

New Labs President and Director Tom Hunter on privileges, opportunities, service, and leadership

Tom Hunter takes office as Sandia's 12th president today (April 29), succeeding Paul Robinson. Here is his letter to employees:

To all Sandians:

Two weeks ago, when I spoke to the Sandia managers at our annual Spring Conference, I talked about how I considered myself to be privileged — privileged to have spent my career at Sandia, and privileged for the opportunities that Sandia has given me.

In those remarks, I was speaking only for myself, but as I began to think about what I wanted to say in this, my first letter to you as Labs Director, it occurred to me that we are all privileged to be Sandians.

At the beginning of our careers, how many different ways might we have gone? How many divergent paths might we have followed? And yet, fortune led each of us to choose Sandia — and for Sandia to choose us, to see in each of us the qualities it sought in forging a team equal to the nation's toughest national security challenges.

Work of the highest consequence

We are privileged to be called to use our skills, our training, our experience — our *passion* — for work of the highest possible consequence. How many of our neighbors, how many of those with whom we went to school, those who faced the same choices we did and chose another path, how many of those individuals are as privileged



SANDIA LABS DIRECTOR TOM HUNTER

as we are?

We are challenged — and honored — to work in an environment where the decisions we make each day, the actions we take, matter for us, for our families, for our communities, for the nation and, indeed, for the world.

We are privileged to be entrusted with such awesome responsibilities. But of this I am as certain as I can be: For nearly 60 years we have proven that we are worthy of that trust.

In the days, months, and years ahead, the nation's challenges will be great. At the same time,

the opportunities for us to contribute will be great. The nation will continue to look to us to meet the challenges of our own time. And we will meet those challenges, for we are worthy of them.

During this time of transition, I want to pay tribute to the role that Paul Robinson played in establishing our position as a vital part of the nation's security, particularly now as we enter the 21st century. Under Paul's leadership, we have been even more engaged in a broad range of missions that address the national security challenges of the post-9/11 world.

And I want to commend Joan Woodard for the role she has played in guiding the operation of the Laboratory as we have taken on new contract requirements and new internal management systems. I especially want to thank Joan for taking on, in addition to her other duties during this transition, the leadership of the Labs' weapons program.

Labs' position is strong

The position of the Labs is strong. Our budget is at a historic high. We also have a very strong and capable staff. We've brought in some 2,000 new Sandians in just the past four years alone. They're bright, energetic, and talented. We've brought them from the best places and put them into an environment where they can contribute their very best.

We've seen about \$150 million in construction each year for the past few years that is rapidly changing our landscape and shaping the vision of
(Continued on page 4)

Sandia/NM Family Day, retiree picnic postponed due to safety concerns

Family Day for Sandia/New Mexico is off. So is the annual retiree picnic.

Family Day 2005 and the retiree picnic, both of which had been scheduled for Saturday, May 14, at the New Mexico facility, have been postponed. Sandia's Laboratory Leadership Team Monday reluctantly decided to postpone the event because of site safety concerns due to the large number of major construction projects currently underway at Sandia/New Mexico. A new date will be determined and announced when possible. Sandia/California's May 21 Friends and Family Day is not affected and will be held as scheduled (see page 3).

"Family Day is an important event for both our employees and their families. While we regret the need to postpone Family Day [in Albuquerque] at this late date," said Les Shephard, VP 6000, "this will give us time to complete some of our construction and thereby help to further ensure the safety of all employees and visiting family members.

"We know that many Sandians and their family members had already planned their visits, and we apologize for any inconvenience. Safety is our overriding concern, and we can't compromise that. We hope everyone will understand."

Watch the *Sandia Daily News* and the *Lab News* for further announcements. If you have other questions, call Bruce Fetzer (12600) at 845-7759.

Some retiree picnic invitations have already been mailed. "Should you receive one, please disregard it," says Benefits Dept. 3332 Manager Mary Romero Hart. "We apologize for any confusion and regret that the picnic must be cancelled. We are looking at options for recognizing our retirees at a future event."

Sandia LabNews

Vol. 57, No. 9

April 29, 2005

Managed by Lockheed Martin for the National Nuclear Security Administration



Sandia assists with project to maintain vehicles' tire pressure automatically

Three engineering concepts provided to small business

By Michael Padilla

Dale Petty was tired of maintaining his old farm tires and dealing with blowouts caused by low tire pressure.

Petty, owner of Petty Farm and Ranch in Clovis, N.M., wanted to develop a gadget that would automatically check tires for the recommended pressure and add or release air.

Now the idea is a reality and is being marketed to various companies.

Petty received assistance from Sandia's Small Business Assistance Program and was partnered with John Browning (5919), principal investigator for the project.

John, a member of the Systems Research Department, came up with various ideas for maintaining the manufacturer's recommended

tire pressure without having to do it manually. He suggested three engineering concepts to Dale: an air compressor system, a high-pressure bottle, and a gas generator.



DETAIL of automatic tire pressure system, developed by Dale Petty of Petty Farm and Ranch in Clovis, N.M., with help from Sandia.

The air compressor concept is similar to systems that operate tools powered by compressed air. A centrally located air compressor would call for tire inflation pressure to come through the air channel of a rotary union mounted on the wheel. John says this concept would work well in semi tractor trailers, for example, but could not be easily implemented on the majority of passenger vehicles that use constant-velocity joints. A more expensive

system could put an air compressor on each wheel, and would require power to be provided through a slip connection on the axles.

(Continued on page 4)



Get the skinny on the world's thinnest-ever lubricant for weapon parts and other applications. Story on page 5.



Red-hot chile peppers are hot topic as Sandia, NMSU, and N.M. chile growers team on pepper-sorting R&D project. page 6.



Safety at work includes ergonomic evaluation . . . and follow-through. See story on page 9.

What's what

"Safety" is a priority of new DOE Secretary Samuel Bodman. Consequently, it has become the watchword around Sandia these days and we're all going to be seeing a lot about it in months to come.

There already have been *Lab News* stories and *Sandia Daily News* announcements, and there'll be all-hands meetings, voicemail bulletins, e-mail messages, letters from up and down the organizational chart, *Porcelain Press* reminders, Video Sandia exhortations, brochures in your snailmailboxes, eye-catching posters, and probably other stuff nobody's even thought about yet. Yet.

The messages will be pointed and, more than likely, sometimes entertaining. But beware of two of those media. You can get a nasty paper cut from brochures, and if you're driving or walking while enthralled with an eye-catching poster warning you to be careful, you could crash or stumble. And although crashing or stumbling would be a graphic lesson, either would produce a negative metric and, besides that, you might skin your knee or dent your bumper.

An example comes to mind. Not too long ago, one of your *Lab News* correspondents was walking to an interview in the MESA complex and was so captivated by the tower crane, nifty buildings, and other stuff going on there that he stumbled, fell, and rolled around a little before recovering. Fortunately, he wasn't injured — falling into the soft mud and suffering only a mud-stained coat.

The empathetic MESA folks brushed him off and gave him a cookie, and everything was OK. But be careful out there. If you fall and get muddy, there may be no one to brush you off. Or give you a cookie.

* * * * *

Despite all the memorable lines she delivered in a long and distinguished acting career, perhaps the truest Betty Davis ever uttered was not theatrical: Getting old is not for sissies.

It is the perfect process, however, for grumps. Aging gives you something to grump about every hour of every day, although there certainly are highlights. And I experienced one of those personal highlights just a few days ago.

After quartering a cabbage — with a large chef's knife — I routinely wiped the blade and gave it a few swipes on the sharpening steel. Then as I slipped it into its space in the cutlery drawer, I made a quick, nifty little slice on the end of a finger.

Now, it wasn't a tragedy and I know things like that happen to people all the time. A few years ago, though, it wouldn't have happened because I was more careful — and quicker. But I'm no sissie, so I grumped about it.

* * * * *

You work at one of the world's great R&D labs — unless you're reading this outside Sandia. So, do you know what QA/QC means? — Quality Assurance/Quality Control?

Well, maybe. But Joe Pavletich (6146) has a more irreverent idea. He says it means Quit Asking/Quit Complaining.

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

Fitness for Life: Own it Love it. Learn it. Live it.

"Own it" is a simple way to express the need to take responsibility for your own personal health. In our society, it is easy to get caught up in the blame game when it comes to negative health outcomes. What we need to do is take individual ownership of our lives. It's easy to get caught up in the things we cannot change, but we need to pay more attention to the behaviors that are modifiable. Many prevalent disorders such as heart disease, high blood pressure, and diabetes are by-and-large preventable. True health insurance is not what one carries on a

Employee Health and Fitness Day

Wednesday, May 18
11 a.m.-1 p.m.

Hardin Field, Wyoming and F Ave., KAFB

There will be five activity stations running at 15-minute intervals. Come try a back-care obstacle course, group fitness, guided imagery and flexibility, circuit exercise program, and walk. Participate in any three activities to receive an event T-shirt.

