate Lewis Grizzard, John Lee Hooker, Hank Williams (Senior), country ham, grits, turnip greens, and sweet tea. And when you hear, "Hey, Grandpaw! Whut's fer supper?" you know who Grandpaw is and what supper's all about.

If you want to know more about Moon Pies, look at this website: www.moonpie.com.

And you'll find more about RC Cola at this website: www.glavergne.com/rca.htm.

— *Howard Kercheval (844-7842, MS 0165, hckerch@sandia.gov)*

Sandia LabNews

Sandia National Laboratories

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LOCKHEED MARTIN

Sandia people

BJ Jones (3030) has been named director of Human Resources Center 3500, effective Nov. 1, VP Don Blanton announced last week. BJ served earlier as manager of the Benefits and Health Planning departments, HR Customer Service, and, most recently, the Workforce Management, Planning, and Staffing departments. More in a future *Lab News*. . . . **Sandra Begay-Campbell** (6219) has been appointed to the University of New Mexico's Presidential Search Committee. She is a member of UNM's Board of Regents and was one of three board members named to the 11-member search committee.

Take Note

Retiring and not seen in *Lab News* pictures: **Wendel Archer** (1733), 34 years; **Paul Elder** (5733), 17 years; and **Gloria Espinoza** (6245), 25 years.

Congratulations

To DeAnna Wagner (9831) and Robert Spulak (2564), married in Las Vegas, Nev., Aug. 28.

To Donna and Craig (3128) Wood, a daughter, Amber Rose, Oct. 3.

Sympathy

To Susie Maldonado (9800) and Gil Maldonado (DOE/AL) on the death of their son, Mark Maldonado, Sept. 19.

To Nancy Campanozzi (3113) on the death of her husband, Lou, Oct. 19.

National Atomic Museum now a Smithsonian affiliate

The National Atomic Museum has a prestigious new partner. An agreement with the Smithsonian Institution makes the museum an official "affiliate" of the Smithsonian.

"This is a win-win situation for our museum

Smithsonian Institution Affiliations Program

and the Smithsonian," says National Atomic Museum Director Jim Walther (12660) "We will be able to share collections, expertise, and exhibit knowledge with some of the most respected museums and curators of our country."

"The Smithsonian affiliation places the National Atomic Museum in a league beyond the normal level," says Jim. "The Smithsonian is known as a quality institution and we are pleased to be affiliated with it.".

The National Atomic Museum, managed for DOE by Sandia, is the first in Albuquerque to become a Smithsonian affiliate. Inspired by a 1996 traveling exhibition celebrating the Smithsonian's 150th anniversary, the affiliations program is designed to bring the nation's most respected museum closer to the American people. The program allows member organizations to borrow from the Smithsonian's estimated 142-million-piece collection. By loaning its collection, the Smithsonian shares its unseen collections and helps other museums attract patrons.

NATIONAL ATOMIC MUSEUM

"The program allows the American people to experience the Smithsonian and its wonders in their own backyard," says Michael Carrigan, Smithsonian affiliations director. There are now more than 115 partnerships, he says.

In addition to borrowing from the Smithsonian's collection, affiliates can avail themselves of opportunities for curriculum development at local schools, lectures, workshops, study tours, and other programs. Smithsonian expertise in care of collections and exhibition development is also available.

Recent Patents

Maarten de Boer (1762), James Redmond (9124), and Terry Michalske (1040): Micromachine Friction Test Apparatus.

Barry Spletzer (15211), Diane Callow (15272), Lisa Marron (15211), and Jonathan Salton (15212): Method and Apparatus for Extracting Water from Air.

Anthony Bentley (2338), John Kelley (6219), and Fred Zutavern (15333): Use of Miniature Magnetic Sensors for Real-Time Control of the Induction Heating Process.

Marc Polosky (2614) and David Plummer (2330): Microscale Acceleration History Discriminators.

Douglas Adkins and Gregory Frye-Mason (1764): Ram-Air Sample Collection Device for a Chemical Warfare Agent Sensor.

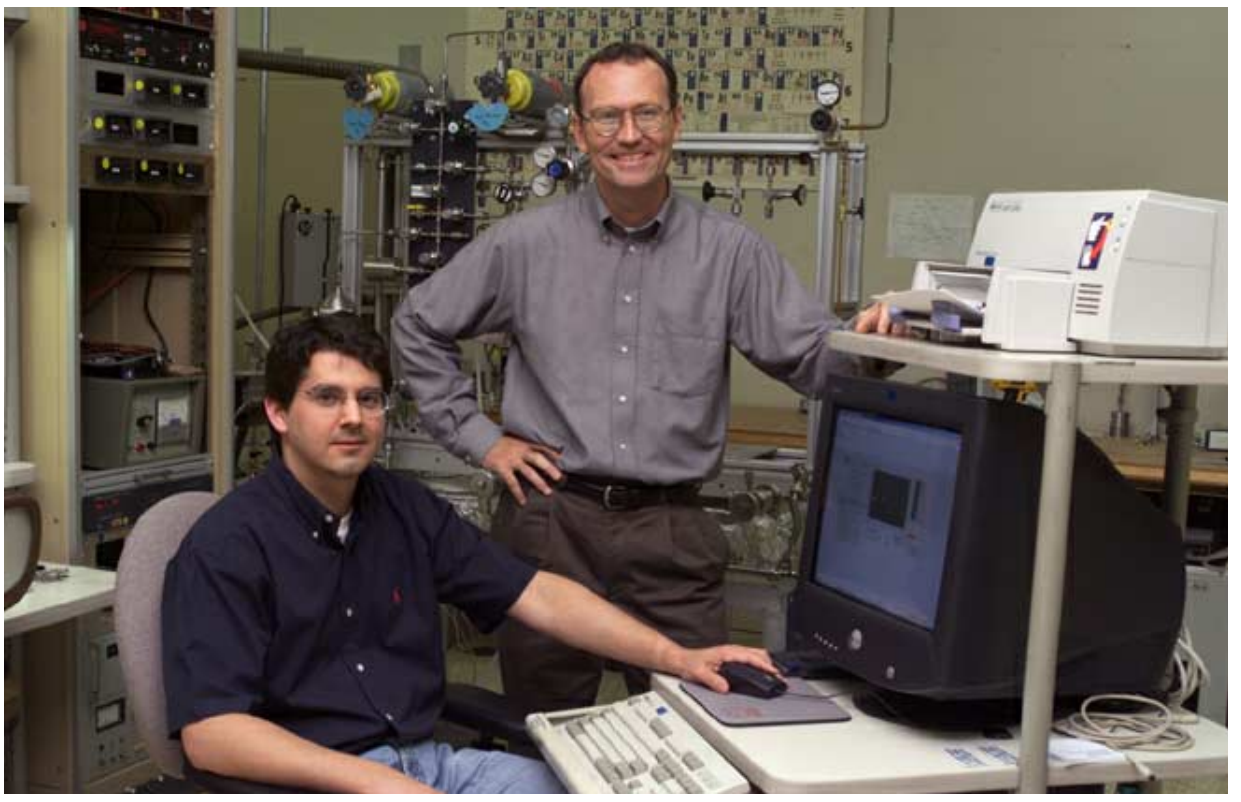
Michelle Griffith (14184), William Hofmeister (Vanderbilt University), Gerald Knorovsky (1833), Danny MacCallum (1833), M. Eric Schlienger (1800), and John Smugeresky (8724): Direct Laser Additive Fabrication System with Image Feedback Control.

Ken Chen (9114), William Morgan (5744), and John Zich (14100): Process for Metallization of a Substrate by Curing a Catalyst Applied Thereto.

LDRD-funded materials breakthroughs hold promise for storing hydrogen energy

Performance of new material termed 'astonishing'; research on it is expanding

By Nancy Garcia



KARL GROSS (standing) and Eric Majzoub (seated) are developing a promising new class of hydrides for hydrogen storage. (Photo by Bud Pelletier)

In creating promising materials to store hydrogen, Sandia researchers have pushed theoretical limits, invented a better method of synthesis, and attracted attention from scientists, research partners, and automotive companies along the way.

This month, the research is expanding under two new Laboratory Directed Research and Development grants to further fundamental understanding of the promising materials and to demonstrate integration with a fuel cell. The newly funded work comes on the heels of a well-received invited plenary talk at an international meeting last month in Alsace, France.

Meanwhile, the new synthesis method is subject to a pending patent, and four industry leaders from automotive and oil companies have inquired about possible partnerships. Material made with the new low-cost, direct synthesis method has no hydrocarbon impurities that could damage a fuel cell and operates 10 to 20 times more quickly to charge or discharge hydrogen.

Materials researcher Karl Gross (8723) has cycle-tested the new material, sodium alanate hydride, up to 160 times and terms its performance "astonishing." With Eric Majzoub (8723), he is studying it as a model system for developing future hydrogen storage systems. "We have been working very hard on developing optimized versions of this material," Karl says.

Sandia CaliforniaNews

More than three years of work have been invested in studying the fundamental and engineering properties of these materials with the goal of developing a practical means to store hydrogen for hydrogen-powered cars.

"Given the progress we've had," Karl says, "I think we'll get there."

Hydrogen's advantages over fossil fuels include its lack of polluting emissions and the fact that it can be produced anywhere from renewable energy resources such as solar electricity or biomass. Proponents of an energy economy that emphasizes hydrogen point to the potential to improve urban air quality, decrease greenhouse gases (released by burning fossil fuels) that contribute to global warming, and gain independence from foreign oil.

Already, points out Karl, demonstration applications exist to generate power in a distributed system (off the electric "grid") with hydrogen fuel, to run portable electronic devices on hydrogen, and to operate vehicles using hydrogen combustion engines and also hydrogen fuel cells. (Fuel cells convert chemical energy to electrical energy, creating water and heat without emitting hydrocarbon pollutants or "greenhouse gases.")

Storing gaseous hydrogen does pose challenges, however. "It doesn't matter what your power plant is," comments Karl, "the biggest problem is storage."

The FreedomCAR initiative announced by Energy Secretary Spencer Abraham in January seeks to promote the use of hydrogen as a primary fuel. It targets a vehicle system's initial hydrogen storage at about 6 to 8 weight percent hydrogen. Given the tradeoffs between weight and volume, that goal accommodates roughly a 300-mile driving range per fill-up.

"No material provides that yet," says Analytical Materials Science Dept. 8723 Manager Jim Wang. "Our research for the past few years has been on the leading edge of hydride development," however, and has identified the class of material that appears to come the closest to that goal.

The material Karl and Eric are investigating was first shown in 1996 by German scientists to have achieved the breakthrough of being able to absorb and release hydrogen at reasonable pressures and temperatures when the material was doped with titanium. The ability of such hydrides to release hydrogen was known for half a century, but earlier versions of the material were not easily reversible.

Their model sodium alanate hydride has a theoretical reversible capacity of 5.6 weight percent hydrogen. This is more than double commercial room-temperature hydrides, which store about 2 weight percent hydrogen, and is equal or better than high-pressure or liquid hydrogen storage methods. Experimenting with material synthesis, they found that milling the elemental components together directly rather than relying on the common solvent synthesis process, was not only a more simple and less costly method, it also improved the purity and performance of the material. Steady improvements have been made in the materials, increasing the deliverable hydrogen from 2.8 to currently over 4.3 weight percent hydrogen.

'A whole new world of materials'

Each of these alanates outperformed about 15 other inexpensive hydrides that operate at close to room temperature. Karl hopes Eric's work to understand fundamental properties of alanates will suggest new types of complex hydrides. "If it does work," he says, "that opens up a whole new world of materials."

Hydride storage of hydrogen fuel competes with pressurized storage (at 5,000 psi) and is an alternative to storage of liquid hydrogen, at 25 degrees above absolute zero, in a fiber-wrapped tank.

