August 19, 2005 • Vol. 57, No. 17

Sandia LabNews

President Bush visits Sandia

Coverage begins on page 3

What's what

Those who were at the Solar Tower or Steve Schiff Auditorium Aug. 8 can be pretty sure President Bush actually paid a visit to Sandia that day, along with Sens. Pete Domenici, R-N.M., and Jeff Bingaman, D-N.M., DOE Secretary Samuel Bodman, and others. They all appeared in television and newspaper reports on the day's activities, which centered on the president's signing the Energy Policy Act of 2005.

If that wasn't enough proof, print and broadcast pundits pontificated for the next couple of days on what they considered to be the good and bad points of the legislation, and it continued to be a point of discussion when crude topped $66 a barrel three days later.

But the real proof of the visit came just over 48 hours afterward when President Bush, Labs Director Tom Hunter, et al. showed up on the *Tonight* show with Jay Leno, seeming, in a quick video bite (http://www-irn.sandia.gov/pubs/video/tonightshow_080805.wmv), to look up from Sandia's solar facility as a Dukes of Hazard car sailed over them. It's all showbiz these days, you know, and when an event is spoofed on Leno's or David Letterman's show, you can be certain it happened.

And by the way, don't miss the *Lab News'* extensive print and photographic coverage of the president's visit, starting on the front page of today's edition.

* * * * *

Language is always a popular subject, and the word-origin note in the last edition confirmed that. Several readers took the time to weigh in on "posh" and "golf," prepositions, and other fine points.

Retiree Don Goodrich wrote that he believes "mind your Ps and Qs" was an admonition to apprentice printers, not a scold from British pub bartenders to revelers to watch their pints and quarts.

About the origin of "posh" and "golf," Tom Laub (1341) did what we all do these days: He Googled them. And he came up with http://www.wordorigins.org/wordorp.htm about posh and http://www.scottishgolfhistory.net/origin_of_golf_terms.htm about golf.

"Both (of the What's what suggestions about their origin) sound reasonable," he wrote, "but, alas, are disputed."

* * * * *

And self-described "wordie" Ashley McConnell (10335) recommends http://www.worldwidewords.org/index.htm, "which will tell you many delightful things about the origin of words – including golf."

Claims that word origins are acronyms are almost always spurious, she writes. "Well-known examples are said – incorrectly – to be derived from the initial letters of 'Constable On Patrol,' 'Port Out, Starboard Home,' and 'To Insure Promptness.' In fact, there's no known example of a word being generated as an acronym before the beginning of the 20th century (and they were rare until the inter-war years)."

Ashley also says her research shows that there's a Scots word "gowf" for a blow or slap, "but the experts think this probably comes from the game, rather than being its source. The name of the game may be related to a Dutch word kolf for a club or bat.

"Alas, another urban legend bites the dust (haven't deconstructed that one yet, but I have hopes)."

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

Sandia LabNews

Sandia National Laboratories

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LOCKHEED MARTIN

Employee death

Eddie Lopez of Custodial Services Dept. 10848-4 died unexpectedly Aug. 6.

He was 37 years old.

Eddie worked as a custodian and had been at Sandia since October 2004.

He is survived by his wife Sarah Salazar, sons Adam Lopez, Felix Salazar, and Jerome Salazar, and daughter Jennifer Salazar.

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A note to readers

Readers will notice that a large proportion of this expanded *Lab News* is devoted to the president's visit to Sandia. As a result, some news and features on other subjects that we had intended to publish had to be held. They will appear in the next issue. For this issue only, the California page is moved to page 13. *—Editor*

On the cover . . .

LAB NEWS photographer Randy Montoya took this photo of President Bush during his tour of Sandia's solar facilities Aug. 8 with, from left, Sen. Jeff Bingaman, Labs Director Tom Hunter, Energy Secretary Samuel Bodman, and Sen. Pete Domenici.

Management Promotion

New Mexico

Carla Chirigos from PMLS, Manufacturing S&T Business Operations Dept. 14032, to Manager of the department.

CARLA CHIRIGOS

Since joining Sandia in September 1976, Carla has had a wide variety of assignments within the technology and business community. She began her career at Sandia in the Materials Processing Apprenticeship Program as a represented employee and later as a technologist in the ceramics and glass department performing thermal analytical measurements and glass-to-metal sealing. When centers developed business offices, Carla became involved in program development activities such as the Technology Transfer Program, National Machine Tool Partnership and the Manufacturing Extension Program. Carla has served as the Manufacturing Science and Technology Center business administrator for the past six years prior to her reclassification as manager.

Carla has a bachelor's degree in education from NMSU, an associate's degree in material technology through the Sandia Technical Equivalency Program, and an MBA from the College of Santa Fe.

Retiree deaths

Francis Daut (age 79) . . . . . .April 13
John O. Weeks (79) . . . . . .June 29
Vernon O. Henning (87) . . . . . .July 2
William W. Peters (87) . . . . . .July 3
Henry T. Martinez (65) . . . . . .July 5
Gordon "Gordo" L. Miller (81) . . . . . .July 5
Colin E. Hackett (62) . . . . . .July 12
Verna Ann Clark (82) . . . . . .July 16
N. Carroll Lowe (90) . . . . . .July 17
Dale Wesley Goens (88) . . . . . .July 18
Johnny R. Chavez (74) . . . . . .July 18
Quirin F. Simon (90) . . . . . .July 18
Nasario G. Romero (84) . . . . . .July 25
William P. Morales (87) . . . . . .July 29

PRESIDENT GEORGE W. BUSH addresses a Sandia audience at the Steve Schiff Auditorium on Aug. 8. Sharing the stage with the president are, from left, Rep. Joe Barton, R-Texas, Sen. Pete Domenici, R-N.M., Sen. Jeff Bingaman, D-N.M., Energy Secretary Samuel Bodman, Rep. Steve Pierce, R-N.M., and Rep. Ralph Hall, R-Texas. (Photo by Bill Doty)

To all Sandians

from Labs Director Tom Hunter

Photo by Randy Montoya

I am writing this note a few hours after the visit of our president, George W. Bush, to Sandia. The president chose Sandia as the location to publicly declare our nation's policy on energy and to sign legislation that advances that policy.

We all recognize the enormous impact our senators from New Mexico, Pete Domenici and Jeff Bingaman, had on the shaping of the Energy Policy Act of 2005. We also know of the leadership Senator Domenici has shown in working towards this historic bipartisan agreement. The president signed this bill in the Steve Schiff Auditorium, Aug. 8, 2005, at 11:30 a.m. It now becomes the law of the land. The signing was witnessed by our Secretary of Energy, Dr. Samuel Bodman, and the leaders from both the House and Senate who framed the legislation.

"It was my good fortune and privilege to represent each of you on this important day."

In his remarks, President Bush commented on the people at Sandia and our efforts to keep our nation strong and secure. Just as New Mexico so greatly contributed to our nation's past, so it is certainly contributing to its future. It was my good fortune and privilege to represent each of you on this important day. I had an opportunity to speak directly with the president on energy and other matters that are so important to our country. I have always carried with me an intense pride to be associated with Sandia and its people. I was overwhelmed by that sense of pride and the way each of you

(Continued on page 5)

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Sandia National Laboratories

Managed by Lockheed Martin for the National Nuclear Security Administration

President Bush visits Sandia, signs sweeping energy bill

Labs' 'most terrific day' includes presidential tour of solar facility

By Bill Murphy

Seated before a huge sky-blue-cloud-and-silver photograph of a Sandia solar collector array, President George W. Bush signed the Energy Policy Act of 2005 into law last week at Sandia's Steve Schiff Auditorium. He said the bill's provisions will make America less reliant on foreign energy sources, encourage more environmentally friendly energy usage, promote nuclear, solar, and other alternative energy sources, boost the nation's recovering economy, and keep the American homeland safer and more secure.

"The Energy Policy Act of 2005 is going to help every American who drives to work, every family that pays a power bill, and every small business owner hoping to expand," the President said. (See "This bill I sign today . . ." on page 5.)

The energy bill is a massive and sweeping document; in its 1,724 pages it addresses the huge, interrelated web of issues that constitute "energy" in a 21st-century economy.

"After years of division and debate, Congress has passed a good bill. It's my honor to come to the great state of New Mexico to sign it," Bush told an audience of VIPs, White House guests, national and local media, and some 100 or so Sandians, many selected by lottery, to attend the historic signing. Bush previously had promised Sen. Pete Domenici, R-N.M., that if the senator could shepherd an energy bill through Congress, Bush would sign the bill at Sandia in Domenici's hometown of Albuquerque.

"Thanks very much for the warm welcome. I appreciate you treatin' a neighbor from Texas so kindly," said President Bush to the standing room only crowd as he entered the auditorium. "I'm

(Continued on page 4)

More coverage . . .

Sandia-created sensor finds loose gap filler on Discovery *during return-to-flight mission. Story on* ***page 12.***

DHS Secretary Michael Chertoff meets with Labs Homeland Security scholars. Story on ***page 13.***

President Bush

(Continued from page 1)

really proud to be here with the men and women of the Sandia National Laboratory."

President Bush's visit was the first to Sandia by a sitting president since his father, George H.W. Bush, came to the Labs during the 1992 presidential campaign (see story below).

Bipartisanship at its best

In 18 minutes of prepared remarks before the signing, Bush praised the bipartisan nature of the effort, singling out Domenici, Sen. Jeff Bingaman, D-N.M., and U.S. Rep. Joe Barton, R-Texas, for special thanks. Domenici is chairman of the Senate Committee on Energy and Natural Resources; Bingaman is the ranking minority member. Barton is chairman of the House Energy and Commerce Committee and chaired the House-Senate conference committee on the energy bill.

