

Sandia helps design chatter-suppression device that would allow US factories to mill metal faster

Smart Spindle Unit corrects tool vibration on the fly

By John German

Machinists dread “chatter,” the violent vibration of a milling machine’s rotating tool bit against the piece of metal being milled.

Chatter can destroy a cutting tool or spoil a surface. If the work piece is a precision-machined part such as an aircraft engine, the damage can be unacceptably costly.

More often though, operators of today’s high capacity milling machines avoid chatter altogether by running their machines at conservatively slow tool speeds and shallow cuts.

Now Sandia — working with an industrial group including Lockheed Martin, Intelligent Automation Inc. (IAI), Ingersoll Milling Machine Co., and Active Signal Technology (AST) — has tackled the industrial-age-old problem of milling machine chatter in a 21st century way.

As the tool turns

Using the latest in computational structural dynamics modeling and “smart structures” capabilities, Sandia examined mathematically how chatter happens, then helped the consortium design a vibration control system that actively suppresses chatter as the tool spins at thousands of rpm. (“Smart structures” refers to the use of sensors, actuators, computers, and control algorithms to produce a response in a structure that makes that structure more effective.)

In a demonstration earlier this month in Rockford, Ill., using Ingersoll’s developmental horizontal-axis hexapod milling machine, the new Smart Spindle Unit (SSU) allowed the machine to cut deeper and faster, removing metal at more than five times its original rate.

Its developers say the SSU could enable machinists to operate their machines closer to their design capacities, possibly shaving minutes or hours off the milling of each metal part and dollars off production costs.

“It could expand the envelope of stable cutting into faster and deeper regimes with the same precision,” says Terry Hinnerichs (9126), Sandia SSU project leader. “It might drive down the cost of metal removal significantly.”

The work was funded by the Defense Advanced Research Projects Agency and led by Lockheed Martin. It began in 1994 as part of a national campaign to bolster the competitiveness of US factories by improving manufacturing technology.

The Sandia project, directed by David Martinez, Manager of Structural Dynamics Development

(Continued on page 4)



BYTES TO BITS — Jeff Dohner helped design a vibration control system for milling machines using computerized tools. (Photo by Randy Montoya)

Sandia LabNews

Vol. 53, No. 9

May 4, 2001



DOE Secretary Spencer Abraham expresses appreciation, support for Labs' mission

If DOE Secretary Spencer Abraham’s comments during a late April visit to the Labs are an indication, then Sandia’s recently articulated vision — to be the laboratory the nation turns to first for technology solutions to pressing national challenges — has just received an important new champion.

“Ever since President Truman awarded the contract [to AT&T] to run this laboratory, the men

and women of Sandia have clearly exemplified the motto ‘Exceptional Service in the National Interest,’ ” Abraham said to a full house of Sandians at the CNSAC auditorium on April 20. “And in the years ahead, we will continue to look to Sandia to design the safety, the security, and the control systems needed for our nuclear deterrence. And I know Sandia will help us to solve other pressing national challenges — increasing our supply of energy, protecting our environment, defending against terrorism, and working to stem the spread of dangerous weapons.”

In a prepared “all-hands” speech punctuated by several flashes of humor, some of it self-deprecating, Abraham affirmed the Bush administration’s support for the mission of the Labs.



LABS DIRECTOR C. Paul Robinson and DOE Secretary Spencer Abraham during the new Energy Secretary’s first visit to Sandia. (Photos by Randy Montoya)

“We take national security issues very seriously,” he said, “and I think the President is very committed to providing the necessary support for the national security efforts of the Department as well as our science efforts.” He added that the excellent briefings he received at Sandia (on weapons development, microsystems, and other technologies) “give me an even better insight to be able to make a

stronger case for support for the science programs for our department.”

Abraham said his first 90 days in office was dominated by the budding energy crisis and that

(Continued on page 4)

Sandia’s 2001 Employee Recognition Awards



Sandia honors 59 individuals, 62 teams for exceptional service, leadership, and technical accomplishment. See the *Lab News*’ multipage ERA spread beginning on page 6.

International Arms Control Conference brings 300 to NM to talk world peace

By John German

When you gather into one room 300 people with titles like ambassador, general, commander, director, and senior analyst representing nations such as Russia, Kazakhstan, China, South Korea, Pakistan, India, Israel, South Africa, and France, you can expect a weighty discussion of topics that influence the world’s ability to get along.

Such was the case last weekend at the 11th International Arms Control Conference in Albuquerque, sponsored by National Security Programs Div. 5000, where you could hardly throw a sweet roll without hitting someone with an embassy for an address, including 15 participating ambassadors.

Five panel discussions explored issues such as

(Continued on page 5)

MicroChemLab breakthroughs lead to first commercialization partnership

3

After years of anticipation, child care center planned for site just outside Eubank gate

10



This & That

National energy policy: Let's get it on! – Energy Secretary Spencer Abraham talked lots about this nation's energy problems during his visit to Sandia and other area facilities April 5-6, and *Lab News* writer Bill Murphy writes about this and more of what Abraham said (see page one).

Much of what he had to say about our energy problems is pretty sobering. Both our problems and the solutions are complex, and there's lots of honest disagreement about what actions are needed in a new national energy policy. But we need to get on with it quickly if we are to continue enjoying a strong economy and high living standard. We must get on with producing more energy in an environmentally responsible way and using/conserving our supplies more responsibly.

Our political leaders can't solve the crisis by themselves, but our nation can't make much real progress until they step up, make the tough decisions, and finally commit us to a true national energy policy. My request to them: Get your heads together. Seriously consider all options. Talk, debate, and compromise when you must for the good of our country, and then let's get on with it! No one will agree with any policy 100 percent, but I believe clear-thinking citizens will credit you for doing your best and thank you for acting. This isn't a partisan problem. It's a national problem, and we need you to act now in the nation's interest.

* * *

Few dim bulbs at Sandia – Maybe something new is in the works that I haven't heard about, but I'm concerned that Sandia isn't more aggressive in encouraging employees to use energy wisely at the Labs. I continue noticing lots of energy is wasted here, even though I'm not necessarily even looking for it. Empty offices, empty conference rooms, and store rooms with lights blazing all day long. Lights left on in these same places after business hours. Computers and printers left on all night and even all weekend long. In some places the air conditioning so cold raw meat wouldn't spoil for a week. We can and should do much better!

If you read the entire Abraham article, you'll learn what fuel will likely be used in most new electrical generating plants in the next 20 years. It's natural gas – what many of us paid more than double for this winter to heat our homes. Something to think about – real hard.

* * *

"Dixie dessert" – Several of my colleagues from the South tell tales about Southern eating habits. Having spent little of my time in the South, their talk never meant much until my wife and I vacationed in Tennessee recently. Our first real stop was at a golf course east of Nashville. We walked into the club house and the first thing I saw was this HUMONGOUS rack of Moon Pies – vanilla ones, banana ones, chocolate ones – enough Moon Pies to feed a small village. As I looked at that rack of pies, I couldn't help thinking that if they were more popular in New Mexico, someone would surely concoct a green chile-flavored pie. I'll bet Southerners couldn't choke those down even with a big ol' RC cola, which co-worker Howard Kercheval (a Kentucky boy) says is a "must" with Moon Pies.

– Larry Perrine (845-8511, MS 0165, lgperri@sandia.gov)

Paul Robinson expresses budget, infrastructure concerns in testimony

Sandia President and Labs Director C. Paul Robinson expressed strong concerns about shortfalls in the new administration's proposed budget for the National Nuclear Security Administration (NNSA) Defense Programs in testimony last week to a Senate Armed Services subcommittee.

He said the three NNSA national laboratories had worked closely with NNSA during the last several months to profile future requirements for the nation's nuclear security program, and that plan reflected a consensus.

"The President's budget for NNSA Defense Programs released on April 9 was \$863 million less than what we [the NNSA and the Defense Programs labs in that study] had estimated would be required in fiscal year 2002 to meet the requirements of that program plan (\$6.163 billion)," Paul said.

His prepared and oral testimony, along with that of the other lab directors and of NNSA Administrator John Gordon, was given April 25 to the Strategic Subcommittee.

"It is also clear," Paul said, "that the infrastructure of our nation's nuclear weapons complex has eroded significantly over the last two decades. . . . The current proposed budget for the NNSA would almost certainly result in a significant deferral or curtailment of several infrastructure activities required for the NNSA complex of the future."

Three reviews of national defense and nuclear posture are still in progress and the results of these reviews could bring policy changes that affect the nation's nuclear security program in one way or another. But Paul said until new guidance comes from those reviews, "we will have to consider how to adjust current program requirements to the budget resources provided."

Three key Sandia initiatives

Paul listed three major Sandia initiatives as "especially important" and at the "forefront of our investment planning" for meeting future NNSA needs:

- Sandia's Microsystems and Engineering Sciences Applications (MESA) complex — "the cornerstone of our initiative to address the need for microelectronics and integrated microsystems to support a certifiable stockpile for the future."

- Facilities supporting NNSA's Accelerated Strategic Computing Initiative. Paul said Sandia plans to support the ASCI program with construction of two key facilities — the Distributed Information Systems Laboratory (DISL) in California and the Joint Computational Engineering Laboratory (JCEL) in New Mexico. Under a tri-lab agreement, allocations for the two new facilities have been deferred in past fiscal years. "Unless additional funds are provided," Paul said, "it appears that construction starts for JCEL and DISL may again have to be deferred in fiscal year 2002."

- Z accelerator refurbishment. "Sandia faces an unfunded need to refurbish Z to extend its lifetime and improve its performance, reliability, and shot rate," Paul said. Z, a powerful x-ray generator, is a major source of critical experimental data for the stockpile stewardship program. Paul noted that last year an independent review committee overwhelmingly endorsed Z's refurbishment, which could be completed in three years at a "relatively modest" cost of \$60 million.

Here's how Paul summed up his concerns about the proposed budget and the need to nurture NNSA:

"I am very concerned that the proposed fiscal year 2002 budget for the NNSA may result in deferral or curtailment of several important infrastructure projects and program deliverables. Depending on what new policy guidance may result from the defense reviews currently under way, NNSA and the laboratories may have to consider how to adjust current program requirements to the budget resources provided.

"I believe the NNSA has made significant progress during the past year. . . . Success of the NNSA is not assured, however. The agency needs strong support from Congress and adequate resources to meet the formidable requirements of stockpile stewardship in the decades ahead."

Paul's entire prepared statement (22 pages) is on the web as a pdf file at: http://www.sandia.gov/testimony/test_hom.html.

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 subsidiary of Lockheed Martin Corporation and a prime contractor to the US Department of Energy.

Ken Frazier, Editor505/844-6210
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 (columnist, 845-8511), Howard Kercheval (844-7842), Barry Schrader (925/294-2447), Iris Aboytes (Milepost photos, 844-2282), Rod Geer (844-6601), Sandy Smallwood (Ads, 284-3704).

Lab News fax505/844-0645
Classified ads505/284-3704

Published on alternate Fridays by Media Relations and Communications Dept. 12640, MS 0165

LOCKHEED MARTIN 

Infrastructure, NNSA, and nonproliferation

Some additional points Paul made in his Senate testimony (see story at right):

Infrastructure revitalization: NNSA's Facilities and Infrastructure Revitalization Initiative is an effort to prioritize unaddressed infrastructure repair and improvement projects across the entire weapons complex. The initiative would require \$300 million to \$400 million a year for five or six years for the complex. "We identified approximately \$300 million in items at Sandia" that would be carried out under the initiative in the next few years, Paul said.

Nonproliferation activities: "I am quite concerned that the fiscal year 2002 budget proposes substantial cuts in NNSA's programs for nonproliferation and verification research and development and arms control," Paul said. "I believe an analysis of the laboratories' contributions to nonproliferation technology will argue strongly for maintaining strong support for them."

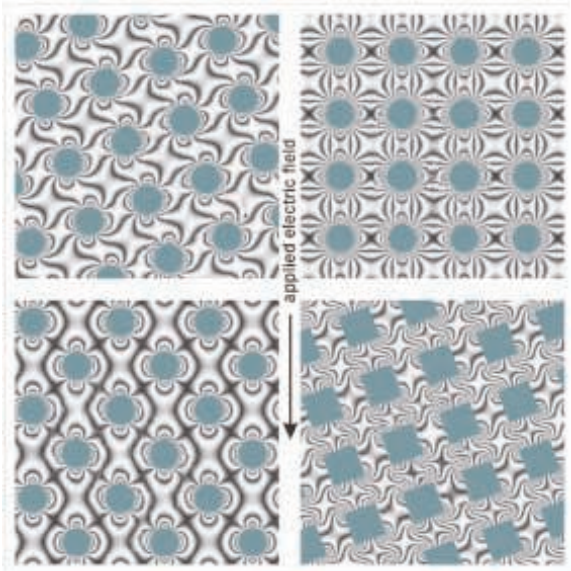
NNSA realignment: "I am very pleased that General Gordon solicited inputs from the laboratory directors as he considered structural alternatives for NNSA. . . . The organizational arrangement selected by General Gordon is both a common corporate model and one that is successfully employed at the laboratories," Paul said.