The new, more-quickly charging material increases the appeal of hydrides, Karl points out. "Nobody wants to wait 20 or 30 minutes to fuel up, unless you put gas stations next to a Starbucks — so you can get your hydrocarbons one way or another," he jokes.

A classic hydride may be thought of as a "sponge" in which the hydrogen is absorbed into the metal and fills spaces in the crystal lattice of the material. Karl and Eric note that when being charged with hydrogen, the alanates actually incorporate hydrogen in a two-step chemical reaction that forms lightweight hydrogen-metal complexes (that have covalent bonding character). The desorption process involves the chemical decomposition of the hydrides again in a two-step process. About two-thirds of the hydrogen is released in the first decomposition reaction and the remaining hydrogen is released in the second decomposition step. These thermal decomposition processes will deliver hydrogen at over an atmosphere of pressure above about 110 degrees C. This is near the temperature of a fuel cell's waste heat, which can be used to warm the hydride bed to speed release of the remaining hydrogen.

A breakthrough invention? Perhaps

For that reason, "this is really an ideal application," Karl says.

The Sandia hydride researchers kicked off an alanate working group meeting for DOE, which has funded the work to date at Sandia. The working group includes United Technologies, the University of Hawaii, Savannah River, and the Florida Solar Energy Center. Eric and Karl also work with the National Institute of Standards and Technology (NIST), the Colorado School of Mines, the University of Geneva, and the International Energy Agency on aspects of the hydride research.

Within DOE, Karl says, Sandia is "probably one of the leading labs for the FreedomCAR program." Adds 8000 VP Mim John, "We may just have a breakthrough invention that could make hydrogen in automobiles a reality."

Combustion Research Facility researchers have also been building on Sandia's long-standing strengths in the study of metal-hydrogen interactions and engine studies to explore hydrogen use for electrical production by stationary power sources — turbines in particular.

Through an overall hydrogen working group, Joe Oefelein (8351) is modeling addition of hydrogen fuel to gas turbine combusters (which typically come online quickly to satisfy spurts in power demand beyond the steady supply of power available from steam turbines). Joe's collaboration with the National Energy Technology Laboratory in this area has drawn interest from four industry leaders, said Jay Keller (8362).

Meanwhile, CRF researchers are also involved in the International Energy Agency's efforts to create next-generation models for turbines that can burn hydrogen. The CRF is also seeking funding to demonstrate use of hydrogen fuel, with its near-zero emissions of NOx (smog-producing oxides of nitrogen), in an internal combustion engine, Jay added.

Although one of the biggest impacts of switching to hydrogen from fossil fuel will be seen in transportation, he said, its use in stationery power generation will also help to develop an infrastructure for its distribution and use.

Red Storm

(Continued from page 1)

tures, which have made a point of relying on off-the-shelf parts. Nevertheless, the machine is said to have an excellent price/performance ratio.

The computer, expected to be operational at Sandia in the summer 2004, will be approximately seven times more powerful than ASCI Red, Sandia's fastest computer now. It is also expected to have the capability to achieve 100 teraOPS with added hardware.

Nuclear weapon engineering simulations are the major driver of the computer, although it will also serve a broad spectrum of scientific and engineering applications.

For this reason, the installation at Sandia will operate in a dual-network configuration — classified (Red) and unclassified (Black). The machine can be rapidly reconfigured to make all the compute nodes classified, all the compute nodes unclassified, or, in normal operations — three quarters of the compute nodes available to either of the two networks and one quarter of the machine available to the other.

Currently, the world's fastest supercomputer is NEC's Earth Simulator (35.86 teraflops) in Japan, followed by ASCI White (7.22) at Lawrence Livermore National Laboratory.

Sandia Red Storm system facts

- 40+ teraOPS theoretical peak performance
- 108 compute node cabinets, 16 service and I/O node cabinets, and 16 Red/Black switch cabinets
- 10,368 compute node processors, 256+256 service and I/O node processors
- AMD Opteron™ processor
- 10 teraBytes of DDR memory
- 240 teraBytes of disk storage
- Approximately 3,000 ft² including disk systems
- < 2.0 megawatts of power and cooling

Red Storm: 'A major step,' a crucial initiative, 'a clear commitment'

Here are some of the prepared remarks of participants in the Red Storm news conference at Sandia:

Paul Robinson: "I am delighted that we were able to negotiate a contract for such a high performance supercomputer with Cray Inc. The history of Sandia's advances in new supercomputers has been one of close partnerships with US companies to simultaneously meet the laboratories' needs for supercomputers, while advancing the state of the art in US computing firms."

Tom Hunter: "This computer will allow modeling and simulation of complex problems that were only recently thought impractical, if not impossible. Calculations that would have taken months only a dozen years ago will now be done in a matter of minutes. This investment by Sandia and the NNSA represents a clear commitment to provide the essential capabilities to support the nation's nuclear weapons program. It is a major step toward establishing computing as the key enabler of science and engineering in the 21st century and reemphasizes our role as one of the world's leaders in that transformation."

William Reed, Acting Director of ASCI for NNSA, said he considers Red Storm a crucial initiative in developing and deploying scalable, cost-effective supercomputers to meet the demanding simulation needs of nuclear weapons stockpile stewardship. "We are excited to have the new Cray Inc. as an industrial partner in the ASCI program," said Reed.

Cray Chairman and CEO Jim Rottsolk said Red Storm reflects Cray's strategy to deliver high-efficiency, high-bandwidth supercomputer systems. "Red Storm embodies the same design philosophy as our new Cray X1™ vector-based product in a highly cost-effective superscalar architecture and will be a key initiative for Cray. With X1 and Red Storm, Cray is demonstrating its comprehensive capabilities in the high-performance scientific and technical marketplace," he said. "We are excited about winning this significant contract, and eager to begin collaborating with Sandia in the ASCI program."

Marty Seyer, vice president of server business at AMD: "AMD has forged a credible reputation in the high-performance computing arena with its current generation of processors. We are proud that a supercomputing leader like Cray selected our upcoming AMD Opteron™ processor for the new Red Storm system. This is an important validation of the performance and stability of AMD Opteron™ processors."

Bill Camp, Sandia Director of Computers, Computation, Information, and Mathematics: "Sandia selected Cray to build this design because of its commitment to engineering, building, and delivering efficient, cost-effective, and reliable large-scale MPP [massively parallel processing] systems." Bill also said that Cray's commitment to developing balanced and cost-effective architectures, together with its focus on the scientific computing market, were key factors. Massively parallel supercomputers, designed as single machines, are more efficient than "clustered" systems that more loosely link together multiple servers or PCs. "We expect to get substantially more real work done, at a lower overall cost, on a highly balanced system like Red Storm than on a large-scale cluster," Bill said.

Jim Tomkins, a Sandia Distinguished Member of Technical Staff, and Bill Camp architected the Red Storm design. Sandia's design was strongly influenced by the successes of the Cray T3E and ASCI Red MPP supercomputers. According to Jim, "The Red Storm contract contains an option to upgrade to 60 teraOPS. The Red Storm system architecture is designed to scale to hundreds of teraOPS."

Spent fuel

(Continued from page 1

nuclear fuel," Gary adds.

This seems obvious on the surface, but in the ultraconservative world of nuclear critical safety, an effect must be proven before it is accepted.

Thus, prior to the Nuclear Regulatory Commission ever agreeing to the more realistic view, it would have to be proven in actual experiments and compared to computer models showing the same effects.

In 1999 Gary obtained a three-year grant from the DOE Nuclear Energy Research Initiative to make benchmark measurements of the reactivity effects that fission products have on a nuclear reactor. The project was called the Burnup Credit Critical Experiment (BUCCX). Rhodium, an important fission product absorber, was chosen for the first measurements.

To do this the BUCCX team first designed and built a small reactor, technically called a critical assembly, which uses low-enriched fuel. The control system and some of the assembly hardware for the reactor came from the 1980s-era Space Nuclear Thermal Propulsion (SNTP) Critical Experiment project, designed to simulate the behavior of a nuclear rocket reactor.

"It took us most of the three years to build the reactor and get authorization to use it. Only in the last few months have we begun actual experiments," Gary says. "Much of the time was involved in getting approvals from Sandia and DOE and to make sure it meets all ES&H concerns."

"It takes a pretty big team to bring up a new reactor, even a small one, in this day and age," he added. "The team included members from all of the Area 5 departments that do reactor work. We also got considerable support from purchasing, the shops, and several of the ES&H departments."

The core of the BUCCX consists of a few hundred rods full of pellets of clean uranium that originally came from the nuclear powered ship NS *Savannah*. Thirty-six of the rods can be opened to insert experiment materials between the fuel pellets. Prior to conducting experiments with the rhodium, the researchers loaded the reactor to critical with only the uranium fuel. This provided a baseline point of where uranium goes critical — information that could be compared to later experiments.

Then, the BUCCX team added about 1,200 circular rhodium foils between the uranium pellets in the 36 rods. The intent was to measure the extent to which the rhodium reduced the reactivity of the uranium.

"We then compared the critical loading of the assembly with the rhodium foils to the critical loading without rhodium," Gary says.

And, not to anyone's surprise, it took significantly more fuel to reach critical with the rhodium-doped rods than without them.

Months before running the physical experiments on the reactor, Gary was modeling on Sandia's sophisticated computers to determine where the uranium doped with rhodium would go critical.

"I was curious," Gary says, "I did calculations ahead of time so I could lay out the experiment and get a peek at what the experiments would say. In the end, I was fairly impressed with how accurate the calculations were compared to the actual physical experiments.'

Of course, the computer codes weren't perfect, and had a small bias when compared to other critical safety benchmarks. And in analyzing the actual experiments in the reactor, Gary took that bias into account.

Gary says two other fission products absorb neutrons better than rhodium. However, he selected rhodium to run the experiments because it is one of the few byproducts of fission that has a single stable isotope, which means the experiment would not be contaminated by the effects of other isotopes. Also, no one else has done any experiments with rhodium in a critical assembly. Subsequent experiments could address the dozen or so other fission products that are important to burnup credit.

Also, to his knowledge, no other lab in the US is doing actual burnup credit experiments. Oak Ridge National Laboratory is running codes to determine how much the reactivity of spent fuel is reduced by fission products, but not doing actual experiments.

At the end of the three-year funding period, Gary says the Sandia program has come a long way in proving that the reactivity of spent fuel is considerably less than that of fresh fuel.

"In essence Sandia is helping pave the way for the Nuclear Regulatory Commission to address the safe and cost-efficient transport and storage of nuclear waste," Gary says.

BUCCX team members

It takes a village to raise a reactor, and not a small one. The lead roles on the BUCCX team were Gary Harms (6423), Sharon Walker (6433), Paul Helmick (6423), John Ford (6431), and Don Berry (6432). The team included Matt Burger (6431), Sid Domingues (6431), Jim Fisk (ret.), Francisco Gonzales (6432), Jim Andazola (6432), Gerald Naranjo (6424), Mike Torneby (3128), Jim Duncan (3128), Dee Brock (3127), Sylvia Gomez (6432), Kevin Cooley (6432), David Samuel (2992), Kevin McBride (2992), Tom Vanderbeek (6433), Bill Peters (10251), Dave Mills (10255), Rob Naegeli (6433), Joe Padilla (14186), Tony Zamora (14186), Rick Anderson (14186), Manny Trujillo (3111), Warren Strong (6433), Laura Latoma (3111), Fernando Dominguez (3111), and Dave Vehar (6432). The management team included Paul Pickard (6424), Jeff Philbin (now 12333), Jim Bryson (6431), Ted Schmidt (6430), Jack Loye (6430), Ron Simonton (now 7004), and Ken Reil (6423).