"The bill is the result of years of effort," Bush said. "It is the result of good folks coming together, people who have made a commitment to deliver results for the American people. This bill launches an energy strategy for the 21st century, and I've really been looking forward to signing it."

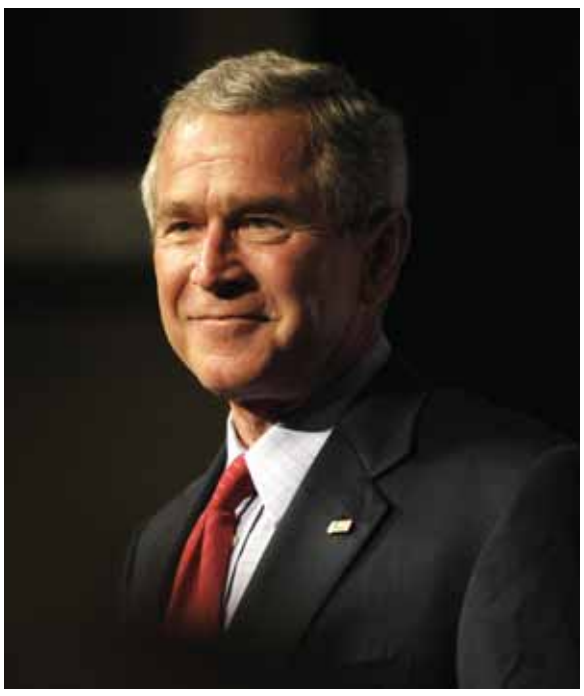
'Once Pete makes up his mind'

"I appreciate Pete Domenici's leadership on this bill. You know, he's the kind of fellow, when he makes up his mind to do something it's hard to stop him. And as Pete said, he's worked on a lot of energy bills in the past; some of them were signed by presidents and some of them never made it to the desk. But he's been dogged in his determination to get a bill done, and he found a really fine partner in Joe Barton."

Domenici, who has been working toward this culminating moment for years, came out onto the stage with President Bush and introduced the president as being the indispensable factor in the successful passage of the bill.

"It's been a long time coming, but today we finally have a national energy policy," Domenici said. Domenici also noted the bipartisan nature of the bill. Addressing Sen. Bingaman, who was seated on the stage with other dignitaries (including Energy Secretary Samuel Bodman), Domenici said, "You and I, Jeff, were able to resist intense partisan pressure in the Senate. We pledged to work together, and we kept that pledge."

President Bush also noted Bingaman's vital role: "Jeff Bingaman gets a lot of credit, as well. He knows the subject matter in the bill, and he's a proven leader on issues such as conservation and efficiency and renewable fuels and research and development. And, Jeff, I, like Pete, want to congratulate you for a job well done, and thank you for being here."



PRESIDENT GEORGE W. BUSH at Sandia.
(Photo by Randy Montoya)

In a news release issued concurrently with the bill signing, Bingaman said, "I am glad to see this legislation signed into law. It represents significant progress and it gives me hope that in the months and years ahead that we can make even greater progress . . . towards national energy security."

A balanced bill

Energy Secretary Samuel Bodman, whom President Bush praised as the right person at the helm to advance the provisions of the bill, said at the time of the bill's passage, "By encouraging greater efficiency, increased energy production in an environmentally responsible way, and encouraging investment in our nation's outdated energy infrastructure, this bill takes a balanced approach and embodies the right priorities for the American people."

President Bush in his remarks echoed the theme of balance. Addressing the nation's multifaceted energy-related issues, he said, "required a balanced approach. And that's the spirit that Pete and Jeff and Joe took to the floors of their respective bodies. They recognized that we need a comprehensive approach to deal with the situation we're in. In other words, we need to conserve more energy; we need to produce more energy. We need to diversify our energy supply, and we need to modernize our energy delivery. And so they worked hard and listened to a lot of good ideas, and they've taken really important steps [with this bill]. . . .

"The bill I sign today is a critical first step. It's a first step toward a more affordable and reliable energy future for the American citizens. This bill is not going to solve our energy challenges overnight. Most of the serious problems, such as high gasoline costs, or the rising dependence on foreign oil, have developed over decades. It's going to take years of focused effort to alleviate those problems. But in about two minutes, we're going to have a strategy that will help us do that."

Touring solar facilities

Before signing the energy bill, the president received a tour of Sandia's solar tower facility and a briefing from Labs Director Tom Hunter about Sandia's energy-related work (see "August 8 a great day for solar power technologies" on page 7).

"We just had a fascinating tour of the [solar] facility," President Bush said. "It was a little quick, but I learned a lot, and I want to thank Tom Hunter for his hospitality and his enthusiasm for the projects that go on here, and his praise for the people who work here. . . . I know full well that the work you do here keeps our military strong, it keeps our nation competitive, and our country is really grateful for your dedication and for the fact that you lend your expertise into helping Americans."

Under the overall leadership of Les Shephard, VP for Energy, Security, and Defense Technologies, dozens of Sandians from departments across the laboratories worked long hours during the previous week preparing for the president's visit (see "What does it take to make a presidential visit happen?" on page 10).

"There just couldn't be a prouder time for Sandia," Tom Hunter told the *Lab News* after the signing ceremony. "The president got a glimpse of Sandia, the people, the work, and the commitment we bring to what we do. He's a president who truly understands the importance of energy and the role it plays in our nation's security and well-being and its role in the world.

"I couldn't be more proud of the people who worked so hard to make this day possible. Senators Domenici and Bingaman, of course, have worked toward this for years, and our team of folks led by Les Shephard has helped make this the most terrific day in our history."

Bush 41, JFK visited Sandia; Clinton came during campaign

PRESIDENT JOHN F. KENNEDY visited Sandia in 1962; here he examines a Vela satellite with Labs President Monk Schwartz and AEC chairman Glenn Seaborg.

George W. Bush is the third sitting president to visit Sandia.

His father, President George H.W. Bush, came to Sandia on Sept. 15, 1992, and spoke for about 20 minutes to an estimated 3,500 Sandians in front of Bldg. 800. He thanked them and all DOE national labs workers and their predecessors for the contributions over the decades that brought an end to the Cold War.

"I can stand before this wonderfully productive and patriotic audience this afternoon and say something no president has ever said before: The Cold War is over, and freedom finished first," he said. "I've come here today on behalf of all Americans, on behalf of all who love freedom, to say thanks to you, thanks to the men and women of Lawrence Livermore, Los Alamos, and Sandia — you were the scientific saviors of the free world." (*Lab News*, Sept. 18, 1992)

Prior to his speech then-Sandia President Al Narath hosted President Bush on a tour of the Intelligent Systems and Robotics Center (Robotics Lab), then located about a block west of Bldg. 800. That 30-minute tour included a demonstration of a noninvasive glucose sensor, RETRVIR (the Remote TeleRobotic Vehicle and Intelligent Retrieval) device, a swing-free gantry crane, and other exhibits.

Prior to the first President Bush's formal remarks, Al Narath presented him with a gift from Sandia — a scale-model plow fashioned from material taken from a Mod-0 B-61 nuclear weapon that was assembled in 1968 and removed from the US stockpile in early 1992 and disassembled. That action, the inscription explained, occurred "as a direct result of President Bush's September 27, 1991, address to the nation. During that address he announced unilateral nuclear weapon reductions and challenged the Soviet Union to respond."

President John F. Kennedy made a brief visit to Sandia in the early dusk of Dec. 7, 1962. Several thousand Sandians stayed after work to greet the president. Then he went into a classified briefing in the training area of Bldg. 892. Earlier in the day, Kennedy visited Los Alamos Scientific Laboratory. Kennedy was accompanied by Presidential Science Advisor Jerome Wiesner, AEC chairman Glenn Seaborg, and a large official party. Sandia President Monk Schwartz gave Kennedy a 45-minute briefing on Sandia's weapons, PAL (permissive-action link), and satellite verification projects. Sandia executives Robert Henderson and Glenn Fowler described Sandia's programs to others in the official party and the media. In what was considered the most impressive event of the briefing, Kennedy held and intently examined a PAL device.

Bill Clinton visited Sandia on Sept. 18, 1992, while campaigning for president, a campaign he won in the election that November. His visit came only three days after that of then President Bush's (see above) and was made because of his expressed desire to learn more about Sandia's "technical programs, particularly those efforts that we believe can help enhance US economic competitiveness through technology transfer."

PRESIDENT GEORGE H.W. BUSH visited the Labs in September 1992. He spoke to employees assembled in front of Bldg. 800 before wading into the crowd for handshakes.

Upon his arrival at Sandia, then–Arkansas governor Clinton traveled first to the Microelectronics Development Laboratory for a short tour and briefing, hosted by Al Narath, "about Sandia's contributions to and interactions with US industry and our emphasis on advanced manufacturing and environmentally conscious manufacturing." Clinton then presented a colloquium (town hall style, which he used often during his campaign) in the TTC. Representative employees from throughout the Labs served as panelists for the discussion and they prepared questions on key issues that "will likely concern all Sandians in looking toward the future." A news release issued by "Clinton-Gore 1992" on the day of his visit to Sandia was headlined "Technology: The Engine of Economic Growth."

Narath presented Clinton with a handsomely mounted printed circuit fabricated in the MDL using environmentally conscious manufacturing.

— Rod Geer, Chris Miller, and Ken Frazier

‘This bill I sign today . . .’