MicroChemLab advances lead to first commercialization partnership

By Nancy Garcia

Breakthroughs that were hardly more than a glimmer in the eye five years ago have led to the first commercialization agreement to stem from the μ ChemLab project.

This effort to miniaturize chemical analysis in a hand-held device resulted in demonstration of the first chip-based system to analyze liquids through microscale high-pressure liquid chromatography. Drawn to this success, a world leader in analytical instrumentation, Waters Corp. of Milford, Mass., announced in March that the company is licensing



MICROFLUIDICS — Each of these four arrays depicts flows within microchannels. The microchannels are studded with perpendicular glass posts (the posts appear as circles or squares in this view). The space between the posts is thinner than a hair. Each post provides additional surface area that helps drive the electrokinetic flow; they function as a “boost pump” against a back pressure. Such post arrays should enable quick and extremely sensitive analysis in lab-on-chip systems.

Sandia’s microfluidics technology and launching a cooperative research and development agreement to further develop this expertise.

Says Duane Linder (8101), who oversees research efforts to shrink liquid analysis into a chip-based system, “Sandia was the first, and only, organization to demonstrate a chip-based version of high-performance liquid chromatography, which is the most widely used method for chemical analysis of liquids in the world.”

The work was initially begun in late 1996 through a Grand Challenge Laboratory-Directed Research and Development project. Based on advancements made since then, a refined unit for detection of chemical and biological agents is being developed. The research involves some 40 Sandians across the Labs, with gas-phase analytical research centered in New Mexico and liquid-phase research centered in California. Primary support of that work comes from DOE’s Chemical and Biological National Security Program (which started a five-year program in 1999) and relatively new funding from the Department of Defense’s Defense Threat Reduction Agency. The focus, Duane says, is to develop units that can be used by emergency responders or soldiers to detect chemical or biological agents in the field, so they may don protective gear.

Since the initial research began, he says, its broad potential applicability has been recognized. Researchers believe a hand-held device might sniff out explosives, signal food quality, and check environmental safety for paramedics, fire fighters, law enforcement officers, and other specialists who respond to emergencies in which chemical or biological hazards are suspected. Devices could also be tailored to detect pollutants near their source, perform medical diagnostics at a bedside, screen new pharmaceutical drug candidates, or optimize industrial processing.

“We are really strong in certain aspects of microfluidics,” Duane says. Sandia researchers have demonstrated the ability to generate more than 9,000 pounds per square inch of pressure in liquids that are moved under an electric current through channels thinner than a human hair. The team has also shown flow rates of more than 100 microliters



CHANNELING — Kate Smith, a former postdoctoral student in the microChemLab group, holds a fused silica wafer bearing microchannels. (Photo by Randy Montoya)

Sandia California News

per minute. Potential applications include microscale pumps, valves, and actuators, as well as cooling for microprocessors.

Waters envisions coupling miniaturized chromatography systems with its mass spectrometry analytical products, Waters’ senior vice president of R&D, John Nelson, said in announcing the licensing and partnership agreement.

“This is a major step forward in our vision to provide miniature chemical analysis systems for national security needs ranging from the detection of chemical and biological agents to the cleanup and monitoring of environmental waste sites,” added John Vitko, Director of Exploratory Systems and Technology Center 8100.

Recent Retirees



Photos by Lynda Hadley



Mike Ferrario
41 8120



Marie Dremalas
38 8521



Pat Leary
31 8910



Barry Schrader
21 8528

In California, New Mexico

Standardized electronic invoicing tested at Sandia is now available to private industry

By Janet Carpenter

Although several good electronic invoice solutions exist, a flexible standard for electronic invoicing that meets industry needs has not been available until now. Rapid e-Invoice, the first XML-based (extensible markup language) standard for electronic invoicing via the Internet, is now available for industry-wide use.

With the help of Sandia, RECAP, Inc., and the Institute of Management and Administration (IOMA), a group of accounts payable and accounts receivable consultants and professionals formed the Electronic Invoice and Electronic Payment Information (EI&EPI) Task Force to increase the use of electronic invoicing throughout industry with a single-standard invoice. Developers say the new standard can be used throughout industry, with vendors and suppliers sending and receiving the same information.

More than 200 organizations participated in developing the standard with the help of accounts payable organizations, standards-setting organizations, and individuals throughout industry.

Sandia along with Direct Commerce, Complete Business Solution, and Abba Technologies tested the standard. Along with the Rapid e-Invoice, the task force created a guide for companies implementing the standard. Sandia and Abba Technologies led creation of the guide, which can be used by companies implementing the standard electronic invoice.

“Sandia’s participation in developing the Rapid e-Invoice was intended to help industry become more efficient,” says Tim Knewitz (10007), Sandia Labs Services business manager

and EI&EPI task force co-chair. “The Rapid e-Invoice provides a mechanism for suppliers of goods or services to bill their customers electronically using the Internet and a universally understood format.”

Rapid e-Invoice is free

The Rapid e-Invoice and the implementation guide are both available free. The Rapid e-Invoice home page at <http://www.sandia.gov/elecinvoice/home.html> gives details, lists major contributors to the task force, and links to the user manual. The website’s links page lists bill-processing software companies, government sites, newsletters, and consulting organizations that can help companies get started with XML and Rapid e-Invoice, standards bodies, and links to XML protocols.

To make the standard successful, the task force hopes that individual accounts payable and accounts receivable organizations will begin working with their management and IS/IT organizations to gain a better understanding of the standard. It contains “open fields” at the invoice header and invoice line item level that allow companies to request or provide company-specific information. For more information, contact Tim Knewitz at tcknewi@sandia.gov or (505) 284-5713.

Smart spindle

(Continued from page 1)

and Smart Structures Dept. 9124, was one of several manufacturing-related smart structures and materials efforts in the mid 1990s by researchers from Dept. 9124 and the Smart Structures Lab in Structural Dynamics Engineering Dept. 9125, managed by Tom Baca.

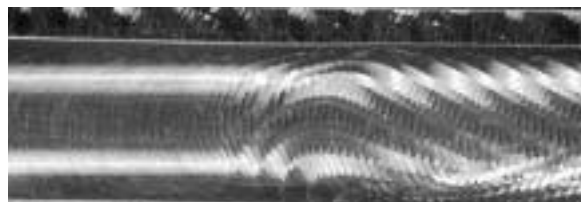
How it works

Just like the bone-jarring bounce that occurs when your car's tires roll too fast over a washboard road, chatter happens when a milling machine's cutting tool bounces off grooves on the metal's surface left there by the previous cut. Choking back the spindle speed lessens the vibration, just like slowing down your car does.

The SSU essentially is a smart suspension system for the machine's rotating parts.

Strain gauges mounted to the cutting tool sense bending strains on the tool. These measurements are radioed via a specially designed telemetry system to the SSU's control processor, which maps the strains into a non-rotating coordinate system and then generates command signals that are sent to four actuators placed around the spindle.

These electrical signals cause electrostrictive ceramic materials inside each of the actuators to



CLOSE-UP VIEW of aluminum surface cut by non-chattering (left) and chattering (right) cutting tool.

expand by just a few microns, instantaneously nudging the cartridge holding the spindle in the direction needed to correct the vibration.

The SSU can update forces on the spindle 16,000 times per second. At 3,600 rpm, that's 266 corrections per revolution, more than enough to correct typical chatter vibrations, says Jim Lauffer (8727), who helped design the unique telemetry system necessary to "fly" sensor data off the rotating spindle and a control system to filter out transmission signals while minimizing the time delay.

"You can hear the machine squeal from the chatter," says Jeff Dohner (1749). "Then when you turn the SSU on, the chatter is silenced."

Now that a developmental SSU has been demonstrated, says Terry, the developers hope to find a manufacturer willing to adapt it for more universal applications.

"The performance characterizations suggest the SSU approach would be particularly useful for milling hard-to-machine materials such as high-strength steels, titanium, and nickel-based superalloys, or for machining deep pockets in molds and dies," says Terry.

"The digital world allows you to design an intelligent machine that wouldn't have been possible a decade ago," says Jeff. "I think we can apply today's technologies to a lot of manufacturing processes to make them better and more economical."

"The idea that you could not just prevent, but in real-time recover from, instability on a milling machine is something not too many peo-



CHARACTERIZATION TESTS — Jim Lauffer (8727) strikes the end of a milling machine cutting tool with an instrumented hammer. One way Sandia characterized the structural dynamics of the machine was by exciting the cutting tool with a known input force and measuring its response using accelerometers mounted on the tool.

ple believed we could do," adds Jim. "Here with the economy down, it would really help some US companies if we could put this into a commercial product. I think others will look at this effort and say it's a significant achievement."

Sandia conducted the detailed computational modeling (coupling cutting forces and structural dynamics), controls analysis, hardware development and implementation, and experimental characterization of the SSU's performance on and off the milling machine.

Lockheed Martin and AST developed the actuators. IAI developed the controls hardware. Ingersoll provided the hexapod milling machine platform.

Labs SSU team members include Terry, Jeff, Jim, Dave Kelton (9125), and Brian Driessen (9124).

Abraham visit

(Continued from page 1)

his trip to New Mexico — he visited both Los Alamos National Laboratory and Sandia — offered him a chance to "listen and learn" about issues of



particular concern to the weapons labs, taking special note of the need to attract and retain highly skilled staff.

Everyone aware of challenge

"I think everyone is aware of the challenge we now confront with respect to both attracting and retaining the best people,"

he said. "I'm not at all unapprised about this. One of the things I did in the Senate was to work a lot on workforce issues. . . . I recognize the tremendous competition that exists in the private sector right now to attract the skilled employees in IT [information technology], in math, in science. I was talking not too long ago with the governor of Oklahoma, who told me that in one of his largest school districts there was not one math teacher older than 27, because they had all been recruited out into private industry in the community. So I know what's going on and what our challenges are.

Beyond dollars and cents

"The difference and the point I just wanted make today is this: you and others like you at our labs around the country appreciate that you can't always measure the value of the work we do in monetary terms. . . . At the end of the day, I think people like you believe that what you're doing goes beyond simply dollars and cents. I

"And so, on behalf of both President Bush and myself, I want to thank all of you . . . We need you. The nation is totally dependent on our ability to both retain and attract people like you."

want you to know that I appreciate that fact. I'm not unmindful of it. . . . And I know that the President feels the same way. And so, on behalf of



both President Bush and myself, I want to thank all of you . . . for making the sacrifices to be part of this extraordinarily important and worthwhile public service. We need you. The nation is totally dependent on our ability to both retain and attract people like you."

Abraham said that although the \$19.2 billion DOE budget for FY02 had been characterized in the media as a reduction, it actually represents a slight increase over the FY01 budget as submitted by the Clinton administration. One-time expenditures, such as the \$203 million spent by the Department in the wake of the Cerro Grande fire, inflated the FY01 budget.

Abraham noted that the Bush administration approach to budget matters is to conduct wide-sweeping strategic reviews, set goals based on those analyses, establish policies that will help achieve those goals, then set budget priorities that advance the policies.

"We decided we wouldn't simply take every

single program that was in place and just move it forward, because those [programs] were driven by policies of a previous time. In some cases — particularly with respect to the National Nuclear Security Administration programs — I think that the strategic challenge ahead of us is far greater than the one that was in essence being addressed by the previous polices and budgets."

Big increase in electricity demand

Abraham spoke about one policy review that, although not directly related to Sandia's core mission, reflects the scope of issues the DOE Secretary deals with.

"We project right now at the Department that there is going to be a 45 percent increase in electricity demand over the next 20 years. In order to meet that demand — and this is after taking into account extensive efficiency and conservation measures to keep the increase to 45 percent — we'll need to build more than one power plant a week between now and 2020. If things don't change in terms of policy, virtually every one of those new plants will be a natural gas generation facility. That means the demand for natural gas will go up, if we don't change our policies to balance the equation, by 62 percent. And that will call upon all of the productive resources in terms of natural gas domestically and force us to be an



even greater importer of natural gas to meet that increase. And that will put us even further at the mercy of the policies of other countries." As such, he said, the administration's energy policies will reflect its views on how to deal with these and other considerations.

Abraham said he has "a deep appreciation for the responsibilities carried out" at Sandia, adding that the ability to certify the safety and reli-

(Continued on next page)

Abraham visit

(Continued from preceding page)

ability of the nation's nuclear stockpile "is as important as anything we do in the federal government."

"If we can't certify — and in America, we do these things in the full public light — if we can't certify the reliability of the stockpile, then the deterrent effect of the stockpile becomes zero. And if the deterrent effectiveness is diminished at any level — at least the way I look at the world — the invitation to those who would try to challenge the United States at any level, the invitation becomes greater."



But, Abraham

asked rhetorically, can the secretaries of energy and defense and the lab directors certify the stockpile absent live testing of nuclear weapons?

"Well, I believe we can keep moving forward with a science-based program . . . and make the progress that is needed. But we're going to be very vigilant about this. . . [and] we're not going to pull any punches. We're going to make sure we're always able to either make those certifications reliably or let the President of the United States know if we feel that we can't."