US Marine Corps places the second US military order for Sandia-developed decontamination formulation

The US Marines have ordered tens of thousands of gallons of a formulation developed at Sandia that decontaminates chemical and biological warfare agents, weeks after the US Army placed the first US military order for the formulation in deployment quantities.

Last week Modec, Inc. received an order for several tens of thousands of gallons of its decontamination product, Modec Decontamination Formulation-200® (MDF-200), from the US Marine Corps Systems Command, the Marines' logistics and supply arm. The exact number of gallons ordered is proprietary.

Modec is one of two US companies granted nonexclusive licenses to manufacture and sell products based on the formulation, under development at Sandia since 1997.

The formulation neutralizes both chemical and biological agents and is nontoxic, noncorrosive, and environmentally friendly. (For more, see http://www.sandia.gov/media/cbwfoam.htm.)

The Sandia formulation is proven effective against both biological and chemical agents, can be applied with current military hardware, causes no collateral damage (such as corrosion of equipment), and creates an effluent that can be washed down the drain.

EnviroFoam, the other Sandia licensee, received an order from the Army for several tens of thousands of gallons of its product, EasyDecon®, on Sept. 25 (*Lab News*, Oct. 18), and another order from the Marines last week.

The three recent, large orders may signal high-level decisions within the services to begin replacing the current decontaminants the US military keeps on hand in case US forces are attacked with chemical and biological weapons.

Versions of the formulation supplied by Modec and EnviroFoam were used to help clean up federal buildings in Washington, D.C., and TV network headquarters buildings in New York following the anthrax-letter mailings in October and November 2001.

The formulation was developed and refined by a team including Maher Tadros (16000), Mark Tucker, Larry Bustard, Cecilia Williams, Rita Betty, Paul Baca, Caroline Souza (all 6245), and Joanne Paul (former Sandian). Ongoing efforts are being supported by Gary Brown (6233), Danny Engler, and Mollye Wilson (both 6245). — *John German*

Shooter ID kit

(Continued from page 1)

Springs.

The kit employs a Sandia-developed concept for packaging a laboratory chemical detection technique useful for identifying minute traces of gunpowder residue left at the scene — and on the shooter's hands, arms, and clothing — whenever someone fires a gun (*Lab News*, Feb. 8, 2002).

Lab bench to police beat

Last summer Sandia explosives engineers, who routinely use similar chemistry to detect explosives in their laboratory, presented the concept to LET founder and CEO Greg MacAleese, a former Albuquerque Police Department violent crimes investigator.

MacAleese, who is working with Sandia to develop several other law enforcement technology projects, sponsored laboratory and live-fire tests at Sandia late last year. The results were promising, so LET licensed the technique from Sandia in February this year and turned it into a product that is compact, affordable, and usable right at the crime scene.

Soon after, LET began shipping samples of the kits to police departments for field trials. As word spread, demand grew, says MacAleese.

Each kit costs $17 and is about the size and shape of a VHS cassette.

Today there are more than 1,600 of the kits in the hands of police departments across the country, he says, with orders coming in every day.

"At first there was some resistance from the forensics lab community," he says, which traditionally analyzed gunshot residue samples in the laboratory using scanning electron microscopes (SEMs). But the forensics labs are underfunded and overworked, and each SEM analysis typically costs hundreds of dollars and takes a month or more, much too long for some police work.

INSTANT SHOOTER ID KIT includes (clockwise from lower right) a breakable vial containing a proprietary liquid chemical, a fiberglass swipe and specimen box for isolation of the sample during detection, and a pair of gloves to prevent cross contamination. (LET, Inc. photo)

"I think now they have begun to view the kits as a way to reduce their workloads and focus on the higher-profile crimes," he says. "Now we are seeing a lot of 40-kit orders from police departments that initially ordered a few."

Subsequent field trials conducted by LET have demonstrated that the kits are more than 90 percent accurate, adds MacAleese, another critical factor in the ID Kit's acceptance.

Blue on white

Each Instant Shooter ID Kit includes a round fiberglass swab that can be rubbed on the hands, arms, or clothing of someone suspected of firing a gun, or on the surfaces of a crime scene.

When the swab is soaked in a proprietary liquid chemical, spots where trace amounts of gunpowder residues are present turn blue against the white swab. A detection takes 3 to 5 minutes.

Other crimes solved with assistance from the Instant Shooter ID Kit include:

• In Glendale, Ariz., officers interceded in a potential confrontation between rival gangs at a park. When they approached one group, the officers noticed a towel on a nearby concrete picnic table concealing a lump, which turned out to be an automatic weapon.

None of the individuals claimed ownership of the gun, so police took them all into custody and swabbed them all. The Instant Shooter ID Kit detected gunpowder on one suspect, who had been released from prison the previous day. He confessed to handling the weapon, a clear violation of his parole.

"He was back in jail that night," says MacAleese. "You don't even have to fire a weapon for the shooter ID kit to work. It can detect residues from handling a weapon."

• Each of six victims in three separate apparent double homicides (Falls Church, Va., Flagstaff, Ariz., and Midland-Odessa, Texas) were swabbed. The Instant Shooter ID Kit helped detectives conclude that each crime was a murder-suicide — in each case one of the victims had fired the gun that killed the other, then turned the gun on himself.

Narrowing down suspects, scenarios

Police departments all over the country are using the kits now, says MacAleese.

The kits have proven most useful in helping investigators quickly narrow the list of suspects right at the crime scene or piece together details of a crime so detectives can focus on the most plausible explanations, says MacAleese.

"Pretty good for a product that's been out only a couple of months," he says. "As police departments are confronted by an increasing number of violent crimes, there is a need for a fast and low-cost alternative to lab work. We are seeing a major increase in demand, and the feedback is all positive."

Sandians involved in the project include project leader Pam Walker, Phil Rodacy, Susan Bender (all 2552), and Kevin McMahon (1321).

Teachers, students: Need a science expert? Just ASK

How do science teachers find an expert? How can students learn about an experiment? How can interested volunteers review the scope of Sandia outreach activities available to science students? Just ASK! That's the message from Pat Milligan, project manager for "Sandia's Adventures in Science and Knowledge" (ASK) website.

You can check the site out for yourself at: http://www.sandia.gov/ASK.

"We wanted one easy place for students, teachers, and others interested in science to learn about our education outreach activities," says Pat. "We have integrated education outreach activities from our human resources organization and our environmental management group with our education partnership programs. There was a lot of information, but not one good place to find it." Pat, a member of Sandia's Corporate Outreach Dept. 12650, says a focus group for teachers conducted last year led to the idea of a single point-of-contact website. Lockheed Martin contributed the funding for the site's development.

While some pages are still in development, there are already a variety of links to Sandia-led programs — such as the CrossLinks program and the popular Family Science Nights — and other relevant science education activities. The site allows the user to select a school level — elementary, mid-, or high-school — or to click on links for teachers or others interested in science.

Each link offers names, phone numbers, and e-mail addresses to contact program experts.

"We believe this site will be invaluable to educators and students across New Mexico," says Mike DeWitte, deputy director for the Labs' Corporate Outreach group. "It integrates a lot of valuable programs in a way that hasn't been done before. It also provides valuable information for our volunteers in various science education activities."

Pat is at work to get the word out on the new site. He's sending postcards to all Albuquerque Public School science departments and will also let schools statewide know about the resources.

Al Romig: What's hot in the Science & Technology SMU?

By Larry Perrine

This is the second in a series of Lab News *articles about Sandia's four Strategic Business Units (SBUs) and two Strategic Management Units (SMUs), discussing current programs, evolving opportunities, and how 9/11 and the volatile world situation may be changing their focus and Sandia's as a whole.*

Based on interviews with each SBU/SMU leader, the articles are published every few months. They are not intended to review all programs in each unit, go into great detail, or focus on individuals, but to highlight "hot projects" and new directions and give employees some insight into the thinking of these leaders. The Lab News *will continue doing regular feature stories on interesting technical programs and projects, so many of those mentioned briefly in this series and the people involved will get more coverage down the line.*

The series began in our July 12 issue with the Energy and Critical Infrastructure Strategic Business Unit, led by Bob Eagan (VP 6000). We continue with the Science and Technology SMU, led by VP Al Romig (1000). Al is also Sandia's Chief Technology Officer, Chief Scientific Officer for the Nuclear Weapons program, and leads Sandia's Partnerships SMU, which will be covered in a later article.

Borrowing a theme from a national car-ad campaign from a few years ago — Sandia's science and technology (S&T) program today is "not your father's" S&T. While the Labs continues traditionally strong S&T programs in computing, engineering sciences, pulsed power, microelectronics, and other disciplines, Sandia also moved quickly in the past few years to ramp up major biotechnology and nanotechnology programs.

"This job is an absolute hoot. Sandia is a 'candy store of science.' "

Science and Technology SMU leader Al Romig notes that all of these programs — new and old — support the work of Sandia's strategic business units. "The S&T organization has two main functions," he says. "One is to apply this underpinning of capability for the SBUs, and the other is to make sure we are investing our S&T funds so we have the right science and technology for the SBUs in the future." (See "Sandia's strategic business and management units" below for basic explanation of their responsibilities.)

SBU/SMU structure has helped

Sandia adopted the SBU/SMU organizational structure about four years ago in part to improve coordination, cooperation, and communication among Labs technical programs, and Al says it has

MICROCHEMLAB PROTOTYPE — One of the most promising technologies coming out of Sandia's Laboratory Directed R&D program is the MicroChemLab (µChemLab). Sandia spin-off companies Eksigent Technologies and MCL have licensed the technology and plan to develop it further for chem/bio national security applications.

helped do all of these things. "We have more synergy and interactivity across the laboratory and are capitalizing on that integrated strength in ways we never have before," he says. "That's one of the reasons Sandia has been so successful the last couple of years."

"Just being around this diversity of science and technology and the brightest collection of people you could ever imagine is very stimulating."

Although S&T R&D work is done in the SMU's centers, not only in Division 1000 but throughout the Labs, Al emphasizes that it is funded and managed by SBUs and the S&T SMU. There are 15 S&T centers scattered throughout the Labs' technical divisions, and 10 S&T councils help coordinate activities in specific technology areas and encourage strong interdependent relations Labs-wide (see http://www-irn.sandia.gov/ organization/smu/ science/index.htm).

Keeping up with the progress and needs in these diverse and technically demanding areas is no small task, but Al relishes the challenge and obviously loves his work. "This job is an absolute hoot," he says. "Sandia is a 'candy store of science.' Just being around this diversity of science and technology and the brightest collection of people you could ever imagine is very stimulating."

Some new directions: bio, nano, cogno

Al talks eagerly about the accomplishments in traditional S&T areas throughout the Labs — computational science, modeling/simulation, materials science, microelectronics/ microsystems, optical science, pulsed power, combustion, earth sciences, batteries and more — but he's especially enthusiastic about Sandia's plans and prospects in biotechnology, nanotechnology, and cognitive science.

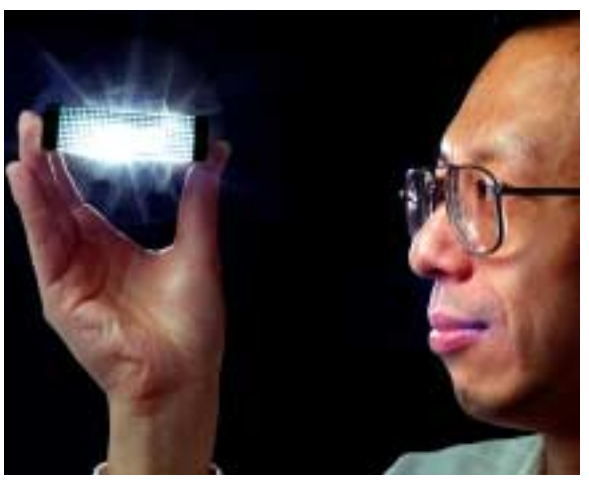
"The Laboratory made a decision to invest in biotechnology approximately three years ago, and it's a natural for us," he says. "First, we have a national security mission countering bio-threats — including bioterrorism, biowarfare, and emergent diseases. But it's also clear that opportunity lies between biotechnology and nanotechnology. There will be new materials and devices developed within nanotechnology, but their origin will actually be biological. We will use biological processes, or laboratory variants of biological processes, to create these new materials and devices.