Energy bill particulars: Provisions boost conservation, alternative energy, nuclear, clean coal, infrastructure

PRESIDENT BUSH signs the Energy Policy Act of 2005 at the Steve Schiff Auditorium. Joining him for the ceremony are, from left, Rep. Ralph Hall, Rep. Joe Barton, Sen. Pete Domenici, Sen. Jeff Bingaman, Energy Secretary Samuel Bodman, Rep. Steve Pierce. (Photo by Randy Montoya)

In his remarks, President Bush offered his perspective on the details in the 1,724-page Energy Bill. Here are some of the high points touched on by the president:

“First, the bill makes an unprecedented commitment to energy conservation and efficiency — an unprecedented commitment. . . . The bill recognizes that America is the world’s leader in technology, and that we’ve got to use technology to be the world’s leader in energy conservation. The bill includes incentives for consumers to be better conservers of energy. . . . Energy conservation is more than a private virtue; it’s a public virtue. . . .

HYDROGEN gets a boost in the new energy bill. It’s an area where Sandia is involved in vital research.

“Second, this bill will allow America to make cleaner and more productive use of our domestic energy resources, including coal, and nuclear power, and oil and natural gas. By using these reliable sources to supply more of our energy, we’ll reduce our reliance on energy from foreign countries, and that will help this economy grow so people can work. . . . [T]he bill I sign today authorizes new funding for clean coal technology so we can move closer to our goal of building the world’s first zero emission coal-fired power plant. . . .

“Nuclear power is another of America’s most important sources of electricity. Of all our nation’s energy sources, only nuclear power plants can generate massive amounts of electricity without emitting an ounce of air pollution or greenhouse gases. . . [The bill] offers a new form of federal risk insurance for the first six builders of new nuclear power plants. With the practical steps in this bill, America is moving closer to a vital national goal: We will start building nuclear power plants again by the end of this decade.

Photo by Randy Montoya

WIND ENERGY and other alternative sources of energy (solar, geothermal, and others) get a breath of fresh air in the 2005 energy bill.

“. . . The energy bill makes practical reforms to the oil and gas permitting process to encourage new exploration in environmentally sensitive ways.

“[It] authorizes research into the prospects of unlocking vast amounts of energy now trapped in shale and tar sands. . . . It includes tax incentives to encourage new construction of natural gas pipelines. . . [and] it clarifies federal authority to site new receiving terminals for liquefied natural gas. . . .

THE BILL features major new incentives for nuclear energy.

“Thirdly, the bill I sign today will help diversify our energy supply by promoting alternative and renewable energy sources. The bill extends tax credits for wind, biomass, landfill gas, and other renewable electricity sources. The bill offers new incentives to promote clean, renewable geothermal energy. It creates a new tax credit for residential solar power systems.

“The bill also will lead to a greater diversity of fuels for cars and trucks. The bill includes tax incentives for producers of ethanol and biodiesel . . . . Using ethanol and biodiesel will leave our air cleaner. And every time we use a home-grown fuel, particularly these, we’re going to be helping our farmers, and at the same time, be less dependent on foreign sources of energy.

“The bill I sign today also includes strong support for hydrogen fuel technology. . . . The goal of the research and development for hydrogen-powered automobiles is to make it possible for today’s children to take their driver’s test in a pollution-free car.

“Fourth, the energy bill will help ensure that consumers receive electricity over dependable modern infrastructure. . . . We have a modern interstate grid for our phone line and our highways. With this bill, America can start building a modern 21st-century electricity grid, as well.”

A letter to Sandians

(Continued from page 1)

makes such a difference in our service to the nation.

This is also a day for all of us in the DOE community to reflect on the breadth of contributions we make to the safety and security of our country. The laboratories, especially, should never doubt the enormous role played in melding science and service to meet our nation’s most pressing challenges. I invited the other DOE lab directors to this event in part because of their labs’ collective contributions to the nation’s energy portfolio, but also because I believe it is important for the nation to know that we stand together to positively impact its future.

I will forever hold this day as a high point in my career at Sandia and certainly an absolute pinnacle in my pride about Sandia. Yet, I remind myself daily that those who are given much should expect to give more in return. We can take this opportunity to feel good about the privilege of this event, but also to rededicate ourselves to the nation’s future. We must now help the president and Secretary Bodman turn the new energy policy into action. They are counting on us. Knowing you as I do, I am sure their confidence is not misplaced.

Pre-ceremony presentation highlights Labs' energy R&D

LED lighting, electrification of tribal lands, hydrogen future, relationship of energy generation and water

Because of security and logistics considerations mandated by the White House and Secret Service, most of the attendees for President Bush's appearance at the Steve Schiff Auditorium were in their seats some two hours before the 11 a.m. start of the Energy Bill signing ceremony.

DEPUTY LABS DIRECTOR for Integrated Technology Programs Al Romig introduced the speakers.

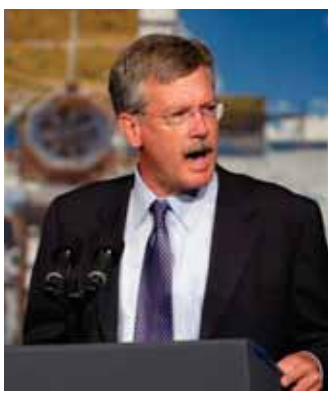
Making a virtue of necessity, Sandia's event planners developed a half-hour presentation for the long-seated audience, highlighting some of the Labs' energy-related research. Presenters, introduced by Labs Deputy Director for Integrated Technology Programs Al Romig, included Div. 6000 VP Les Shephard and Sandia innovators (as Les called them) Jerry Simmons, Sandra Begay-Campbell, Peter Davies, and Terry Michalske.

Les first offered high-level comments putting the nation's energy requirements in a Sandia context. He cited some energy-related facts:

- By 2025 world energy consumption will grow by 40 percent.
- By 2025 the United States will import 70 percent of its oil.
- Electric power generation requires more than 40 percent of all fresh water used in the United States.
- In one month enough solar energy falls on the State of New Mexico to power the United States for one year.
- One out of seven Native American households does not have access to electricity — this compares with one out of a hundred for the rest of the United States.
- Nuclear power produces 20 percent of the electricity generated in the United States — with no greenhouse gases.
- Hydrogen offers the potential for independence from imported oil — without carbon emissions.
- Lighting consumes 20 percent of all electricity.

Second semiconductor revolution

Jerry Simmons spoke of what he called "a second semiconductor revolution." The first was the transition from vacuum tubes to solid state electronics. The next, Jerry said — and it is well under way — is the transition from vacuum tube-based lighting to solid state lighting. In making his point, Jerry noted that part of the long-term solution to burgeoning global energy demands over the next century will be to improve the efficiency of existing technologies. And, Jerry noted, "If you look around for where new energy-efficient technologies could have a big impact, lighting really stands out. About 20 percent of electricity is used for lighting. But fluorescents are only 25 percent efficient, and incandescent bulbs — the Edison light bulb — are only five percent efficient. Lighting is incredibly wasteful! Why can't we do better?"



JERRY SIMMONS

He praised aspects of the Energy Policy Act of 2005 that continue support for the Next Generation Lighting Initiative.

Energy needs of tribal homelands

Sandra Begay-Campbell caught the audience's attention by noting that even today having electric power in your home is not a given.

ENERGY SECURITY FOR THE 21ST CENTURY

PUTTING ENERGY IN CONTEXT — Div. 6000 VP Les Shephard, whose portfolio includes many of the Labs' alternative energy programs, offered the audience at the Steve Schiff Auditorium an overview of the issues addressed in the Energy Policy Act of 2005. At right is Deputy Labs Director for Integrated Technology Programs Al Romig. (Photos by Bill Doty)

"I grew up only a few hours drive from Albuquerque and it was an exciting day when one of my grandmothers received electricity for the first time. We made a special visit that night, just to see her shiny new porch light. This basic need for infrastructure and to solve community problems sparked my interest in engineering.

SANDRA BEGAY-CAMPBELL

"As I drive hours on rural dirt roads, I am proud to show people who are interested in tribal energy issues the photovoltaic and small wind turbines that provide electricity to many Navajo people. These technologies provide a viable electrification option, which fits in well with the Navajo culture."

Sandra, a member of the Navajo nation, said she has high hopes that the Energy Bill's provisions addressing the energy needs of tribal lands will "foster energy development and electrification of Indian country."

Water and power generation

Peter Davies focused on a subject widely overlooked in discussions about energy — the staggeringly high demands that electricity production puts on fresh water resources.

PETER DAVIES

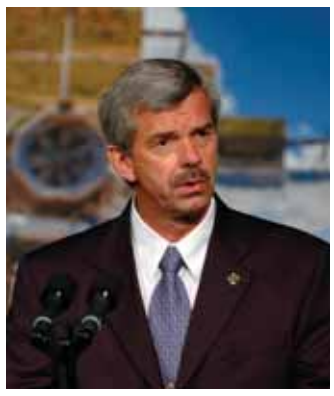
"Today is a typical day across the United States," Peter said, "and on a typical day we import about 12 million barrels of oil. On a typical day, we also withdraw about 3 billion barrels of freshwater from our rivers, lakes, and aquifers in order to generate electricity. This water is used in coal, gas, and nuclear power generation plants across our country. This water is essential for power generation. No water, no electricity."

Just three percent of that water is actually consumed, Peter noted, but explained that it contains waste heat — a byproduct of the generation process — that must be dissipated.

"The impact of this critical energy-water interdependency will grow in the future. . . . Therefore, we must develop more water-efficient power generation technologies, develop alternative sources of water, and bring on line renewable technologies that do not require water." The Energy Bill authorizes DOE to carry out research on the issue.

Imagine a hydrogen-fueled future

Terry Michalske discussed the nation's potential hydrogen future, noting that the transition from fossil-fuel based energy for transportation to a hydrogen-based approach calls for vision, leadership, and commitment. Terry said President Bush has provided the vision for the hydrogen future, while the Energy Bill provides the leadership and commitment.



TERRY MICHALSKE

"Imagine a future where the currency of world energy is measured in kilograms of hydrogen instead of barrels of oil," Terry said. "Imagine a world where driving your car to work or turning on the lights in your house adds no pollutants to our environment. Imagine a world where every nation can pursue its own energy independence.