For more information, browse the Health, Benefits and Employee Services UPDATE at www.sandia.gov/health/update/

plastic card but what one does for oneself. Understanding that what we do day to day has either a positive or negative impact on our lives can play a huge role in the activities we choose, the foods we eat, and the lifestyles to which we aspire.

Here are a few "own it" ideals that you can immediately put into practice:

- Love it. Put your whole heart into whatever you choose to do in attaining better health. Often, we begin a positive lifestyle change without actually accepting it as a positive move. Instead, we begin to discount our choices. Expecting ourselves to fail will, in fact, lead us down that very road. Next time you meet with a doctor, begin an exercise program, or make adjustments to your health, try to be as positive about it as possible. Maintain a healthy perspective and believe in your ability to follow through.

- Learn it. Educate yourself on the aspects of health that you need to change. When you understand more about the components of health, you will become better equipped to make healthy choices, more open to changing your lifestyle, and more capable of making the necessary adjustments.

- Live it. Once you start taking steps in the right direction (tracking blood pressure, watching salt intake, exercising, eating right, etc.), reinforce the change you've made by accepting it into your everyday life. Lack of time is the number-one reason that we don't care well for ourselves. Make time for the lifestyle changes you've adopted by writing them into your calendar. Scheduling what you value will reinforce the importance of making time for the positive behaviors that are meaningful to your health.

Your health care is within your own power, not something in a chart or on a plastic card. Take the initiative to live well — own it!

— Callie Butler (3331-2), health educator

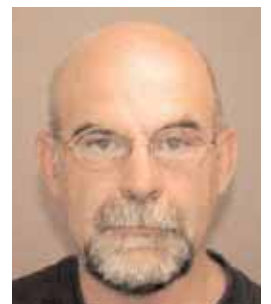
Employee death

Chris Davis, contract employee in Video Services Dept. 12653, died April 20 after a heart attack.

He was 56 years old.

Chris was a video producer and editor who had been contracted to Sandia's Video Services for the past five years.

He is survived by his daughter, Caitlin, and his father, John Davis.



CHRIS DAVIS

Sandia LabNews

Sandia National Laboratories
<http://www.sandia.gov/LabNews>

Albuquerque, New Mexico 87185-0165
Livermore, California 94550-0969
Tonopah, Nevada • Nevada Test Site • Amarillo, Texas •
Carlsbad, New Mexico • Washington, D.C.

Sandia National Laboratories is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin company, for the US Department of Energy's National Nuclear Security Administration.

Ken Frazier, Editor 505/844-6210
Bill Murphy, Writer 505/845-0845
Chris Burroughs, Writer 505/844-0948
Randy Montoya, Photographer 505/844-5605
Nancy Garcia, California site contact 925/294-2932
Contributors: Janet Carpenter (844-7841), John German (844-5199), Neal Singer (845-7078), Larry Perrine (845-8511), Howard Kercheval (columnist, 844-7842), Will Keener (844-1690), Iris Aboytes (844-2282), Michael Padilla (284-5325), Rod Geer (844-6601), Michael Lanigan (844-2297), and Michelle Fleming (Ads, Milepost photos, 844-4902). Dept. 12651 Manager: Chris Miller (844-0587).

Lab News fax 505/844-0645
Classified ads 505/844-4902

Published on alternate Fridays by Media Relations and Communications Dept. 12651, MS 0165



Recent Patents

Paul Dentinger (8764) and Karen Krafcik (8753): Photoimageable Composition.

Bertise Tise (2348) and Dale Dubbert (2345): Digital Intermediate Frequency Receiver Module for Use in Airborne SAR Applications.

Timothy Shepodd (8762) and Brian J. Kirby: Fluorinated Silica Microchannel Surfaces.

James Gee, Shawn-Yu Lin, James Fleming (1749), and James Moreno: Method for Fabricating a Photonic Crystal.

William Sweatt (1743) and Todd Christenson: Microoptical System and Fabrication Method Therefor.

Matthew Blain (1764): Microfabricated Cylindrical Ion Trap.

David Follstaedt and Michael Moran (both 1111): Method for Thinning a Specimen.

Robert Sanchez (1733): High Frequency Transformers and High Q Factor Inductors Formed Using Epoxy-Based Magnetic Polymer Materials.

Lab News Reader Service

The *Sandia Lab News* is distributed in-house to all Sandia employees and on-site contractors and mailed to all Sandia retirees.

Retirees (only): To notify of changes in address, contact Carol Wade, Benefits Dept. 3341, at 505-845-9705, e-mail cawade@sandia.gov, or Mail Stop 1021, Sandia National Laboratories, Albuquerque, NM 87185-1021.

Sandian is a really good neighbor: Fire victims find temporary shelter due to kindness of this stranger

By Nancy Garcia

Watching TV news the morning of March 23, systems analyst Navid Jam (8941) realized the six-alarm fire that left 250 apartment dwellers homeless was not far from his San Jose neighborhood, where helicopters were circling and sirens sounding.

He told his father, who is on the governing board of the Bahá'í Center two blocks from the fire, that he wanted to open its doors as a temporary shelter.

Some didn't even have shoes

"The poor guys were standing out in a parking lot in the rain," Navid said. "Some had shoes, some didn't. Some were in their pajamas. The fire struck at around 5 a.m."

He drove over and offered the shelter to the Red Cross representatives at the temporary command center. "They were jumping up and down for joy because they didn't have a place to take the displaced residents," Navid recalled. "This was a perfect place for them to hang out. . . . What's the purpose of having a church if you can't open your doors when people are in need?"

From this staging area, where the displaced residents warmed up, had refreshments, used the facilities, and (the children) played with toys, the Red Cross later moved them to a middle school that also offered showers and could be used as

"They were jumping up and down for joy because they didn't have a place to take the displaced residents."



NAVID JAM interceded with his father, a member of the governing board of the Bahá'í Center in San Jose, Calif., to make the center available to victims of a six-alarm fire in the neighborhood.

temporary lodging for residents unable to go to a hotel or friends or family to stay.

Navid busied himself setting up the coffeepot, picking up spare diapers, and making photocopies, along with several other members of the Bahá'í Community who showed up to help. Other nearby residents also showed up, willing to

help, dropping off food, clothes, and other items. "It was amazing so many people brought so many things," he said. He himself provided an extra Macintosh power cord to a programmer who was ruefully clutching his laptop, lost in worry about a software release due the next day.

He was also impressed with the logistics of the Red Cross, whose crew focused on lining up medications and relief kits. The fire was the worst displacement in that area in roughly a decade. The Bahá'í of San Jose in conjunction with the Red Cross sponsored an emergency preparedness class for neighbors on April 9 and had a fundraiser on April 17 to raise cash donations to replenish the Red Cross disaster assistance fund.

Sandia California News

Feedback

Voicemail etiquette applies to all Sandia sites

Q: I have called or e-mailed employees only to find out they were either on vacation or on their 9/80 Friday off. I've mentioned this issue to some line managers and some don't appear concerned their employees fail to notify their customers. Is there a corporate requirement or practice requiring employees to change their voicemail and their e-mail when they are out of the office due to absences or their 9/80 day-off?

A: There is no corporate requirement directing employees to keep their voicemail or e-mail options current so that they detail an individual's presence at or absence from work. At the same time, there is an expectation that Sandians demonstrate professional behavior and Sandians, simply put, do the right thing. Failing to manage your voicemail is not doing the right thing. The lack of concern and professionalism demonstrated by failing to keep people who tried to reach others via e-mail or phone is especially bad when it's members of service organizations who drop the ball and keep others waiting and guessing with what really are bogus e-mail or voicemail greetings; e.g., "Hi, This is Andrew Smyth's phone. Leave a message."

In fact, here is a reprint of an item that ran in the *Sandia Daily News* early this year:

"Voicemail etiquette: The e-mail team says it was obvious during the week prior to shutdown that many people in service organizations took off without changing their voicemail greetings and reminds everyone that when you're going to be

away from your office for a day or more, it's really important that you leave a voicemail greeting reflecting that. You don't have to say where you are or what you're doing, but you should say you'll be unavailable until a specific time and who to contact in your absence. Gary Shepherd (9335) says it's easy to change your greeting. From the voicemail main menu, enter 4-3-1-2-1 and record the changed greeting. (You can also record an extended absence greeting if you want to force callers to listen to your greeting. To do that, enter 4-3-2 from the voicemail main menu.) Paying attention to this simple process can save your callers a lot of time and frustration, says Gary."

Perhaps too few people know about the very helpful web site offered by the Sandia Voice Information System (SVIS). Its home page is www-irn.sandia.gov/SVIS/svishome.html. Underneath that home page is another page that explains how to easily create multiple greetings. Find that one at www-irn.sandia.gov/SVIS/tmultiple.htm. It's a way to, without much hassle, create some tailored messages. To select a pre-recorded greeting using the web, you can use <http://odapps2/multiple-greetings> and you even can have the system send you an e-mail reminder to set your voicemail greeting back to an 'everyday' version when you return from an absence.