— Bill Murphy

Abraham on energy, polygraphs in Albuquerque news conference

The day before his visit to Sandia, Energy Secretary Spencer Abraham spoke to Albuquerque-area news media in a DOE news conference in the lobby of the Kirtland Air Force Base theater. Here are a few selected comments that may interest Sandians:

Energy prices: Abraham said the administration had inherited the problem, essentially caused by a strain on capacity and supply. He said the problem is that "We [as a nation] haven't done what we should" in expanding energy supplies. "There are no quick fixes." He repeatedly indicated a long-term energy policy is needed and that's what the administration now has under review.

To a question about administration support of nuclear reactors for power generation, Abraham noted that in recent decades opposition has built up to every form of energy generation — nuclear, coal, hydroelectric. When the review of energy policy now under way is completed, he said, "I think . . . there will be clear support for nuclear." He said nuclear is the cleanest form of energy, and new, still cleaner and safer reactors are on the drawing boards. "I think nuclear has to be a part of the picture."

As for renewable energy sources, Abraham indicated that there are many overoptimistic ideas about the contribution they could make. He said renewable can't really provide the percentage of supply a lot of people think: "6 to 7 percent is optimistic." But, he said, energy demands will continue to go up. "We have to have a diversity of supply sources to meet them."

To a question on polygraphs: "As a former

member of the Senate, the Congress is going to support the things we do here only so long as they believe they are effective, and productive, and vital, and that they believe the work that we do in the labs can remain safe and secure," Abraham said. "Any challenge to either of those assumptions I think will be translated into significant reductions in the commitment that Congress makes."

"We have a responsibility to the American people to make sure that national security secrets remain secret. How we do that is something that [NNSA Administrator] General [John] Gordon is working on very seriously and I think very effectively." Abraham referred to several studies of polygraph issues under way, including the National Academy of Sciences' year-and-a-half-long study. He said those who take the polygraph test are given a questionnaire afterward, and asserted that "an overwhelming percentage, 95 percent, in some cases 99 percent, have indicated that they did not feel that these tests have been administered in an intrusive way or in a way that they feel was inappropriate, and that is how I answered [when he took the test upon becoming energy secretary]. That was my perception. But we want to do this in a way that is effective both in terms of security and morale. I don't think those two have to be inversely related. General Gordon will do his best, and I believe we will proceed forward in a way that is consistent with the highest levels of morale and the highest levels of security. I have great confidence in John Gordon's ability to do that." — Ken Frazier

Arms control

(Continued from page 1)

offensive versus defensive military postures, cooperative US-Russia threat-reduction efforts, biological weapons proliferation, North Korea's nuclear ambitions, and homeland defense.

In an opening address, Amb. Abdallah Baali, Permanent Representative of Algeria to the United Nations, described successes at the 2000 Nonproliferation Treaty (NPT) Conference, interpreting the new agreements reached there as having "underscored the unequivocal undertaking by the nuclear weapon states to accomplish the total elimination of nuclear weapons — a task no longer described as just an 'ultimate goal.'"

Ballistic missile defense

Amb. David Smith of Global Horizons, Inc. spoke in favor of US proposals to develop a national missile defense system. "America should consult its allies, explain its missile defense plans, act transparently, and cooperate with any interested country," he said. "But our view of the ballistic missile threat to our country, our role in the world, and our consequent defensive response are not matters for debate . . . It is time to move from a strategy based on nuclear destruction to a more balanced strategy that includes defenses, which, after all, harm only attacking missiles."

Guillaume Parmentier of the French Center on the United States countered, calling for a more balanced approach to deterring and responding to aggression. "The geopolitical conditions of European countries, coupled with historical memories [of failures to contain aggression based on a defensive posture], create widespread skepticism of American plans in this respect. The illusion of vulnerability could create much misperception and be the cause for disastrous decisions. . . . Defense is seen in Europe as a supplement to offense and diplomacy. It is not and cannot be a substitute."

Jack Mendelsohn of the Lawyers Alliance for World Security warned of the potentially destabilizing effects on US-Russia-China relations if a US ballistic missile defense is developed. "Any national ballistic missile defense system that threatens the ability to retaliate



LABS PRESIDENT C. Paul Robinson talks with Ambassador Ahmad Kamal, retired representative of Pakistan to the United Nations. (Photo by Bill Doty)

will, in turn, stimulate a response to ensure that offensive forces retain the capability to deter."

In a keynote address, Amb. Wolfgang Hoffman, Executive Secretary of the Comprehensive Test Ban Treaty Organization, discussed ongoing measures to support the treaty. More than 250 people from 70 countries are working to develop an international monitoring system capable of detecting clandestine nuclear tests forbidden under the treaty, he said. The system should be operational by 2005.

Brig. Gen. Thomas Kuenning (ret.), Director of the Cooperative Threat Reduction (CTR) program, detailed the "remarkable" achievements in US-Russian efforts to retreat from their Cold War defense postures. So far more than 5,000 warheads, 600 ballistic missiles, 360 silos, and 330 launchers have been eliminated through CTR programs, he said.

Victor Mizin, Russian Diplomat-in-Residence at the Monterey Institute of International Studies, cautioned against proposed US cutbacks in funding for CTR projects, which, he said, have from a purely pragmatic viewpoint "reduced the number of warheads and launchers aimed at the US" and reduced the "danger of the massive proliferation from the ex-USSR territory."

However, he said, Russian leaders sometimes take the cash flow for granted, and many Russian people misinterpret the program as US meddling in Russian security issues. "Russian officials . . . will do nothing if . . . lavish financial support is not assured," he warned.

In a session on North Korea's nuclear ambi-

tions, Piet de Klerk, Director of Policy Coordination at the International Atomic Energy Agency (IAEA), said that at no point has the IAEA been able to conclude that North Korea has complied with its obligations under the Nonproliferation Treaty.

Gary Samore of the US Department of State said the Bush administration is in a Catch 22 regarding North Korea's nuclear program. "On one hand," he said, "a strategy intended to undermine and ultimately replace the North Korean regime in order to eliminate its nuclear and missile programs would accelerate these programs in the near term and increase the danger of conflict on the peninsula . . . On the other hand, a strategy of carrot-and-stick engagement, which provides assistance and improved bilateral relations to North Korea in exchange for restraints on its nuclear and missile programs, helps prop up the regime with no guarantee that it will ever give up those capabilities in the end."

Seoksoo Lee (South Korea) of the National Defense University added: "It should be reminded that peace be created both by peaceful means and non-peaceful means. In order to cope with Pyongyang's military adventurism, it is necessary but not sufficient to adopt diplomacy for nonproliferation. If diplomacy is not working, containment becomes the norm."

In a session on homeland defense, Amy Smithson of the Henry L. Stimson Center questioned the effectiveness of programs to respond to a mass-casualty terrorist attack on US soil. "In the years ahead, domestic preparedness must put as much emphasis on public health and hospital preparedness as on disaster-scene rescue capabilities," she said. "A sign of maturity in the program will be its transformation from an inside-the-beltway justification for a spending carnival to preparedness standards and capabilities that are institutionalized and sustained over the long term. . . . Bluntly put, an absurdly small slice of the funding pie has made it beyond the beltway."

Conference chair James Brown (5325) says, "This was a very successful two-day symposium that provided the venue that permitted the leaders of the arms control and nonproliferation communities to come together in an environment that allows the free ranging exchange of ideas. This in turn enhances the opportunities for better understandings and establishes valuable relationships among these national security and foreign affairs experts."

Sandia Employee Recognition Night 2001 honors 59 individuals, 62 teams for exceptional achievements

Sandia's annual Employee Recognition Night celebration has become *the* ticket to have. . . perhaps because you can't buy one, you can only earn it by deeds. The May 12 event, to be held again this year at the Albuquerque Marriott, has developed a grass-roots reputation as the party of the year — a party that lots of Sandians want to attend.

So how do you get an invite?

"My personal recollections of the past year were that Sandians accomplished some really exciting results," says Labs President Paul Robinson. "Evidently many of you felt the same way, as the nominations for Employee Recognition Awards increased by nearly 25 percent over the previous year. This year's winners included major contributions in business processes, technical advances, and achievement of major program milestones. It should be an exciting event."

Says Executive VP Joan Woodard: "Every time I visit some part of the Laboratory, I'm overwhelmed with the tremendous work we do on engineering research and development, science, and the infrastructure operations. The ERA winners are to be congratulated because they exemplify the best."

The "best" bring an impressive suite of accomplishments to the party this year.

"For outstanding leadership in the Manufacturing Enterprise (Organizations 14181 and 14186) in providing manufacturing technology vision and excellence in manufacturing trades training."

That's the citation for Sandia Employee Recognition Awards (ERA) 2001 recipient Douglas Abrams (14186), alphabetically the first recipient listed in this year's ERA banquet program.

And...

"For establishing the Computer Science Research Institute and enabling research in algorithms, applied math, and organization by guiding two departments, the MICS and ASCI algo-



Employee Recognition

gorithms programs." That's the citation for David Womble (9214), the last (alphabetically) Sandian listed in the program.

In between Doug and Dave, 57 other individual employees this year earned the right to add "Employee Recognition Award" recipient to their résumés.

As notable as the individuals' achievements are, the accomplishments of Sandia teams prove every bit as exceptional. As such, it is only appropriate that the ERA process recognize and pay tribute to notable Sandia teams, from the ACRR Pulse Mode team to the Z Radiation Effects Science team — and the 60 teams (representing more than 1,000 team members) in between.

Now in its eighth year, Sandia's Employee Recognition Awards program carries on a tradition that since 1994 has honored Sandians — individuals and team members — for outstanding services rendered to Sandia and the nation. The individual recipients are pictured on these pages. A complete listing of team winners and team citations and the names of individual team members begins on page 8.

The Recognition Night 2001 celebration (black tie optional) is based on the theme "An Evening in France." Festivities will include a reception, formal dinner, legendary dessert buffet, a dance featuring super West Coast party band Haute Chile Grande, and presentation of the awards. All 59 individual recipients and a designated representative from each winning team will be recognized at the banquet.

During this year's awards dinner, Paul and Joan will present each honoree with a pin symbolizing the award, as well as a framed certificate of recognition.

The Sandia ERA program commends superior results in three categories for individuals and one category for teams. For individuals, the categories are exceptional service, technical excellence, and leadership. Teams — both technical and business/operational — are recognized for exceptional contributions to an important program or process.

From Sandia's 2001 ERA winners, Paul Robinson and Joan Woodard will select the nominees that will represent Sandia in Lockheed Martin's NOVA award program. This annual program honors 50 individuals and teams across the Lockheed Martin Corporation who have made outstanding contributions to Lockheed Martin Mission Success. NOVA awardees will attend a Lockheed Martin Corporate celebration in early summer 2001.

Public Relations and Communications Center 12600 and Human Resources Division 3000 organize the annual awards event. — *Bill Murphy*



Douglas Abrams
14186



David Adams
14171



Ronnie Albers
14186



J. Loraine Aragon
10503



Michael Bohn
12333



Bruce Boughton
5817



Charles Browder
7133



Theresa Broyles
2554



Donna Chavez
1030



Rosario Chavez
2660



Roger Lee Clough
1811



William Conley
14405



Charles Craft
5941



Bruce Dale
12112



Russell Elliott
11500



Susan Esfahani
2341



Barbara Funkhouser
6531



Pauline Gerstle
3000



Steven Goods
8725



Steven Hatch
9813



Roy Hertweck
7853



Clifford Ho
6115



Barbara Hoffman
10250



Rebecca Hunter
5000



Steven Ikebe
2255



Tracy Jones
10305



Gabriel King
7134



John Lanoue
2554



Richard Lehoucq
9214



Barbara Lucero
9329



Gregory Lyons
2616



Michael McDuffie
12620



Exceptional service
Leadership
Technical excellence



Leslie McReaken
7102



Paul Miller
1118



Carol Murray
2912



James Osman, Jr.
12830



Polly Owens
10501



Deborah Payne
1322



Daniel Rader
9112



Linda Sager
8524



Kristy Savage
3000



John Schwartz
2952



Diana Sipola
1843



Heidi Smartt
5323



Jody Smith
5712



Sheryl Stewart
8522



Michael Tachias
7140



Tan Thai
5902



James Tomkins
9220



Pamela Tyler
10501



Marianne Walck
6116



Gregory Wickstrom
2125



David Womble
9214

Not pictured

- Linda Chavez 7853
- Laura Connolly . . . 5302
- Mary W. Green . . . 5861
- Rosemary Hriczko-
Zdunczyk 7845
- Michael Kurtzer . . . 8945
- Darl Patrick 9327



A Celebration of
Excellence

Team awards recognize achievement across all divisions

The 2001 Employee Recognition Awards program, continuing a trend begun several years ago year, again found divisions placing a special emphasis on team accomplishments. The 62 teams listed on the next three pages were deemed to have made exceptional contributions to an important program or process. A few representative teams are pictured.