"The Laboratory made a decision to invest in biotechnology approximately three years ago, and it's a natural for us."

"It's clear to me," continues Al, "that some of the materials and devices produced for engineering application 20 years from now will have at least a partial biological heritage. And there is an opportunity for Sandia's traditional science skills in New Mexico and California — physics, chemistry, computation, and engineering — to contribute to solving the nation's serious problems in biotechnology and medicine."

(Note: More information about Sandia's young biotechnology program is available on the web in a recently issued group of news releases; see www.sandia.gov/news-center/news-releases/2002/ gen-science/bioinitiative.html. The releases are based on the *Lab News* series that ran this summer.)

Al is eager for the recently announced



S&T SUCCESS — Shawn Lin (1743) shows an early prototype of a photonic lattice he developed with several Sandia colleagues. Their work has attracted international attention to Sandia's photonics research program and has brought them several major scientific awards and honors. Photonics involves the containment and bending of light. (Photo by Randy Montoya)

Center for Integrated Nanotechnologies (CINT, *Lab News,* Aug. 9) to come on line in a few years and into Sandia's S&T program mix. Approved as a joint project involving Sandia and Los Alamos National Lab by DOE's Office of Science this summer, CINT is one of five new Nanoscale Science Research Centers being created by the Office of Science. CINT construction costs are expected to total more than $75 million.

The Center will include a core facility in Albuquerque and a smaller building in Los

(Continued on next page)

Sandia's strategic business and management units

Here are the basics about Sandia's strategic units. The list includes Sandia's four Strategic Business Units (SBUs) and two Strategic Management Units (SMUs), with their VP owners and their primary missions.

• **Emerging Threats SBU** — Owner: Jim Tegnelia. "We will develop high impact responses to emerging national security threats."

• **Energy and Critical Infrastructure SBU** — Owner: Bob Eagan. "We will enhance the surety (safety, security, and reliability) of energy and other critical infrastructures."

• **Nonproliferation and Materials Control SBU** — Owner: David Nokes. "We will reduce the vulnerability of our nation to threats of (1) proliferation and use of weapons of mass destruction, (2) nuclear incidents, and (3) environmental damage."

• **Nuclear Weapons SBU** — Owner: Tom Hunter. "Our primary mission is to ensure that the Nuclear Weapons Stockpile is safe, secure, and reliable and fully capable of supporting our Nation's deterrence policy."

• **Partnerships SMU** — Owner: Al Romig. "Our mission is to provide business leadership to develop new lines of business and establish technology partnerships that enhance Sandia's ability to achieve its strategic objectives, fulfill its mission, build constituencies, and generate revenues."

• **Science and Technology SMU** — Owner: Al Romig. "Our mission is to ensure that the right Science and Technology are available and provide differentiating strengths to Sandia's Strategic Business and Management Units."

Sandia's exciting science, from the solid traditional areas to some surprising new fields, is helping forge the future

(Continued from preceding page)

Alamos, and the two labs will bring in cooperating researchers from industry and universities to work side by side with them. Sandia's Terry Michalske (1040) and Don Parkin of LANL will serve as founding Director and Associate Director, respectively, for CINT.

Just getting CINT approved for Sandia and Los Alamos was a real accomplishment, Al says, because it was awarded in a crowded Office of Science competition.

The joint Sandia/Los Alamos proposal tapped into the two labs' "incredible strengths" in a very synergistic way, he says. "It's exciting that we have a role in determining how nanotechnology will develop in the country and how it can contribute to our national security missions."

Another S&T area that's still pretty much in its infancy is cognition, or "cogno" as some call it. Al thinks it could be the "next frontier." He explains: "One issue for cognitive science is to understand how the brain thinks and processes so much information, and how we might emulate that in computational devices.

The brain/machine interface

"Another important part of cognition is to understand the brain/machine interface," he continues. We've already made minor progress in this area, he says — for example, understanding that a touch-screen is better than using a mouse for doing some tasks on a computer.

"Now we need to find ways to get thoughts directly transferred from the brain into computers and other machines," Al says. "How cognitive science will develop over the next decade is totally unknown."

Sandia has inched into the field, he says, starting last year with a Laboratory Directed Research and Development (LDRD) project that is exploring ways to enhance humans' ability to process data (look for a future *Lab News* story).

Although he's enthusiastic about cutting-edge technologies, Al also touts Sandia's accomplishments and ongoing work in traditional S&T areas. "Those new things excite me, but I'm also a practical person and excited that the science and technology we do here produces useful results today."

As just one good example, he cites the work that Sandia Fellow Gordon Osbourn (1001) and colleagues did years ago on strained-layer superlattices. "This fundamental work gave rise to VCSELS [vertical-cavity surface emitting lasers], now making an impact in a variety of national security applications.

"The fact that we deliver real products that the country needs to solve real problems — based on our strong S&T capabilities — excites our people. Our science is done with a mission in mind."

LDRD and MESA — paying off for national security

The Laboratory Directed Research and Development program, Sandia's sole source of discretionary research funds, managed by Chuck Meyers (1010) and reporting to Al, is another big source of pride for the Labs, he says. The program funds long-term, high-risk research that has a high potential for future payoff in potential applications in the Labs' four SBUs.

The *Lab News* has published several stories over the past year noting important developments for homeland security that resulted from LDRD projects. One is the chem-bio decontamination formulation that has been used to clean up anthrax contamination in late 2001 in several facilities, including federal buildings in Washington, D. C., and television network buildings in New York. It was recently selected for deployment by the US Army Central Command (CENTCOM), which coordinates overseas military actions. CENTCOM ordered tens of thousands of gallons of the formulation from one of Sandia's two commercial licensees (*Lab News*, Oct. 18).

Another important development growing out of the LDRD program, notes Al, is the MicroChemLab, which involved several S&T groups from Sandia's California and New Mexico sites. Several varieties of the portable, hand-held chemical analysis systems incorporating "lab on a chip" technologies have been developed. Sandia has established cooperative research and development agreements and licensing agreements with several companies to further develop the technology for national security needs ranging from the detection of chemical and biological agents to the cleanup and monitoring of environmental waste sites.

SANDIA VP Al Romig says his position as the head of the Labs' primary science and technology R&D organization is a real "hoot." (Photo by Randy Montoya)

No coverage of "what's hot in science and technology" at Sandia would be complete without referencing the huge MESA (Microsystems and Engineering Applications) Project, a state-of-the-art facility now in the early stages of construction. MESA will create a computationally intensive environment for the design, integration, prototype fabrication, and qualification of integrated microsystems into weapon components, subsystems, and systems for the US nuclear weapon stockpile, as well as systems for the other SBUs. MESA Program Office Director Don Cook (1900) reports to Al's Division 1000.

"I describe MESA as computationally enabled microsystems," says Al. Depending on the final construction schedule [it is being funded in pieces, year by year], it's almost a $500 million investment. If that doesn't say the Labs is committed to a new way of doing business, then nothing does." (See Oct. 18 *Lab News*, page 5, for recent MESA update.)

New Mexico Academy of Science Centennial Conference is Nov. 16

The New Mexico Academy of Science will celebrate its 100th anniversary Saturday, Nov. 16, at the Sheraton Old Town Hotel, from 7 a.m.-4:30 p.m. The Centennial Conference, "Science Today - Solutions Tomorrow," will feature papers by distinguished speakers from New Mexico State University, University of New Mexico, New Mexico Tech, Sandia, Los Alamos, and museums, medical research facilities, and other organizations in New Mexico. The all-day conference will cover science education, science policy, defense, energy, astronomy, archaeology, earth science, water, nanoscience, genetics, medicine, and agriculture.

All presentations are designed for scientists and nonscientists alike, as well as educators and policy makers. The Technical Program Chairman for the Centennial Conference is Sandian Richard Nygren (6428).

The annual banquet will take place immediately following the conference. The banquet speaker will be evolutionary biologist Ken Miller, Professor of Biology at Brown University, textbook author, and recipient of five major teaching awards. The title of his talk is "Time to Abandon Darwin? The Challenge from 'Intelligent Design.'"

Conference registration fees are: non-NMAS members, $50 (fee includes one-year's membership), and NMAS Members, $35. The fee includes a continental breakfast, lunch, two coffee breaks, and the published proceedings. The additional cost for the banquet and talk is $25; for the talk alone, $15. Seating for Miller's talk is limited; early sign up is advised. If additional seating remains on the day of the conference, attendees will be sold tickets on a first-come, first-served basis. Mail checks made out to NMAS to: New Mexico Academy of Science, Attn. Jayne Aubele, 1801 Mountain Rd. NW, Albuquerque, NM 87104. For information call (505) 841-2840 or 296-5640.

Founded in 1902, the New Mexico Academy of Science has been in continuous existence since 1915 (www.nmas.org). Retired Sandia physicist Marshall Berman is its current president.

The Academy seeks to foster scientific research and cooperation, increase public awareness of the role of science in human progress and welfare, and promote science education in New Mexico. It works with teachers, state agencies, and the legislature to establish appropriate standards for the teaching of the sciences. The Academy can also act as a resource center, providing expert scientific advice to these groups and others.

Membership is open to any person or organization engaged in or interested in scientific research or science education, or the goals and activities of the Academy. Membership categories are: Member ($20/yr), Student ($15/yr), and Institutional Journal Subscription ($30/yr).

In Sandia talk, Stephen Covey emphasizes that people need to follow universal principles

By Chris Burroughs

Stephen R. Covey stood on the stage in the Steve Schiff Auditorium during an Oct. 21 presentation calling for someone 6'3" or taller to come up and arm wrestle with him.

People in the audience started shouting, "John, you go up." John Stichman, who is Sandia's VP for Weapons Systems 2000 and fits the description, made his way to the stage and offered his hand for what promised to be an interesting arm wrestling match. Covey announced that every time an arm went down, the winner would receive one dollar.

After an initial tug, Covey's arm went limp and soon both his arm and John's flip-flopped back and forth several times.

"You see, I arrogantly insulted him," Covey said. "He was on the lower road aiming for conflict. I was on the higher road and wanted him to win. The result was we both won."

Covey was trying to demonstrate that when people let go of their "emotional bank accounts" — which is what he did when he let John win — they can work together better to find a solution that benefits both parties.

Covey, author of *The Seven Habits of Highly Effective People* and co-founder /vice-chairman of Franklin Covey, a global professional services firm, spoke at Sandia as part of a Leadership Series 2002 being presented by Sandia's Business and Leadership Development Dept. 3022, DOE, and Los Alamos National Laboratory. Future presentations, done through video links and sponsored by Dept. 3022, include "Living Leadership Worldwide" with former New York City mayor Rudy Giuliani and others on Nov. 13 and "Leading Change" with John Kotter of the Harvard Business School on Dec. 10. More information about the series can be obtained by contacting Phyllis Padilla Owens (3022) at 845-7110.

Covey's talk emphasized that people need to follow universal principles like integrity and trustworthiness and take the high road where they can find their voice and inspire others to find theirs. On the low road there is low trust, no shared vision or values, and disempowerment.

Pulling out a compass handily attached to his watch, he used the direction north as an analogy for universal principles.

"People can walk away from it or reject it, but north is always constant," he said.

Following the principles, he added, produces wisdom and creates a sense of the universal and timelessness. "To learn, to love, to live, and to leave a legacy" are the four capacities that come from the bringing the principles into your life.