All in all, some pretty helpful services to make you more accessible and helpful, while reducing hassle.

— Rod Geer (12600)

Family Day at Sandia/California is still on for May 21



Family Day is just around the corner for California Sandians.

Family Day is coming to Sandia/California on Saturday, May 21, from 10 a.m. to 4 p.m.

Volunteers are welcome to escort retirees who no longer have a Q clearance, and retirees who have a Q clearance may volunteer to help escort. The time commitment for retiree visits is limited to between 10 a.m. and 2 p.m. If interested, sign up at the web site listed below.

It's considered important that all key departments and program areas participate with activities, whether elaborate or simple. Ideas include exhibits, poster displays, science experiments, talks or presentations, or even an "open house" to show visitors a laboratory or place of work.

To register or for more information, please see: <http://www.ran.sandia.gov/shakin/familyday/index.html>

To all Sandians

(Continued from page 1)

a 21st century national security laboratory. Although that level of investment will not continue, it also is at a historic high. Perhaps the most significant investment in our history is the MESA complex, almost a half-billion dollar government investment. That's unprecedented. MESA represents one of the largest-ever national commitments to redefine engineering — the exquisite integration of design, modeling and simulation, and microsystem technology.

In addition, we've purchased one of the world's largest supercomputers, upgraded our pulsed power facilities, and we are revitalizing our test areas in Coyote Canyon and parts of Area 3. These are all vital measures in our continued ability to serve the nation.

Well-poised to meet challenges

We are well-poised to meet the challenges ahead. But that's not to say we don't have challenges of our own. We must address and focus on operational excellence. We have to face the fact that especially in the area of operational safety and our safety basis, there is hard work ahead. We need to make sure our customers have confidence in our safety performance and our commitment to a culture of safety.

We have challenges in security. Again, we've made good progress, but even more can be done. And we need to be perceived by our customers and stakeholders as leaders in the area of operational efficiency. We want to be seen as the institution that sets the benchmark for standards of effectiveness and efficiency.

As we plan for our future, we must all be aware that there will be some transformation of the nation's nuclear weapons enterprise. People in policy-making positions are asking important questions about the future of the weapons complex. How can the components of the complex work together more effectively and efficiently? How can we be sure this several-billion-dollar investment is spent in the best way for the nation's security? How do we look forward 30 years or so and have the right infrastructure for the missions we'll have at that time?

These are not unreasonable questions and we need to be ready to answer them. It is my hope that we will help lead the transformation of the nation's future nuclear weapons complex.

I understand that during any transitional time uncertainties will occur. I

ask you not to put stock in rumors and speculation, but to watch what we do. Our actions will be fairly deliberate. Over the next 60 days or so, we going to spend time trying to structure and position the pieces of the laboratory so that they align with the future. But we don't start this process with a blank slate: As we move forward, we'll have principles to guide us, and we'll continue to develop and refine those over time. I believe very strongly in building on the foundations we have and making only the changes that will clearly move us forward.

We are one Sandia

There is a principle that underpins all the others: We are one Sandia. As we move forward, we'll make every effort to be clear about assignments and responsibilities, and we'll also make it emphatically clear that we are all in this together. The future that we design will be one that we all aspire to and one that we all can achieve together.

Another principle: In national matters, the nation comes first. That principle was set down in writing by then-Martin Marietta president Norman Augustine in 1993 and it certainly holds true today, as it has throughout our history. And, likewise, in corporate matters, in our engagement with Lockheed Martin, Sandia comes first. Lockheed Martin, to its credit, not only agrees with this principle, but insists upon it.

There is a long-standing Sandia value that I will continue to embrace and work to embody: Each person matters. The core value of each person and the core value of what we stand for together matter to us as an institution and as individuals. Anything less is not worthy of Sandia or Sandians.

I hope everyone understands that we are not considering radical transformation of Sandia. We are aiming to make sure every step we take is a step forward, every action builds on what we have and makes it better.

As I take on this new role, I need your support. And I pledge you mine. I have come to believe that, at the end of the day, our success, as individuals and as an institution, derives from our ability to trust, enable, and support each other.

And finally, I want you to know that I'll do everything I can, as your leader, to make sure Sandia remains a place where we feel privileged to come to work every day, where each person is valued and respected and where our country continues to turn to us for exceptional service in the national interest.

TOM HUNTER

Sandia Labs President and Director

Tire pressure

(Continued from page 1)

The high-pressure bottle concept is similar to systems used to inflate life rafts and aircraft emergency slides. A high-pressure bottle with a pressure regulator can be placed on each wheel of almost any vehicle. Product pricing issues, however, include costs of the high-pressure-rated parts and possible regulatory maintenance requirements such as periodic testing of the system components.

The gas generator concept would use materials already in use in automobiles today to inflate airbags. A series of small, hot-wire-ignited pellets (e.g., sodium azide) could provide nitrogen gas for periodically replacing lost tire pressure. The pellets could be mounted on a flex circuit board, which would be strapped around the tire rim inside the tire volume, along with a battery, pressure sensor, microcontroller, and igniter electronics. John says the gas generator concept is potentially the lowest cost manufacturing solution, but because of the relatively high development cost was not pursued under the small business assistance project.

Air compressor

The air compressor concept was chosen in the preliminary design of an automatic tire pres-

sure maintenance system.

A prototype system was built under the small business assistance project to address the safety and economic issues of under-inflated automobile tires frequently driven on American's roadways.

A portable prototype has been created to hand-carry to trade shows and potential customers. The portable system is designed for demonstrations, and may be powered either by a portable 12-volt, sealed lead-acid battery (with a 110-volt AC battery charger), or by a 12-volt DC output, 110-volt AC power converter. The system features a mounted tire and wheel, attached to a pedestal by a bearing, with a handle for manually rotating the tire. A carrying case is included. The pedestal contains an air compressor, pressure switch, and vent valve, with associated tubing and wired connections to a control box with an internal pressure sensor.

The prototype has some features similar to the Dana Corporation's central tire inflation systems (CTIS) which have found utility in the trucking industry, particularly in off-road vehicles, and have been employed with both trailer axle vehicles and tractor drive axle vehicles. The CTIS is currently available on some models of the Hummer, but, says Petty, "Hopefully someday all vehicles will be equipped with a device that will help save lives."

High pressure bottle

With the assistance of John's brother David, an automotive technician at Galles Chevrolet in Albuquerque, Dale also created an automatic tire pressure maintenance system using wheel-mounted high-pressure nitrogen bottles.

The system has been installed on all four wheels of a 1966 Ford Mustang.

Testing of the system included tire balance check and various bottle road tests. The bottle road tests test rim and tire assemblies, shock and vibration from various highway speeds, and the



DALE PETTY got tired of having to check his tire air pressure all the time, so he developed a system that does it automatically. (Photos by Randy Montoya)

structural integrity of the system. In addition, tests were conducted to detect leaks and simulation of proper functioning of the automatic tire pressure maintenance system.

Small idea, big concept

Petty says the idea for the system came after his son came home with a homework assignment. The assignment was to not to reinvent the wheel but to make it better. Petty sat on the idea for a year and soon contacted Sandia's Small Business Assistance Center.

Besides being tired of changing flats and dealing with blowouts, Petty says the idea was also based on safety.

Petty was alarmed with the 2000 recall of Bridgestone/Firestone's 6.5 million tires. Close to 300 complaints had been received by the National Highway Traffic Safety Administration about the tires. Several hundred lawsuits were filed because of fatal accidents due to the faulty tires.

After meeting with Mariann Johnston (13021), the Small Business Assistance Program team leader, he knew his idea would soon be developed.

"I am pleased with all the assistance Sandia provided," Petty says. "Sandia took the lead and helped out tremendously."

278 businesses helped in 2004

Sandia assisted 278 New Mexico small businesses in 2004 thanks to a tax credit passed by the New Mexico Legislature.

This was Sandia's fourth year of providing technical assistance to small businesses in the state.

The New Mexico Small Business Assistance (NMSBA) program allows Sandia to use a portion of its gross receipts taxes paid each year to provide technical advice and assistance to New Mexico small businesses. During 2004, Sandia received \$1.8 million in tax credits.

There are few requirements for small-business participation — mainly that assisted companies must be for-profit New Mexico small businesses and that the help is not available for a reasonable cost through private sources.

Innovative Kansas City Plant process yields lubricant of unprecedented thinness — with help of Sandia

This story, reprinted from the Kansas City Plant's internal newsletter, Connections, offers a vivid account of a collaboration between Sandia and the Kansas City Plant to solve a sticky friction challenge.
— Editor

By Monta Morris, Kansas City Plant

Mark Smith doesn't like to say no. So when customers at Sandia National Laboratories came to him with a requirement that — as far as any of them knew — had never been met, he considered it a challenge.

The requirement was for an extremely thin layer of lubricant — thinner than has ever been achieved either within the weapons complex or in industry — to be applied to small bearings and parts for the W76 and W80.

