Sandia experts field flurry of media calls in wake of busted British terror plot

JOHN PARMETER displays the Hound II™ sniffer, one of the detection technologies his group has developed. (Photo by Randy Montoya)

By Michael Padilla

Last week's foiled terrorist attack aimed at blowing up as many as 10 airplanes over the Atlantic was stopped short by British authorities.

The attackers apparently planned to bring down the planes by smuggling liquid chemical explosives disguised as drinks onto the aircraft. Reports said the intention was to mix liquids and assemble bombs in flight with various components.

Immediately after news of the foiled terror plot broke, Sandians John Parmeter and Kevin Linker, experts in the general area of explosives detection and members of Contraband Detection Technologies Dept. 6418, spent a hectic couple of days fielding questions from members of the national and local media. Among news outlets they talked to were the *Los Angeles Times*, *Boston Globe*, *Baltimore Sun*, The Associated Press, *New Scientist*, *Albuquerque Tribune*, KOB-TV Channel 4, and inquiries from CNN, *Nightline*, and *Wired* magazine, among others.

John says he doesn't know what specific materials were to be used. He says there are materials that are not explosive individually, but when mixed with other materials become explosive.

"ANFO (ammonium nitrate/fuel oil) is a well

(Continued on page 4)

Sandia LabNews

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Sandia National Laboratories

2006 Student Symposium

Sandia's best and brightest interns share their research

By Darrick Hurst

The Albuquerque Convention Center was a high-energy, bustling hub of activity Aug. 1 as Sandia interns, employees, and a multitude of representatives from industry and academia gathered for the 11th annual Student Internship Symposium.

As the culminating event of Sandia's internship program, the symposium focuses on the wide variety of research activities and projects students participate in during their time at Sandia.

More than 600 attendees from around the country came to see the student presentations and posters.

"Whether people are here to present or just observe, the symposium is just as much fun as it is educational," says Jenny Villamarin (3555), whose poster presentation was voted "most informative" by attendees.

"The student symposium is a fantastic way to wrap up a summer of hard work," says Meghan Barnhart (6215). "Presenting research at the student symposium enabled me to truly appreciate the learning experiences I've had at Sandia Labs."

Meghan's presentation, entitled "Sampling Collection Method Efficiency and Peroxide Oven Aging Studies," dealt with her work with decontamination of chemical and biological agents.

"Condensing the research I helped with into a presentation highlighted the most important aspects of the work I do. Explaining that research to others really forced me to understand it on a deeper level," says Meghan.

Trying to summarize an entire research project in a concise and intelligible presentation is only a small part of the real-world experience the symposium seeks to instill in students. For many

(Continued on page 5)

Sandia develops contaminant warning systems for EPA to monitor water systems in real time

By Chris Burroughs

Sandia researchers are working with the US Environmental Protection Agency (EPA), University of Cincinnati, and Argonne National Laboratory to develop contaminant warning systems that can monitor municipal water systems to determine quickly when and where contamination occurs.

It's all part of the EPA's Threat Ensemble Vulnerability Assessment (TEVA) program to counter

(Continued on page 4)

JUST CHECKING — Bill Hart (1415), project lead for the team that developed water system software, does some field checking in the Albuquerque foothills. (Photo by Randy Montoya)

Sandia/Monsanto CRADA gives Labs' biofuels, bioanalytical efforts a boost.
Story on ***page 3.***

NNSA Defense Programs AWARDS of EXCELLENCE

Five individuals, 17 teams honored. See pages 6-7.

ISO 9001: 2000

Center 2400 earns ISO 9000 certification recognizing its quality management processes.
Story on ***page 5.***

What's what

There was shocking news in Albuquerque last week: The two Krispy Kreme doughnuts stores closed. Not just while they mixed up a fresh batch of batter — *closed*! *For good*?

Everybody (everybody in his/her right mind, anyway) wants to be healthy, and many of us do watch our diet. Okay, so most of us just give it a sideways glance now and then — that's still some degree of awareness.

But when weight-watching becomes so obsessive it wrings the profit out of Krispy Kreme to the point of shuttering doughnut shops, well. . .where could it all lead? No Krispy Kreme doughnuts for Friday mornings at work, that's where! Next thing you know, the fries will disappear from McDonald's, your BLT will come with turkey bacon and no-fat (no-taste) mayo, there'll be fat-free frozen yogurt in your milkshake, and who knows what else.

Where's The Kingston Trio or Peter, Paul and Mary or Bob Dylan when you need a good protest song?

* * *

With apologies to *Lab News* Editor Bill Murphy, that law named for someone way back in his clan was invoked while I was vacationing in Kentucky over the Fourth of July holiday.

About 10 o'clock one night, I got a call from the alarm monitoring folks that they were getting a "low-battery" notification from my house. Initial concern was eased after the on-call people at the alarm company reassured me that no zone had been breached and everything was okay and I had about 30 days to replace the battery.

Hearing about heavy rains in Albuquerque during that week, I wondered if the roof had leaked anywhere. That anxiety was replaced with another as soon as I opened the door and an unpleasant odor greeted me. The fridge had died while I was away and lots of food had spoiled. That was Sunday.

Monday evening after work, I bought a new fridge. It couldn't be delivered until the end of the week.