"This is the vision of hydrogen . . . but significant technological challenges stand between us and that future."

Terry noted that Sandia is well-positioned to work with industry, academia, and other national laboratories to address those technical challenges; in fact, it is already doing so.

"I'm excited by the possibility of using nuclear and solar technologies to produce hydrogen without adding carbon to the atmosphere," he said. "We may even use nanotechnology to mimic the fundamental processes of biology and convert light directly into hydrogen fuel."

Following the presentations, a video produced by Sandia's Video Services Department especially for the event, "Energizing America," offered more highlights of Sandia's wide-ranging energy work and provided an overview of many other areas of Sandia research.

August 8 great day for solar power technologies

President Bush, Secretary of Energy Bodman, Sens. Domenici and Bingaman see different Sandia solar power technologies; solar researcher Chuck Andraka called out by president to shake hands

By Chris Burroughs

Monday, Aug. 8, was a great day for concentrating solar power technologies, says Sandia researcher Chuck Andraka (6218).

That was when Labs Director Tom Hunter showed off Sandia's different solar power technologies, and in particular six Stirling Energy Systems solar collector dishes, at the Sandia-operated, DOE-owned National Solar Thermal Test Facility to President George W. Bush. Also on hand for the tour were Secretary of Energy Samuel Bodman and US Sens. Pete Domenici, R-N.M., and Jeff Bingaman, D-N.M.

Taking center stage in preparing for the president's visit to the solar facility was Chuck, the lead engineer who has been involved from the beginning in planning, constructing, and calibrating the six Stirling units. Filling critical supporting roles were the employees who work at the Solar Thermal Test Facility in Dept. 6218, located south of Tech Area 3. Behind the scenes, efforts by Sandia's facilities, safety, security, media relations, and graphics arts groups also helped make the presidential tour a success.

The six-dish mini power plant — the largest array of solar dish-Stirling systems in the world — works together to provide enough grid-ready solar electricity to power more than 40 homes. They produce up to 150kW of grid-ready electrical power during the day. Sandia and Stirling Energy Systems (SES), which owns the dishes, worked together over the past several months to assemble and test the state-of-the-art systems.

Chuck says he was recalled early from his August vacation for a "security issue."

"I had no idea what I was getting into," Chuck says. "When I arrived, Margie Tatro [director of Energy, Infrastructure, & Knowledge System Center 6200] and VP 6000 Les Shephard told me that the president was coming and they wanted to see Solar Tower activities, and especially the SES dishes. We immediately began a weeklong preparation for the visit. Les was enthusiastic, and that became contagious."

A Sandia team spent 12-hour days cleaning the mirrors on the dishes, rewriting scripts, moving equipment, and testing operations. They covered safety, security, choreography, press opportunities, and many other angles.

Tom was tapped to give a briefing to the president on the Solar Tower activities prior to the president's going to the Steve Schiff Auditorium to sign the new energy bill. Margie, Rich Diver, Jeff Nelson (manager of Solar Technologies Dept. 6218), and Chuck wrote and rewrote a script for Tom, who "proved to be a quick and enthusiastic study."

"He anticipated a lot of possible questions, and we supplied him with a continuous flow of factoid sheets," Chuck says. "We were faced with two to three walkthroughs per day, each with different challenges such as security, photo angles, technical details, and personnel. It was a joy working with Tom, Les, and Margie throughout the preparations."

Chuck says Les was the "image man."

"He insisted on an American flag to be reflected in the dishes," he says. "On Friday we had one FedExed from Colorado."

Daniel Ray and J.J. Kelton (both 6218) spent the day hanging the huge flag on the side of the building, keeping safety in mind throughout. Chuck says Les was elated and then asked "where were the thunderbirds." They quickly found the appropriate thunderbird decals and, with guidance from Sandia's media relations staff, affixed them to some equipment as well.

Ten minutes before the president arrived at the Solar Thermal Test Facility, Margie and Chuck briefed Secretary Bodman on Sandia's solar technologies.

"Everything went smoothly for the president's visit," Chuck says. "We had contingencies for every possible failure scenario, but needed none. Tom did a great job covering our technologies, even pointing out the windows where the rest of the staff was located so the president could wave to them."

The president was so engaged in the Stirling Energy Systems units he wanted to know who was the primary technical lead working on the project. Tom looked in Chuck's direction, but told the president he couldn't immediately find him because

(Continued on page 12)

A FRIENDLY HANDSHAKE — President Bush shakes Sandia researcher Chuck Andraka's hand during his Aug. 8 visit to the National Solar Thermal Test Facility. The president wanted to know who was the primary technical lead working on the Stirling Energy Systems units and waved Chuck to come out and see him. Also on hand are Labs Director Tom Hunter, left, Sen. Pete Domenici, and Sen. Jeff Bingaman. In the back is Secretary of Energy Samuel Bodman. (Photo by Randy Montoya)

SES to partner with California utility

SES to partner with Southern Cal Edison to build 20,000 solar-dish engine units like those demonstrated during president's visit.

Story on ***page 12.***

Getting ready for the president

Getting ready for the president was an experience like none other, says Chuck Andraka (6218), and it involved most of the people who work at the National Solar Thermal Test Facility.

Some included:

• Margie Tatro (6200), who coordinated planning for the entire visit, spearheaded the script writing effort, and arranged timely support in many areas.

• Doug Brosseau (6218), who worked with White House Communications, the Secret Service, and Facilities staff and provided critical safety and security reviews.

• John Quintana (6218), Chuck's "right hand man," who assisted with preparation of dish/engines, movement of equipment, site cleanup, and staging of displays.

• Rich Diver (6218), who assisted with technical logistical preparations for the dish/engines and safety coordination for the event and provided substantial input to the script.

• Gary Thomas of Stirling Energy Systems (SES), who cancelled his plans to go home for the weekend and worked long hours to operate the systems for the various preparatory walkthroughs and dry runs.

• Cheryl Ghanbari, Robert Edgar, Ernie Trujillo, Kye Chisman, Mike Usher, Blaine Emms (all 6218), and others, who ensured the heliostat field for the tower was operational and could be positioned for the best photo opportunities.

• Jeff Nelson, manager of Solar Technologies Dept. 6218, who assisted with overall coordination of the event with upper management and staff at the National Solar Thermal Test Facility, including contributing to the script.

• Joe Tillerson, who returned from his DOE assignment for the weekend to assist with final preparations.

• Daniel Ray and J.J. Kelton (both 6218), who put up displays, hung the flag, and built fixtures and stands without formal drawings with rapid turnaround.

• Loula Killian (6032), who coordinated with White House Communications, Sandia Security, Facilities staff, and management.

• Andrew Frank, Al Morales (both 6218), and John Everton of SES, who cleaned mirrors and installed logos and generally prepared the field for the best appearance.

• Moss Tallant and Wayne Potter of Building Management Dept. 10864, who worked through the entire week and weekend arranging facilities.

• Don Joe (10322) and Vincent (Marty) McRoberts (6200), who provided critical ES&H reviews throughout the planning process.

• Jimmy Lloyd (6218), who assisted with technical logistical preparations for the dish/engines, photography, and overall support.

• Gerry Rodriguez of SES, who ensured the engines were ready to run without hiccups.

• Mary Jo Baucom (6218), who provided administrative support and communication throughout the planning and execution of the event.

• Tim Moss (6218), general support for site preparation and project engineer on rotating platform.

• Renee Dillow (6218), who provided front office support and assisted with communication.

• Paul Veers, manager of Wind Energy Technologies Dept. 6214 and Jose Zayas (6214); Ward Bower (2731, photovoltaics); Craig Tyner, manager of Geothermal Research Dept. 6211, David Raymond, Jim Grossman, Joe Henfling, Pat Gronewald, and Elton Wright (all 6211); and several people from Margie Tatro's center office.

SES dishes 'front and center' for whole visit

Chuck Andraka (6218) says the Stirling Energy Systems dishes were "front and center" for the whole day, including the Solar Tower tour and as the large photographic backdrop at the Steve Schiff Auditorium where President Bush signed the energy bill.

While at the tower, the president's photo opportunity was directly in front of the dishes with the tower in the background. The flag and other points of interest could be seen reflected in the mirrors.

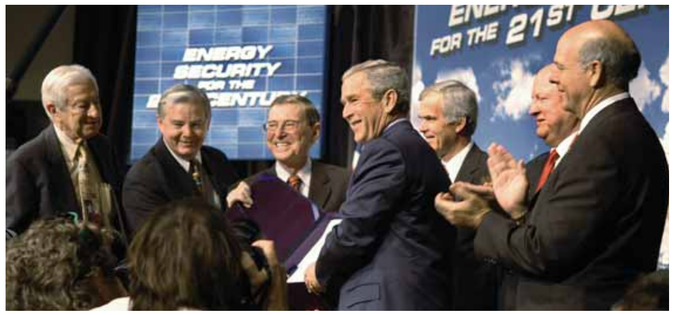
An SES engine was also placed in the foreground and Labs Director Tom Hunter got to "pop the hood and show the engine to the president," Chuck says.