"Oil can't be used on these parts because oil flows and could eventually spread to parts of the system where it might interfere with performance," said Smith, principal engineer in materials engineering at the Kansas City Plant. "Also, for systems that are likely to remain in stockpile for years at a time, oil can settle, leaving parts unprotected by lubrication."

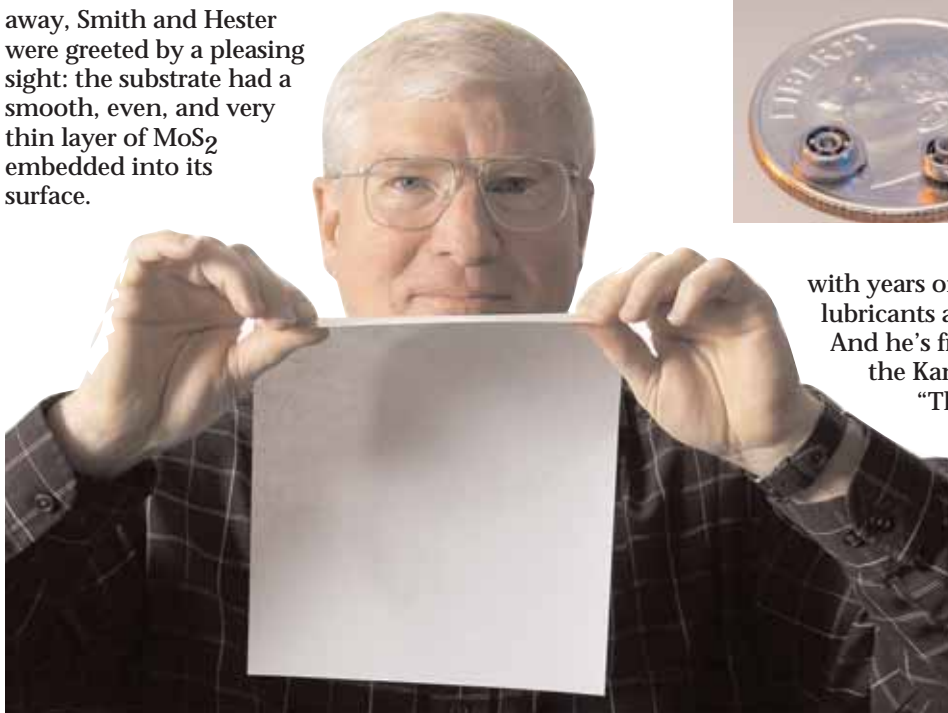
What the lab asked for was a layer of lubricant to be applied at a maximum thickness of .05 mils, or 50 microinches.

For comparison, typical paints and coatings go on at 1.0 to 3.0 mils thick. Bonded solid film lubricants, which are applied as a solid lubricant powder mixed with a liquid adhesive, are generally thinner, at 0.6 to 0.9 mils; but that's still more than 10 times too thick. The Kansas City Plant's production paint department, using their expert techniques, can apply those adhesively bound lubricants at 0.1 to 0.3 mils, but that's also too thick to meet the new requirement.

"We were trying to solve a 'micro' problem with a 'macro' solution," said Smith. Faced with these impediments, he determined that an entirely new approach was called for.

Initially, Smith, who has extensive expertise in spray coating with powder, considered incorporating the lubricant into a powder coating that could be sprayed onto the substrate. But because the goal was thinness, and lubricant by itself is as thin as you can get, Smith tried something unusual — spraying the solid lubricant directly onto the substrate without using an adhesive.

The lubricant he used, molybdenum disulfide (MoS_2), is a dry powder in the form of microscopic flakes or plates. Senior engineering technologist Mike Hester dry-blasted the MoS_2 at high pressure onto clean substrates in a dry nitrogen atmosphere. When the dust settled, and the loose material was washed away, Smith and Hester were greeted by a pleasing sight: the substrate had a smooth, even, and very thin layer of MoS_2 embedded into its surface.



HOW THIN IS IT? — The new lubricant is less than 1/100th the thickness of a sheet of paper, held here by Kansas City Plant researcher Mark Smith, and 30 times thinner than normal dry film lubricants. In the inset photo above, note that the lubricant on the bearings in these small parts is 1,500 times thinner than the dime on which they sit.

An 'interesting challenge:' Make the thinnest-film lubricant ever

The Lab News asked Mike Dugger (1824) for some additional Sandia context to the ultra-thin lubricant achievement. Here's his story:

Our colleagues in component design presented us with an interesting challenge last fiscal year. New stronglinks (safety and security components) for the W76 and W80 life extension program would use designs with tolerances down to 2.5 microns on some dimensions. The solid lubricant films typically used in these mechanisms to minimize wear and ensure consistent friction performance over the life of the component would require that parts be left undersized to allow for the thickness of the lubricant. A lubricant layer so thin that it can be ignored in the design, and yet produce low and consistent friction behavior, was needed. Commercial sputtered solid lubricant films would meet this requirement, but a process external to the weapon complex presents some challenges in terms of lead times, inspection, and qualification for the stockpile.

Metal dichalcogenide lubricants used in stronglinks operate by "transfer film" formation. Shear occurs between weak c-axis bonds in the crystal, forming an atomically thin layer of the lubricant on both sliding bodies even if initially placed on only one. We reasoned that a particle of MoS_2 blasted at a metal surface in a stream of nitrogen (to minimize oxidation) would fracture and form the transfer film. Based on a fundamental understanding of how these materials work, the process should also be quite robust since additional lubricant will not tend to stick to the sulfur-termi-

nated surface that forms. In other words, the lubricant thickness should be self-limiting.

The staff at Honeywell have done a great job implementing this idea, and our measurements show that we get friction coefficients around 0.03 in nitrogen, where these films will operate.



MIKE DUGGER displays a part that will use the ultra-thin lubricant.

(Photo by Bill Doty)

The previous resin-bonded lubricant gave a friction coefficient of about 0.10 under the same conditions.

We have examined this film on complex mechanism parts as well as bearings, and it appears to perform well. This process should be amenable to any surface that can be reached with a line-of-sight gas stream. We are also working under an LDRD on other approaches for forming thin films conformally on hidden interfaces.

It was Mike Dugger, Ph.D., distinguished staff member at Sandia Albuquerque, who had initially suggested to Smith the possibility of blasting the



lubricant directly onto the substrate. Dugger is a tribologist — an expert in friction and lubrication —

with years of experience analyzing lubricants and their properties.

And he's frankly impressed with the Kansas City Plant's success.

"This process generates a film of unprecedented thinness and excellent friction behavior," said Dugger.

Lubricant is measured using a coefficient of friction: the lower the coefficient, the less friction exists. "This process provides an excellent friction coefficient," said Dugger. "Typically, for the kinds of

products we build in the weapons complex, we get friction coefficients of 0.15 to 0.12. This process is significantly lower. The lowest we've measured with the new process is .03, which is so low it is getting hard to measure."

The thinness of the MoS_2 lubricant is what pleases Smith most about the process. "That's what we were after," he said. "It's a good lubricant, and it's as thin as you can get. Adhesive and binder are what make the lubricant thicker, and we've eliminated them."

He's also extremely pleased with the simplicity of the process. It's easy and inexpensive to perform and, unlike many other methods of applying lubricant, it uses no hazardous solvents or other pollutants.