Tuesday morning I got in the car, pushed the garage door-opener button, started the engine, backed out, pushed the door-closer button and . . . nothing. The opener part of the logic board had died.

That evening (I think it was that evening — incidents all began to run together), really heavy rain swamped the city and the roof did leak, although only a little and only in one place, which I had known needed attention (grumble, grumble). That was the last really heavy rain and the roof didn't leak any more.

After two visits by garage door repair folks over a week and a half, I bought another garage door opener and a third garage door repair guy installed it. The new fridge was delivered. There were a couple of dry days so I could repair the roof.

There's a lot of talk these days about the cost of travel, and I can tell you — it's all true.

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

Sandia LabNews

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LOCKHEED MARTIN

For the record

In the Aug. 4 *Lab News*, Frank van Swol's (1114) name was inadvertently left out of a story titled "Sandia researchers solve mystery of attractive surfaces." The research paper on which the story was based was published in the Aug. 3 *Nature*, and was authored by Seema Singh, Jack Houston, Frank van Swol, and C. Jeffrey Brinker.

* * *

An article in the July 21 *Lab News* inadvertently excluded forklift rodeo team members Mona Anderson (10531), project budget coordinator, and Lynn Ruiz (10872), facilities liaison.

Lab News Reader Service

Retirees (only): To notify of changes in address, contact Benefits Dept. 3332, Customer Service, at 505-844-4237, or Mail Stop 1021, Sandia National Laboratories, Albuquerque, NM 87185-1021.

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Employees: To change the number of copies of the *Lab News* your mail stop is receiving please call Honario Anaya, Mail Services Team 10268-4, at 844-3796. At Sandia/California contact the Mail Room at 294-2427.

Labs technology, partnerships honored by tech transfer group

The Sandia-developed Athena Radar-Responsive Tag Sensor, a device that helps prevent friendly fire incidents in combat, has been named a Notable Technology Development winner in the 2006 Federal Laboratories Consortium (FLC) Mid-Continent regional awards. Sandia also had two winners in the Regional Partnerships category: the University Alliance Program and the Sandia Science and Technology Park.

Awardees will be honored at the upcoming FLC Mid-Continent regional meeting later this month in Colorado Springs. At that meeting, Sandia will also receive a special award recognizing past and present accomplishments in the FLC Mid-Continent Regional Award program.

FLC is a technology transfer organization created by legislation to be a central coordinating, support, and educational organization for federal technology transfer. For more information, contact Carole Lojek (9104), 284-2583, or Jackie Kerby Moore (9105), 845-8107.

TVC makes technology maturation funds available

Up to $100K per project available to develop promising technologies for the marketplace

Technology Ventures Corporation (TVC) is making available technology maturation funds of up to $100,000 per project to help mature selected federal laboratory technologies with potential high commercial value. Qualified applications for TVC technology maturation funds must be submitted in accordance with the 2006 TVC Technology Maturation Fund application Guidelines found at: http://www.techventures.org/about/TechnologyMaturationFundingInitiative.php.

Interested applicants should submit their application to TVC and then notify Licensing and IP Management Dept. 9104. If you need help completing the application, TVC personnel are available. The deadline for applications to be received at TVC is close of business Sept. 8.

TVC is a nonprofit organization founded by Lockheed Martin in 1993 and funded by Lockheed Martin and the National Nuclear Security Administration. It was established to help national laboratories, regional universities, and small businesses secure venture capital investment to move technologies into the marketplace.

Employee death

Paul Linke of of Technical Surveillance Countermeasures Dept. 301-1 died Aug. 9. He was 49 years old.

Paul had been at Sandia nearly eight years. He is survived by his wife Cynthia, sons Nicholas, Kevin, David, Steve Tartaglia, daughter Kacie Tartaglia, and father Marvin.

Retiree deaths

David L. Schafer (age 78) . . . . . May 23
James A. Duggar (69) . . . . . July 1
James M. McKenzie (80) . . . . . July 2
Einar V. Forsman (80) . . . . . July 2
Roy E. Brett (81) . . . . . July 8
Lloyd G. Miller (81) . . . . . July 17
Charles W. Harrison (92) . . . . . July 18
James E. Hare (78) . . . . . July 19
Albin J. Canute (80) . . . . . July 19
Betty C. Hogan (83) . . . . . July 19
Phillip R. Owens (85) . . . . . July 21
George T. Chapman (78) . . . . . July 24
Raul Sanchez (88) . . . . . July 26
R.E. Peppers (64) . . . . . July 29

Sandia biofuels initiative pushes forward with Monsanto CRADA; will stretch Labs' bioanalytical imaging and analysis

Organizations will initially partner in bioanalysis of crops, study of plant tissue samples