Covey also talked about the four different economic ages — hunter/gatherer, agrarian, industrial, and now the information/knowledge age. And although the country is supposedly in the knowledge age, the management of many organizations remains in the industrial age.

"How many of you feel a lot of pressure to produce more for less and how many believe that the vast majority of people in your organization possess far more creativity, resourcefullness, integrity, intelligence, and talent than their job requires or even allows?" he asked

If the answers are "a lot," he said, then you and your organization are still in the industrial age. And that is not good, he added.

"The industrial age focused on weaknesses, not strengths," Covey said. "The knowledge age recognizes that a person may have weaknesses to overcome, but the focus is on strengths."

STEPHEN COVEY, author of *The Seven Habits of Highly Effective People*, spoke at Sandia as part of a Leadership Series 2002 presentation by Sandia's Business and Leadership Development Dept. 3022. Earlier he met with the Labs Leadership Team and high-level executives from Los Alamos National Laboratory and DOE for breakfast. (Photo by Randy Montoya)

In the industrial age the management mindset was to "control" — a paradigm that must be replaced with the new knowledge-age mindset of seeing people's potential so clearly they see it themselves. "That's the definition of leadership," Covey said.

Sandia VPs flip pages, flapjacks to fling annual ECP into fast-forward

ECP CAMPAIGN GETS VP BOOST — Sandia VPs Tom Hunter (9000), Lenny Martinez (14000), and Frank Figueroa (10000) helped kick off Sandia's ECP campaign last week by participating in several community events. In top photo, Tom reads to young children at the Christina Kent Day School. In the bottom photo Lenny, in forefront, with Frank (back) and Fred Sexton (1762, middle), Sandia chair for the ECP campaign, serve pancakes at the Coronado Club as part of the campaign kick-off. Some 700 plates of flapjacks were cooked, served, and eaten by Sandians.

Feedback

Reader questions new retiree healthcare premiums

Q: *It was with great discouragement that I read in the* Sandia Lab News *[Oct. 4] details of the new medical insurance premium costs for retirees to be effective on Jan 1, 2003. I am one of those unfortunate souls who came to Sandia later in my career, and was intending to retire in the 15-19 years of service category. I now discover that it will cost $337/month to retain the same medical coverage I currently have, and that is just at next year's rates! That is outrageous. It was certainly good for Sandia to increase its retirement pension plan, but not good to then turn around and take most of the dollars back for medical insurance premiums.*

It would be nice to get some explanation about why the group of employees that I am in is taking it in the shorts regarding medical insurance premiums. Since employees were not part of the negotiations that determined these benefits, we deserve some information about how this came about. There are other people who make valuable contributions and didn't come to Sandia right out of college and then work here for 30 years. Without additional information, I would argue that you are discriminating against employees you hire who are in the "experienced" category. It is unfortunate that since I've been at Sandia, many of the great employee benefits that made this a special place to work continue to erode. Twenty-four days of vacation go to fifteen days (I'm in that category too). It seems you have given a new benefit with one hand and taken it away with the other.

I expect a response to the above request for information. You are greatly affecting the future lives of many people. Signed – a very unhappy "experienced" employee.

A: When we redesigned the pension plan and the associated health plan changes for retirees, we established a set of design principles. One of these principles was to encourage employee retention to support the Laboratories' mission. Both the new pension formula and the retiree premium sharing are designed to provide a greater benefit to employees with longer service. Varying benefits based on length of service is a common design strategy used to retain critical skills and knowledge.

Our intent is to reward employees who have long service — not to discriminate against employees who are experienced at the time of hire. The average age of participants in the Retirement Income Plan is 46 and the average service is 15 years; therefore, on average, employees who continue to work for Sandia until they are age 62 (the age at which one receives the maximum age multiplier in the pension formula) will also have 30 or more years of service (which results in a 10% premium share for medical insurance).

We are also faced with the need to try to control or reduce the ever-increasing health care costs (projected to be in excess of $100 million by 2005) while at the same time providing competitive medical benefits. We implemented several changes, which included a strategy whereby those who use the plan pay more and a strategy whereby employees and retirees pay according to their own experience. In the past, the way we figured non-Medicare premiums was to blend the claims experience of employees (approximately 7,500) and non-Medicare retirees (approximately 1,000) and come up with one premium for both groups. This artificially increased employees' premiums and lowered non-Medicare retirees' premiums. (Medicare retirees have been paying according to their own experiences for many years.) As was mentioned in the *Lab News* article, Sandia paid $6,039 per employee on average in 2001 vs. $7,925 for non-Medicare retirees for health care overall, showing that non-Medicare retirees' cost experience is higher. We felt that non-Medicare retirees experience should be pulled out because employees were not only seeing significant increases in their own premiums but were also subsidizing the higher cost non-Medicare group.

I understand your discouragement with the cost increases you would face upon retirement with 15-19 years of service. We are all faced with increased health care costs and we are all concerned about the impact. Many companies are dealing with the increased costs by eliminating retiree medical insurance altogether. One major survey reports that coverage for pre-Medicare-eligible retirees is now offered by 29 percent of large employers, down from 31 percent. Coverage for Medicare-eligible retirees is offered by 23 percent. We are fortunate that we have been able to continue to provide medical benefits to our retirees, albeit at an increased cost.

I hope this helps you to better understand our reasoning behind the changes.

—Larry Clevenger (3300)

History and mystery: Berm-flanked building in Coyote Canyon undergoing D&D process

By Will Keener

Say goodbye to 9800B.

After a rigorous historical study, numerous reviews to meet federal regulatory requirements, and detailed photo documentation, members of the Labs' facilities organization will soon "decontaminate and decommission" this 40-year-old Coyote Canyon experimental facility.

In this case "decontaminate and decommission," or D&D in the vernacular, means that anything of value will be salvaged and the building will be demolished. "Its days are numbered," says Nick Durand, project leader for assessment and decontamination with Customer Projects Dept. 10825.

Rebecca Ullrich, team leader and corporate historian in Sandia's Recorded Information Management Dept. 9612, expended considerable effort researching 9800B as a part of the D&D process. In reviewing the site — per the National Historic Preservation Act — she determined the facility is a historic property and needs full documentation prior to decommissioning. "The site is an unusual design for a firing pit. In most firing pits, it's typical for instrumentation to be well set off. You don't just pack them in close to the explosives. But this site needed the instrumentation to be closer."

BUILDING 9800B — Located in Sandia's original Coyote Canyon test area, 9800B is contained by berms on three sides lined with steel plating. Unused for several decades, the test facility went up in 1964 and 1965 as a part of the "Halo" test series. More information on activities at the site would be helpful to Sandia historians documenting the site.

Contained by berms on three sides

Bldg. 9800B is contained by berms on three sides lined with steel plating. Each of the berms covers an instrumentation bunker with a porthole to the center of the firing pit. Unused for several decades, the berms helped pond scarce desert water and supported a number of small trees during its years of disuse. More recently, Nick and his colleagues have cut back brush at the site to aid in the needed surveying and photo documentation.

"We know it went up in 1964 and 1965 as a part of the 'Halo' test series," Rebecca says. "It's interesting to know that Sandia was working on lasers at that early point."

The Halo experiments involved boosting laser power using explosives, she says. Reports and other documents indicate up to 50 pounds of explosives were used in some tests with ruby argon lasers.

A now-unclassified report on work at 9800B provides no information about work on the project beyond 1966. "Our data objective is to have an unbroken sequence of information about the use of a site from construction to abandonment," says Nick. "We're lacking on this one."

A logical choice for risk reduction

"We have a checklist and do an assessment. If there is potential for contamination, we do a characterization with samples and surveying. We look for drains, spills, spots, and materials like asbestos." The site, although remote to Sandia facilities, abuts the Four Hills area. "It's fairly close to a residential areas, so it's a logical choice for our risk reduction work. Without the building we'll be one step closer to returning the site to the Air Force or readying it for another Sandia use," Nick says.

D&D is part of an overall strategy of managing space for Sandia with the goal of safely removing substandard, nonusable space that creates a financial drain on limited resources. These resources are needed to maintain active heating systems, fire protection systems, structural elements such as roofs, and necessary security, while the buildings remain standing. Their removal also frees up limited real estate for new modern structures needed to support the Labs' mission work, says Stanley Harrison, Manager of Sandia's Technical Services Program Dept.10820.

Roots in the early 1990s

According to Gerry Lipka, the original D&D project manager and now Manager of Facilities Projects Dept. 10826, the program had its roots in the early 1990s. Bldg. 815, an old auditorium on the northwest corner of Technical Area 1, was the first building removed. With no processes in place or contracts to support the work, the small building took a year to get to the point where it could be demolished. In the subsequent year, Lipka and colleagues developed a roadmap to guide the team through the process. The steps included developing a history of the facility's use, characterizing any suspected contaminants used in the facility, and coping with regulations on waste issues, historical preservation, and the possible reapplication of the structures for other uses.

Over the years, the process evolved, and a $1 million budget was established through Sandia's Nuclear Weapons Strategic Business Unit, which enabled the D&D project team to demolish buildings on a regular basis. Removed under the program were Bldg. 814 (the former home of the *Lab News*); Bldg. 834, located south of medical; the 844-45-46 Quonset huts, south of Benefits; and Bldgs. 838 and 839, now the site of the open space near the Center for National Security and Arms Control (Bldg. 810). This past year efforts of the team took a bite out of Technical Area 2, where only Bldgs. 919 and 920 remain.

In making decisions about which D&D projects to take on within the scope of the D&D budget (about $5 million this year), decision-makers also consider environmental restoration sites where cleanup has been completed or isn't deemed needed by state regulators. The Labs' Environmental Restoration (ER) Project deals with soils and surrounding environment, says Nick, but not structures, which belong to the facilities organization. However, if a structure is on a site where ER work is completed, it might be a candidate for D&D.

Nick's group also makes use of ER's investigations to try to fill out the historical picture. "It's detective work on a budget," he says. "One of the problems is that there are people who worked on these sites, but they haven't thought about them in 30 years. Sometimes if you're lucky, you can find one person."

Decontamination isn't always required, depending on the detective work, but clearance surveys for regulated chemicals and radiation are on the checklist. The proposed demolition must also undergo DOE review to ensure there is no other use for it by another agency. Finally, facilities staff work with the demolition contractors to determine what materials might be salvaged in keeping with good waste-minimization principles.

Although demolition is the most obvious part of the timeline, it only makes up about 20 percent of the activity, Nick notes. In the case of Bldg. 9800B, the obvious is fast approaching.

If you have information about past activities at 9800B, please contact Rebecca at 844-1483.

Open house features rough-and-ready gear as part of security force's 52nd birthday

READY TO RESPOND — Sandia security forces demonstrate some of the gear they use to protect the nation's most sensitive and vital national security assets during a 52nd birthday open house in front of Bldg. 800. Pictured here are SPO III Robert Brown (3114, in HumVee) and Marvin Garcia, Rescue/RECON (3115). (Photo by Mike Lanigan)

Mileposts

New Mexico photos by Iris Aboytes
California photos by Bud Pelletier


Eric Jones
40 1123


James Kobs
40 5744


David Baldwin
30 2115


Ronald Lipinski
25 6424


Arthur Verardo
25 2990


Richard Westfall
25 15342


Jerome Ford
20 9335


Stanley Garrison
20 10511


J. Michael Griesmeyer
20 6521


Milo Harcourt
20 6218


Bill Houf
20 8728


Richard Howe
20 2561


Riley Kilgo
20 1745


Mark Poiles
20 14406


Sheldon Tieszen
20 9132


Rodney Schmidt
15 9223

Management promotions

New Mexico

The Lab News *has begun publishing notices of monthly promotions to the management ladder and within the management ladder. Thanks to HR Information Systems Dept. 3051 for its assistance. The biographical information is supplied to us by the employee.*

Rick Contreras from PMTS, Emerging Technologies Dept. 5908, to Manager, Defense Nuclear Material Stewardship Dept. 5326. Since joining Sandia, Rick has specialized in electro optics and the study of laser propagation phenomena; supported and designed field tests at White Sands Missile Range, and worked as chief of system engineering on the Multispectral Thermal Imaging (MTI) Satellite Project. Just before his recent promotion, he was a project leader for vulnerability assessments projects. The department he will now manage provides research and development, test, and evaluation of advanced technologies and modern material management systems to enhance safety, security, and accountancy of nuclear weapons, nuclear material, and weapon components during storage, handling, and transportation. Rick has a BS in electrical engineering from California State University at San Diego and an MS in electrical engineering from the Air Force Institute of Technology at Dayton, Ohio.