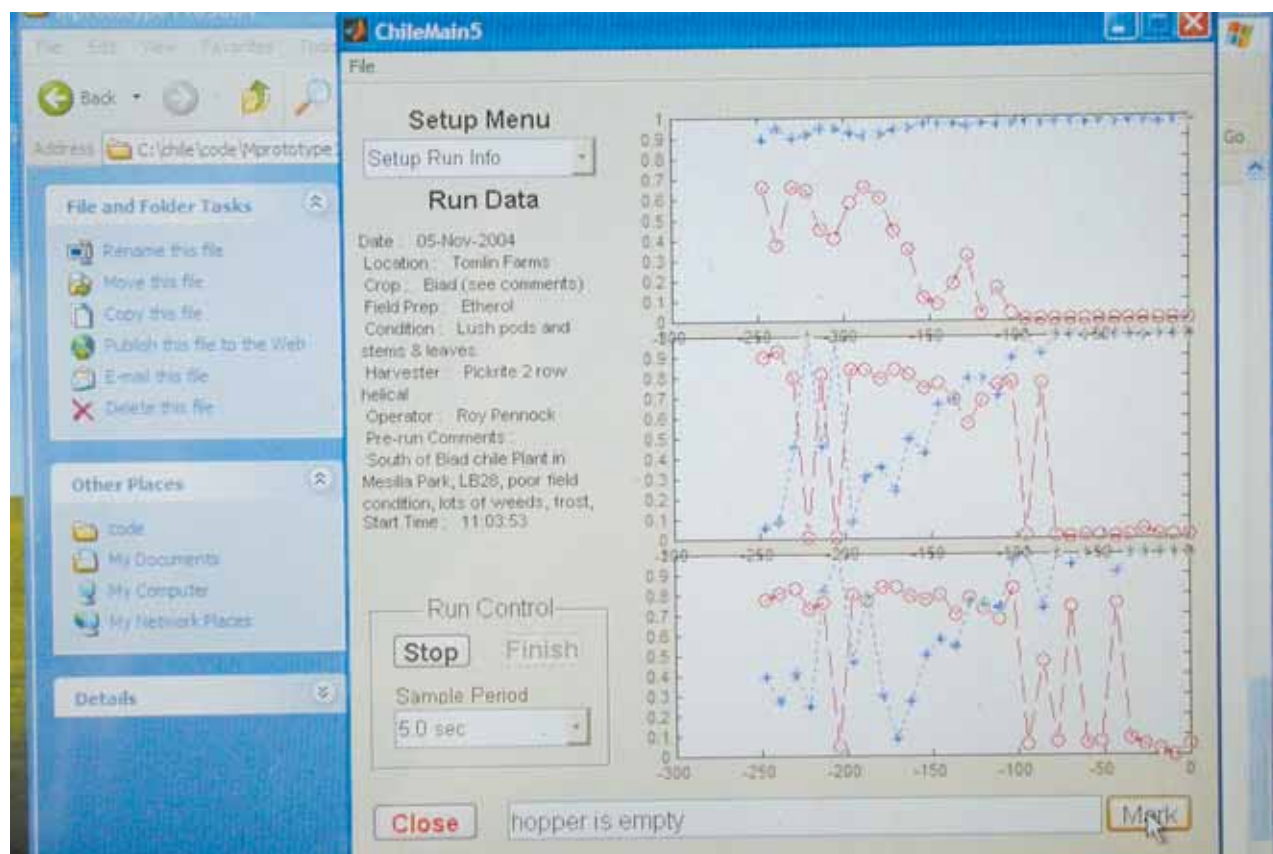
"This process can be easily applied to production throughout the nuclear weapons complex," said Smith. "It will lend itself to new weapon designs that require or can make good use of extremely thin permanent lubricants."

The Air Force is highly interested in the new lubricating process and has asked the Kansas City Plant to consider reprocessing 2,000 gyroscopes — containing 20,000 individual parts — for them. The MoS_2 dry-blast coating will allow the gyros to remain in long-term storage without losing lubrication protection.

"What we really need is a material that can be applied with a thickness so small that we don't have to allow for it in the dimension of the part," said Dugger, "and this lubricant is providing that. I've looked at a lot of solid lubricants over the years, and this is one of the best I've seen."



SEEING RED — A team from Sandia's Intelligent Systems Control Dept. 15234 has developed a system that uses a digital camera and software to analyze the chile and debris on a mechanical chile cleaner's conveyor belt based on color differences and provide feedback to the operator on percentages of product and waste.



Working to make New Mexico's chile industry high-tech and healthy

By Will Keener

Across southern New Mexico and into Texas and Arizona, a major effort is under way to modernize the harvesting and production of a product near and dear to many lovers of Southwestern cuisine — chile. Mechanization is coming gradually to an industry that has been synonymous with handpicking and hand-cleaning for many decades. Survival is now at stake.

Mechanization of this valuable crop (\$300 million in New Mexico alone) is a critical step toward success, says Roy Pennock, a Cooperative Extension research specialist at New Mexico State University who has spent his life in the industry. As labor costs and availability fluctuate and availability of red chile powder from Peru, Africa, India, and China increases, the industry has come together to fight back. The New Mexico Chile Task Force combines growers, processors, crop consultants, university extension experts, and others "... to get everyone working on the same page," says Pennock.

Add Sandia Labs to that mix, as Chris Wilson, Maritza Muguira, David Novick, Jon Salton, and Jesse Schwebach, all of Intelligent Systems Controls Dept. 15234, are working hard to play a contributing role. Now moving into the fourth year of a project with the task force, Chris and his team took their high-tech contribution to the effort on the road for last year's harvest.

New machines

Working with Pennock, New Mexico State University Extension Engineer Ed Eaton, and others, Chris and the Sandia team have developed an imaging system that can measure the effectiveness of mechanical harvesters, cleaners, and sorters for chile producers. "We looked at the mechanical devices under development and decided we could help most with a measuring system," says Chris. The system measures chile on a conveyor belt and quantifies the percentages of chile and "field trash," which generally consists of sticks, leaves, and other natural debris.

The system was used in connection with a two-stage mechanical chile cleaner developed by Eaton during last year's harvest. But it may also be of use to processors in the future, Pennock believes. "Mechanically harvested chile isn't always perfect. You get pods, but you get leaves, branches, and maybe a few other things," Pennock says. Without the "vision device" developed by Chris and this team, laborious before-and-after sampling is needed to gauge success.

"I think the system has tremendous potential for processing plants. You could have it at the beginning and at different stages of the system and it would tell you quantity and quality of the chile during processing," says Pennock, who operated the system last year as part of the evaluation process.

The original idea of how Sandia might help the task force has evolved over the past three years, Chris says. He started out with the goal of doing a survey to provide some factual information on which methods of mechanical cleaning work and which do not. Originally, he thought Sandia's robotics talents might be brought to bear on developing machines, but others, including researchers at NMSU, were ahead of the curve in this area, so Chris found another niche. He continues to consult with Eaton on design issues but has focused on measurement.

Cleaning chile fresh from the field is complicated by the fact that the peppers change throughout harvesting season. Early in the season the plants are green and fresh and there's little field trash. Later as the plants turn red, mature, and endure frost, mechanical harvesters tend to pull up large amounts of brittle branches and leaves with the pods.

"Chris has been a good sounding board for me," says Eaton. "He's someone I can talk to who

listens and is very helpful." Eaton plans to take a new version of his cleaner, mounted on a conventional chile harvester, into the field this year. "We need investment to help us go forward to the commercial stage," he says.

Examining different imaging technologies, Chris and his team developed a system that analyzes the chile and debris on a conveyor belt based on color differences. A digital camera connected to a portable computer takes still images of cleaned product on the conveyor belt. Software then analyzes the image, segmenting it according to color into product, trash, or background. Then the system counts pixels and provides feedback to the operator on percentages of product and waste. The operator can then adjust the cleaner and recheck the output plots to see the effect.

More variables

The project has thrown problems at Chris that he hadn't seen before. "There are a lot more variables out in the field than there are in a controlled laboratory space," he says. Given the variety of difficulties, Chris believes the task force, led by NMSU's Rich Phillips, is doing a good job. "They've reduced the scope of the problem significantly. Part of what we do involves educating customers as well as trying to listen to them."

Right now, most measurements are made by "eyeball," says Chris. "There is no standard for estimating the amount of product. An objective metric system is needed."

To achieve segmentation or determine what part of the image is actually the conveyor belt, debris, or chile, the system operator must "train" the software. The operator can develop appropriate masks to screen the images, based on hue and saturation values plotted as histograms. "This makes it easy to move from one conveyor belt to another with different color belts, or to measure differences in chile color based on the variety being harvested," says Chris. "We should be able to work with our customers to make changes as necessary."

"This work builds on and adds to what we are doing at Sandia. Here, I work on a lot of 3-D imaging, and this is a switch to 2-D. We are stretching ourselves in some different directions, but I think it will make us stronger."

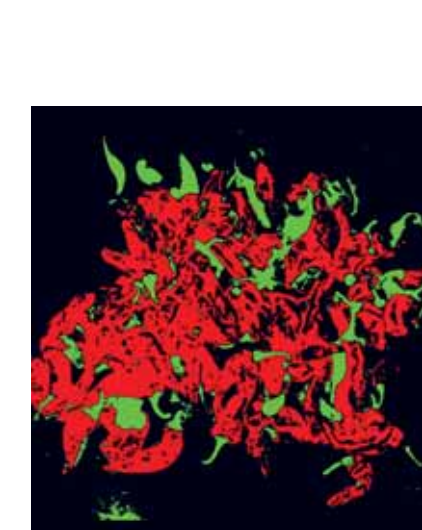
Chile cleaning sponsored by NM Small Business Assistance Initiative

The automated chile cleaning effort in collaboration with the New Mexico Chile Task Force was one of 12 leverage projects sponsored by the New Mexico Small Business Assistance Initiative at Sandia last year. Leveraged projects are a group of five or more (limited to 25) small businesses working with Sandia to investigate a single industry issue, relating to all the small businesses involved. The anticipated length of a leveraged project is three years or less to determine a solution for the industry issue involved.

Fifteen to 20 private companies have been involved in the New Mexico Chile Task Force over its three-year duration. The benefit of Sandia's work will continue to affect the entire New Mexico chile industry along with each of the participating small business growers and producers. Through the initiative's tax credit program, New Mexico and Sandia have invested more than \$500,000 in the task force for research and development efforts. The Small Business Assistance Program, approved by the New Mexico legislature, allows the Labs to use a portion of its gross receipts each year to provide technical advice to small businesses in the state.