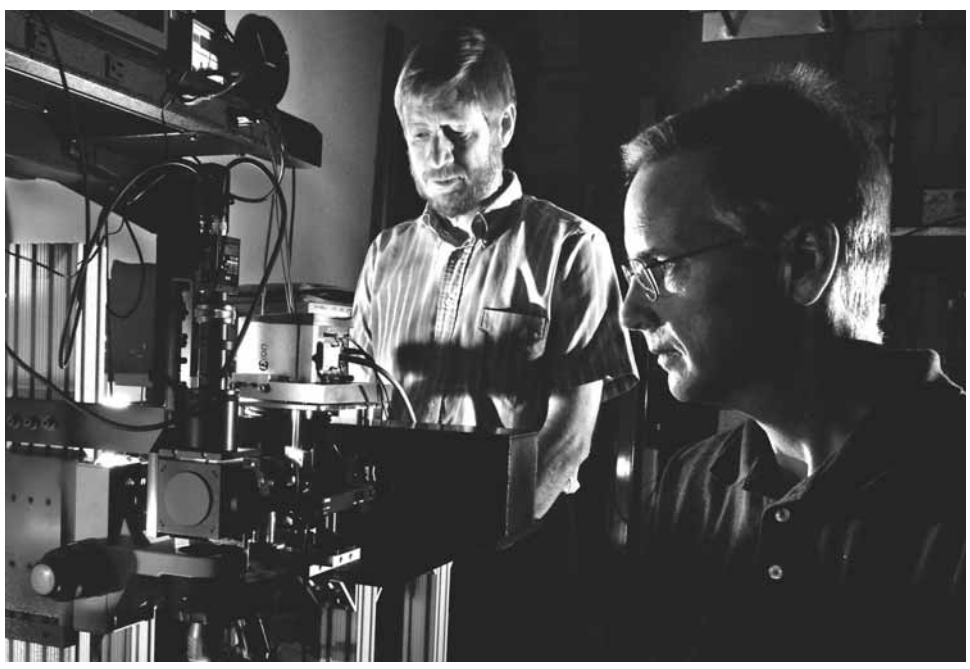
By Mike Janes

Sandia and Monsanto Company have announced a three-year, $1.5 million cooperative research and development agreement (CRADA) that is expected to play a role in both organizations' interests in biology and bioenergy. The partnership is aimed at aligning Sandia's capabilities in bioanalytical imaging and analysis with Monsanto's research in developing new seed-based products for farmers, including corn products that may be able to produce more ethanol per bushel.

"A strategic relationship with Monsanto makes sense on many levels and will bolster our collective long-term objectives in bioenergy and biofuels," says Terry Michalske, director of Biological and Energy Sciences Center 8300.

Recent biotechnology endeavors at Sandia have focused on developing and applying biotechnologies to identify early signs of infectious diseases through protein interactions and biomarkers at the single cell and whole organism scale. Sandia also is planning a key role in a multi-lab/university effort to bring a DOE-funded bioresearch facility to the San Francisco Bay area. DOE's Office of Science reissued a solicitation earlier this month for one or more such facilities, with a focus expected to be on cost-effective, biologically based renewable energy sources to reduce US dependence on fossil fuels.

The Monsanto CRADA will initially focus on hyperspectral fluorescence imaging and spectral analysis. Under the partnership, researchers from the two organizations will apply Sandia's hyperspectral imaging and multivariate image analysis technology to aid in the study of plant tissue samples of interest to Monsanto. Hyperspectral imaging is an advanced scanning technology that provides significantly more information than other approaches, necessitating the use of sophisticated computational analysis.



SANDIA RESEARCHERS Michael Sinclair (foreground) and David Haaland prepare a hyperspectral confocal microscope for measurement of a biological specimen. The new microscope, shown on the left, was designed and fabricated at Sandia and is expected to be used by Monsanto to enhance the company's current crop analysis technologies. (Photo by Randy Montoya)

The research is expected to enhance current crop analytical technologies, offering an additional technological resource to support Monsanto's robust product discovery engine and development pipeline. Monsanto's crop analytics research program has recently played a role in discovering new seed-based products for farmers, including corn hybrids that offer more ethanol-output per bushel and soybean varieties that produce healthier oils for consumers.

"Seeking out new and innovative scientific tools is an important part of how we bring forward new technologies for the farmer," says Pradip Das, director of crop analytics for Monsanto. "This partnership provides Monsanto with a new opportunity to further bolster our existing crop analytics program, offering our researchers another way to better understand genomic profiles for seed and trait development."

Sandia researchers in New Mexico will investigate, develop, and further advance the Labs' hyperspectral imaging and multivariate data analysis methods and capabilities for agricultural product discovery and development applications.

Terry says researchers at the Combustion Research Facility could eventually benefit from the CRADA by gaining experience with agricultural samples that have bioenergy/biofuel applications and uses.

Ancillary research focusing on the photosynthetic properties of various plants and microbes, for instance, will add to the Lab's growing expertise in understanding the conversion of sunlight to sugars, relevant not only to the production of new fuels from biomass but also essential to the global carbon cycle and carbon sequestration.

Monsanto Company is a leading global provider of technology-based solutions and agricultural products that improve farm productivity and food quality. For more information on Monsanto and the company's products, see www.monsanto.com.

Sandia CaliforniaNews

Rafael Davalos to receive HENAAC award for Most Promising Engineer, Advanced Degree

By Iris Aboytes

In the sixth grade Rafael Davalos (8125) wrote a computer program to help first-graders learn addition and subtraction. Since that promising beginning, Rafael has come a long way. In October Rafael will receive an award from the Hispanic Engineer National Achievement Awards Corporation (HENAAC) in Anaheim, Calif., for Most Promising Engineer or Scientist, Advanced Degree.