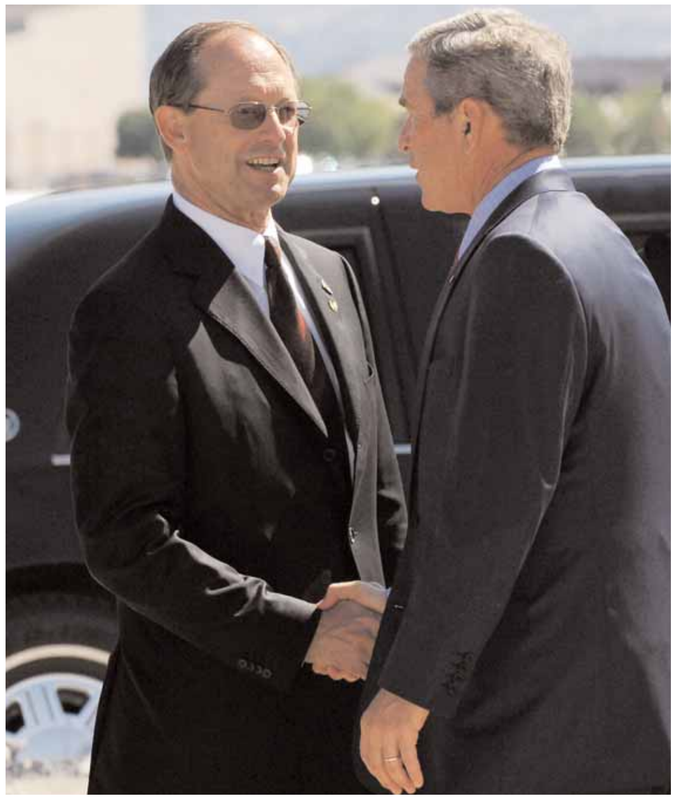
"We then rotated the dishes to sun and put power to the grid," Chuck adds.

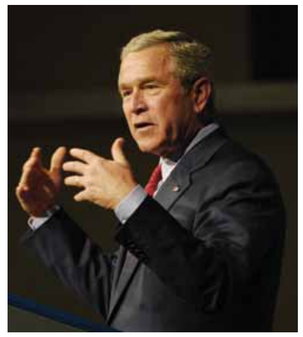
At the Steve Schiff Auditorium, where the president signed the energy bill, an enlarged picture of the SES dishes was in the background taken just five days earlier by "Sandia's Ansel Adams," Randy Montoya, Chuck says.

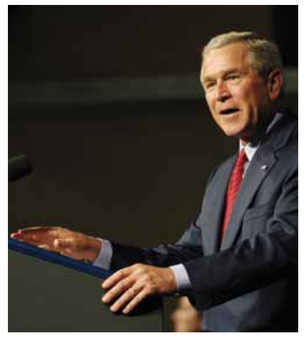
'A terrific day in our history'

President Bush visits Sandia









BEFORE SIGNING the Energy Policy Act of 2005 at the Steve Schiff Auditorium (top left photo), President George W. Bush visited Sandia's solar facilities south of Tech Area 3. He was accompanied by Labs Director Tom Hunter, who described the Labs research to the President, and by New Mexico Sens. Pete Domenici and Jeff Bingaman and Secretary of Energy Samuel Bodman. Below he waves goodbye from Air Force One.

Photos by Randy Montoya

You want it when?! What does it take to make a presidential visit happen?

Long hours, many people, and a lot of work and cooperation, that's what

By Iris Aboytes

Photo by Randy Montoya

Tents were set up. Carpets were shampooed. Sidewalks were cleaned. Videos were made. Exhibits were erected. Invitations were sent out. Buses brought dignitaries. Meals were served. Safety was a prerequisite. Security was everywhere. And that is just *some* of what is necessary to make a presidential visit happen.

Paula Schoeneman, Protocol Dept. 38151, was the lead protocol officer for President's Bush's Aug. 8 visit to the Labs. "I was telling my husband, Barry (6926), about a month ago," says Paula, "that it had been a long time since a president had visited the Labs." Barry responded, "Be careful what you wish for."

PAULA SCHOENEMAN

Paula and her protocol team made sure tents were set up, ordered meals, invited dignitaries, badged visitors and escorted them on base, and much more. Paula worked with the Secret Service and White House staff to ensure every detail was addressed. Paula says she introduced herself to her husband on Monday after the visit.

"One of our biggest issues to resolve was tents," she says. We only had a window of Thursday afternoon to set up the display tent because the company we ordered from was booked Friday and over the weekend. Every time we thought we had a decision made on where the tent could go, Secret Service changed their mind because of security issues and national media equipment coming in.

Tents and more tents

After moving the display tent set-up to four different locations and moving parking bumpers, it was finally decided to put it on the south side of Bldg. 823 — out of Secret Service's sight and their 300-foot buffer zone. "After the display tent was set up," Paula says, "I was told there would be a lunch for 70 people included in this tent. The display tent couldn't accommodate the set-up of displays and all the table and chairs required, so we had to order another tent. Then on Friday, we were told to set up a tent for the president's limousine because the president had to be out of the line of sight. So we ordered another tent! On Saturday, we were told by Secret Service they needed a tent for the magnetometers and again, order another tent! I can't thank Mike Lanigan (3651) and Mike McDuffie (3654) enough for being so diligent, and patient, in overseeing all the tent issues. We couldn't have done it without them."

Judy Hubbard, manager of Video Services Dept. 3653, says her staff worked between 10- to 14-hour days including the weekend. "New requirements would come in every few hours," said Judy. "We created two new videos and combined them with existing technology videos to come up with one show."

1,000 feet of cable

The Steve Schiff Auditorium was totally changed. "The sound system had to be completely redesigned," says Judy. "Additional specialized lighting had to be installed. At 8 p.m. on Sunday night, my staff had a request to track down 1,000 feet of cable for a White House press feed." And it wasn't over yet. Several full days of work was needed to put the Schiff Auditorium back to the way it was.

Wayne Potter and Moss Tallant of Facilities Building Management Dept. 10864 and their facilities staff were responsible for preparing the Solar Tower, the Steve Schiff Auditorium, and building interiors that President Bush toured.

Their work included everything from painting, cleaning, and landscaping to setting up banners on the stage, removing rows of seating in the auditorium for media platforms, hooking up generators for display tents, building new walkways and safe/secure exterior corridors, coordinating the installation of parking lot barriers and perimeter fencing.

16-hour days? Ho hum!

Linda Lovato-Montoya, manager of Creative Arts Dept. 3654, says her staff designed and produced poster presentations representing the "Energizing America" theme while under extreme time restrictions with multiple reviews and change cycles. The staff worked up to 16-hour days.

"All of this work involved bringing the entire staff together — from exhibit design and production, editing, and proofreading, to large formatting, printing, and laminating to display setup," says Linda. "Even though we were under severe time limitations, we found time to laugh and support each other."

Due to greater overall awareness, safety was front and center in all phases of the visit.

"The Safety and Emergency Management organizations were an integral part of the planning, setup, and live event," says Jaime Moya, senior manager of ES&H Planning & Assurance Dept. 10030. Emergency Management worked with the Secret Service and provided them with a comprehensive list of Sandia hazards as well as hazards posed by the DoD and other agencies' facilities located on Kirtland AFB. Sandia took the lead by imposing a moratorium on hazardous operations and shipments of hazardous materials.

Pro Force and EOC: an all-out response

The Emergency Operations Center was activated during the president's visit and included a representative from the White House team. "The Secret Service commended Sandia's Safety and Emergency Management operations for their professionalism and responsiveness to all phases of the dynamic operations," says Jaime.

Sandia's Protective Force Dept. 4211 was responsible for providing general service and security support. Lt. Mike Merlino was responsible for the motorcade. Captain Phil Gonzales coordinated the visit to the Solar Thermal Test Facility, and Captain Barbara Beggs coordinated security at the Steve Schiff Auditorium.

Each team leader coordinated Sandia's security support with the Secret Service agent in charge of each activity. Each team leader briefed the day's event to the entire Protective Force to ensure general knowledge, continuity, and compliance. Like any operation, the plan covered the anticipated operation and recognized that the plan would undoubtedly change, and to expect the unexpected. Many unanticipated events occurred, including the detection of trace explosive components on the media equipment that arrived on Sunday night. The Protective Force used 82 percent of its entire staff to support the visit as well as its entire vehicle fleet to assist the Secret Service.

These are just a few examples of what it took to make the presidential visit happen. Many other groups and individuals made equally important contributions.

NEWS MEDIA from every major news outlet in the country accompanied the president to Sandia. The media entourage included reporters, photographers, news producers, support staff, technicians, satellite vans, and trunks — mounds of trunks — full of equipment. It was all set up in a matter of days in a media center in Bldg. 822 to cover the president's whirlwind trip to the Labs. And as quickly as it was set up, it came down, loaded into crates and onto vans, ready to move on to the next stop.

'WOW! What an incredible experience and what a fabulous team'

Sandia VP Les Shephard was in charge of coordinating Sandia's complex preparations for President Bush's visit. Here is the text of the e-mail he sent to team leaders (the headline on this story was the subject line of that e-mail) on the afternoon of the visit, after the president had departed:

LES SHEPHARD

Words are hardly adequate to express my gratitude to all of you and to your teams that so beautifully put together the program for the president. Seldom if ever have I had the privilege of working with a group of individuals that were so absolutely selfless in responding to every need or request and so dedicated to put Sandia in the very best light at every turn.

Please pass on my immediate thanks to all of your folks — they are indeed awesome!!! Please also thank your families, spouses, and loved ones for their support to this effort. I know how many hours were consumed by this experience and the amount of time each of you has spent here at the Labs in the last week. We will be planning a celebration shortly to recognize all of the folks that have played such a major role in this effort.

Please get some rest and savor the moment — it will only be another 40 years before the next presidential visit.

My most sincere thanks,

LES

Sandia-created sensor finds loose gap filler on *Discovery*

Labs team worked 14-hour shifts during two-week shuttle mission

By Michael Padilla

It was the dangling pieces of gap fillers from the belly of the space shuttle *Discovery* that captured the attention of millions around the world during the recent return-to-flight mission.

The short strips of dangling material required an unprecedented repair by spacewalking astronauts. The material posed danger for overheating on reentry.