CHILE CLEANER — Ed Eaton, an agricultural engineer with New Mexico State University's Cooperative Extension Service, fine-tunes a prototype mechanical field cleaner for chile peppers. (Photo by J. Victor Espinoza)



RED OR GREEN? Segmenting, illustrated here, is the process of determining what is product, what is debris, and what is background on a conveyor belt. Picture at left shows product in red, stems and debris in green, and conveyor belt in black. Pixels can then be counted to arrive at product percentages, showing how effectively the chile has been cleaned. (Images courtesy of Chris Wilson)

Emotional intelligence: Are you as smart as you think?

This report is republished from Los Alamos National Laboratory's electronic Daily Newsbulletin, by permission.

Are you as smart as you think?

Before answering this question, perhaps you should talk to Rochelle Lari, diversity program leader at Sandia National Laboratories, who spoke about emotional intelligence on Tuesday at the Physics Building Auditorium as part of Women's History Month.

"As humans we need to become a little more intelligent about our feelings," said Lari.

According to Lari, emotional intelligence is about being honest, being aware of your feelings and the feelings of others — it's about being smart with emotions and exhibiting empathy and compassion. Sentiments and input from the audience echoed her definition.

Five essential competencies

In a video, which was shown as part of the presentation, creator of "Working with Emotional Intelligence" Daniel Goleman outlined the five essential competencies of emotional intelligence. The first three competencies are how people relate to themselves while the second two are how they related to others. The steps are presented in chronological order:

Step 1) Self-Awareness — Emotional intelligence starts with self-awareness, being in touch with your values, strengths and weaknesses and simultaneously expressing your feelings to others in a constructive way.

Step 2) Self-Regulation — This building block entails accepting responsibility for your actions — managing your feelings so you can reason well and make logical choices when responding to emotional triggers.

Step 3) Self-Motivation — The third component of emotional intelligence encourages individuals to "strive to be in the moment" and resist self-defeating thoughts. According to Goleman, high performers can see to what degree they are responsible for setbacks and thus have the power to affect situations.

Step 4) Empathy — Switching the focus to someone else's feelings, empathy encourages an individual to see the world through the eyes of others. In short, empathy requires "recognizing and responding to other people's emotions."

Step 5) Effective relationships — This last step combines the first four emotional intelligence skills to help an individual consistently connect with others in a positive way. Effective relationships build consensus and support for team goals.

In addition, Goleman's video contained case studies illustrating how emotional intelligence



ROCHELLE LARI gives a presentation on emotional intelligence at LANL. Rochelle is a program leader for Sandia's Diversity Leadership program.

(Photo by Ed Vigil, LANL)

helped various businesses and organizations such as State Street Bank, Kaiser Permanente, North Beach Volleyball Academy, and Nichols Aluminum achieve their objectives.

Professional benefits

Lari insisted that there are professional benefits to emotional intelligence, such as improved communication and less workplace conflict.

"With communication comes trust. You have to have the trust first," adding, "actions speak louder than words — 65 percent of communication is body language. It's not necessarily the spoken message, but all the other messages that come across." She said that emotional intelligence helps manage these messages.

Further, a speaker in the video argues that emotional intelligence gives you an edge — the higher someone goes in an organization, the more emotional intelligence skills matter. "So-called IQ is woefully inadequate in predicting an individual's success in the real world," he said. He suggested that while IQ gets people "in the door," it is emotional intelligence that makes them star performers.

Lari agrees. "You need technical intelligence to get hired, but it doesn't stop there," she explained. She said that people can be technically excellent, but if they "leave bodies in the road" to achieve their tasks, they have essentially failed. "Technical knowledge is important, and by that I mean your accounting skills, receptionist skills, administrative skills as well as your scientific and research skills, but you need people to

get your work done. It is important to acknowledge that we all have emotions," she added.

Therefore, she asserts, emotional intelligence has a positive impact on measurable business goals, including increased productivity, decreased downtime, and fewer employee sick days. It also propagates the cycle of innovation among those who create ideas, elevate ideas, refine ideas, and finally those who implement the ideas.

Addressing classism and arrogance

Specific to Laboratory culture (Los Alamos, Sandia, and Livermore), Lari mentioned that emotional intelligence could be used to address classism and a "mind-set of arrogance." She said, "I talked to students who are not coming back [to intern at the Labs] because the people they have to work for have lower emotional intelligence [than the students]."

She also cited the three-legged stool example relayed to her by a Lab employee. According to the analogy, the customer sits on the stool — the first leg is science, the second leg is operations (safety, security, requirements, etc.), and the third leg consists of people. When one leg takes precedence over the others, it grows in length and the customer is at risk of falling off. "It is the job of the Laboratory to maintain a balance," she said.

Finally, Lari noted the importance of inclusion and straight talk. "Inclusion is a behavior, a choice we make — it is also a business choice. Differences should not be seen as wrong. We should strive for a work culture and environment that is very [inclusive]," she said. In reference to straight talk she added, "It is not what you say, but how you say it. Emotional intelligence says that within the context of my workspace, I am going to translate my feelings — my gut — into a language that would be well received by others."

In closing, Goleman summarizes the importance of emotional intelligence in his video when he said, "Nothing great in life has ever been achieved without the power of emotion behind it."

— Hildi Kelsey

4th Annual Corporate Diversity Team & Division Council Forum

A Journey of Achievement On a Path Toward Success

May 5, 2005, Mountain View Club

For information call Barbara Baker or <http://cfo.sandia.gov/diversity/forum/forum.aspx>

Have you had any injuries attributed to repetitive motion?

Cindy Turner (2305): I first noticed my hands and fingers going numb and tingling when I was pregnant with my third child. I asked my obstetrician about it. He suggested it might be carpal tunnel syndrome. I went to a neurologist (after the baby was born) and was tested and diagnosed with carpal tunnel on both wrists.



CINDY TURNER

I came back to working on a computer 95 percent of the time. Physical therapy and wrist bands did not alleviate the pain. My hands and fingers would get completely numb and would tingle at night. The pain would wake me two to three times a night. I experienced total numbness driving to work. I consulted with a surgeon and had an operation on my left wrist (which was the worst).

I had the operation two years ago and am glad I did. My left hand does not become numb anymore and I'm finally sleeping through the night! I continue to be very aware of the symptoms on my right hand and have become pro-ergonomic. I use a joystick-type mouse and am

currently looking into getting an ergonomic keyboard. I want to avoid another operation. I exercise my hands, wrists, and fingers daily because I still work on the computer. I use my wrist band when my hand starts to become tingly or numb.

Juanita Sanchez (12651): When I worked in the machine shop, I operated a large metal lathe. The chucks were tightened by using a t-wrench. I twisted the wrench either repeatedly to tighten the metal stock or to adjust the piece. The constant twisting and awkward torque pressures of the t-wrench resulted in my developing frozen-shoulder syndrome. Both shoulders were affected.



JUANITA SANCHEZ

At first I lost full range of motion on the right shoulder and was in considerable pain. Even cortisone injections did not help. Physical therapy was too aggressive and caused further damage, so I was sent to a sports physical therapy clinic.

The healing process took over three months. It took almost a year to achieve full range-of-

motion. The other shoulder healed a bit quicker since the cause had been determined. The only ergonomic fix was to try to use different machines instead of the same one continually since the cost to reconfigure these machines was not feasible.

Linda Lovato-Montoya (12654): Pills didn't help. Shots and splints helped (for a while). Numbness, tingling (pins and needles), and sharp shooting pains in the hands are symptoms of carpal tunnel syndrome. I never thought about how being a typist for many years, using a computer on a daily basis, and pushing a wheelchair (my mother's) for some time would affect my ability to use my hands. The pain often wakes me at night requiring me to get up and "carry" my arm trying to "wake up" the hand. As strange as it may sound, I have to carry my arm because it is numb and weak.



LINDA LOVATO-MONTOYA

Carpal tunnel is the passageway in the hand made up of the median nerve (which runs from

(Continued on next page)

Betty Boop gets an ergonomic evaluation. You can too!

By Iris Aboytes

The mere mention of an ergonomic evaluation would make me cringe as I imagined my body in a totally distorted maneuver. It was not a pretty sight. Besides, I never had time. One day my coworkers were all scheduling evaluations, so I decided, why not.

The assessment scheduled, the evaluator came to my office. Some of the first questions were relatively simple: "Do your feet always dangle from the chair that way? Don't you have a foot rest?" It was great. I was actually getting an evaluation and was not asked how tall I was or how much I weighed. Not bad, I thought to myself. This was a good decision on my part.

I always knew about sitting up straight. My mom taught me that. Taking breaks to relieve eye strain was not hard. In my arrogance I believed I had all the answers. What a rude awakening. I found out I was doing more things wrong than right. I was a prime candidate for carpal tunnel syndrome, plus back and neck pains were waiting around the corner. My arrogance was transformed into meekness and humility as I asked more questions.

Most of us do not look to find out what we are doing wrong, only what we are doing right. I was not any different.