RAFAEL DAVALOS

After receiving his undergraduate degree from Cornell University in mechanical engineering, Rafael came to work at Sandia. "This was an opportunity that has had a great impact on my life," says Rafael. "I am extremely grateful to Sandia and the doors they have opened for my career." He went through the One Year on Campus Program and received his MS in mechanical engineering from the University of California, Berkeley.

Back at Sandia, Rafael was assigned to lead the development of a radiometer detection technology for unmanned aerial vehicles (UAVs) to monitor the effects of global warming. He then became the lead mechanical engineer for a US Navy flight test unit and its telemetry system. The project was a success and Rafael was given the opportunity to work full-time on his PhD through Sandia's Doctoral Studies Program. When he earned his PhD in bioengineering, one of his dreams came true.

Rafael's father, Alejandro, came from Cuba at age 18 with nothing but a bag of clothes, but he was determined to learn, work hard, and succeed. His mother, Mayra, came from the Dominican Republic. She left her family at age 14 to escape from the Trujillo regime, where she was being pressed to become a concubine for the dictator. From Mayra, Rafael learned about obstacles being surmountable. She instilled in him a passion for helping others achieve their goals.

A neighbor helped Rafael shape his future: She gave him access to a computer when he was in third grade. Rafael discovered a new world. That sixth-grade computer program was his first step in helping others.

While attending school, Rafael was a volunteer teacher and tutor for several outreach organizations. He and a group of Hispanic engineering students chartered the Latino/Latina Association for Graduate Students in Engineering and Science while working on his master's degree.

Rafael is a member of the Hispanic Leadership committee and chairman of the Diversity Division Council at Sandia/California. He represents Sandia on the Berkeley Edge Program Planning Committee, a National Science Foundation-sponsored program to encourage traditionally underrepresented students to attend graduate school in engineering and science.

Rafael is currently the principal or coprincipal investigator on three projects developing microfliudics for homeland security and biomedical applications — rapid, low-cost bioagent detection for subway protection; devices to interrogate single cells; and micro-reaction chambers for faster biodetection.

Rafael and his wife Michelle have been married a year — another dream come true. Michelle does graphic design and office management for a small family-run engineering company started by her grandfather. "She puts all the superlatives in my life," he says.

Rafael is happy to receive this award and is looking forward to sharing it with his mother and father. His father's words ring true: "Only through hard work can one gain self respect."

Explosives

(Continued from page 1)

known example," he says. "This has been used in numerous car bombs in the UK."

Ammonium nitrate by itself is not considered an explosive, but when mixed with fuel oil it becomes an effective explosive.

"The mixture is normally solid, but there are ways you could probably make it more like a liquid slurry," he says. "There are some materials made of two components, where at least one component is a liquid, that would not be considered explosives separately but would make an explosive if mixed."

He says "liquid explosive" is a catch-all term and can include a variety of chemicals such as nitroglycerin and related compounds, and ammonium nitrate slurries.

Some explosives can be used in both liquid and solid forms. Pure nitroglycerin is a liquid at room temperature, but Alfred Nobel's invention of dynamite is a widely used solid explosive based on nitroglycerin, he says.

"With both liquids and solids there are things one could do to make the explosive more or less stable — i.e., more or less sensitive to detonation," John says.

John works alongside other Sandians whose primary work is in trace explosives detection system development and test and evaluation of explosive detectors. Kevin and others in the department have been involved in the development of trace explosives detection portals for personnel screening, as well as handheld explosive detection systems.

Liquid explosive detection

Detection of liquid and solid explosives can in many cases be done using the same types of trace chemical sensors, he says. Furthermore, if an explosive is made by combining two components that are not explosives themselves, it does not follow that a trace sensor used for explosives detection could not detect the individual components. "If a sensor detects a mixture it will normally detect at least one of the components," he says.

KEVIN LINKER and colleague John Parmeter (pictured on page 1) fielded media queries about liquid explosives. (Photo by Randy Montoya)

One generic difference between liquid and solid explosives is obvious — liquid explosives require some sort of container. "There might be some issues with corrosion, but there would be containers you could put liquid explosives in," he says.

A variety of detectors are used at airports. Metal detectors that do not detect explosives might find bombs that have metal components. X-ray scanners are used to image the contents of carry-on luggage. Trace detection systems are used to swipe laptops and other personal electronic equipment, and personnel portals have been tested or used on a trial basis at some airports.

Ion mobility spectrometry (IMS) is a widely used trace analytical technique for detecting explosives. It is used to detect molecules or molecular fragments after they are ionized. The mobilities of these ions in an applied electric field are then measured. One of the requirements is that the molecules to be detected must form a stable ion of some sort. IMS can detect drugs, environmental pollutants, and other types of compounds in addition to explosives.

"Trace explosive detectors like ion mobility spectrometers are increasingly being used in airports," John says. "While the decisions on what sorts of detection to require are up to the Transportation Security Administration, I certainly expect that trace detection technology will become part of the standard suite of screening tools in the future."