Gap fillers are thin fabric stiffened with a ceramic material and used to plug gaps between the shuttle's tiles. One piece was sticking out 1.1 inches between thermal tiles. The other was at an angle from six-tenths to nine-tenths of an inch. One of the gap fillers kept the tiles from vibrating against each other during liftoff and has no purpose for reentry. The other was designed to prevent repeated overheating of a gap between two tiles.

The loose gap fillers were characterized by Sandia's orbiter inspection sensor, which was attached to the space shuttle *Discovery*'s robotic arm.

Bob Habbit (2624) says once it was discovered that there was something visible, NASA took action to use the sensor, called Laser Dynamic Range Imager (LDRI), to characterize the protruding gap filler. The geometric data collected by the LDRI allowed NASA to model the effects of the protruding gap filler. The modeling indicated potentially catastrophic results if the pieces were left in place. Astronaut Stephen Robinson added a significant milestone to the history books when he removed the protruding gap fillers during the extravehicular activity.

Bob says the sensor provided hours and hours of data including raw video of the scans. Once the data was processed it was given to NASA to clear Discovery for reentry.

"We had the smallest but most capable sensor on the orbiter," Bob says. "The LDRI was able to take enhanced 2- and 3-D images of the orbiter."

The sensor began scanning the orbiter on day two of the flight, after the robotic arm was deployed. The sensor completed wing leading edge and nose cap scans, and focused on inspection of tile, gap filler, and the port wing.

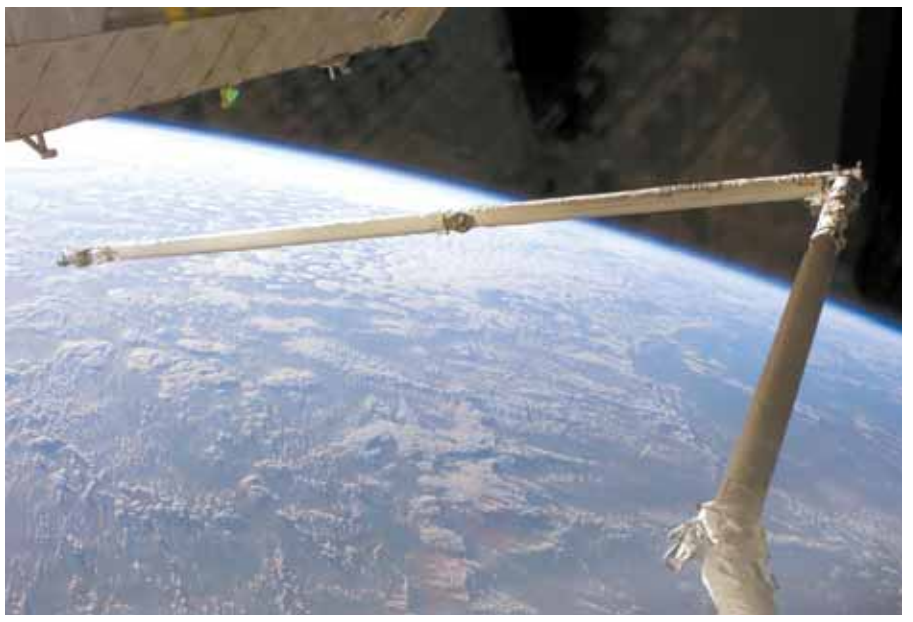
Bob said the team took the Sandia factor with them to Houston. "We worry about everything and plan for the worst," he said. "This helped us out a lot."

The team, consisting of 23 Sandians, worked 14-hour shifts during the two-week mission. The Sandians focused on three areas including 2- and 3-D imagery and imagery processing. Each member has a specific skill set that met all mission requirements, Bob says.

Bob said the Sandia team received praise and thanks from NASA.

"You provided hardware that met and absolutely exceeded our expectations," Bill Parsons, NASA program manager, wrote in an e-mail to the Sandia team. "I just want you to know how much I appreciate it."

NASA has requested the Sandia-developed sensor be on the next space shuttle mission. The next mission is tentatively planned for September, with space shuttle *Atlantis*, but that date is likely to slip.



SANDIA'S ORBITER INSPECTION SENSOR, attached to the space shuttle *Discovery*'s robotic arm, characterized loose gap fillers. (NASA photographs)

SANDIA NASA team poses for a photo following the shuttle's successful landing.

Sandia team

The Sandia Mission Control Center team involved in the project includes Matthew Montano (1711); Linda Gilkey (2026); Colin Smithpeter (2615); Larru Dalton, Patricia Tempel (both 2622); Tom Casaus, Bob Habbit, Bob Nellums, Todd Pitts, Mark Heying, Gus Rodriguez, Richard Taplin, Jose Rodriguez, John Sandusky, Joel Jordan (all 2624); Steve Gradoville, Megan Slinkard (both 2661); Chuck Graham (2666), David Karelitz (4326); Cristina Montoya (4341); Daniel Talbert (5415); Steve Lebien (5919); and Erik Fosshage (12342).

Sandia engineers receive Otto Hamberg award for *Columbia* study

Award recognizes team for test validation of shuttle wing leading edge panels

Five Sandia engineers received the Otto Hamberg award for best paper at the 22nd Aerospace Testing Seminar held recently in Manhattan Beach, Calif.

KENNETH GWINN

Kenneth Gwinn, Kurt Metzinger (both 9126), Wei-Yang Lu, Bonnie Antoun, and John Korellis (all from 8754) received the award for their paper titled "Analytical Impact Models and Experimental Test Validation for the *Columbia* Shuttle Wing Leading Edge Panels."

KURT METZINGER

Established in 1997, the award is named after Otto Hamberg (1923-1991), who was test technology section manager at The Aerospace Corporation. Hamberg pioneered and led studies in space vehicle failures during ground testing and on orbit. His early recognition of the need and importance of systems engineering information for test effectiveness studies has evolved into the Space Systems Engineering Database (SSED) at The Aerospace Corporation.

WEI-YANG LU

The award recognizes the author or authors who most clearly attains the high standards for technical excellence and valued contribution to the aerospace testing community set by Otto Hamberg.

The paper describes the analyses and the experimental mechanics program to support the investigation of the shuttle *Columbia* accident. Preliminary calculations of foam impact onto the shuttle's wing leading edge determined if enough energy was available to damage the leading edge panel. These analyses also determined the strain-rate regimes for various materials to provide the material test conditions. Experimental testing of the reinforced carbon-carbon wing panels then proceeded to provide the material behavior in a variety of configurations and strain-rates for flown or conditioned samples of the material. After determination of the important failure mechanisms of the material, validation experiments were designed to provide a basis of comparison for the analytical effort. Using this basis, the final analyses were used for test configuration, instrumentation location, and calibration definition in support of full-scale testing of the panels in June 2003. These tests subsequently confirmed the accident cause.

BONNIE ANTOUN

JOHN KORELLIS

"The paper was an excellent example of the integration of testing and analysis to provide invaluable insight needed to solve some of most challenging technical problems," says Tom Baca, manager of the Structural Dynamics Engineering Dept. 9125. "The selection of the paper reflects the high quality of the technical contribution described in the paper."

The paper will be published in the *Journal of the Institute of Environmental Sciences and Technology*.

— Michael Padilla

SES to partner with California utility to build 20,000 solar-dish engine units initially tested at Sandia

By Chris Burroughs

Six Stirling Energy Systems Inc. (SES) solar-dish engine units that were demonstrated to President George W. Bush and Secretary of Energy Samuel Bodman Aug. 8 at the Sandia-operated National Solar Thermal Test Facility will soon multiply due to an agreement signed that same week by SES and Southern California Edison (SCE).

The agreement, announced Aug. 9, calls for development of a massive, 4,500-acre solar generating plant using the SES technology to be built in the Mojave Desert 70 miles northeast of Los Angeles. When completed, it would be the largest solar facility in the world, capable of producing more electricity than all other US solar projects combined.

Southern California Edison is one of the nation's largest electric utilities, serving a population of 4.6 million customer accounts in a 50,000-square-mile service area within central, coastal, and southern California.

Over the past several months, Sandia and SES jointly built and tested the six-dish engine prototype mini-power plant, making the dishes work together and ultimately proving that the technology is almost twice as efficient as other solar technologies.

This same technology will be enhanced and eventually be part of a 20,000-dish array in the Mojave Desert near Victorville, Calif.

BRUCE OSBORN, right, CEO of Stirling Energy Systems, Inc., talks to Sandia researcher Chuck Andraka just as the six-unit mini-power plant construction starts last fall. (Photo by Randy Montoya)

The first step, says Bob Liden, SES executive vice president and general manager, will be to build a one-megawatt test facility using 40 of SES's 37-foot-diameter dish assemblies — enough to power 400 to 500 homes. These first 40 dishes may be installed at the Solar Thermal Test Facility, Mesa del Sol in New Mexico, or in Southern California. If the units are built in New Mexico, SES may be able to take advantage of an incentive included in the FY06 Senate budget that earmarks $5 million for a solar dish engine demonstration project if it is located at or near Sandia.

"In this initial stage we will have to reach comfort levels that we can go into high production volume," says Bruce Osborn, CEO. "We will also have to prove that we can scale production up by the thousands and still validate them."

The second stage will involve the construction of the 20,000-dish array in California.

Although the Stirling dish technology has been successfully tested for 20 years, the Stirling/Southern California Edison project represents its first major application in the commercial electricity generation field.

Liden says SES sees Sandia as a continuing partner in the development, product testing, and reliability testing as SES and SCE gear-up operations.

"I expect our relationship will continue to evolve and improve for the next several years," Liden says. "Sandia has always been top-notch, providing important technical support to the solar dish technology and SES over the years. This first large-scale deployment of solar dishes will require even more intensive involvement by the Sandia NSTTF team."