RICK CONTRERAS

* * *

John McBrayer from PMTS, Design and Products Dept. 1730, to Manager, Frequency Devices Dept. 1732. He has more than 25 years experience in microelectronics, MEMS, and related fields. Since arriving at Sandia in 1977, John has worked on the design and fabrication of integrated circuits, contributing to the development of silicon solar cells, both design and fabrication. He has researched, designed and fabricated high-energy-density storage capacitors. John has been the technical project and program leader for numerous Sandia projects, including high-energy-density storage capacitors, single-crystal silicon photovoltaics, 64K SRAM, 1.25 micron technology, and the research and development program with SEMATECH. He managed Sandia's Agile MEMS Prototyping, Layout, Education, and Services (SAMPLES) program. John was selected as the first Distinguished National Laboratories Space Fellow and spent a year working on projects at the Air Force Research Laboratory's Space Electronics and Protection Branch. More recently, he has been coordinating customer interface activities for the components supplied to DP programs from Microsystems, S&T, and Components Center 1700. John has a BS and an MS in electrical engineering from the University of Utah and a PhD in electrical engineering from Stanford University through Sandia's Doctoral Study Program.


JOHN McBRAYER

* * *

Jodi Maheras from PMLS, Office of the Deputy Directory of Procurement, Dept. 10250, to Manager, Fleet Services Dept. 10265. Jodi joined Sandia in December 2001. She has 19 years (13 as a manager and or director) of experience in the areas of supply chain management, cost accounting, project management, automated business systems, budgeting and financial reporting, and fleet operations at the Idaho National Engineering and Environmental Laboratory. Jodi has a BBA with a major in finance and minor in accounting. She is a Certified Purchasing Manager, certified by the Institute for Supply Chain Management, and is a Certified Manager, certified by the National Management Association.


JODI MAHERAS

Brett Remund, from Manager, Synthetic Aperture Radar I Dept. 2348, to Level II Manager, RF Remote Sensing Dept. 2340. Brett came to Sandia in 1988 as an MTS from graduate school. His work has included synthetic aperture radar systems development, digital signal processing, image processing and analysis, and embedded software development. Brett has a BS and an MS in electrical engineering, both from Brigham Young University.


BRETT REMUND

California

Dennis Siebers, from DMTS, Engine Combustion and Hydrogen Dept. 8362, to Manager, Engine Combustion and Hydrogen Dept. 8362. Dennis joined Sandia in 1976 and worked in the thermal/fluid mechanics group in support of various weapons programs and the Solar Central Receiver Program. Since 1983, he has been working at the Combustion Research Facility in the engine combustion research program, focusing his research on using optical diagnostics to develop a fundamental understanding of the processes that control spray development, ignition, combustion, and emissions formation under the high-pressure conditions that occur in internal combustion engines. He has a BS and an MS in mechanical engineering from Purdue University, and a PhD in mechanical engineering from Stanford University through Sandia's Doctoral Study Program.


DENNIS SIEBERS

Sandia Classified Ads Sandia Classified Ads Sandia Classified Ads Sandia Classified Ads

MISCELLANEOUS

CONSOLE TV, Heathkit, 25-in., w/manual, good picture & cabinet, $30. Savage, 881-1645.

RIMS/TIRES, 33 x 12.5 x 15, BFG AT, mounted on 6-lug, 10 x 15 aluminum rims, great shape, $450. Vigil, 798-0322.

LIFE JACKETS, used, different sizes, $10 ea.; motorcycle leathers & cold weather suit, best offer(s). Jaramillo, 294-1779, leave message.

KING-SIZE BED, mattress, box spring, frame, firm, very good condition, no tears or stains, $175. Green, 281-4533.

MOVING BOXES, used once, various sizes, priced to sell fast. Cox, 299-2963.

WASHER/DRYER, electric, Maytag Heavy Duty, extra capacity, will not split set, $300 firm. Chavez, 792-1673.

CAMPER SHELL, B/W longbed, keys, 4 clamps, $150 OBO; Provincial couch, beige/silver, $50; grandfather clock, $35. Crosby, 260-1070.

ENTERTAINMENT CENTER, w/drawer & shelves, solid oak, $100; computer desk, good for student, $15. Lippert, 299-6594.

GOLF CLUBS, Callaway S2H2 irons, 3-PW, $125 OBO. Gillespie, 899-4084.

TELESCOPE, Orion AstroView 6 EQ Reflector, brand new, $350 OBO. Simon, 286-6492, www.telescope.com, type in 9827 for search & picture.

WASHER/DRYER, Kenmore, white, 5 yrs. old, extra large capacity, washer includes hand-wash cycle, great condition, $250/pair. Konkel, 298-4403.

KID'S BICYCLE TRAILER, Burley, $90; butcher block, w/drawer, solid wood, $50. Muguira, 286-2393.

SNOWBLOWER, Sears, 9-hp, track drive, electric start, used 2 seasons, $1,100 new, asking $800. Radloff, 323-1980.

AIR TASER, $150; PK Electronics Blackout Buster, 500VA computer, UPS, $75; both NIB. Johnson, 296-3431.

EXERCISE EQUIPMENT: flat weight bench, $50; incline weight bench, $75; incline crunch board, $50. Levenhagen, 821-7055.

QUEEN-SIZE BED FRAME, pine, 4-poster, pineapple-style, $75. Wagner, 298-7839, ask for Linda.

LIVING ROOM FURNITURE, 1 yr. old, sofa & oversized chair, w/ottoman, $600. Baca, 881-0588.

KITCHEN/BATHROOM CABINETS, new, 5, maple, 30-in. vanity, 12-in. vanity, 18-in. vanity, medicine & linen closet, $200 all. Lambert, 899-8817.

BABY ITEMS: Pali crib, $390; Perego high chair, $90; stroller, $80; co-sleeper, $85; Baby Bjorn, $40. LeGalley, 797-2643.

COFFEE TABLE, sofa table, 2 end tables, oak parquet, $75 all. Miller, 299-0785.

FOUNTAIN, faux rock, 2-tier, indoor/outdoor, needs pump, retail at Rowlands $700, asking $250. Blaine, 299-1036.

DIGITAL CAMERA, Nikon Coolpix 5000, over $300 of accessories, $850 firm, or $800 w/o extra memory. Cocain, 281-2282.

CAR AUDIO, 2, 12-in. Sony subs in Competition box, $200; 1000W Kenwood amp, $300, all new. Fleming, 869-9165.

POOL TABLE, $125; Foosball table, $150; refrigerator; free-standing bar; ping-pong table; gun rack; exercise equipment; extension ladder. Harcourt, 275-1628.

FRAMED PRINT, Steve Hanks, $60; student desk, $80; mountain bike, $300. Campbell, 281-0744.

PRINCETON REVIEW, for the GMAT, 2003 edition, CD included, $28. Sorenson, 298-1593, ask for Ken.

SOFA, buckskin leather, 3 yrs. old, $500 OBO; Mission hardwood dining set, $500 OBO. Martinez, 265-5920.

SKI-JOGGER, R2002, excellent condition, $200 OBO. Perea, 256-4578, leave message.

LATHE, Atlas 10" x 36", metal cutting, w/3 chucks, milling attachment, center rest, follower, & many tools, $1,850. Adams, 881-4351.

TABLES, 4-pc. round, oak, $150; 6-pc. dining, 10-ft., $100; tan loveseat, $50; 19-in color TV, $35. Brown, 323-1391.

8MM CAMCORDER, Minolta, 8X zoom, 12 yrs. old, not used since 1989, book, extra batteries & all cables, $150. Duvall, 881-4406.

REFRIGERATOR, Kenmore, 18 cu. ft., white, $150; 2 Kenmore gas stoves, good condition, $70 ea. Gonzales, 296-8006.

GOLF CLUBS, Pole Kat, steel-shafted, PW-3 irons, SW, Taylor Made driver, 3, & 5 graphite-shafted fairway woods, $250. Candelaria, 730-9400.

COUCH/SLEEPER, full-size, green w/accent pillows, like new, $200; carved chest, Mexican, pine, $90. Phelan, 869-6094.

UPRIGHT PIANO, Wurlitzer, w/storage bench, excellent condition, $1,200. Mickelsen, 821-5036.

MOVING? bankers boxes, tops, $5 per dozen. Reed, 821-7782.

MICROWAVE OVEN, $35; push lawn mower, $35; skis, 3 pairs, $25/pr.; poles, 2 pairs, $8/pr.; 30" x 60" metal desk, $25. Pacheco, 292-0490.

TABLE SAW, Rockwell 10-in. contractor, 3/4-hp; 6-in. joiner, Sears, 1/2-hp. Baird, 604-1488.

LA-Z-BOY SWIVEL ROCKER RECLINER, paid $700, asking $250; 18-in Schwinn mountain bike, paid $400, asking $100. Stronach, 294-1013.

BLACKSMITH FORGE, Champion, w/manual, crank blower, $150. Beauchamp, 884-0334.

SOFA & LOVESEAT, ivory, w/accent decorator pillows & lamps, excellent condition, $450. Campos, 294-3771.

TOOLS, belt sander, $20; orbital sandia, $15; portable airtank, $20; 7-1/4 in. worm drive Skillsaw, $35; saw guide, $10. Linn, 271-0336.

LOBO BASKETBALL SEATS, 2; 2 new bikes; bike rack; 2 boat motors; marine battery; Total Gym. Cooper, 888-0967.

GENERATOR, for home emergency power, Robin G100, plus 2 transfer switches, $2,000. Hayes, 299-1200.

TRAILER JACK, heavy duty, swing-away, 1,000-lb capacity, Performance Series by Fulton, $20; spare tire carrier, Pro Max by Fulton, $10. Dwyer, 271-1328.

EXERCISE EQUIPMENT: BMI 8700 home gym, weights & pulleys, $50; Schwinn Accufit 1500 dual action bicycle, $50. Bundy, 821-1846.

COMPUTER DESK, w/hutch, wood hanging file cabinet, computer hideaway, CD rack, excellent condition, $75 OBO. McLendon, 797-2675.

ORGAN, Thomas El Camino 164, excellent condition, fun for the whole family, $250 OBO. Jordan, 293-4117.

TOSHIBA DVD ROM DRIVE, for Compaq Laptop, $40; 128MB RAM for Compaq Laptop, $35. Hale, 298-1545.

BABY SWING; bouncer seat; baby boy clothes; maternity clothes, large; excellent condition, call for price. Garcia, 836-2827.

FLASH CARD READER, Scandisk Compact, $18; HP color printer, $30; Dot Matrix printer, $10. Rieger, 281-0757.

GOODYEAR EAGLES, 245/45ZR17, serviceable; set of Taurus SHO wheels, 16x6.5, 3 w/good condition tires mounted. Richards, 822-7958.

FUR COAT, white/silver mink, w/shadow fox trim, 3/4 length, medium 4-10, excellent condition, $725. Kilbane, 922-9025.

WHIRLPOOL WASHER, runs fine, has one broken plastic knob, free if you pick up. Stauffer, 268-8819.