ACRR Pulse Mode Preparation for Defense Program Tests

For outstanding teamwork in providing unique testing capabilities for NWSBU and DOE/DP hostile environment requirements.

James Bailey, Danny Beets, Al Bendure, Ken Boldt, Jim Bryson, James Duncan, Ron Farmer, Jim Fisk, John Garcia, Rick Gomez, Paul Helmick, Mary Horvath, Lance Lippert, Albert MacDougall, Lonnie Martin, Mitch McCrory, Paul Pickard, James Rice, Ted Schmidt, Terry Wallace

Advanced Concepts Group

For successfully developing new programs and technology initiatives that confront long-term threats to the security and well-being of people in the US and abroad.

Adele Caldwell, Stewart Cameron, Mike Cieslak, Alicia Cloer, Mark Derzon, Dennie Engi, Vipin Gupta, Howard Hirano, Thomas Karas, Rob Leland, Kenneth Miller, Judy Moore, Tim Moy, Sandy Pino, Richard Pryor, Elaine Raybourn, Pat Scharnberg, Raechl Scharnberg, Maher Tadros, Jessica Turnley, Tommy Woodall, Gerold Yonas, Al Zelicoff

Advanced Information Systems Lab

For developing a revolutionary new approach to information security that addresses threats of all kinds, even the insider threat.

Steven Goldsmith, Gabi Istrial, Hamilton Link, Brian Murphy-Dye, Brad Nation, Laurence Phillips, Shannon Spires

Aircraft Composite Inspection and Reference Standards Team

This program produced an optimum set of composite reference standards to allow for accurate damage assessment and post-repair inspection of all composite aircraft structures.

Gerry Doetkott, Tom Dreher, Bruce Garbett, John Hewitt, Jeff Kolgaard, Kirk Rackow, Dennis Roach, Phillip Walkington

B61-11 ALT 349 Certification Team

Performance certification of the B61-11 Alt. 349 through advanced predictive analyses supported with a limited field test effort.

Luis Abeyta, Yaz Aragon, Jeanne Bando, Fred Brown, Tim Brown, John DeBaca, Jim Calderone, Jerry Cap, Ralph Carr, Ed Case, Kenneth Chavez, David Clements, Elizabeth Connors, James Dalton, Neil Davie, Al Dennis, Nick Dereu, Dennis Dunn, Kevin Eklund, Ned Hansen, James Harrison, Steve Hatch, Steve Heffelfinger, John Heise II, Doug Hodge, Ed Hoffman, Martin Imbert, Joseph Jung, Jeffrey Kawola, Barbara Lagree, Jack Laing, Charles Lloyd, Donald Longcope, Ray Macallister, Wilbur Martin, Jan Martinez, Don McCoy, Jeffrey Morgan, Thomas Paez, Doug Pastor, Steven Pink, Galen Puls, Bob Reese, Norman Riggan, Tedd Rohwer, Al Sehmer, Stewart Silling, Malcolm Stringer Jr., Mudd Vigil, Gerald Wellman, Jim Wifall, Dennis Wilder, Ben Woosley, John Zubersky

B61 Spin Aero Team

This team defined ALTs 354/356 for increasing B61-3,4,10 spin rate within stringent schedule constraints and requirements that the ALTs demonstrate success on the first flight.

Vincent Amatucci, Steve Beresh, Kenneth Chavez, Major John DelBarga, Kevin Eklund, Rocky Erven, Ron Greene, John Henfling, Aaron Hillhouse, Phil Hoover, William Oberkamp, Jeffrey Payne, Carl Peterson, Chris Roy, David Salguero, Bev Sturgis, Walt Wolfe

Building Bridges Corporate Program Coordinating Team

A leadership-driven, customer-focused forum to address racial profiling concerns with goals to enhance understanding of diversity and build work environments exhibiting trust, inclusion, and respect.

Anthony Baca, Judith Borrowdale, Tom Davis, Ellen Evans, Claire Gallipoli, Mark Garrett, Laura Gartling, Elizabeth Gonzales, Margaret Harvey, Robin Jessen, Rochelle Lari, Lyle Lininger, Dolores Lujan, Olivia Moya, Ray Ng, Tom Perea, Jane Poppenger, David Sparks, Heidi Welberry

Chemical/Biological Non-Proliferation Micro-Chem Lab Team

The team overcame substantial obstacles to build and test a research prototype of a hand-held, low-power device suitable for rapid detection and analysis of biotoxins.

Mark Richard Claudnic, Bob Crocker, Rafael Davalos, Scott Ferko, Julia Fruetel, Charlie Hasselbrink, Brian Holliday, Gary Hux, Leo Mara, Jason Rehm, Ron Renzi, George Sartor, George Schubert, Isaac



LIGA TEAM, recognized for successfully developing the scientific framework for LIGA manufacturing processes and licensing that know-how toward establishing the country's first commercial LIGA foundry.

Shokair, James Stamps, Victoria Vandernoot, John Warmouth Jr., Dan Yee

College Cyber Defenders Program Team

The CCD Team objective is to collaborate with undergraduate and graduate students and university faculty to develop capabilities in information technologies, protection, and distributed computing.

Nina Berry, Fred Cohen, Holly Stryker, Barb Zaragoza

CSU Project Managers' Team

The Computer Support Unit Project Managers' Team has managed to significantly increase customer satisfaction while significantly decreasing the overall cost of the service to Sandia.

Mary Adams, Cynthia Caton, Debbie Pope Chavez, Jim House, Sam Jones, J C Kelly, Tom Klitsner, David Ortiz, Scott Rogers, Susan Sackinger, Michael Schalip, Charles Shirley, Wayne Shirley

DARPA PASEM Team

For technical excellence and exemplary multidisciplinary, multiorganizational skills leveraging that resulted in a new, strategic DARPA program focused on hard and deeply buried targets.

Patrick Barney, Lew Bartel, Greg Elbring, Bruce Engler, Michael Holzrichter, Mark Ladd, Tim McDonald, Sean McKenna, Hung Nguyen, Gerry Sleaf, Terry Stalker, Marianne Walck

Divisions 1000 & 2000 ES&H/S&S Coordinator Team

This team coordinates ES&H within two Divisions. In the last year, they expanded their scope to include Safeguards and Security, and Quality Assurance.

Larry Baca, Bess Campbell-Domme, Pete Chauvet, Wayne Davis, Sally Douglas, Robert Fisher, Mark Lewis Harris, BJ Joseph, Larry King, Susan Leach, Taffey Maddox, Ken Nunez, Carol Phelps, Patricia Trelue, Lawrence Weirick, John Zich

Enhanced On-Site Container Development Team for Chemical Stockpile Demilitarization Program

An automated Enhanced On-Site Container (EONC) was designed, developed, and delivered to the US Army for movement of all stockpiled chemical munitions.

Michael Arviso, Jeff Bobbe, Dennis Bolton, Raymond Dukart, Glenn Hohnstreiter, Joe Koski, John Ludwigsen, Mark McAllaster, Jim Pierce, Hal Radloff, Ken Sorenson

EOS Flyer Plate Team

In recognition of a revolutionary new method for launching flyer plates with the Z Accelerator was developed, which allows unprecedented accuracy in ultrahigh-pressure equation-of-state studies.

William Anderson, James Asay, James Bailey, Tom Bergstresser, Alan Carlson, Brian Clark, Jean-Paul Davis, Steve Dropinski, Mike



THE EVERGREEN Security Team, recognized for extensive hours of service to protect sensitive classified material and weapons.

Furnish, Clint Hall, David Hanson, Dennis Hayes, Dave Hebron, Randy Hickman, Robert Johnston, Gerry Kerley, Marcus Knudson, Pat Lake, Raymond Lemke, Mike Madlener, Edgar Marsh, Josh Mason, John McKenney, Gregory Mize, Brian Oliver, Steve Rothman, Chris Russell, Diana Schroen-Carey, David Tanner, Phil Watts

ERA IS/IT Enhancement Team

For the smart deployment of IS/IT tools in support of and integrated with the Division and Corporate-level ERA business processes.

Alan Armentrout, Samantha Flores, Polli Gerstle, Ken Hammond, Michael Hess, Chris Morgan, Mike Mink, James Taglianetti, Linda Wagner

Evergreen Security Team

The Evergreen Security Team has distinguished themselves in a meritorious manner by working extensive hours to protect sensitive classified material and weapons.

Andrew Aragon, Kermiet Baker, Daniel Barela, Gary Batson, Gregory Baum, Robert Beamon, Michael Benavidez, Robert Brown, Willie Brown, Joseph Castillo, Erick Chavez, James Cook, Almer Dial, Raymond Duran, Michael Espinoza, Dwayne Fleming, Daniel Frampton, Alfred Garcia, David Garcia, Raymond Garcia, Carlos Gonzales, Fernandez Gonzales, Phillip Gonzales, Donnie Greene, Orlando Griego Jr., Bobby Grimes, General Holman III, Peter Irwin, Walter Lucero, Ronald May, Dale Meredith, Russell Mickey, Thomas Moquino Jr., Danny Moreno, Joseph Moreno, Joseph Padilla, Michael Padilla, Mike Padilla, Ruben Padilla, Mike Patton, Abram Prairie, Anthony Ramirez, Paul Romero, Tommy Serna, Walter Smith, Paul Tapia, Peter Tapia, Steven Teague, Joseph Torres, Robert Ulibarri, Leroy Wallace, James Young, Keith Young, Joseph Zamora

Explosives Detection Development Team

Exceptional design, development, fabrication, and evaluations of multiple trace explosive detection systems used to search vehicles, personnel, and packages for vanishingly faint odors of bombs.

Lester Arakaki, Mark Baumann, Frank Bouchier, Charles Brusseau, Sackery Chanthery, Jerry Davis, David Hannum, Karl Hanold, Kevin Linker, John Parmeter, Chuck Rhykerd Jr., Eric Varley, Nathan Varley

Extended Division Diversity Council Team

The Extended Division Diversity Council was responsible for the planning and execution of the Department of Energy's Diversity Standdown at the Sandia/California site.

Gerri Albright, Angela Amaral, Noel Baggett, Joan Bersie, Barry Bolden, Tamara Cagney, Martha Campiotti, Carol Crown, Mike Dyer, Johnny Ellison, Gabe Gutierrez, Chrisma Jackson, Michele Kahn, Bill McLean, Ray Ng, Ken Nunez, Ginnette Nunez-Ciesla, Patricia Smith, Emily Soares, Sheryl Stewart, Ken Washington, Rhoda Whipple, Barb Zaragoza

Foreign Interactions Team

For consistently exceeding customer expectations, the Foreign Interactions Team is seen by Sandia staff and management, the Weapons Laboratories, and DOE as the prototype program.

Cathleen Ehgartner, Samantha Flores, Melanie Florez, Marcie Jordan, Leslie McReaken, Juanita Nunez, Lil Radtke, Jackie Silva

Gallium Nitride Growth and Materials Science Team

For broad and fundamental research into scientific-based Gallium Nitride growth, stress engineering, and materials science culminated in demonstration of the world's first near-UV VCSEL.

Carol Ashby, Albert Baca, William Breiland, Larry Bruskas, Michael Coltrin, Mary Crawford, Jeff Figiel, Jerry Floro, David Follstaedt, Stephen Lee, Nancy Missert, Christine Mitchell, Sam Myers, Jr., Greg Peake, Paula Provencio, Carleton Seager, Randy Shul, Karen Waldrip, William Wampler, Alan Wright

Gas Cylinder Disposal Team

Waste Management initiated a one-time event identifying the storage of unowned gas cylinders which could have resulted in >\$100,000,000 in fines.

Dee Dee Dicker, Johnny Ellison, Mike Fallon, Laurie Farren, Leighton Ford, David James Hinton, Sarah O'Connor, Theo Pope

Goodyear Interlug Prototype Team

This team developed solid models and used them to build prototype mold components, called "interlugs," for farm and earthmoving tires.

Jo David Bridge, Ron Brubaker, Tony Bryce, Bill Haydu, Virginia Lovato, Mike McWilliams, Brian Pardo, Michael Saavedra, Terry Smith, Bill Sullivan

Helium Measurements Team

Extensive partnering among Design, Primary Standards, and Production was required to establish a technique to measure helium-3 content in gaseous ambients.

Richard Antepencko, Larry Azevedo, Steven Balsley, Mark Benner, Jim Browning, Bill Conley, Michael Courtney, James Gebhart, Carol Laduca, Edwin Lopez, Gerald McCarty, Bruce McGee, Frere McNamara, Ramona Myers, Diane Peebles

(Continued on next page)

(Continued from preceding page)

HIFES Concept Study

For exceptional work in developing an advanced satellite sensor system concept that revolutionizes national remote sensing capabilities.

Ron Akau, Jerry Allen, Anthony Bentley, Clinton Boye, Robert Brown, Root Gomez, Carter Grotbeck, Chris Lanes, Kurt Lanes, C. Rowe, Michael Sharp, Susie Smith, Sue Spaven, Peter Stromberg, Scott Strong, Julian Trujillo, Jeff Wilcoxon

High Speed Optical Transceiver Development Team

This team of 50 Sandians, working with EMCORE engineers, has developed a high-performance, manufacturable, optical transceiver product over a 9-month time period.