Water tests

(Continued from page 1)

threats against water systems. The program uses a suite of software tools that can simulate threats and identify vulnerabilities in drinking water systems, measure potential public health impacts, and evaluate mitigation and response strategies.

The EPA became particularly concerned about potential water system contamination after the Sept. 11, 2001, attacks in Washington, D.C., and New York. US water systems consist of large networks of storage tanks, valves, and pipes that transport clean water to customers over vast areas. By the very nature of their designs, they provide multiple points for potential contamination — either from natural or manmade sources.

"Our involvement dates back about three years ago when the EPA became aware of some LDRD [internally funded Laboratory Directed Research and Development program] research we were doing to model threat assessments to water systems," says Sean McKenna (6115), project researcher. "We started working with the agency [EPA] in March 2003."

During the ensuing three years, the Sandia team created world-class software to address water security issues. The Sandia software can determine where to place sensors to help design a contaminant warning system. The software can also determine when and where a contamination event happens, track changes, and determine when the event is over.

"Through careful adaptation of classical algorithms, we are able to solve sensor placement problems on networks 100 times larger than those previously cited in the water security literature," says Jon Berry (1415), who works on sensor placement methods for the project. "Our team recognized and exploited mathematical structure that hadn't been associated with water security before."

Bill Hart (1415), project lead, says the Sandia software "helped the EPA meet several internal milestones over the past year," including developing a contaminant incident timeline for the EPA's WaterSentinel program and working with a large city water utility to determine the best locations for sensor placement. The WaterSentinel Program is being developed in partnership with select cities and laboratories in response to a Homeland Security Presidential Directive that charges the EPA to develop surveillance and monitoring systems to provide early detection of water contamination.

The EPA will test Sandia's event detection methods later this summer at a large water system.

"These tests [that the EPA will conduct] will assess Sandia's event detection methods so that we can understand how to respond more intelligently to contaminations as they occur," Bill says.

Sandia's event detection methods have been specifically tailored to use a variety of affordable, off-the-shelf devices commonly used by water utilities to monitor water quality.

Sandia TEVA team

Sensor location optimization: Bill Hart, Jon Berry, Jean-Paul Watson, Cindy Phillips, Lee Ann Fisk, Robert Heaphy, Vitus Leung, Erik Boman, Bob Carr (all 1415), Harvey Greenberg and Todd Morrison (University of Colorado at Denver), Jim Uber (University of Cincinnati), and Phil Meyers (PNNL).

Water quality change detection: Sean McKenna, David Hart, Kate Klise, Mark Wilson (all 6115), Victoria Cruz (6116), Sanjay Srinivasan (University of Texas).

Source location optimization: Bart van Bloemen Waander, Judy Hill (both 1411), Carl Laird (Carnegie Mellon University).

Bart van Bloemen Waander was the principal investigator for the initial LDRD focused on water security. Bill Hart is the principal investigator for the Sandia TEVA team.

Retiree Bob Baca, who 'flunked retirement,' gets A+ from First Lady

On June 12, First Lady Laura Bush hosted the National Center for Missing and Exploited Children (NCMEC), honoring its work in reuniting more than 5,000 missing and displaced children after Hurricanes Katrina and Rita. Retiree Bob Baca was one of the consultants honored. Bob's story, "Sandia retiree Bob Baca flunks retirement," which discussed his work with NCMEC, was recounted in a story by Iris Aboytes in the April 14 issue of the *Lab News.*

Symposium

(Continued from page 1)

students, preparing a presentation for the first time also means learning the processes of peer review and Sandia's approval procedures.

"Where many presenters described the entire scope of whatever project they had been a part of, I was only able to give my attendees a fairly limited view of some of the work I did, due to my project's sensitivity level," says Jesse Herrera (2124), who gave a presentation dealing with weapons coding and verification.

"Making such specific and highly technical information interesting to others was tough but with some enthusiasm and patience, I took on the challenge," he says.

JENNY VILLAMARIN (3555) explains her poster presentation, which was voted "most informative" by attendees. Her poster showed student interns how NOT to fill out expense vouchers. (Photo by Bill Doty)

Like Jesse's presentation, the majority of the projects at the symposium were highly technical, but a few interns took a creative approach in presenting their nontechnical projects.

"While working in the student internship office this summer I reviewed hundreds of student expense vouchers," says Jenny. "As a reflection of that work, I created a false voucher that was riddled with the same errors I saw every day, and then showed how to fix them. I hoped my presentation could save relocating students, as well as myself, a little time.

"In a symposium filled with technical presentations, it never occurred to me that I would have such a great response," she says. "I had many people stop at my poster and say, 'Oh finally, something I understand,' and then stay and talk with me for several minutes."

WILLIAM MARTIN (6863) discusses his poster presentation on the Labs' length, mass, and force calibration program update. (Photo by Bill Doty)

Wide spectrum of work represented

The symposium gives attendees the opportunity to see a wide spectrum of Sandia's work represented, as well as a chance to gather from each other's experience and knowledge, says Rebecca Vickers (10861).

"It was really exciting to see all the work and knowledge we had gained during the summer come together into one final product," says Rebecca, who gave a presentation on retro commissioning — a process for improving energy efficiency — of institutional general plant project buildings. "We were able to share everything we had learned with other people. We also had the satisfaction of knowing that the research and work we did would continue to be used in the future."