My arms from my elbow to my keyboard were not straight; mine pointed up. My monitor was not positioned the recommended 18"-24" from my eyes. The evaluator asked when I had last had my eyes checked. I answered, "Two years." She suggested I get an eye exam and get a prescription for computer glasses. I wear reading glasses. Why computer glasses? I made an appointment anyway.

My mind being a steel trap, I was wrong. It had been six years since I had my eyes checked. So after getting scolded by my ophthalmologist for not going sooner, I got a prescription for computer glasses.

The evaluator also suggested I get a new chair. The chair I had would not go any lower. The new chair would help my feet touch the ground. I was scheduled for a chair evaluation. I got to sit on several chairs, and then the evaluator recommended the chair she thought would be best for me. Our administrative assistant ordered the suggested chair. Now my feet actually touch the ground and I am ready for take-off (just kidding).

Oh, you have to hear this. Sandia paid for my glasses. All I paid for was the \$25 copay to my ophthalmologist. I took my prescription to the onsite optician, selected my frames, had them fitted, and voila, new computer glasses.

I know what you are thinking. You would not do it for a new chair or new glasses. Would you do it because it would enhance your quality of life? I did. Now my cringing comes from thinking what could have happened had I not gotten an evaluation.

I have always worked at eating healthy and exercising for a healthy heart, but I had omitted

Repetitive motion

(Continued from preceding page)

the elbow, through the forearm and wrist into the hand), tendons and the carpal bones. The nerve becomes irritated and swollen due to repetitive motions, causing the numbness and pain in the middle and index fingers. After ignoring my symptoms for much too long, I had a special electrical test confirming I had carpal tunnel. I wanted a quick fix. The quick fixes are medication, shots, and splints. I'm still getting relief from shots, but I will need the surgery. I'm hoping for a new form of treatment. My experience with carpal tunnel has made me be very aware of ensuring that people I work with all receive an ergonomic assessment and have the necessary equipment to help them perform their job with as much comfort and safety as possible.

Ergonomic Resources for You



Chair Fittings: To be accurately fit for a chair, call: Maggie Ferguson, 845-8561. (Help is also available fixing broken chairs.)



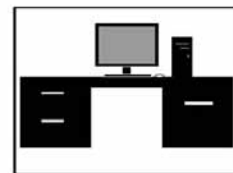
Keyboard Trays: For keyboard and wrist support to assist with proper posture, call Sandra Garcia, 844-6447, or Maggie Ferguson, 845-8561.



Headsets: For custom ear molds and/or a custom headset, a manufacturer is onsite every Thursday in the Thunderbird Café on Thursdays from 1:30-3 pm. Walk-ins are welcome, or to make an appointment call: Maggie Ferguson, 845-8561.



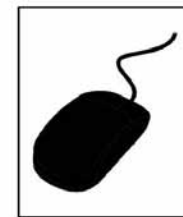
Eyeglasses: For computer glasses, call Sandra Garcia, 844-6447, or Maggie Ferguson, 845-8561 for an assessment. (Sandia has an onsite optician who will need an eyeglass prescription less than two years old, your ergo measurement to a computer screen, and a project/task.)



Workstation Evaluation or Relocation: To assess your workstation to ensure ergonomic accuracy, call Sandra Garcia, 844-6447, Maggie Ferguson, 845-8561, or Mark Warner, 284-6070.



Questions: If you mainly do non-office work and your primary activity involves, lifting, carrying, and walking, you can have an industrial ergonomic assessment. Call: Mark Warner, 284-6070.



Computer Mouse: For a specialized ones (like left-handed), call Sandra Garcia, 844-6447, or Maggie Ferguson, 845-8561.

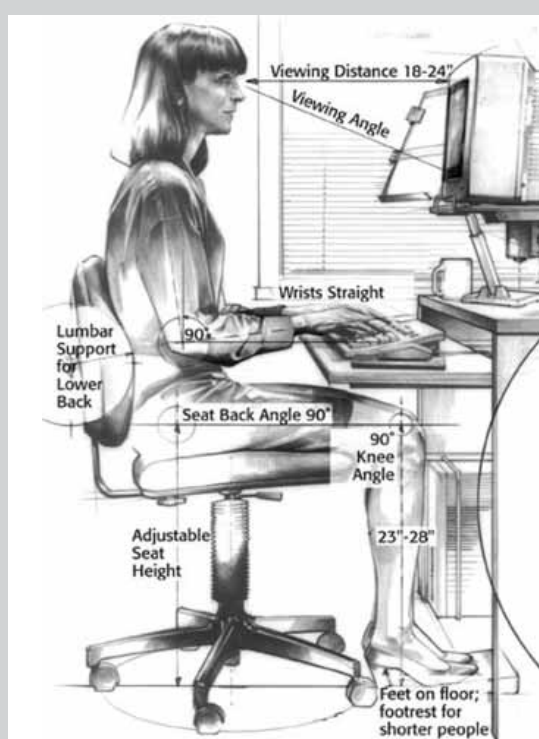
my eyes. How could I have forgotten about my eyes? Me, who believes a person's eyes are the windows to the soul?

I have become the Pied Piper for getting an ergonomic evaluation. Now I sit up straight, my feet touch the ground, I have new glasses, and I take breaks. How about you? When was the last

time you had your eyes checked? Now my workstation fits me. Does your workstation fit you?

For more information on getting an ergonomic evaluation and not becoming just a statistic, go to <http://ergo.sandia.gov> or contact Maggie Ferguson (6335) at 845-8561.

Do you spend a lot of time in front of your computer?



	2004	2005
# Cases with repetitive motion as cause	69	13
# Cases related to computers	47	9
% Related to computers	68%	69%

If you are working on a computer for more than two hours a day — not two hours in a row, but at any time in one day — then you are a candidate for an ergonomic evaluation in a new corporate ES&H initiative.

"Sandians are getting hurt from repetitive trauma and motion injuries while sitting in front of their computers. This can be easily avoided through ergonomics," says Jaime Moya, manager of ES&H Planning and Assessment Dept. 6330.

In fact, nearly 50 percent of injuries at Sandia are caused by slips, trips, and falls or repetitive trauma/motion. The majority of the latter injuries are related to computer use. This is no small problem. According to estimates, there are 6,000 office workers at Sandia.

"The good news is that we have launched a comprehensive ergonomics program to prevent injuries within our corporate initiative to rank Best-in-Class for ES&H within three years," Jaime says. "This year, we have launched a lab-wide screening program to evaluate everyone who sits at a computer for more than two hours. It will be accomplished by either going building by building or division by division."

You may want to be proactive and schedule your assessment ahead of time — before going away for summer vacation. An ergonomic assessment lasts 10 to 20 minutes, depending on your work situation. Sandia also has a screening tool able to detect 85 percent of existing ergonomic problems in the workforce.

Mileposts

New Mexico photos by Michelle Fleming
California photos by Bud Pelletier



T. J. Allard
25 80



Steve Heaphy
25 6337



Ivars Gals
40 16341



Robert Monson
25 8205



Don Sheaffer
20 8235



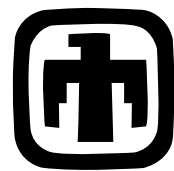
Kevin Ewsuk
15 1815



Cheryl Lari
15 8231



David Straub
35 5932



Carol Meincke
15 10853



Hae-Jung Murphy
15 2621



Shirley Ward
15 10872

Sandia writers, artists, editors win 11 Communicator Crystal Awards

Sandia writers, editors, and photographers captured 11 of the top-level Crystal Awards of Excellence in the 2005 Communicator Awards print competition. The Communicator Awards is an international competition honoring excellence in communications.

Here are the Sandia Crystal Awards winners:

- Sandia Lab News, writing/newsletter, Lab News Staff
- Labs Accomplishments 2004, newsletter/special edition, Bill Murphy
- Gigapixel, photography, Randy Montoya
- Lab on a Chip, writing/technical, Chris Burroughs
- Wes Martin in Iraq, writing/news article, Iris Aboytes
- Sandia 2005 Calendar, photography, Randy Montoya, Bud Pelletier, Diana Helgesen, and Randy Wong.

- Juan Ramirez biography, writing/other, Sherri Mostaghni
- Sandia Overview, brochure/company overview, Larry Perrine, Michael Vittitow, Randy Montoya
- Sandia Technology, magazine/government, Will Keener, Doug Prout (Technically Write), Sherri Mostaghni
- State of the Labs speech, writing/speech, Bill Murphy
- Strategic Education Plan, writing/communication plan, Sherri Mostaghni

Sandians also received 16 Awards of Distinction and 6 Honorable Mentions.



Three Sandia writers take awards in Press Women media contest

Three Sandia writers were recognized recently with awards in the 2005 Media Communications contest sponsored by New Mexico Press Women (NMPW).