Ron Akau, Ron Anderson, Marce Armendariz, Johnny Baca, Daniel Barton, Niel Berg, Dante Berry, Mark Braithwaite, Ron Briggs, Rob Bryan, Steven Burchett, Pat Candelaria, Craig Carmignani, Tony Carter, Melissa Collins, Mathew Donnelly, Ed Duckett, Pete Dudley, John Emerson, Bettie Fisher, Gene Fogwell, Rachel Giunta, Mary Gonzales, Anthony Griego, Terry Hardin, Gerald Hash, Gordon Iben, Shanalyn Kemme, Dale Leonard, Rob Mitchell, John Nevers, Al Opichka, David Peterson, Guy Prevost, Cathleen Ann Reber, Merideth Rising, Donald Rohr, Lauren Rohwer, David Samuel, Thomas Sanchez, Charlie Sandoval, Gayle Marie Schwartz, Catharine Sifford, Gerard Simmons, Norman Smith, Terry Smith, Alice Splawn, Mark Stavig, Belinda Tafoya-Porras, Paiboon Tangyonyong, Daniel Urenda, Michi Wada, Jonathan Weiss, Dave Zamora, Lila Zurzolo

Hopping Robotic Mobility Team

The team nominated here has recently completed development on the prototype mesoscale advanced mobility platform, termed the hopper.

Jon Bryan, Gary Fischer, Michael Kuehl, Lisa Marron, Michael Martinez, Rush Robinett III, Barry Spletzer, Thomas Weber

Information Technology/Computer Science Retraining Team

Sandia successfully launched its first Information Technology/Computer Science (IT/CS) Retraining Program to help alleviate shortage of IT/CS professionals across the Laboratory and to enhance careers.

Jodi Case, Sharon Chapa, Bill Cook, Patti Cover, Carol Crown, Larry Ellis, Carlos Griego, Belinda Holley, Bill Swartz, Linda Wilson



GAS CYLINDER Disposal Team, honored for identifying the storage of unowned gas cylinders which could have resulted in more than \$100,000,000 in fines.

In-Ground Storage Vault (IGSV) Team

For outstanding teamwork, performance, and excellence in the design, construction, authorization, and use of the In-Ground Storage Vault (IGSV) for storage of Category I SNM.

Tom Blanchat, Matthew Burger, Wayne Burton, Bob Cutler, Sid Domingues, Jim Fisk, John Ford, John Garcia, Bob Gardner, Paul Helmick, David Hendrix, Mary Horvath, Larry Humphries, Willie Johns, Randall Kubasek, Carlos Medrano, Lance Miller, Claude Potter III, Sandy Ragan, Ken Reil, Edward Sanchez, Michael Thorneby, Dale Vandongen, Terry Wallace, Steve Wright

Keck Foundation Microarray Scanner Team

For cross-program collaboration leading to a \$1M Keck Foundation Grant to UNM for development of the next generation micro-array scanner.

George Davidson, Steve Gentry, Dave Haaland

LDRI Team

In recognition of the job done in developing and delivering the Lasar Dynamic Range Imager for the Space Shuttle Mission 97 launched November 30, 2000.

Ron Akau, David Armistead, Howard Arris, Irene Bentz, Tom Casaus, Tim Dubay, Mark Heying, Steve Lebien, Jack Martinez, Robert Nellums, Kate Olsberg, Kenneth Reaves, Colin Smithpeter

LIGA Development and Commercialization Team

For successfully developing the scientific framework for LIGA manufacturing processes and licensing that know-how toward establishing the country's first commercial LIGA foundry.

Michelle Bankert, Howard Bender III, Thomas Bennett, Dale Boehme, Bill Bonivert, Martha Campiotti, Doug Chinn, Randy Christman, Paul Dentinger, Linda Domeier, Stewart Griffiths, John Hachman Jr., Craig Henderson, Dave Heredia, Jill Hruby, Richard Janek, Pat Keifer, Karen Lee Krafcik, Steve Leith, Jill Mischeau, Alf Morales, Bob Nilson, Kurt Olsen, Laura Santos, Renee Shediak, Dawn Skala, Jay Spingarn, Ming Tan, Aili Ting, Nancy Yang

Line-ORVIS Diagnostic Development and Demonstration

For development and demonstration of the line imaging optically recording velocity interferometer system (Line-ORVIS) for quantifying material dynamic response at unprecedented temporal and spatial resolution.

James Asay, Melvin Baer, Jaime Castaneda, Lalit Chhabildas, Marcus Knudson, John O'Hare, Wayne Trott

Low-Level Radioactive Waste (LLRW) Team

Sandia recently completed a 2-year project for Lockheed Martin with the commissioning of a radioactive waste processing facility at the Zvezdochka Shipyard in Russia.

Chris Aas, Joe Jones, Joe Saloio Jr.



MTI LAUNCH & OPERATIONS TEAM, sustained outstanding team performance resulting in the successful launch and operations of the Multispectral Thermal Imager satellite.

MC4380 Neutron Generator Hostile Environment Qualification Team

Qualification of the MC4380 Neutron Generator to operate in a hostile environment was a major corporate milestone for FY00. All objectives were met on time.

Robert Anderson, Ruth Bargman-Romero, Bill Barrett, Danny Beets, Dave Beutler, Dave Bodette, Roy Dickey, Sid Domingues, Ron Farmer, James Foesch, David Fordham, Patrick Griffin, Gary Harms, Bob Lagasse, Warren Lewis, Mike Luker, Lonnie Martin, Jay Newquist, Kazuo Oishi, Mark Poiles, Joe Sidlauskas, Otis Solomon Jr., Robert Stiers, Keith Vollmer

MTI Launch & Operations Team

For sustained outstanding team performance resulting in the successful launch and operations of the Multispectral Thermal Imager satellite.

Ron Akau, Bill Anslover, Brian Brock, David Bullington, Patrick Case, Frank Chavez, Dennis Clingan, Max Decker, James Garsow, Charlie Greenwood, Dennis Gutierrez, James Hughes, Merrill Jones, Jeff Kalb, Randolph Kay, Jim Krone, Dennis Lierz, Chuck Looney, Roman Martinez, Chuck Miller, Zane Miller, Carlin Newcom, James Opalka, Glenn Rackley, Billie Self, Jim Snell, Gary Webb, Joe Wehlburg

National Missile Defense Integrated Flight Test Targets Team

For providing exceptional service and uncommon dedication to the National Missile Defense Integrated Flight Test program by providing high-quality target objects.

Charlie Adams, Mark Aguilar, Jimmy Aldaz, William Aldrich III, Janise Baldo Pulaski, Mark Beader, Dave Berst, Tamera Bravo, Barry Bronkema, Wendy Brothers, Ron Coleman, Dale Cooper, Hovey Corbin, Earl Creel, Bryan Culler, Randy (Cooze) Cusenbary, Keith Danielson, Rance Edmunds, Christopher Gallegos, Bob Gardner, Curtis Gibson, Ken Harris, Ronald Hartenberger, Diana Helgesen, Andy Jones III, James Kish, Gary Kishi, Amy Leyba Essary, Daniel Luna, Dean Manning, Lee Marshall, Roman Martinez, Carolyn Marvin, Mark Meindl, Dominic Montoya, Jeffrey Morgan, Patrick Moore, Hae-Jung Murphy, Chuck Nelson, Charles Nidever, Christian O'Gorman, Bruce Page, Jay Penn Jr., Eva Renninger, Ronald Richardson, Johnny Ruybal, Matthew Sena, Alton Shaut, Bob Sheldahl, Roxanna Sippio, Linda Sparling, John Stanalonis, Mike Stegmaier, Jim Trentham Jr., Judith Tripp, David Trujillo, Don Van Zuiden, Jim Vanderburg, Venito Vasquez, Mudd Vigil, Lou Zelnio, Richard Zuni

Non-actinide Isotopes and Sealed Sources Management Group (NISSMG)

For developing the technical basis to permit the shipment of the last major nuclear materials from the Mound site, facilitating site closure.

Tracy Dunham, Cathy Ottinger, Jim Pierce, Gary Polansky, Larry Sanchez, Martin Sherman

Norton Compressed Air Energy Storage Team

The SNL Norton CAES team played a pivotal role leading toward licensing the first-of-its-kind storage facility for off-peak electrical power production.

Glenn Barker, Stephen Bauer, Richard Beauheim, David Bronowski, Tim George, Mark Grazier, Moo Lee, Darrell Munson, Christopher Rautman, Steve Webb

1.3-Micron VCSEL Team

A Sandia/industry team has developed the first 1.3-micron electrically pumped vertical cavity surface emitting laser (VCSEL) for ultra-high bandwidth datacomm and integration with silicon microsystems.

Andrew Allerman, Marce Armendariz, William Breiland, Larry

Bruskas, James Bur, Kent Choquette, Art Fischer, Ian Fritz, Kent Geib, Grant Grossetete, Terry Hargett, Jana Jo Hindi, Andy Jackson, Gary Karpen, David Kisker, John Klem, Steven Kurtz, Jacob Lester, Ryan Naone, Darwin Serkland, Robert Sieg, Olga Blum Spahn

Polaris Missile Interstage Disposal Team

This Team researched disposal options for Polaris Missile Interstages from the STARS Program, reducing potential disposal costs from several million dollars to a few 100K.

Mary Ann Krauss, Carla Rellergert, Margaret Scheffer

Processing and Environmental Technology Laboratory (PETL) Project Management Team

Exceptional project management and teaming contributed to the multiple successes of the Processing and Environmental Technology Laboratory (PETL) through design, construction, and occupancy.

Gilbert Aldaz, James Brunese, Larry Chavez, Nydia Chelette, Rhonda Dukes, Strom Edstrom, Richard Elliott, Robert Fisher, John Harding, Bill Hendrick, Roy Hertweck, Jim Jellison, Darrick Jones, Ricardo Ortiz, Philip Pelzman, Jay Peterson, Scott Rowland, Gerald Savage, Dan Sherman, Paul Silva, Erlinda Silva-Sweeney

Procurement Card Program Team

The Procurement Card Program Team has taken an outstanding procurement process and moved it to new heights

of excellence for the Laboratories customers.

Linda Gilkey, Dolores Gonzales-Limon, Bob Martinson, Cathy Putelli, Matt Riley, Lynn Shackelfoot, Cynthia Williams

Program Budget Team

For exceptional commitment in representing the WFO requirements and customer interests in the new corporate financial and management reporting systems.

Veronica Argo, Trudy Blake, Margaret Jacobs, JJ Jones, Marlene Keller, Emily Lujan, Linda Ristvet, Kathy Wade

PROTECT Chem-Bio Demonstration Team

Key elements enabling infrastructure defense against chem/bio attacks have been demonstrated through a subway detection testbed and response characterization of a major airport terminal.

John Brockmann, Donna Edwards, Wayne Einfeld, Greg Foltz, Fred Gelbard, Susanna Gordon, Richard Griffith, Robert Kinzel, David Lovato, Dan Lucero, Scot Marburger, Kenneth Murata, Joseph Romero, Ray Trechter, Beth Wichman

Radiation Transport Team for ASCI Milepost

The radiation transport team developed and applied codes that were used for the successful completion of Sandia's first ASCI Milepost, 3D Prototype Hostile Environment Simulation.

Clif Drumm, Wesley Fan, Brian Franke, Gary Harms, Ronald Kensek, Leonard Lorence, Jennifer Powell

RCT2 Targets Team

Achievement and technical excellence in designing, building, testing, and flying the targets used to collect performance data for the National Missile Defense Ground Based Radar.

Jimmy Aldaz, Robert Brown, David Foral, Mark Grubelich, Martin Imbert, Melvin Krein, Brian Pardo, Doug Pastor, Jay Penn Jr., John Stanalonis, Dan Talbert, Venito Vasquez

Salinas FY00 ASCI Level 1 STS Hostile Milepost Team

For successful completion of the FY00 ASCI Hostile Environment Milepost calculations that modeled the three-dimensional W76 system response to blast and impulse loads.

Ken Alvin, Manoj Bhardwaj, David Day, Mike Eldred, Rich Field Jr.,

(Continued on next page)



FOREIGN INTERACTIONS TEAM, cited for consistently exceeding customer expectations, is seen by Sandia staff and management, the weapons labs, and DOE as the prototype program of its kind.

(Continued from preceding page)

Clay G. Fulcher, Kendall Pierson, John Red-Horse, Garth Reese, Todd Simmermacher, Bart Van Bloemen Waanders, Howard Walther, David White

Sandia Classified Network (SCN) Infrastructure

The SCN infrastructure provides computing resources for sharing tools and information necessary to perform engineering work in an enterprise-wide classified environment.