Participating in the annual symposium is entirely voluntary, and although not all students choose to present projects, many still attend just to have the chance to see the variety of presentations.

"Being here, I get a chance to see things that are outside my technical area that I wouldn't get to see otherwise," says Dominic Saavedra (10322), who works in safety engineering.

"I really like going to the symposium each year because it brings all the students to a common place, and at the same time allows us to realize how many areas of research are out there and available," says Judy Banet (1825).

Some 85 students delivered short lecture presentations on a variety of topics at this year's symposium. Presentations ranged from areas of government relations (Valerie Salim, 12121), to approaches for addressing spent reactor fuel (Courtney Cox, 6924), to pathogen removal from water (Carlee Ashley, 6118).

A career fair offered fellowship opportunities, graduate school recruitment, and employment opportunities from Lockheed Martin. Other activities included a graduate opportunities panel, a luncheon featuring talks by Sandia President Tom Hunter and motivational speaker Derius Swinton, two workshops, and an evening reception.

Center 2400 earns coveted ISO 9001:2000 certification

By Darrick Hurst

During World War II, the United Kingdom had a growing problem in its bomb factories — the bombs were detonating before ever leaving the assembly line. The Ministry of Defense was understandably alarmed by these developments, and in response had inspectors stationed in the factories that supplied munitions. To continue producing munitions for the government, the companies had to write up their procedures for making their product, have the procedures approved by the Ministry, and ensure their workers followed them.

This concept of control and inspection is the basis for today's International Organization for Standardization (ISO) quality management systems. ISO 9001 is a standard of conformity that ensures work is done in compliance with defined, continuously improving processes.

In accordance with this business management standard, Sandia's Manufacturing Science and Technology Center 2400 has become the Labs' most recent recipient of ISO 9001 certification.

A BRITISH MUNITIONS PLANT IN WORLD WAR II, not unlike the plant where the forerunner quality processes of the ISO movement were developed.

"I view this upcoming certification as a watershed moment for Sandia," says Lenny Martinez (VP 9000). "While the notion of using an internationally recognized industrial standard such as ISO has been discussed as something usable for manufacturing entities, I was completely surprised and pleased to hear that the feedback given to the 2400 management team was not just about its manufacturing processes but also its research areas.

"I'm incredibly encouraged about the potential for this standard in our research areas because this speaks to me that we are doing quite well from a quality management standpoint, and until now have not had a standard to which we really measure ourselves," says Lenny.

The Manufacturing Science and Technology Center develops and applies advanced manufacturing processes for production of components in support of Sandia's primary mission of ensuring that the nation's nuclear weapons stockpile is safe, secure, and reliable.

"One of the major barriers for Sandia and other research institutions to use and embrace ISO 9001 is the perception that it cannot be applied to R&D," says Bobbie Williams (2400).

ISO 9001:2000 is the latest version of the ISO 9000 family of business standard certifications. It is intended to be a framework for management systems to provide assurance that products conform to established standards as well as giving customers avenues for feedback.

The center became aware of ISO 9000 as a way to improve its business interactions several years ago when one department in the center began using the business model. As the center continued to evolve, its example was soon adopted throughout the entire organization.

Center 2400 was chosen for certification based on its implementation of the processes and systems necessary to have an effective business management system. These processes include a robust internal audit and management review system, a corrective and preventive action tracking process, a customer communications procedure, measures for customer satisfaction, and continuous improvement of the overall business management system.

"Congratulations are really in order to all the employees in Center 2400 for their recent accomplishment obtaining ISO 9001:2000 certification," says ISO 9000 Program Manager Felipe (Phil) Rivera (10743). "This took a concentrated team effort and I am proud of the achievement."

Before modifying or buying equipment, check to find out if an environmental permit is required

By Chris Burroughs

Before you modify it, buy it, install it, or operate it, you must first find out if you need to run a National Environmental Policy Act (NEPA) checklist to determine if an environmental permit is required.

By doing so, you'll be helping the Labs avoid costly fines that hurt not only the pocketbook but also the Labs' reputation.

The first step, says Terry Cooper, manager of Environmental Compliance and Assurance Dept. 10333, is for people wanting to modify existing equipment or buy, install, or operate a new piece of equipment to work with their line management and look at the Dept. 10333 web page as a resource. Then call Dept. 10333, explain what is needed, and work with a department representative to determine if a NEPA checklist is necessary.

If a checklist is a must, the appropriate person in Dept. 10333 will help you work through the list. The end result will be a determination about whether an environmental permit is required. Dept. 10333 has subject matter experts for waste, water quality, air quality, and NEPA checklists.

Because this simple process has not been followed in the past, Sandia has incurred fines.

"Here's a true-life example of how people get Sandia in trouble: Someone bought a new piece of equipment and installed it, not aware that the equipment produced small amounts of emissions," Terry says. "Sandia wound up receiving a fine for this because the appropriate permit was not acquired in advance. If the owner had only checked with my department in advance and gone through the NEPA checklist, the whole situation would have been avoided."

Entities requiring permits are the Environmental Protection Agency, city, and state.