BEDROOM SUITE, antique, Waterfall, 5-pc.; baby dresser, antique; pine cannonball bed, lingerie chest, nightstands. Sena, 873-1665.

KING-SIZE BED SET, metal frame, wood headboard, $550; 10 sets of king-size sheets, $15 ea. Sanchez, 821-6391.

RUMMAGE SALE (DATE CORRECTION), Nov. 2, OLA Catholic School, Lomas/Tennessee, donations accepted., receipts issued. Sanchez, 550-1001.

HUTCH, early American, maple, 60" x 40" x 17", 2 cabinet doors, 1 center drawer, 2 open shelves, w/plate grooves. Ross, 293-4141.

HOLIDAY ARTS & CRAFTS BAZAAR, handcrafted items, over 180 participants, Cleveland Middle School, 6910 Natalie NE, Sat. Nov. 9, 9 a.m. to 4 p.m. Edgar, 884-8567.

LUMINARIAS, delivered Dec. 7 or 14, Albuquerque Youth Symphony fundraiser, $6/doz. Sons, 294-1747.

COMPUTER, 333MHz, 64MB, 3.8GB, 17-in. monitor, CDROM, 28K modem, color scanner, Epson color printer, $250. Holloway, 294-5815.

CAMPER SHELL, lightweight, fits older Ford longbed, $200; 5th-wheel tailgate, chrome, $100; storm doors, $25 ea. Calderone, 291-9484.

PICKUP SHELL, aluminum, 8-ft., sliding front window, $200; 3 parabolic solar collectors, free for removal. Conrad, 299-5316.

FUTON, full-size, pine frame, comfortable foam-core mattress, w/cover, disassembles for easy transport, paid $225, asking $125. Klarer, 344-0612.

VIEWSONIC MONITOR, 17-in., E773, .25mm, $150; Sears Best air compressor, 12-gal, 5.6cfm, @90psi,120V, $150. Murata, 881-8459.

How to submit classified ads

DEADLINE: Friday noon before week of publication unless changed by holiday. Submit by one of these methods:

- **E-MAIL: Michelle Fleming (classads@sandia. gov)**
- **FAX: 844-0645**
- **MAIL: MS 0165 (Dept. 12640)**
- **DELIVER: Bldg. 811 Lobby**
- **INTERNAL WEB: On Internal Web homepage, click on News Center, then on Lab News frame, and then on the very top of Lab News homepage "Submit a Classified Ad." If you have questions, call Michelle at 844-4902. Because of space constraints, ads will be printed on a first-come basis.**

Ad rules

1. Limit 18 words, including last name and home phone (We will edit longer ads).
2. Include organization and full name with the ad submission.
3. Submit the ad in writing. No phone-ins.
4. Type or print ad legibly; use accepted abbreviations.
5. **One ad per issue.**
6. We will not run the same ad more than twice.
7. No "for rent" ads except for employees on temporary assignment.
8. No commercial ads.
9. For active and retired Sandians and DOE employees.
10. Housing listed for sale is available without regard to race, creed, color, or national origin.
11. Work Wanted ads limited to student-aged children of employees.
12. **We reserve the right not to publish an ad.**

RIVER ROCKS, 2-in.-4-in. diameter, about 300 sq. ft. of coverage, free for the loading. Draelos, 296-3078.

DIGITAL KEYBOARD, Yamaha, 76 keys, like new, paid $300, asking $200 firm. Hill, 299-9416.

FLORIDA CONDO, 1 week, anytime before 1/20/03, sleeps 6, 1 mile from Disney World, $800. Lockwood, 821-6331.

OAK CABINET BAR, w/tile counter top. Chavez, 898-8195.

TRANSPORTATION

'97 FORD MUSTANG COUPE, AC, V6, 5-spd., spoiler, forest green, $6,700 OBO. Garcia, 798-0322.

'94 CHEVROLET 1500 Z71, 4x4, xtra-cab, AT, AC, all power, cruise, CD, excellent condition. Marchi, 271-7610.

'76 POWER WAGON, Club Car, full time 4x4, AT, PS, shortbed. Baca, 864-3709, ask for Salo.

'92 CHEVY LUMINA APV VAN, needs minor work, 185K miles, $1,800 firm. Potter, 869-4716.

'96 MERCURY MYSTIQUE, 4-dr., 4-cyl., 35K miles, 1 owner, $5,100. Blackwell, 897-5090.

'94 MERCURY COUGAR RX7, V8, AT, power everything, AC, AM/FM/cassette, new paint, excellent condition, runs great, $5,600 OBO. Boyd, 363-6988.

'77 DODGE POWER WAGON W200, 3/4-ton, 360, 4-spd. manual transmission, PS, great work truck, $1,250 OBO. Mulhall, 892-2131.

'68 TOYOTA LANDCRUISER, 350 Chevy Crate motor, 33-in. BFGs, digital dash, Muncie 4-spd., Moroso ignition, $4,000. Widler, 720-0943.

'87 HONDA ACCORD DX, 2-dr., hatchback, 4-cyl., AT, AC, PS, PW, new CD & speakers, 1 owner, 123K miles, $1,900 OBO. Washburn, 766-7671.

'01 FORD F150, 4x4, SuperCrew Lariat, plethora of option, 24K miles, asking NADA trade-in, $27,000 OBO. Szklarz, 796-0976.

'90 TOYOTA 4-RUNNER, 4x4, V6, standard, loaded, PW, PL, very nice, runs great. Roddick-Dunbar, 286-0000.

'82 CHEVY CHEVETTE, sedan, 4-dr., hatchback, 4-cyl., engine FAC, low mileage, good condition, $1,200. Martin, 869-1212.

'47 FORD, sedan, 2-dr., project car, original, rolling chassis, no motor, transmission, $850. Buteau, 891-2925.

'01 HONDA CIVIC COUPE, 5-spd., power everything, AC, AM/FM/CD/cassette, lots of extras & warranty, $12,000. Sanchez, 865-9077.

'02 CHEVY CAVALIER, w/sports package, 4-dr., 5-spd., 8K miles, excellent condition. Sanchez, 261-7262.

'01 CADILLAC DEVILLE, V8, OnStar, Northstar, leather, security, excellent condition, 39K miles, below wholesale, $23,900. Bozone, 242-8205.

'01 FORD RANGER EDGE, 4L, 6-cyl., AT, 4WD, beautiful yellow, extras. Johnston, 248-0650.

'92 CHEVROLET 1500, 4x4, V8, longbed, regular cab, AT, AC, camper shell, tow package, 110K miles, $8,000. Konopka, 299-9059.

'00 FORD MUSTANG, 5-spd., V6, 17-in. aluminum polished wheels, Borla dual exhaust, loaded, excellent condition, $15,000 OBO. Salas, 459-5974.

'90 FORD RANGER, longbed, rebuilt engine & transmission, new paint, 129K miles, $3,500. Eicker, 293-8435.

'96 DODGE STEALTH, 6-disc CD, very good condition, 35K miles, $11,000 OBO. Ward, 296-2207.

'01 SUZUKI XL7 SUV, 4WD, 3rd row seat, rear AC, 14K miles, excellent condition, $17,500. Maese, 296-4944.

'01 HONDA CIVIC LX, 5-spd., AC, power everything, AM/FM/CD/cassette, extras plus warranty, beautiful, $12,000. Sanchez, 720-9078.

'02 DODGE RAM SLT, 4x4, AC, AM/FM/cassette, Gibson headers/muffler, lots of extras, paid $26,000, asking $23,000 OBO. Sanchez, 730-6009.

'71 CHEVY 1/2-TON, 4WD, AT, newer engine, new carburetor, new seat, no rust/dents, electric ignition, great tires & wheels, $4,800 firm. Muirhead, 281-2925.

'93 MAZDA PROTÉGÉ, 4-dr., AT, AC, sunroof, new tires, new paint, exceptional maintenance, great condition, 58K miles, $4,000. Jennings, 610-1142.

'01 CHEVY SILVERADO, 2500HD, 4x4, ext. cab, ShBox, 6.0L, LS trim, Rhino liner, running boards (pipes), under 10K miles, $25,000. Mayes, 821-0698.

'00 DODGE STRATUS ES, V6, auto-stick, ABS, fully loaded, leather, white, 43K highway miles, $10,700. Shannon, 281-3038.

'92 JEEP CHEROKEE, many new parts, runs awesome, lots of life left, 190K miles, $1,500. Williamson, 332-7399.

'74 MERCEDES 450 SLC, classic, excellent condition, less than 68K miles, well cared for, below book, $8,995 OBO. Pound, 899-9123.

'97 AUDI QUATTRO A4, turbo, AWD, 5-spd., sport/winter package, sunroof, red, can't tell from new. Everett, 505-585-2299.

'93 TOYOTA 4-RUNNER SR5, 4x4, 4-dr., CD, moonroof, super condition, 1 owner, garaged, records, 141K miles, $6,500. Contreras, 344-2492.

'93 DODGE B-250 CONVERSION VAN, 8-cyl., white, 4 captains chairs, TV/VCR, excellent condition, 69K miles, $6,100 OBO. Serna, 899-9618.

'95 VW JETTA GLX, VR6, leather, alarm, sunroof, 6-disc CD, 1 owner, 65K miles, $8,900 OBO. Johnson, 296-1236.

'72 GMC PICKUP, 4x4, 4-spd., limited slip differential, 350 CI, long wide, great truck, $2,650. Hammons, 281-1205.

'00 FORD ESCORT SE, 4-dr., AC, AT, power, 11K miles, salvage title, $4,700. Lenberg, 238-0362.

'98 OLDSMOBILE AURORA, 4-dr., FWD, sunroof, aluminum wheels, leather & more, new tires, pearl white, excellent condition, 32K miles, $14,300. Hart, 292-5110.

'89 GMC SIERRA SLX 2500, V8, 5.7L, Posi-Traction, 4-spd., 1 owner, AC, PS, new clutch, excellent condition, 120,717 miles. Maynard, 865-1288.

'90 HONDA CIVIC, 4-dr., AT, CD, runs great, $2,000. Garcia, 573-7448.

'93 CADILLAC DEVILLE, loaded, sedan, red, gold package, looks, runs beautifully, picture at CU, 179K miles, $4,000. Brown, 291-3280.

'86 TOYOTA TRUCK, 4WD, runs well, always maintained, $1,200. Adams, 281-6767.

RECREATIONAL

'87 HONDA VFR700F2 INTERCEPTOR, original owner, 49K miles, saddle, tank & tail bags, $1,800 OBO. Kazensky, 362-2624.

'87 HONDA REBEL 250, w/cover, black & chrome, 11,200 miles, immaculate condition, $1,650 OBO. Nimmo, 610-5560.

'99 AMERICAN EAGLE 40EVS, w/slide out, 27K miles, 350-hp, Cummins, many upgraded amenities, new batteries, excellent condition, $169,900. Eno, 821-3055.

4 WHEELERS: '02 Polaris 50cc; '02 Kawasaki Mahave 250cc; '03 Kawasaki 250cc, all less than 3 hrs. Rohl, 833-3697.

GO-CART, Manco Off-Road, seats 2, all safety equipment & trailer included, great Christmas present, $4,000 OBO. Fajardo, 232-9303.

'94 POLARIS 400L ATV, AT, 4x4, adult ridden, great tires, runs well, 4,500 miles, $1,650. Rowley, 294-4849.

CANOE, 17-ft. Coleman, used twice, oars included, $200. Barr, 298-4007.

'96 KTM620 RXC D/S, LC, thumper, new Michelins, under 5K miles, good condition, $2,750. Hesch, 350-9903.

O'DAY DAYSAILER, 17-ft., 3 sails, fiberglass hull, Highlander trailer, all excellent condition, $2,222 OBO. Schaub, 821-7242, evenings only please.