Mary Adams, Jeffrey Anastasio, Anne Barnes, Mike Bencoe, Don Bragg Jr., Doug Brown, Sam Cancilla, Andrea Cassidy, David Chacon, Greg Conrad, Fran Current Jr., Donna Davis, Shelley Eaton, Rich Gay, Mike Gomez, Susan Gonzales, Mark Gutscher, Michael Hannah, Deborah Hansknecht, Robyn Hartley, Dick Hawkins, Cynthia Huber, Jack Hudson, Carol Jones, JC Kelly, Tom Klitsner, Jonathan Kreisle, Michele Leshner, Barb Lucero, Tim Macalpine, Glenn Machin, Scot Marburger, Leroy Martinez, Timothy Meeks, Bill Mertens, Pat Moore, Beth Moser, Steve Nichols, Rose Omidvaran, Tam Orth, Bev Ortiz, Ken Osburn, Darl Patrick, Karen Rice, Eddie Roberts, Paul Sands, David Schoch, Carla Ann Scott, Jim Scott, Charles Shirley, Gloria Solis Spidle, Scott Stephens, Mark Stilwell, Tony Sweeney, Walter Vandevender, Dirk Vanwestrienen, Walter Walkow, Jeffrey West, Jeff White, Bruce Whittet, Hank Witek

Sandia Decon Formulation Commercialization Team

For incisive business acumen, exceptional teamwork, and technical excellence in commercializing SNL Decon Formulation for Mitigation and Decontamination of Chemical and Biological Warfare Agents (DF-100).

Rita Betty, Larry Bustard, Rusty Elliott, Kevin McMahon, Joanne Paul, Mark Tucker, Cecelia Williams

Sandia MEMS Visualization Tools

This team has developed MEMS Visualization Tools for the Sandia SUMMIT MEMS fabrication process. The release of these Tools enabled new partnerships in this area.

Craig Jorgensen, Brian Priddy, Victor Yarberry

Sandia Radiological Assistance Program (RAP) Team

For outstanding service to the Department of Energy, State of New Mexico, and the public for critical radiation monitoring services during the Cerro Grande Fire.

Jeffrey Downs, Brad Elkin, Don Hanson, Al Horvath Jr., Doug Kayatt Jr., Jim Keagy, John Kilbane, Ann Kirk-Schweitzer, Bill Larkin, Alan Miller, Christopher Mullaney, Betsy Neuhaus, Gus Potter, Bill Rhodes III, Kevin Rolfe, Dave Schweitzer, Roland Seylar, Richard Stump, Brenda Townsend

SHARP-B2 Flight Test Team

The Sandia team successfully designed, fabricated, and flight-tested the SHARP-B2 vehicle to gather critical data for NASA's Advanced Space Transportation Program.

Vance Behr, Al Hodapp Jr., Martin Imbert, Teresa Jordan-Culler, David Keese, David Kuntz, Amy Leyba-Essary, Kraig McKee, Dannie McNeill, Bruce Page, Doug Pastor, Mark Pilcher, Donald Potter, Ronald Sorley, Larry Whinery, Larry Young

Surface-Alloy Nanomotor Team

The team has discovered a new mechanism for the alloying together of metals on surfaces. This work may enable the construction of nanometer-scale motors.

Norman Bartelt, Bob Hwang, Andreas Schmid

Swing Shift Preventive Maintenance Team

For employing a team approach to reducing costs, improving performance, and reducing customer disruption in maintenance of building mechanical systems.

Steve Buckles, Mark Davis, James Dotson, Alex Galaz, Nathan Garcia, Randy Gates, Bill George, Sylvia Gomez, James King, Phillip Maldonado, Brian Mora, James Robinson, Richard Torrez

Synthetic Aperture Radar Fielded Systems (SARFS)

For successfully delivering the first of several state-of-the-art Synthetic Aperture Radar systems to the US Navy to support critical, time-urgent, all-weather, day/night, national security objectives.

Sam Bensonhaver, Timothy Bielek, Wallace Bow, Billy Brock, Rob Bugos, Bryan Burns, Thomas Cordaro, Dick Corderman, Sparky Doren, Mark Dowdican, Dale, Dubbert, Pete Dudley, John Fuller, Jeff Greving, Charlie Healer, Freddie Heard, Jeff Hollowell, Richard Hurley, Bob Hurtado, Philip Kahle, Peter Karnowski, Stan Kawka, Tony Kill, Susan Kitsch, Dale Leonard, Tom Levan, John Littlejohn, Joe Lucero, Randy Mayer, Brian Milesosky, April Navarro, David Nichols, David Outka, Michael Pedroncelli, Jim Redel, Brett Remund, Ted Salas, Grant Sander, George Sloan, Kurt Sorensen, Jeff Spooner, Dan Sprauer, Mike Striker, Peter Stromberg, Michael Taylor, Martin Thompson, Tony Trujillo, Daniel Wahl, Kyle White, Kathie Woods, David Zittel

Trades Training Program

The team designed and implemented a new training program to provide fully qualified trades people at greatly reduced cost.

Douglas Abrams, Ron Albers, Vanessa Anderson, Daniel Archuleta, Steve Benavidez, Margarito Crespin, Phillip Gallegos, Louis Gonzales, Lucy Justice, Robert Kaneshiro, Paul Lemke, David Leyva, John McAuliffe, Sharon Ortiz, Steff Perea, Jane Poppenger, Debbie Rimbart, Joseph Rodman, Thomas Souther, Charles Townsend

Virtual Node Operating System Team

The Virtual Node Operating System Team extended the Cougar OS to enable user applications to transparently access compute coprocessors on the ASCI Red supercomputer.

Bob Benner Jr., James Tomkins, John Vandyke

W76 Type 2F FTQU Telemetry Redesign Team

Developed and flight-tested the W76 redesigned instrumentation system. The highly successful flight test qualification unit (FTQU) allowed for scoring of the W76 JTA in development testing.

Robert Chan, Dean Clark, Rex Eastin, Levi Forman, John Freie, Paul Jarnevic, Matthew Johnson, Mark McConkie, Robert Repine, Pete Royval

W80 6.2/6.2A Study Team

The excellent work by the Sandia W80 6.2/2A Study team was instrumental in completion of the study and approval of the W80 Phase 6.3.

Jerry Adams, Dennis Anderson, Grant Bloom, Dexter Boone, Peggy Casbourne, Mark Richard Claudnic, Douglas Cotter, Leslie Cumiford, Bill Engleman, Carole Farnan, Edward Fronczak, Doug Gehmlich, Phil Hoover, Steven Humbert, Carole Le Gall, Kevin Maloney, Mark Mickelsen, Raphael Molle, David Neustel, Jack O'Connor, Keith Ortiz, Charles Ray, Dave Schultz, Pat Smith, Keri Sobolik, Charles Vanecek, Jay Vinson, Phil Zablocki, Rena Zurn

W80 Reinvention of Surveillance Team

Team successfully planned and conducted a series of technical reviews of W80 Surveillance Program to modernize the program to be responsive to an aging stockpile.

Jerry Cashen, Sandy Chavez, Bernard Gomez, Mike Kelly, Roy Pearson, Roger Roberts, John Zuberksy

WIPP PCB Risk Assessment Group

The WIPP PCB Risk Assessment Group identified that PCBs expected in WIPP transuranic waste have insignificant risks. Reductions in waste characterization could result in savings.

Larry Brush, Michael Lord, Melvin Marietta, Larry Sanchez, Palmer Vaughn

The Z Radiation Effects Sciences (RES) Team

The RES team increased high-energy soft x-ray sources by 8 to 30 times over previous capability, enabling new AGEX RES tests and code validation experiments.

John Apruzese, Bill Barrett, David Bell, Christine Coverdale, Frank Davies, Christopher Deeney, Melissa Douglas, Vic Harper-Slaboszewicz, David Lapell, Henry Sze, Ward Thornhill, Ken Whitney

Child-care center planned for Science & Technology Park

The lack of quality child care in close proximity to Sandia has frustrated many generations of Sandians and other employees working in the area.

Because Sandia Laboratory Federal Credit Union (SLFCU) plans to build a branch facility in the Sandia Science and Technology Park (east of the Eubank Gate), Sandia Corporation/Lockheed Martin and the SLFCU took the opportunity to address this need. The first step was the formation of a nonprofit corporation, separate from and independent of the two organizations. The new nonprofit, SSTPS Inc., plans to lease space from the SLFCU to provide an early childhood education center in the research park area by August 2002.

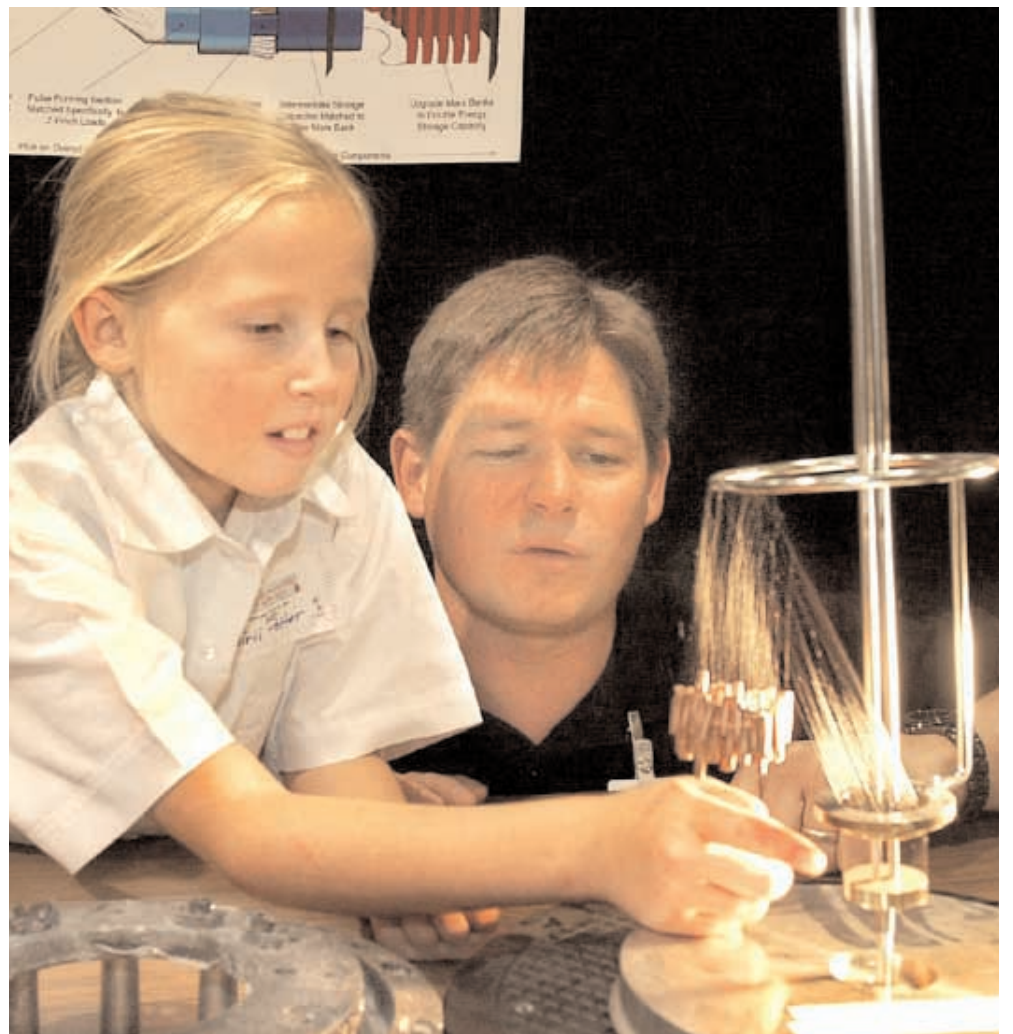
SSTPS Inc. is hosting a meeting on Thursday, May 17, from 10:30 to 11:30 a.m. in the Steve Schiff Auditorium (Technology Transfer Center, Bldg. 825) to present an overview of the proposed childhood learning facility.

3 to 1 and 4 to 1 respectively — and is targeted to serve 112 children in a home-like environment.”

“The addition of this facility may also help attract more hi-tech companies into the research park complex with a long-term goal of providing early childhood education for their employees in addition to supporting Sandia employees,” says Carlos Griego, on loan from Sandia to SLFCU and president of SSTPS Inc. “SSTPS engages in educational and charitable activities designed to enhance the well-being of the New Mexico residents it serves through a variety of services. The first SSTPS project is to provide the center for early childhood education. Our intention in building this facility is to provide a unique service in an unmet market niche. Our customers will be able to differentiate our facility from others in the area.”

SSTPS Inc. officers include Carlos, president; Larry Clevenger (3300), chairman; Elena Aguirre, vice president; Joan Harris (7131), vice president; Bruce Winchell (11400), secretary; and Chester Wright, treasurer. Consultant Allison Ward-Osborne and Max Martinez provide staff support to this nonprofit corporation. Companies in the research park area and contractors for Sandia will be invited to join as contributing members. — *Janet Carpenter*

Sandia celebrates annual Take Our Daughters to Work Day April 26



SIRII POTTER, 8, and her father Jimmy Potter (1630) look at a Z-machine target array made of wire one-tenth the diameter of a human hair. Sirii was one of several hundred young girls who visited the Labs April 26 as part of the annual Take Our Daughters to Work Day. This photograph was taken by Laura Montoya, 9, daughter of *Lab News* photographer Randy Montoya.