Terry adds, "Sandia is a very large and complex operation with diverse programs requiring a variety of commodities. So before you make a modification or purchase and install a piece of equipment, you should check with your management and consult with us. We are here to help our line customers and get everything taken care of. We want to do it legally and properly."

What may appear to be a routine and simple equipment modification, purchase, or replacement may trigger environmental permitting requirements with long lead times and costs prior to installation. With Dept. 10333's help, the design or size of equipment may be adjusted to minimize the environmental impact and perhaps avoid permitting requirements completely.

People modifying or buying many types of equipment — excluding most office equipment, computers, printers, and small electronic devices — should be sure to check with their management and Dept. 10333 first before making changes or purchases.

"In the past, Sandians have not sufficiently considered the implications of some of their equipment modifications or purchases," Terry says. "Now we are being much more proactive so that we can properly integrate these activities in a way that accomplishes our mission safely, securely, and mindfully."

This monthly column, compiled by Janet Carpenter, highlights Sandia Lab News *items from 50, 40, 30, 20 and 10 years ago, but each column does not necessarily include items from each decade.*

50 years ago . . . Operation Redwing in the Pacific ends for Sandians — More than 100 Sandia Corporation employees who had been participating in experiments at the Atomic Energy Commission's Eniwetok Proving Grounds since the first of the year returned to the mainland. The nature of Sandia's role in Operation Redwing was still veiled in security. . . . General Training and Education released its fall schedule of after-hours educational classes, which included blueprint reading, shop mechanics, radar principles and systems, and shop processes. Employees could also enroll in Albuquerque Vocational Evening School, which offered shop arithmetic, elementary shop mathematics, and advanced shop training. . . . Not Flying Saucers — Sandia's Meteorological section was testing a new type of helium-filled neoprene balloon in its continuing study of the upper atmosphere. Tests were conducted to determine the feasibility of using them for upper air measurements before tests at the ballistic range at Salton Sea, Tonopah, and Yucca Flat.

WORM'S EYE VIEW of experiments with ballons by the meteorology section in 1956.

PUNCHED OR "VENTILATED" BADGE inserted into a badge reader automatically logs in visitors at the Livermore Lab Badge Office.

40 years ago . . . Skyhook, a new 72-foot-long prototype balloon, was used to lift up to 400 pounds of air blast pressure gauges to monitor testing of a Project Plowshare unit in Coyote Canyon. The project was one of a series of high-explosive detonation experiments to study air-blast-caused damage at long distances from a detonation. . . . Automatic login — Sandia Livermore was using an automatic badge system during non-operational hours to speed access to restricted areas. The code-punched badge was inserted into a reader that transmitted information to a console at guard headquarters. The console added the date and time and passed the information onto a receiver unit, which punched the information onto paper tape that was then fed into the central computer.

30 years ago . . . Sandia was testing a new material twice as strong as nylon called Kevlar-29 for weapon parachute use. Kevlar was used on suspension lines, radials, and parachute skirt band for the B77 bomb lifting parachute, reducing the weight of the recovery system from 83 pounds to 50 pounds. Another program where Kevlar made a difference was the B61-3 bomb. In a new parachute incorporating Kevlar, parachute size was increased from 17-foot diameter to 24-foot diameter with the same weight and volume. The new parachute (Kevlar/nylon hybrid) provided a greater impact angle and a softer landing for the lay-down weapon. . . . Sandia Da Vinci program project engineer Preston Herrington was a member of a crew of four aboard the Da Vinci III scientific balloon to track urban air pollution across five states in a continuing study of the lower atmosphere. Other members of the crew were from the US Naval Weapons Center, a project consultant, and a member of the National Oceanic and Atmospheric Administration.

TEST UNIT on new Kevlar hybrid parachute design for the B61-3 weapon saw Mach 1.05 on a rocket sled in Area III.

20 years ago . . . Sandia engineers in the Parachute Systems Division were working on a couple of Sandia firsts. One was redesign of the F-111 aircraft crew module recovery parachute; the other was a design and development of a parachute system that could withstand deployment at velocities as high as Mach 2 (twice the speed of sound, which is about 1,100 feet per second at sea level).

SANDIANS fit the chute cluster into an F-111 crew escape module.

10 years ago . . . Monitoring seal degradation and an O-ring's ability to keep a weapon's inside clean and free of dangerous elements are important aspects of weapons surveillance. Sandia announced development of a new method using argon to monitor O-ring stability in weapons. The PACER (Probing Argon Concentration to Evaluate Reliability) method was used with two weapons systems at the time, the W86 warhead and the land-based Peacekeeper-mounted W87 warhead and was being evaluated for use on several other systems, including the W88 and W78 warheads.

Recent Patents

Richard Ormesher (5354) and Robert Axline (5711): Methods and System Suppressing Clutter in a Gain Block, Radar-Responsive Tag System

Richard Diver (6218) and James Grossman (6211): Solar Reflection Panels

David Teter (0243), Patrick Brady (6118), and James Krumhansl (6118): Inorganic Ion Sorbents and Methods for Using the Same

Sympathy

June Harrington, 72, died July 31. She is survived by daughter Elaine Chemistruck and son-in-law, Gary Chemistruck (3653). June worked at Sandia/New Mexico in Facilities Express and took advantage of the Labs' Voluntary Separation Incentive Program 10 years ago.