He adds that the president's visit to Sandia gave the SES technology very "high visibility." And "Secretary Bodman saw first-hand what this technology is all about. This was an excellent opportunity for us. This is a springboard for future projects in the southwest and worldwide."

Solar

(Continued from page 7)

Chuck "didn't normally wear a suit."

"The president shouted over to me, 'I'm glad you wore a suit today.' He then waved me out to see him," Chuck says. "I checked with the Secret Service and they said go."

So Chuck ran out to meet the president and shake his hand. He got in only a few short comments about the dish systems that were moving into position and beginning to generate power. Tom then described the systems and Sandia's partnership with SES.

The president appeared very interested in the technology. When he was guided back toward the presidential limo at 11 minutes, he stopped and asked Tom questions for another four minutes, fully using the allotted 15-minute window.

"I was excited beyond belief that the project I am most associated with was highlighted for this visit," Chuck says. "I think the point got across through Tom's talk that this is a technology ready for commercialization and that we have key partnerships with industry that will bring this vision to reality soon."

Other renewables explained to Bush

Besides explaining Sandia's efforts with Stirling Energy Systems solar collector dishes, Labs Director Tom Hunter also described to President Bush during his visit to the Solar Tower Sandia's contributions in the areas of wind blade design and photovoltaic systems integration. He pointed out a portable solar power system built by Sandia industry partner, Sacred Power, which was on display near the dish systems. Tom discussed other future energy possibilities such as hydrogen from solar energy and the biomicrofuel cell innovations. He mentioned the Center for Integrated Nanotechnologies (CINT) and Microsystems and Engineering Sciences Applications (MESA) as capabilities to help solve future energy challenges.

Feedback

Who set rules for presidential visit lottery?

Q: *As occupants of Bldg. 821, we were very excited to learn of President Bush's visit on Aug. 8. For several days before, we watched all of the preparations being made for this visit. Since Sandia resides on Kirtland Air Force Base and all employees are required to be badged, we were somewhat disconcerted and upset when we were instructed to put all of the blinds down on the south side of the building; we were instructed not to look out; we were informed of a lottery to attend the president's speech, but this came late on the Friday before via email, and in this lottery, we were required to put our race and gender. What does one's gender and race have to do with first — a lottery, and second — seeing the president? We thought a lottery involved putting your name in a hat. We didn't know that Sandia's lottery involved our ethnicity.*

Although we respect and understand the security requirements of such a visit, many people have expressed very strong disappointment that we were not even allowed to see the president — from a distance, or wave at him to show our support, or even just stand behind barriers to watch his motorcade go by. Apparently we are not safe people to be around. If we are such an untrustworthy group of people, then why didn't you just close business operations down for the day?

What we did see, however, were news people who most likely did not have a DOE clearance, people who were not appropriately dressed for such a visit, and people who didn't appear to be badged standing in front, on the north side, of the Steve Schiff auditorium. The DOE-cleared Sandia employees in 821, who are badged, were locked behind closed doors, windows and drapes. What's up with that?

If it's a Secret Service requirement — fine. But that still does not explain the "lottery."

If this is the protocol for an official dignitary's visit, after the restrictions placed upon us, we have serious doubts that anyone would be interested in participating in future events such as this. We design nuclear weapons — if you can't trust us, then who can you trust.

A: Near the end of your comments, you state, "If it's a Secret Service requirement — fine." That, frankly, is the response to all your concerns. Providing one's gender and race had absolutely nothing to do with being chosen in the lottery for the limited employee seating to see the president, nor was it imposed to say "we don't trust Sandians." It did have everything to do with the Presidential Advance Team (consisting of representatives from the White House and the Secret Service) requirements for any such presidential appearance and that team's mission of absolute protection of the president. Sandians who got lottery seats were not the only attendees who had to provide this information. All Sandians who participated in any manner, including Labs Director Tom Hunter, provided this information. News media covering the event provided it. So did other guests. Moreover, this is not recently established policy. The same requirements existed for official Sandia participants of the September 1992 visit by President George H. W. Bush. The venue for that event, however, was quite different. It was held in a cleared parking lot immediately west of Bldg. 800, which permitted many more Sandians to attend; however, all had to pass through arrays of metal detectors.

— Rod Geer, Senior Administrator
Public Relations &
Communications Center 3600

Department of Homeland Security scholars and fellows meet Secretary Chertoff in Livermore

By Nancy Garcia

Up-and-coming scientists, doctors and engineers rubbed shoulders recently in Livermore with the cabinet member whose agency is financing their education, Department of Homeland Security Secretary Michael Chertoff.

Chertoff had attended a day of briefings at Lawrence Livermore National Laboratory, ending with a reception for 17 Sandia DHS fellows and scholars and 25 of their LLNL counterparts.

The briefings focused on counterterrorism research activities at both laboratories. Introducing Chertoff at a news conference before the reception, LLNL Director Michael Anastasio said, "Throughout his visit, we've been showing him how we at Lawrence Livermore and our sister laboratory Sandia across the street are working very aggressively to assist the Department of Homeland Security to win the war on terrorism."

A former federal appeals court judge who became the second DHS secretary in February, Chertoff impressed the students with his interest and knowledge. He asked each student to individually describe his or her line of research.

"He genuinely seemed interested," said LLNL intern Adam Jodelson. "It was neat to see him taking so much time to say 'hi' to us." Chatting with Jodelson and LLNL intern Matthew Dawson, intern Kristin Pelon (8941) said she appreciates the financial support for her undergraduate studies (she is entering her senior year as a math major at Cedarville University in Ohio with interests in encryption or becoming a special agent). In the competitive scholarship program begun in 2003, undergraduate students receive full tuition and fees their junior year, a $1,000 monthly stipend for nine months, and $500 weekly for a summer internship at a DHS-designated facility. Recipients may request a one-year renewal for their senior year.

Katie Imhoff (8114) extended her stay just to get a chance to attend the reception. The Michigan State University senior spent this summer analyzing pros and cons of options for responding to an anthrax attack. Majoring in microbiology, molecular genetics and human biology, she is applying to medical school for her postgraduate training.

She said she pretty much applied for the scholarship "on a whim" after an announcement was forwarded to her. Chertoff's level of interest shown in the students was impressive, she said. "It makes you feel like you're a part of something," she explained.

Josh Kaufman (8232) found him "down to earth," and Saul Harari (8227) noticed his depth of knowledge. "He seemed to have a good grasp of what was going on," said Saul, who is pursuing his master's in mechanical engineering at the Polytechnic University in Brooklyn, "and of the technical details of what we need to do to address the threats. He's not just into quick fixes; he's in it to get to the root of the problem."

Graduate fellows receive full tuition and fees, a $2,300 monthly stipend for the full year, and may renew the award for a maximum of three years.

"The students were thrilled," commented Catherine Dawson (8524), team lead for the student programs in California. "It's a top-notch program and they are all strong contributors and great candidates for future employment."

The students from Sandia and LLNL continued mingling at a dinner that evening (arranged by Sandia Student Programs). Homeland Security Senior Manager T.J. Allard (80) attended.

"There was a very sharp set of students there," T.J. remarked. "It gave me confidence in the following generations that are going to be worrying about Homeland Security. They were very sharp, very committed to the security of the homeland. It's very comforting."

Overall, 206 students from 37 different states who are studying math, engineering, or science at 73 different schools have received the scholarships during the program's first two years. Undergraduate awardees are termed "scholars" and graduate-level awardees are termed "fellows."

TOP GUY — Flanked by Maureen McCarthy, director of the Office of Research and Development in the Homeland Security Department's Science and Technology Directorate, DHS Secretary Michael Chertoff meets with the DHS scholars and fellows who have received scholarships from the agency. Among the interns present were 14 from Sandia's California site and three from New Mexico.

LAWRENCE LIVERMORE Laboratory Director Michael Anastasio, left, looks on as Department of Homeland Security Secretary Michael Chertoff addresses members of the news media prior to his reception with DHS interns.

(Photos by Jacqueline McBride)

Sandia CaliforniaNews

California and New Mexico

Ethics Corner: Improprieties couldn't happen here . . . could they?

The headline "Improprieties Bring Congressional Inquiry" couldn't happen here — or could it? Sandia's Ethics and Business Conduct Office (E&BCO) was established in 1994 to specifically address such concerns. Though the players have changed, the functions remain the same as the Corporate Ethics Officers strive to implement a comprehensive ethics program that fosters a work environment of high ethical standards and helps promote compliance with laws, policies, processes, and values.

No doubt you know us from the Annual Ethics Awareness Training and the Code of Ethics and Business Conduct booklet. However, this is only a small part of our role. Consultative services provide advice and guidance to employee, retiree, contractor, and vendor questions and concerns. This accounts for 80 percent of our business — and this is good news because it helps to keep those negative news headlines at bay. We also provide investigative services to ascertain facts and determine whether a violation of law, policy, process, or value occurred.

Each aspect of the E&BCO is designed to foster a free and open atmosphere that allows and encourages individuals to make inquiries, express work-related ethics issues, or report business ethics violations without fear of retribution or retaliation. The E&BCO had more than 300 inquiries and investigations in fiscal year 2004 and has had 287 so far in FY 2005.

In November 2005, the sixth Lockheed Martin Corporation Ethics Survey will be rolled out. The last survey was conducted in 2003 and provides the baseline for comparing trends. This year's survey will be electronic, but one important change is that the results will be given to us at both the Center and Division level, making the tool more useful to Sandians. This year Lockheed Martin really wants to hear from all of you.

You may wonder just how useful is such information. The survey is useful just like a preventive medical check-up. Survey information gives us an insight into our corporate culture and is also used by ES&H in their Injury and Illness Predictive Model as an indicator of workplace safety.