Sandia Classified Ads Sandia Classified Ads Sandia Classified Ads Sandia Classified

MISCELLANEOUS

TAILGATE, \$400; chrome bumper, \$200, from '99 Ford F-series pickup, like new, fits all F-series after '98. Vaughn, 284-2787.

ROPER WASHER & DRYER, white, 5 yrs. old, \$250; outdoor dining table, white plastic, 48-in. diameter, 4 chairs, \$40; aviation headset, lightweight, volume control, \$200. Eisler, 866-0096.

GOLF CLUBS, 2 ladies' right-hand starter sets, \$45 each; one bag, \$15. Anderson, 293-2490.

FOUR DAYTONS, 13 x 7, chrome, w/gold nipple, \$350; 3 roadsters, chrome, w/gold nipple, caps, w/locks & spinners, \$200, firm. Garcia, 839-1742.

FREEZER, 18 cu. ft., upright model, excellent condition, works perfectly, \$90 OBO. Wittwer, 298-0589.

MANDOLIN, Trinity College Celtic Octave, solid top, new \$700, hardshell case, 1 yr. old, asking \$550. Talandis, 877-0626.

HEATER DUCT, 4-in. round, approximately 20-ft., \$2 takes all. Mozley, 844-6288.

ANTIQUE BIRDSEYE MAPLE DRESSER, \$300; old metal bed, complete, \$125; sewing machine, w/wood cabinet, \$250. Powell, 877-4939.

GE KITCHEN APPLIANCES: self-cleaning gas range, \$200; venthood microwave, \$150; dishwasher, \$50; maple winerack/work-center, \$75. Mayer, 856-1445.

SEARS LAWN TRACTOR, 12-hp, w/grass catcher, very good condition, \$650. McClellan, 844-6979.

DOUBLE STROLLER, navy, reversible front seat, canopy over both seats, smooth ride, nice condition, \$65. Muguira, 286-2393.

MAYTAG WASHER, & gas dryer, excellent condition, approximately 4 yrs. old, good for another 20, \$500. Hecht, 281-4635.

MOBILE HOME AXLES, w/tires. Aguilar, 873-1261.

SOUTHWEST AIRLINES, round trip voucher, expiration 2/2002, \$300. Jacksits, 866-7383.

PICKUP SHELL, aluminum, for short-wheel-base Toyota or other make of pickup, \$100. Marrs, 281-9889.

POOL FILTER, 18-in. sand, w/multi-flow valve, good for above-ground pool, almost new, \$50. Ganter, 265-5007.

PUZZLE, 200 pieces, by Ravensburger, "Picture of Versailles," 98cm x 70cm, gorgeous, no missing pieces, \$12; shower chair in top condition, white, w/backrest, \$11. Wagner, 823-9323.

DUAL BIKE RACK, Thule, excellent, approximately 35-in. between roof clamps, new \$250+, asking \$100 OBO. Griswold, 856-5968.

RESONATOR GUITARS, square necks, sunburst finish: both in good condition, 1 Regal, \$375; 1 Dobro, \$700. Gendreau, 268-3436.

BREADMAN BREAD MAKER, \$25; VCR, Sears, \$30; Kitchenaid portable dishwasher, 4 colored panels can be installed, \$130. Smith, 299-7151.

LEATHER LOVESEAT/CHAIR, ivory, good shape, \$95; Trek mountain bike, 16.5-in. frame, great shape, \$60. Hesch, 237-1768.

TREADMILL, \$150; Nordictack, \$100; Healthrider, \$75, all excellent condition; entertainment center, cherry wood finish, glass doors, \$250. Nunez, 823-9203.

KING-SIZE WATERBED, includes 2 sets of drawers, mattress, heater, & accessories, good condition, \$150 OBO. Bonano, 298-6508.

FEMALE GERMAN SHEPHERD MIX, 4-5 months, loveable, playful. Kristek, 877-1254.

BEAUTIFUL POOL TABLE, equipment & lighting fixture, 8-ft., rosewood, green felt, 3 yrs. old, \$2,495. Pitts, 293-5481.

SOFA, early American, dark brown, 79-in., \$100 OBO. Thuman, 881-3885.

NORDICTRACK, \$200; kangaroo caddy, \$400; hobby jig saw, \$30; miscellaneous golf clubs, individual & sets, various prices. Mitchell, 299-5144.

NETGEAR RH348 ISDN ROUTER, Ethernet hub, \$250; Sharp fax-copier, \$50; new THOR motocross pants, child's, size 26, \$65. Christon, 880-0113.

TOYOTA TRUCK PARTS, Downey 2-in. springs, w/poly-bush, Modine radiator, stock exhaust, repair manuals, all \$250. O'Malley, 798-1553.

TWO SPRUCE VIGAS, new, 8-ft., 1 6-in. diameter, 1 8-in. diameter, both for \$40. Stamm, 255-2640.

THREE CHILD CAR SEATS, infant through toddler yrs., \$25 each. Ludwig, 856-5111.

DINING TABLE & 4 chairs, almost new, birch wood, \$145. Montano, 821-1235.

VACATION PACKAGE: 6 days in Orlando & Daytona, w/free car rental, 2-day Bahama cruise, expires 3/5/03, \$200 pp. Pritchett, 280-8949.

SHOPSMITH MARK 5, w/jointer, table saw, belt sander, band saw, lathe tools & accessories, \$850 OBO. Pierce, 239-5533.

CRIB, bassinet, high chair, Snuggli, play saucer, bouncy chair, etc., good condition. Hanselmann, 254-1782.

MAC CLASSIC, for the Mac aficionado, great condition, \$60. Manginell, 298-6188.

BASKETBALL POLE & adjustable-height graphite backboard, w/slam-dunk rim, \$55; recumbent bicycle, \$250. McLaughlin, 286-1355.

WOODTEK BANDSAW, 20-in., w/mobile base, \$950; oversized table, w/folding outfeed table for Powermatic 66, \$50. Henry, 856-5915.

TWO INDY 500 TICKETS, seats located turn 1 (outside), \$75 each (face value). Barr, 281-1858.

FISH, convict cichlids, gray, w/black stripes. Leisker, 293-3075.

ANGLO-ARAB HORSE, 12 yrs. old, 15.2 hands, gray, gelding, hunter/jumper, needs experienced rider, \$2,000 OBO. Tapia, 280-8888.

SIAMESE CAT, beautiful blue point, neutered male, 4 yrs. old, looking for good home, all shots current & history available. Schuster, 284-4923.

SOFTTUB, 4-6 person portable hot tub, 110v., weighs less than 50 lbs., diameter 5-ft., motor works great, needs new top & upholstery, \$125. Newman, 266-6928.

TODDLER BED, red tubular frame, w/futon mattress, \$50. Chow, 281-9235.

PATIO SET, elaborate wrought iron, includes round table, four large arm chairs, very elegant but not right for our patio. \$150. Murphy, 294-1778.

UNIQUE GLASS DISPLAY CASE, measuring approx. 5' x 2', came from Maisel's downtown, approximately 50 yrs. old, \$250 OBO. Owens, 877-0901.

MALE HOUSE CAT, cream & gray, blue eyed, good natured, 4 yr.-old-neutered, declawed. Smith, 881-0361.

ANTIQUES, 3-door glass-front bookcase; carved rosewood chair; floor model radio; chifforobe; more, call for details. Hollister, 323-1659.

HORSE TRAILER, '87 Sundowner, 2-horse, w/dressing room, tack slideouts, feed bins, storage, all steel, excellent condition, \$3,800 OBO. Goodson, 286-1267.

COMPLETE BABY ROOM FURNITURE, w/bedding set, white, like new, \$500; high chair, \$25; 12-in. color TV, \$40. Salari, 292-6138.

MATTRESS, Sealy Pillowtop king, w/box spring, 2 yrs. old, \$300; oak dining table, 40" x 78" & 6 oak highback arm chairs, \$280. Underwood, 246-8281.

FUTON, black/chrome, excellent condition, \$180; RCA color console TV, \$95. de la Fe, 271-6694.

MULTI-FAMILY GARAGE SALE, May 3, 4, 5, power lawn tools, golf clubs, bikes, vacuum cleaners, tools, & much more. Gluvna, 884-5251.

RECLINER/OTTOMAN, contemporary, navy leather, \$125; breakfast table, beige, 36"H x 36"D, \$100; Autumnwood barstools, \$50 each. Gruebel, 323-2414.

KITCHEN TABLE/CHAIRS: oak table, w/4 padded chairs; \$75. Roach, 296-0432.

LINCOLN ELECTRIC POWER ARC 4000, AC generator/AC welder, \$800. Nelson, 828-2755.

TWO "CHICAGO" TICKETS, Sat., May 19, 2 p.m., Popejoy Hall, front row center, \$70. White, 892-2316.

VINTAGE DINING ROOM SET, sideboard, table & 6 chairs (1 captains chair), 1940's (?), must sell. Williams, 238-5177.

TOW DOLLY, electric brakes, used once, \$500 OBO. Roseth, 856-6964.

CLOTHES DRYER, \$75; microwave, \$35; commercial heavy-duty meat slicer, \$60; all in very good condition. Jaramillo, 299-3441.

NEW MAC G4, dual 500 MHz, 512 MB RAM, dual 36 GB SCSI drives, DVD ROM, Fire Wire, \$4,200. Hickerson, 281-2329.

VICTORIA MAGAZINES, free. Harris, 858-0667.

DINETTE SET, kitchen table, w/extension, 6 chairs, \$350. Chavez, 831-3193.

TRANSPORTATION

'86 BUICK CENTURY, power windows, seats, & door locks, AC, PS, PB, AM/FM/cassette, 2.8 V-6, 67K miles, \$2,700. Greenway, 299-1104.

CORVETTE, 62K miles, silver, convertible top, excellent condition, \$13,000. Graham, 865-9427.

'87 JEEP CHEROKEE LAREDO, 4-dr., 5-spd., 6-cyl. 4.0l, AC, CD player, 143K miles, some body damage, otherwise good condition, make offer. Loucks, 255-9444.

'64 FORD TRUCK, LWB, 4-spd., V8, body in excellent condition, good to restore, \$975. Sanchez, 832-6260.

How to submit classified ads

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

- E-MAIL: Sandy Smallwood (sksmall@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 Sandy at 284-3704. 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.**

'78 BLAZER, full-size, 4x4. Gutierrez, 452-3276.

'98 TOYOTA CAMRY LE, AT, AC, all power, 4-cyl., spoiler, keyless, AM/FM/cassette, 30K low miles, nice, \$13,900. Brown, 262-1998.

'89 HONDA CELICA GT, 3DHB, 92K miles, sunroof, etc., great shape, no kids or pets, \$3,500. Landa, 821-4374.

'91 VOLKSWAGEN VAN, AT, AC, CC, new tires, 98K miles, excellent condition, original owner, \$6,000, negotiable. Sorenson, 294-1625, ask for John.

'97 JEEP GRAND CHEROKEE LAREDO, 4x4, V8, AT, AC, one owner, \$700 below wholesale, \$11,700. Mertens, 821-5511.

'98 CHEVY 4X4, half-ton, ext. cab, short bed, AT, Z-71, CD/cass., locking rear differential, towing pkg., 3rd dr., bed liner, heavy-duty trans. cooler & air filter, shell, 17.5K miles, \$21,700. Vigil, 271-1328.

'97 JEEP WRANGLER, 39K miles, white/white/soft-top, book value \$12,500, great condition, asking \$9,800. Bencomo, 247-9948.

'84 CHEVY 4X4 PICKUP, rims (6 lug), 2/set, 4-steel rally, w/caps & rings, \$250 OBO; 4-aluminum SenDel 8.5" x 15", \$250 OBO. Golden, 823-9656.

'86 ACURA LEGEND, 5-spd., 215K miles, \$2,500; '81 BMW 320i, 5-spd., 180K miles, \$2,000. Carson, 294-2230.

'94 CHEVROLET S-10, extended cab, less than 80K miles, \$5,600; '88 Chevrolet S-10 less than 80K miles, \$2,600. Smith, 821-0024.

'95 FORD TAURUS, 4-dr., V6, AT, 25K miles, security, remote control entry, 100% loaded, perfect condition, \$10,000 firm. Ahr, 823-1827.

'31 FORD MODEL A TOWN SEDAN, 4-dr., restored, runs great, drive away, \$10,500. Jones, 281-8080, ask for Robb.

'98 HONDA ACCORD EX, AT, AC, PW, PL, CD, cruise, power moonroof, tint, excellent condition, \$15,500. Brown, 296-2977.

'97 HONDA CRV, 19K miles, silver, 4-dr., AWD-SUV, keyless entry, roof rack, fully loaded, extended warranty, excellent condition, \$15,500. Thompson, 823-4567.