MOTORCYCLES: '96 Honda 250 Rebel, 3,086 miles, $1,600; '96 Yamaha 535 Virago, 1,982 miles, $2,800. Krause, 858-1289.

'01 SUZUKI SAVAGE 650, just had 4K miles servicing, excellent condition, saddle bags, $3,000. McRoberts, 299-6862.

REAL ESTATE

3-BDR. HOME, 2,050 sq. ft., open plan, central vac, storage, pond, Unser/Ouray, 20 mins. to KAFB, open house 11/3, $157,500. German, 839-1583.

1.5-ACRE HOMESITE, gas, electric, telephone in nearby street, between 2 new schools in Los Lunas, $15,000. Shaffer, 256-7601.

3-BDR. HOME, 2-1/2 baths, 2-car garage, quiet corner lot, excellent access to base, bike path, foothills, good schools, $162,500. Shepherd, 232-9653.

3-BDR. HOME, double garage, 2,100 sq. ft., RV pad, 2 FP, near Sandia HS, $149,000. Rice, 352-7590.

3-BDR. HOME, 1-3/4 baths, 1,400 sq. ft., near Constitution & Moon, excellent starter home, low down, flexible owner financing to Sandian if needed, $89,500. Watkins, 884-7015.

4-BDR. HOME, 2-1/2 baths, deck, garden house, El Dorado district, 12408 Morrow, $192,400. Walker, 294-7538.

2-BDR. MOBILE HOME, 2 baths, completely remodeled, near base, in nice 4 Hills area park, shed, moving must sell, only $8,500 OBO. Sustaita, (AM) 453-2131, (PM) 275-5983, ask for Lilly.

1/3 ACRE W/HOUSE, plus 1/3-acre lot, unique, stained glass, beams, some old Alvarado, view, view, view. Talbert, 298-9036.

4-BDR. HOME, 3-1/4 baths, 2-car garage, Glenwood Hills, great schools, views, landscaped, fireplace, hardwoods, gazebo, $325,000. Trinkle, 237-1051.

WANTED

TRUMPET, preferably Bach or Yamaha, but will consider others, reasonable. Gutierrez, 239-7059.

LAPTOP COMPUTER, inexpensive, for use in tuning a Holly Commander 950 fuel injection system. Plut, 298-3060.

SOMEONE TO TRIM & shape a tall evergreen tree. Wilson, 293-2228.

HOUSEMATE, responsible, nonsmoker, house by Big I & UNM, $430/mo, utilities included, deposit. Mattes, 255-2454.

ROOMMATE, to lease apartment/house in NE, new to Sandia & Albuquerque. Tejani, 512-779-5800.

TRAMPOLINE, w/side netting, in good condition. Sotelo, 298-0358.

CRAFTERS, Holy Ghost Catholic School craft fair, November 23 & 24, $30/booth both days. Austin, 256-1563.

FACTORY MANUAL for '93 Geo Prizm. Leisher, 281-5258.

THREE BATTERIES, C&M, ECY 420, 8-volt each. Hilborn, 228-9085.

GUN SAFE, fireproof, w/room for at least 10 guns. Zirzow, 281-9896.

SHARE-A-RIDE

EAST MOUNTAIN VAN, stop driving everyday, Frost Road, N-14, Tijeras, Edgewood riders welcome. Burns, 281-3922.

Nigel Hey's literary eye turns to the *Solar System*

By Ken Frazier

All those fortunate enough to have worked with Nigel Hey during his years as Sandia's main contact with science and technology journalists worldwide know he has an eclectic mind, deeply interested in science and philosophy and always reaching outward.

How fitting then that Nigel's first book since he retired from being a full-time Sandia employee in October 2001 to write books (he's still a part-time contractor to Center 12600) is about the "out there," our solar system.

His beautiful 272-page coffee-table book *Solar System* was published Oct. 17 in the U.K. by Weidenfeld & Nicolson, London, and will be distributed beginning this month in the US by Sterling Publishing, New York.

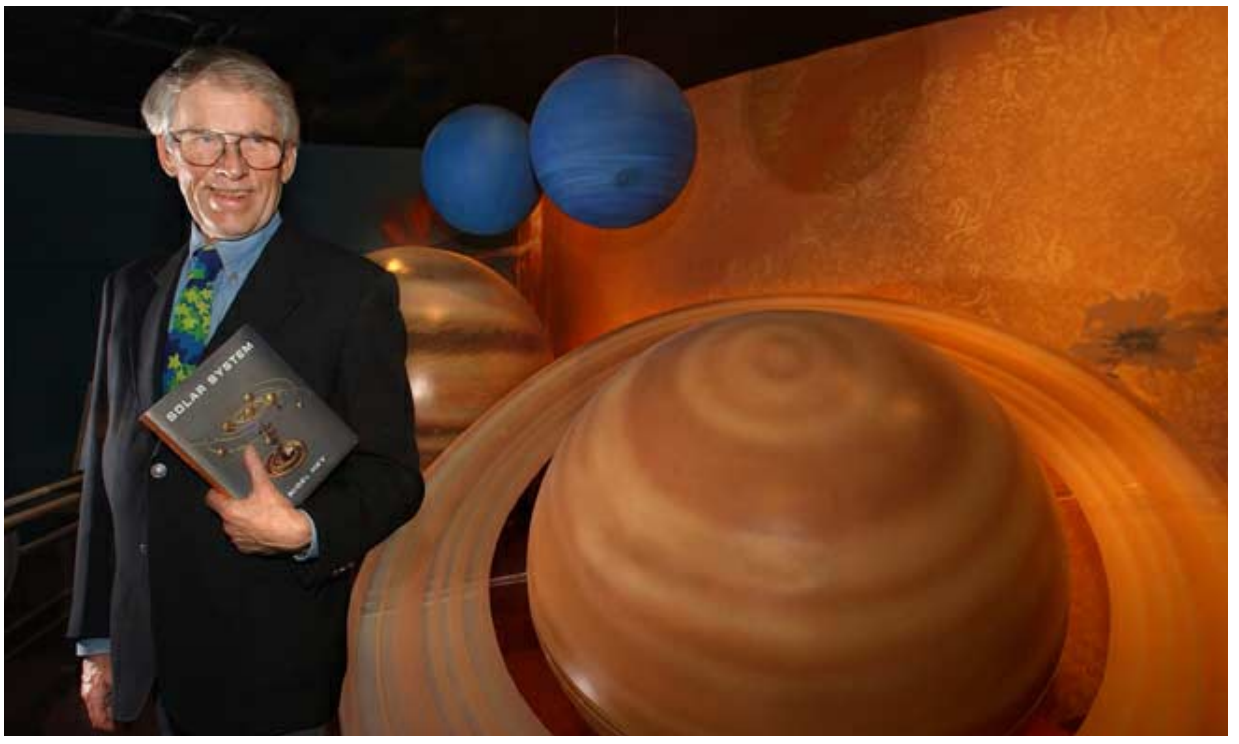
He's back home now in Albuquerque (actually Los Ranchos in the North Valley), but for a busy week or so at publication time in the UK Nigel was in London signing books (at the Science Museum in Kensington, at Borders on Oxford Street), meeting with his London-based editor, participating in a science writers meeting at the Royal Institution, attending a planetary sciences session at the Royal Society, doing interviews about his book for BBC regional radio, and giving a speech to the National Space Centre.

Now some of the same may happen soon with the book's US publication. Several New Mexico bookstores and the Lodestar Planetarium at the New Mexico Museum of Natural History have scheduled signings and talks (see box below), and other events are possible as well.

Solar System covers the history of the exploration of the solar system, profiles each of the planets, and explains launch systems and spacecraft instrumentation. Nigel's reader-friendly text is interspersed with 12 short essays written by space experts such as Arthur C. Clarke ("Humans and Machines, Space and Time") and David Morrison ("Killer Asteroids"). One is even by a Sandian, Roger Lenard (6424), on nuclear space propulsion. The book has 120 color illustrations, including some striking original photo illustrations commissioned by his editor. Nigel says the whole thing was quite a collaborative effort.

Nigel's book-signing schedule

Lodestar Planetarium . . . . . .6:30 p.m., Fri., Nov. 15
Borders, Albuquerque . . . . . .3 p.m., Sat., Nov. 16
Borders, Santa Fe (Sanbusca) .3 p.m., Sat., Nov. 30
Barnes & Noble,Westside . . . .7 p.m., Thurs., Dec. 12



NIGEL HEY shows off his new book, *Solar System*, during a photo session at Albuquerque's Lodestar Planetarium. (Photo by Randy Montoya)

"Because of its broad treatment of the subject, *Solar System* makes an excellent introduction to space studies," Nigel says. "It is not a textbook, but I hope it finds its way into schools and colleges."

Nigel fears that today's modern urban populations have fallen into what Carl Sagan called "cosmic isolationism," unable due to light pollution to see the nighttime skies in all their grandeur and missing that sense of wonder and awe that comes from a visual and visceral identification with the cosmos. He's become a steadfast space advocate. "We will never be so civilized that we give up the adventure, the wonder, and the pure delight of our star-filled sky."

And perhaps that's why Nigel calls his book "a nonfiction adventure story."

Planetary scientist Clark Chapman of the Southwest Research Institute in Boulder, Colo., calls Nigel's *Solar System* "a delightful book and an easy read. Eschewing the usual organization of a text, the book reads more like a collection of often philosophical essays about exploration of the solar system."

Nigel traces his work on *Solar System* back to 1989. That year, while at Sandia, he served a stint working as a public information specialist for the launch of the Galileo spacecraft at Cape Canaveral (Sandia provided Galileo's radiation-hardened microchips). He'd already written an earlier book about planetary science, *How We Will Explore the Solar System*, and he began incrementally updating it, all the while working in Sandia's media relations group and later, as a Senior Administrator, heading National Outreach Programs in Public Relations and Communications Center 12600.

For further information, see Nigel's website for Solar System *at www.thesolarsystem.org. It provides reference material used for the book and many hyperlinks to other information and images.*

In the summer of 2000 Phillip Campbell, editor of *Nature*, introduced Nigel to editors at Weidenfeld & Nicolson, and the book was soon on its way.

The London connection comes naturally for Nigel. He was born in England, and two of his three children, a son-in-law, and grandson live in England now. Nigel had journalistic stints in Britain, the US, and Bermuda before coming to Sandia in 1967. Except for a period away from 1972 to 1982 working for a London-based pharmaceutical market research company, here at Sandia he stayed, until his ever-outward perspective took him away again, out to the S*olar System*.

Sandians pitch in to make a difference

SANDIA VOLUNTEERS pitch in to help put together promotional materials for the Mothers Against Drunk Driving organization as part of the Labs' involvement in the annual Make a Difference day activities last Friday. (Photo by Randy Montoya)

Feedback

Q: *When new web applications are being developed, are secretaries included on the teams or are they being left out of the loop as usual? They are the most frequent users of many processes that have been changed recently; e.g., Iprocurement and Benefits (particularly the vac/flex balance page). The end results suggest they didn't have input. There is a Move team that has been in existence for about a year, is there a secretary on that team?*

A: We always strive to have representation from our customers in determining the requirements and operation of the computer programs used to interact with the business systems. This is accomplished for the software Sandia develops. In the cases cited above (Iprocurement and Benefits), it involves commercial off-the-shelf software (COTS). With COTS software, we do not have the opportunity to develop or design. We strive to meet business needs with best business practices as determined by the commercial suppliers that don't necessarily meet all of our requirements but allow commercial practices to drive the customer interface. We also strive to incorporate customer feedback to the companies involved in the design and development of the software. Regarding the second question, is there a secretary on the Move team? At this time, no; the team is working behind-the-scene processes and not the interface with the customers. — *Gary Concannon (10305)*