So before you step across that ethical boundary, ask yourself, "How would my actions look on the front page of the newspaper?" and "How well will I sleep tonight?"

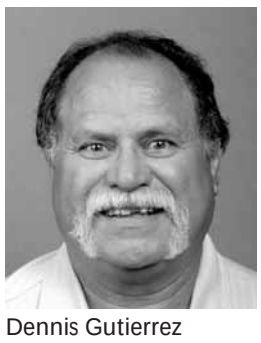
Editor's note: This item was submitted by the Ethics and Business Conduct Office (12810), which solicits your feedback.

Mileposts

New Mexico photos by Michelle Fleming
California photos by Bud Pellitier

Recent Retirees

James Metcalf
36 1649



Dennis Gutierrez
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Richard Roy
40 8226

Stephen Gonzales
35 10842

Michael Neuman
35 8221

Jerry Smith
35 10827

Russell Smith
35 4532

Richard Weatherbee
35 4225

Jim Alvarez
30 8945

Tomas Archuleta
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Clint Atwood
30 10114

Tino Casaus
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Sam Griego
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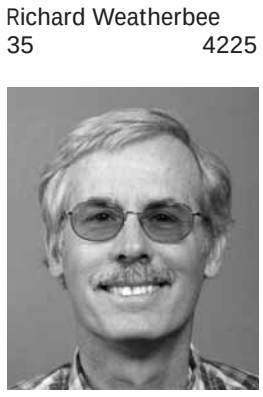


Larry Kovacic
30 2714

John Lanoue
30 2552

Bill Morgan
30 5744

Lyndon Pierson
30 5616

Theodore Simmons
30 10328

Lorraine Baca
25 5524

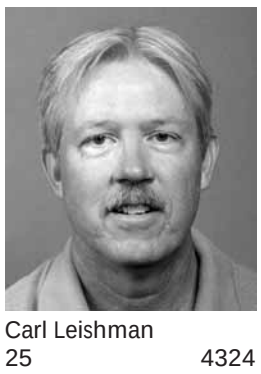
Linda Branstetter
25 247

Sandra Chavez
25 2951

Donald Davis
25 2451

John Goldsmith
25 8772

Cal Jaeger
25 6441



Carl Leishman
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Philip Montoya
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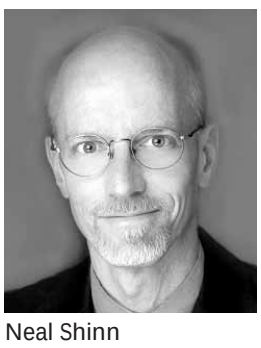
Martin Pilch
25 1533



Neal Shinn
25 1131

Tom Souther
25 2433

Bernard Argo
20 10863

J. Douglas Bentley
20 5356

Mark Grohman
20 6926

Patrick Hoffman
20 10264

David Plummer
20 5330

Bruce Berry
15 6445

Eric Burns
15 1741

Jeanne Evans
15 224

Loren Riblett
15 6452

William Richmond
15 8945

Ground broken for Sandia's Computer Science Research Institute at Science & Technology Park

High expectations voiced for future of computer simulations

By Neal Singer

A fifth groundbreaking this year for Sandia — a sign of the vitality of the institution — took place on Aug. 9 for the Computer Science Research Institute.

The 34,500-square-foot building, under the direction of David Womble (1410), will be at the far eastern end of the Sandia Science & Technology Park.

In an event arranged by Dorothy McCoy (38151) of Sandia protocol for Sandia Science and Technology Park executive director Jackie Kerby Moore (10105), six dignitaries made speeches and shoveled earth to mark the start of a building from which much is expected.

Among the participants were Sens. Pete Domenici and Jeff Bingaman, Sandia President Tom Hunter, DOE Advanced Simulation and Computing program director Dmitri Kusnezov, City of Albuquerque representative Ed Adams, and Albuquerque developer Scott Whittington.

Expectations were broadly stated by Tom Hunter, who summarized for an audience of about 200 the problems that challenge US technical supremacy in the 21st century. He also offered a solution based in part on work expected to emerge from CSRI.

"In the past century, this country dominated science and technology," he said, citing the invention of the transistor, the journey to the moon, the development of the Internet, and the creation of the atomic bomb.

Maintaining US technological dominance in 21st century will mean "re-thinking thinking," or reinventing the way researchers approach problems, he said. "The notion that creative thought can be translated rapidly into something that can be built, and built rapidly. . . has at its core [the advantages of] computer simulation."

Computing smarter, not just faster

The point, he went on, is not merely to have very fast computers but to harness their power through efficient programming to help build the best products right the first time, through Sandia centers such as MESA and CINT.

"Modeling and simulation is [about. . .] allowing your mind to do things you can't do any other way. It's not about just computing faster, because we're doing that. It's really about computing smarter, and that's what CSRI is about," Tom said. "It's about figuring out how to figure out better. It's about thinking through what a computer can do and doing it in a very efficient, clever way with fundamental mathematics."

CSRI senior manager David Womble, in an interview with *Lab News*, said, "We'll have specially designed office space that can co-locate as many as 55 external scientific collaborators with more than 135 Sandia staff to solve problems in computer science, computational science, and mathematics and to devise new capabilities in modeling and simulation."

CSRI will bring together researchers from universities and the national laboratories to collaborate in solving problems in national security, David said. The new building will include space especially designed and furnished to facilitate collaborative interactions. This includes high-bandwidth connections and visualization capabilities, enhanced telecommunications and video conferencing, electronic whiteboards, and projection capabilities.

Bingaman said, "If you can't keep bringing the very best people here, [the US] can't maintain its [technological] lead. The CSRI facility should help do that for a long time into the future."

"We've had the safety of an overload of developed brains," said Domenici, "but this isn't going to last." The CSRI, he said, "is what we're doing to keep up with the world."

The building will be constructed and then leased back to Sandia by the real estate development company Avalon Investments, Inc.

Said Avalon president Scott Whittington, "We hope we can facilitate David Womble's vision." The company, says Whittington, owns more than four acres in the research park and hopes to build another 25,000-square-foot building for future tenants. Avalon was selected as developer in a year-long bid process with criteria set by DOE.

CSRI GROUNDBREAKING — Dignitaries break ground for the new Computer Science Research Institute at the far eastern end of the Sandia Science & Technology Park. (Photo by Bill Doty)

Some light moments

The groundbreaking, while serious, did have a succession of light moments. Opening the meeting, which took place in a tent in the heat of midday, master of ceremonies Sherman McCorkle sternly informed the row of formally dressed dignitaries behind him that "the official Sandia groundbreaking August dress is: no tie." They wore ties. McCorkle did not.

McCorkle is chairman of the Science and Technology Park Development Corporation.

Domenici described how the paper copy of a speech he was expected to deliver when President Bush visited Sandia the day before had been given by Domenici's aide to a Secret Service agent to bring through security to the senator. The agent, acquainted with neither New Mexico senator, promptly delivered the speech to Senator Bingaman, who looked at it casually, decided it was a copy of the President's speech, and put it in his pocket. When Domenici stepped to the lectern, no speech was there to read from. "The President even looked for it," he said. Sen. Bingaman, realizing what might have happened, took out the speech and passed it to Sen. Domenici. The Republican senator jokingly held up the speech's unexpected arrival as an example of true bipartisanship. More seriously, he told the CSRI audience that he'd like to have Tom Hunter's speech similarly arrive on Pete's lectern for him to deliver it. He praised Tom's speech for its clarity and simplicity.

Belinda Garcia's ***Alyson's Adventures in Computer Land*** targets kids, Java developers

Sandian Belinda Garcia (2663) has just published a children's book, *Alyson's Adventures in Computer Land*, about a modern girl who becomes trapped inside a computer.

Belinda hopes to interest kids in the world of technology. The book follows its young heroine as she is sucked into a computer during an electrical storm and must find her way home. Meeting a cast of characters who are actually computer programs, Alyson hurries to escape the virus she released by mistake.

Belinda has included much from her experience at Sandia in software research and development. The book is primarily aimed at eight- to 13-year olds, but she envisions a wider audience due to the book's technical content.

"Adults who like *Alice's Adventures in Wonderland* as well as technical people would enjoy this book. It does have some humor that Java developers and technical people would get," says Belinda.

Belinda terms her new pairing of technology and children's fiction "kids techno fiction" and attempts to fill a gap in the children's fiction market. She speaks of the challenge of bringing the computer to life without sacrificing educational or entertainment value. Sandian Scott Joyce (9516), who designed the book's cover, recommends the result.

"Many of the technologies and concepts I've worked on appear in one place or another in Belinda's book, which is part of why I think it is a great book for kids," he says. "It is an imaginative and fun introduction to concepts they may later use professionally."

Joyce created the cover, which shows a bruised Alyson standing on a circuit board and confronting the computer mouse, "Louse," in place of Lewis Carroll's Cheshire Cat.

"I was idly doodling during a Business Rules class. Belinda thought they were high-quality doodles, and that is how we started talking," says Scott.

Belinda is planning a sequel to explain the Internet entitled *Through the Web and What Alyson Found There*, in which the "lost boys" have been trapped inside computer games.

Alyson's Adventures in Computer Land will be available at the locations listed below. In addition, Belinda will sign copies at the following times and locations:

Aug. 19 ..... 6-8 p.m. at Hastings on Wyoming
Aug. 20 ..... 1-3 p.m. at B. Dalton Books at Cottonwood Mall
Aug. 26 ..... 5-7 p.m. at Hastings in Rio Rancho
Aug. 27 ..... 2-3:30 p.m. at Page One
Sept. 24 ..... 1-2 p.m. at Barnes and Noble at Coronado Mall
Oct. 1 .....1-3 p.m. at Borders at Winrock Mall

— *Elizabeth Malone*