Lab News writer Chris Burroughs (12651) took first place in news reporting special articles for the article she wrote on a well blowout in Carlsbad. She also got a first place for a news release she prepared about using chemlab-on-

Twister touches down near KAFB



NOT IN KANSAS ANYMORE — The dark skies sweeping up the Rio Grande Valley toward Albuquerque on April 16 turned mean, eventually culminating in a funnel cloud that formed up south of Kirtland Air Force Base. According to the National Weather Service post-storm analysis, "The severe thunderstorm that struck Albuquerque on 4/16 initially developed over northeast Valencia County shortly after 2:30 pm and rapidly intensified as it moved slowly north. . . . The funnel cloud appeared to develop well ahead of the hail core and most likely along the leading edge of the thunderstorm outflow ~10 miles southeast of the Albuquerque Sunport. . . . It was between 3:04 pm and 3:10 pm MDT when the funnel cloud peaked in intensity and briefly touched down." Several Sandians sent photos of the funnel cloud to the Lab News. If anyone knows who took this photo, call Lab News editor Ken Frazier at 844-6210 for a photo credit in the next issue.

a-chip for medical purposes.

Iris Aboytes (12651) won a first place for an article she wrote on United Way. It was in the category of Public Service Campaign or Program for the Public Good. She also won an honorable mention in the category of Features Special Publication.

Noel Fletcher (6330) won several awards. She took a first place in the category of speeches for a speech she wrote for Sandia; a second place for an article she wrote for the Catholic News Service, and a third place in the category of writing for the web for a piece she did for Sandia.

The Lab News won a first place in the category of magazine/paper/tabloid.

Results of the annual contest, which is open to all New Mexico media professionals, were announced April 15 during NMPW's annual conference.

First-place winners go on to compete in a national competition sponsored by the National Federation of Press Women, of which NMPW is an affiliate.

Labs efforts honored in STC international competition

Two of the pieces that earlier this year won top awards in the Society for Technical Communication (STC) regional technical publication and art competition (Lab News, Feb. 4) have now also won awards in the STC's international competition (which accepts only regional entries that won a Distinguished-level award).

Randy Montoya won an Award of Excellence for his SnifferStar photograph. Larry Perrine, Randy, and Michael Vittitow won a Distinguished Technical Communication award for the Sandia Overview booklet. The entries will be displayed at STC's 52nd annual conference in Seattle May 8-11.

Water a key theme at Sandia's Earth Day 2005

The focus was on water at Sandia's version of Earth Day 2005, held April 14 at the Technology Transfer Center at Sandia/New Mexico. Two speakers looked at scientific aspects of water shortages in the western US, applicable to other hot spots around the world. Several activities highlighted water issues, including a xeriscaping booth, a water conservation survey, and information from the New Mexico state engineer and the Interstate Stream Commission.

And firefighters thought they might have to use a little water, too, when they responded to check out the building. But they quickly determined that smoke from a nearby barbecue for the noontime event had set off the alarms. The event picked up where it had left off.

Organizer Jack Mizner (6334) estimated 400 to 450 employees stopped by to learn more about environmentally sound activities at home and work, to listen to the speakers, or to pick up giveaway hats, recycled notepads, water bottles, and other reminders to be earth friendly.

Peter Davies, director of Sandia's Geoscience and Environment Center 6100, introduced the two featured speakers, noting that water is a fundamental source of both conflict and cooperation in the world today.

Stephen Gray of the US Geological Survey Desert Laboratory in Tucson reviewed research he and his colleagues are doing based on tree ring data. The drought in the western US that is now continuing is part of a historical pattern of wet and dry cycles that ring data show reaching

into the 16th century, Gray said. These cycles, which tend to last for several decades, correlate closely to the social history of the region.

The current drought actually began in the early 1990s, but was concealed by a few *El Niño* years where precipitation spiked, Gray said. This is a moderate drought statistically, but because demand increased with population during the last wet cycle, resources are now over-allocated, leading to significant social and economic impacts.

Howard Passell reviewed modeling work he has done with Vince Tidwell and other colleagues in Geohydrology Dept. 6115. The three-year project addressed the fact that much of the world is finding itself at a "tipping point" in terms of water management. Increased population, increased resource consumption, and decreased availability are coming together to create problems in many places and "there is no place to move on to anymore," he said. Better water management is the only option for these places, Howard said.

The powerful Middle Rio Grande Cooperative Water model he and his colleagues developed will soon be on the World Wide Web and available to anyone interested in using it, he said.

Members of Sandia's Earth Day planning committee included Morgan Gerard, Margie Marley, Samuel McCord, Doug Vetter, and Jennifer Payne (all 6331), Malynnda Aragon (10862), Lucille Roybal (10861), and Dave Castillo (6334). — *Will Keener*



RAIN CHAIN — Margaret Mora, John Ledet, and Marcos Zamora (all 6337) check out a "rain chain," at Sandia's Earth Day observance April 14. The three were part of an emergency management team that responded to a fire alarm at the Tech Transfer Center during the event, which then got back on track. Rain chains are hung below rainspouts or canales to slow the velocity of the water and create musical sounds.

(Photo by Randy Montoya)

Alternative fuels capture attention at youth environmental conference

In the auditorium at the South Broadway Cultural Center, some 140 high school students from around Albuquerque are watching a movie. The subject is a rap-reciting, forward-thinking mechanic-philosopher, who gets Telluride, Colo., restaurants to pay him to pick up the oil they use for deep-frying. He in turn refines the sticky fluid into vegetable diesel, which he calls "grassoline" and runs it in an open-top four-wheeler he cruises about town in.

"The students loved it," said Jennifer Payne (6331), who helped organize this year's Eighth Annual Youth Conference on the Environment. Sandia has been a key sponsor of the event for the past several years and helped make this year's April 13 conference a notable success.

This year's focus fell on alternative fuels. Students — largely from the metro area but also from Laguna and Acoma pueblos — along with their teachers started with a big picture view from New Mexico Public Regulation Commissioner Jason Marks. Marks outlined the state's commitment to renewable energy and noted that 10 percent of New Mexico's energy is already being supplied by wind, with a second 100-megawatt wind power facility coming on line in the near future.

Students also learned about geothermal energy, fuel cells, solar power, and wind power in breakout sessions. A lunchtime hybrid car demonstration was a hit, says Jennifer. After lunch, the students listened to panelists discuss the pros and cons of nuclear power, specifically addressing questions posed by the students.

Jennifer and Danielle Nieto worked on planning for the conference, while several



ALTERNATIVE TRANSPORT — Students at the 8th Annual Youth Conference on the Environment check out a hybrid Toyota Prius during a lunch break. About 160 attended.

(Photo by Danielle Nieto)

other Sandia colleagues (all 6331) acted as guides and filled other roles on conference day. They included Stephanie Salinas, Amber Montoya, Bryn Stuart, Katrina Wagner, Joanna Eckstein, Tess Goering, and Robert Ziock. Four Rio Grande High School students also worked on planning for the event and presented opening remarks to frame the conference, Jennifer said. The City of Albuquerque donated space for the event.

"Our department manager, Su Hwang, has a strong commitment to the conference and to reaching out to the community and providing education on relevant environmental issues," said Jennifer. "This is a good investment in the future of New Mexico. New Mexico has a good future in renewable energies and the students are the future of New Mexico. It's great that Sandia is playing a part in it." — *Will Keener*

Feedback

Readers have questions about Carlisle gate, parking

Q: The closest gate to my residence is the Carlisle gate, so I have been using it for entry to KAFB. A Carlisle gate guard recently told me that unless I work on the west side of the base, I couldn't use the Carlisle gate. I was just wondering if this is a new Kirtland entrance policy? Are there any changes to which gates Sandia employees can use?

A: We have verified with the Air Force that all gates are open to people with the proper credentials for entry. There may have been some confusion during recent construction activities; however, Sandians are welcome to use the Carlisle gate or any other gate if it is most convenient for their entry to KAFB.

— *Ed Williams (10864)*

Q: I regularly park in front of Bldg. 701 and have had a number of issues with other vehicles parking so close to my car that I can't even open the doors. I am in early, am generally in one of the spots on the end, and try to park as far to the edge as I can to make sure I have space, but still I have this problem (in most cases, there are no other cars in the lot when people choose to park adjacent to my vehicle). Recently, it has been the same SUV and it occurs literally every day. I do not know who the owner of the SUV is, so I am unable to approach them directly. In this case, the person parks their vehicle literally half in one spot and half in another. What can I do to see that this doesn't occur again? I realize that the 701 parking lot doesn't have lines, but I would think that most of us are intelligent enough to understand that the concrete divider at the end of a parking spot defines the parking slot.

A: I can certainly understand your perspective, and not being able to enter a vehicle because another driver is encroaching into a parking space is not acceptable. If you observe this, please immediately contact the Security Desk Lieutenant at 844-3155 and they will dispatch a Security Police Officer to ticket the offending vehicle. If this is a recurring violation you may contact the Desk Lieutenant with the number from the base decal and describe the exact location and they will provide an appropriate follow up investigation. — *Ed Williams (10864)*