'95 CORVETTE CONVERTIBLE, white exterior/ red interior, AT, loaded, includes hardtop, less than 20K miles, \$26,990. Thalhammer, 298-8521.

'91 CHEVY HIGH-TOP CONVERSION VAN, 68K miles, runs great, many extras, \$4,995. Graham, 896-2231.

'84 CHEVY VAN, runs great, \$1,800 OBO; 16-ft. boat, 75-hp motor, \$600 OBO. Sells, 565-8514.

'90 DODGE DAYTONA, needs body work, runs good, \$1,200 OBO. Brown, 831-6242.

'77 DODGE W200 POWERWAGON, HD 3/4-ton, 4WD, fully rebuilt 360 V-8, 4-spd., recent clutch, \$2,200 OBO. Mulhall, 892-2131.

'92 TOYOTA PASEO, good condition, less than 70K miles, \$3,200. McMurtry, 344-7452.

'00 CAVALIER Z24, 2-dr., PS, PB, PW, sunroof, tinted windows, alarm, \$14,995. Baker, 865-3611.

'92 MAXIMA SE, 130K miles, new tires, brakes, \$1,000 stereo system, white/gray interior, excellent condition, \$5,700 OBO. Avila, 286-5731 or 780-1788 cell.

'98 DODGE RAM, Cummins 4x4, quad-cab, 15K+ miles, loaded, extras, excellent condition, NADA quote \$28,000 OBO. Yip, 294-8124.

'91 CHEVROLET SILVERADO, 3/4-ton, extended cab, 2WD, AT, AC, loaded, looks & runs excellent, 81K original miles, \$9,300 OBO. Torres, 294-7273.

RECREATIONAL

POOL, above ground, 16' diameter x 4' H, Dough Boy brand, like new, w/everything you need, \$1,300 OBO. Penn, 883-4195.

TRIATHALON BIKE, '99 Kestrel KM40 Ironman edition, Spinergy Rev-X wheels, Ultegra components, perfect condition. Evans, 294-0774.

RACING BIKE, Eddie MerckX, Dura-Ace components, 60cm frame, dark blue, orange, white frame, approximately 1,500 miles, near perfect condition, \$800. Dwyer, 271-1328.

'79 WILDERNESS TRAVEL TRAILER, nice, clean, well-maintained, 28-ft., full bath/shower, stove, refrigerator, bed, AC, plus extra amenities, great deal, must see, \$3,800 OBO. Pope, 243-4381.

'97 LANCE SQUIRE CAMPER, 9-1/2 ft., like new, awning, elec. jacks, roof storage pod, all season, \$8,000. Blankenship, 281-2257.

'93 POLARIS JET-SKI & TRAILER, SL-750 2-seater, top condition, low use, garage-kept at Elephant Butte, \$2,600. Strong, 861-3725.

'87 HONDA HURRICANE MOTORCYCLE, low miles, great shape, accessories included, \$2,395. Ahr, 294-0292 or 821-2536.

'99 POLARIS SPORT 400L, 2WD, perfect condition, used 12 hrs., many extras, \$4,400. Baca, 271-2962.

SAILBOAT, Robroy 23-ft. yawl, green hull, teak & bronze, 7.5-hp inboard, tandem trailer, excellent condition, \$12,000. Errett, 856-1592.

'00 KAWASAKI ZRX1100, only 570 miles, black, w/Corbin leather seat, garaged, excellent condition, \$7,000. Kear, 440-2764.

'92 FLSTHC HARLEY, black Heritage Classic Softail, extras, approximately 13K miles, excellent condition, \$15,000, make offer. Coca, 797-9136.

'98 CUSTOM SUZUKI MARAUDER 800, custom paint/pipes, w/fairing, C/A red, w/inlay, saddle bags, 4,400 miles, \$6,400. Lippert, 299-6594.

ITASCA MINI-MOTOR HOME, '78 Chevy, 14-ft., 27K miles, great mechanical condition, \$9K OBO. Garcia, 268-3848.

FIFTH-WHEEL TRAILER, Terry Resort 18-ft., double axle, AC, heater, & more, \$5,000. Ceballos, 831-4913, ask for Sam.

'98 YAMAHA WAVERUNNER XL760, 3-seater, cover, anchor, stainless-steel impeller, runs great, \$5,200 OBO. Ortiz, 292-0304.

'96 TRAILMANOR TRAVEL TRAILER, 27-ft., excellent condition, garaged, shower, toilet, furnace, refrigerator, awning, range/oven, 2,550 lbs., \$12,500. Hutchins, 856-3361.

BICYCLE, girl's 18-in., offroad style (no suspension), \$100; portable basketball goal, adjustable, \$75. Attermeier, 293-2505.

REAL ESTATE

2-BDR. HOME 1,200 sq. ft., near base NE Heights, great condition, security iron all around, very private, nicely landscaped, solar heating & fireplace, w/2 car garage, \$110,000, motivated seller. Baldonado, 269-7795 or 294-2904.

2-BDR. MOBILE HOME, '85 K&B Baywood, 14' x 56', 1 bath, Four Hills Park, vaulted ceilings, refrigerator, washer/dryer, \$14,000. Haushalter, 275-6772.

2-BDR. PATIO HOME, Mossman, 2-baths, approximately 1,970 sq. ft., vaulted ceiling, fireplace, 2-car garage, near Albuquerque Academy, FSBO, \$169,000. Benham, 792-1264.

STUDIO CONDO, 6057 McKinney Dr. NE, 615 sq. ft., good condition, \$59,000. Gonzalez, 280-5555 or 865-7068, ask for CJ.

3-BDR. MOBILE HOME, Schultz, 3 yrs. old, 28' x 57', excellent condition, 2 baths, large kitchen, walk-in pantry, 20 min. from Kirtland, 3 miles N. 14. Ortega, 352-2597.

3-BDR. MOBILE HOME, '97, 2 baths, w/ wrought-iron windows, located near Kirtland Air Force Base, excellent condition, appliances included, take over payments. Herrera, 319-6310, ask for Richard.

4-BDR. HOME, near Osuna Elementary, new stucco, furnace, bathrooms rebuilt, gated courtyard, covered patio, fireplace, \$150,000. Payne, 291-0124.

2-BDR. MODULAR HOME, 2 baths, Heron Lake, 1.93 acres, panoramic lake views, lake access, \$128,900. Carlyon, 299-2318 or 505-377-6087.

WANTED

TWIN-SIZE WATERBED. Padilla, 292-8936.

PROPANE TANK, 250-or 500-gal., reasonably priced. Heald, 281-7885.

WORKING METAL DETECTOR, must distinguish between valuable & trash metal. Nation, 298-5605.

USED SCUBA DIVING EQUIPMENT, regulator/tank/gauges/wet suit. Evans, 681-4915.

SOUTHWEST AIRLINES VOUCHER, reasonable round-trip ticket to take grandson on trip June 2. Colgan, 344-3776.

HOUSEMATE, for apartment in private home, nice residential area, private entrance, convenient to Sandia, \$350/mo. Smith, 298-7365 or 292-1976.

TEXT, *Understanding Computers:2000*, for College of Santa Fe class, author: Parker. Chavez, 265-7331.

FERTI-LOME or Scott fertilizer spreader; large ice chest. Sorenson, 298-1593.

HOUSEKIT, for someone or rent furnished "mother-in-law's" apartment this summer while mom visits here from Kansas. Kemme, 298-8392.



LOST & FOUND

MAN'S DIAMOND RING, found morning of 4/11 in Bldg. 6630, Area III. Connie, 844-4404.

CROSS TREKKERS RUNNING SHOES, found in parking lot south of 821/823 on April 19. Turner, 845-0480.

READING GLASSES, in red windsurfer case, found in conference room, Bldg. 811. Sandy, 284-3704.



She's baaaaackkk! The *Lab News*' own 'Betty Boop' still slip-slidin' her way toward fitness

By Iris Aboytes, aka Betty Boop

This is a test of the Betty Boop Physical Warning System. When do you feel better about yourself? When you are all put together ready to go out or when you return from working out all sweaty looking like something the dog dragged home?

You got it. You look good because you feel good. And why is that? Because you worked at it.

I know some of you don't have to work at it, and I hate you. Most of us aren't quite that lucky. Chug, Chug, Chug. One step at a time.

The heart is pumping, the music is loud. Hot dog! Then it begins. Step aerobics, that is. So, I miss a few steps. Who cares! Enthusiasm fills your every pore and you're on the jazz.

A basic step, first the left foot, then the right. Leg raises for that tricky part right below your waist and the outer part of your legs. Then kicks. Dimples on the extremities of a humanoid are just not very attractive.

Do we have to do shoulders? I know, I do want square shoulders. Oh no! Not push ups. OK! OK! I'll do them. Triceps dance to different beats in your upper arm identifying themselves as the FBI (flabby bouncing inches), if you don't constantly work at them.

You see, every exercise we do has a purpose. Every move is choreographed for a total-body benefit. You sweat a lot too. That is not planned, it just seems to magically happen.

Why do I enjoy this? Am I crazy? I love the instant energy. It doesn't make sense to me how I can use so much energy and still have so much left over. Why is it that when I don't exercise I have less energy? Go figure.

Stress, the number one culprit for a lot of ailments, seems to lessen or disappear with exercise. Where did it go? It ain't sticking around under these conditions. Stress is too smart for that.

Without thinking, I have taken care of my weight-bearing exercises for the prevention of osteoporosis. People who know me can testify to this. Since I have been doing aerobics, my legs have gotten longer so that means I have gotten taller. Don't laugh! It is still not visible to the naked eye, but it's there.

What have I missed? I have taken care of my heart, stress, blood pressure, bones, muscles, flexibility, strength, cholesterol, and skin. Oh fudge! I forget my abs — those dreaded abom-



JENNIFER HAMRAH and Eileen Burch, SALUD instructors, illustrate use of an exercise ball.



SALUD instructor Eileen Burch teaches an aerobics class on a slide.

(Photos by Randy Montoya)

inables. Crunch, crunch. They start to shake as they realize they are being worked and are running scared. I know stronger abs make a stronger back. Isn't it amazing — all parts work together. Not one stands alone.

All these parts working together create a furnace to burn the fat and retain the nutrients. This is some human machine.

I hope I have impressed you with my depth of knowledge. It's all fake. The knowledge comes from the ¡SALUD! professionals: Eileen, Lisa, Jennifer, and Deb, who work at making exercise fun and enjoyable.

You don't have to do step aerobics. There is swimming, yoga, tai chi, working out at a gym, hiking, playing baseball or softball. How about an evening walk with your spouse?

¡SALUD! is sponsoring Employee Health and Fitness Day — Fitness Fever — Catch It! Come and find out for yourselves what it is you enjoy. If you try something and don't like it, you've lost nothing. If you don't try, you've lost everything.

Fitness Fever

Fitness Fever - Catch It!

May 17, 11 a.m.-1 p.m., Hardin Field

Get moving with ¡SALUD!

Complete 3 of 5 (15-minute) activity stations for an event T-shirt

- ¡SALUD!
- Kickboxing
- Strengthening and Toning
- Stretching
- Abs/low back
- Pilates
- Yoga
- Tai Chi
- Walking

Stop by our vendors' tents for information on Sandia's Safety Campaign, Sandia Bicycle Commuters Group, Sandia's Running and Fitness Club, and SERP.

Ask Dr. Larry Clevenger, Sandia's Medical Director, for a Healthy People 2010 prescription.

Coronado Club

May 4 — Cinco de Mayo celebration. Dining, 6-8 p.m.; dancing, 6:30-10:30 p.m. Music by Spinning Wheel Band. Special entertainment by Miguel Caro Mexican Dancers — performance at 7:30 p.m. Make reservations by calling 265-6791.

May 3, 10, 17 — Bingo.

May 13 — Mother's Day brunch. Seating times start at 10:30 a.m. with 40 seats available every 15 minutes.

May 18 — Friday night dinner. Dining, 6-8 p.m.; dancing, 6:30-10:30 p.m. Music by Topaz.

May 24 — Retiree picnic, 11 a.m.

Feedback

Q: I read with interest the recent Lab News article on people-management skills. It is great that these skills are more widely recognized and rewarded for our managers. I appreciate it being part of management PMFs. However, it is my understanding that there is now a requirement on promotional candidates to have an advanced degree (engineering is fine) before becoming a manager. An advanced engineering degree does not teach you people-management skills. As Paul Robinson stated at the first managers' conference in April 1996, this is like promoting Michael Jordan to coach. While making managers accountable for people-management skills is a step in the right direction, why not make it a higher requirement than an advanced degree when it comes to promotions? In the 1990s we hired a lot of great bachelor's degree-level people. Many of these have acquired a great deal of knowledge and skills that could make them excellent managers. They are now refused interviews for promotions due to this requirement.

A: The credentials required for any management position depend upon the nature of the specific job. For an employee to be promoted, he or she must have completed the pre-management curriculum offered at the Labs. There are no corporately mandated requirements that candidates must have advanced degrees in order to be considered for management positions. However, such educational credentials may be important factors in some jobs.

— Don Blanton (3000)