'My Rewards/Benefits' to become 'HR Self-Service'

Upgrade builds on just-in-time, self-service web technology available in latest version of PeopleSoft

"My Rewards/Benefits," the familiar face HR has presented to Sandia employees on the internal web for several years, will be changing with a new front-end called HR Self-Service (HRSS). The changeover is scheduled to begin Aug. 18 and be completed by 8 a.m. on Aug. 22. During that period, the "My Rewards/Benefits" page will be down.

But HRSS is more than a facelift. It offers employees new functionality and enhancements, made possible via a major upgrade to the underlying PeopleSoft software foundation. The upgrade is being launched by HR Information Systems Dept. 4544, which develops and deploys software related to HR, benefits, and payroll.

HRSS taps into the new capabilities of PeopleSoft 8.9 to allow Sandians to take advantage of a range of self-service features. Employees will have the ability to view and manage issues related to their health, wealth, career, and work life. In addition to offering new capabilities, the new design still includes the same content and functionality of the My Rewards/Benefits site, but with better navigation tools and an updated look.

Online open enrollment and automated job-hunting

As one of the enhancements, HRSS will include the ability to make benefit selections during the annual Open Enrollment period (scheduled this year for Oct. 20-Nov. 9). For the first time, employees will be able to review and change benefits elections online either from work, home, or on travel.

HR Self-Service will also include (for regular employees) a powerful "Job Agent" tool, a personalized, automated job-hunting tool that searches the internal jobs database for new job postings that meet predefined criteria. When matches are found the employee will be notified by e-mail. Multiple job agents can be used to organize searches for different criteria or jobs. As part of the implementation of this new capability, the Job Posting Subscription Application (JPSA) will be retired. Users will need to resubscribe in the PeopleSoft system using the My Profile/Job Agent tool.

Says HR Div. 3000 VP Kim Adams: "HRSS is a great new integrated tool for employees. It offers users access to and control over virtually all aspects of their work life experience here at Sandia, including pay, benefits, career opportunities, learning and development resources, and a very user-friendly gateway to our open enrollment process."

Manager-specific features

The major PeopleSoft upgrade being rolled out this month offers new manager-specific capabilities. Specifically, it impacts Fill a Job (also known as "e-Recruit"), Sandia's online recruiting/job application system for managers. The new software should increase efficiency for line managers, enable strategic hiring, and ensure fair and equitable hiring practices, says PeopleSoft implementation team lead Sheila Carr (4544).

Additionally, the upgrade will help in the upcoming transition from Social Security numbers to employee ID numbers and will bring the Labs in compliance with new federal applicant recordkeeping requirements.

Most of the changes will be transparent, but hiring mangers will notice modifications to some features in the Get People System (GPS) module.

The upgrade will take place Aug. 18. During the upgrade changeover, users will not be able to view information in the system or update or enter new data. The new system is scheduled to be back up no later than Tuesday, 8 a.m., Aug. 22.

To view screen shots see the PeopleSoft project website on the web: http://www-irn.sandia.gov/hr/hris/peoplesoft_gps.html

For more information about the upgrade, contact PeopleSoft team lead Sheila Carr by e-mail at sacarr@sandia.gov or by visiting the PeopleSoft 8.9 project website.

Sandians Andy Kraynik, Neal Shinn elected presidents of professional societies

By Darrick Hurst

Andy Kraynik

Andy Kraynik, a member of Sandia's technical staff in Multiphase and Nanoscale Transport Processes Dept. 1514, has been elected to a two-year term as president of the Society of Rheology.

The Society of Rheology is a professional association of physicists, chemists, biologists, engineers, and mathematicians interested in advancing and applying the science of deformation and flow of matter.

ANDY KRAYNIK

Andy is recognized as a leading authority on foam rheology and processing. As an undergraduate, Andy attended Carnegie Mellon University. He went on to receive his MS and PhD in chemical engineering from Princeton.

Andy has been a member of the society since 1973 and has served as the secretary for 10 of those years and vice president for two years. He also serves as the US delegate to the International Committee on Rheology.

He is a recipient of the society's Distinguished Service Award, a prestigious and infrequently issued distinction. Andy takes particular pride in the work he did planning and hosting the 62nd Annual Meeting of the Society of Rheology in Santa Fe in 1990.

The Society of Rheology is the first and largest society of its kind. The society boasts a membership of more than 1,600 professionals, including many Sandians.

"This is a field of study and research that is particularly relevant to applications at Sandia," says Andy. "Moreover, Sandia has been a strong supporter of both this area of science and this society — something that is reflected by the number of Sandians belonging to this association."

The society's greatest contributions to the scientific community, according to Andy, are the group's *Journal of Rheology* and annual research conferences.

Andy succeeds Susan Muller of the University of California, Berkeley, as president.

Neal Shinn

Neal Shinn (1131) is the new president-elect of the AVS (American Vacuum Society) Science and Technology Society. AVS is dedicated to promoting communication among academia, government laboratories, and industry for the purpose of sharing research and development findings over a broad range of technologically relevant topics.

Neal is the user program manager of the Center for Integrated Nanotechnologies, a new national user facility operated jointly by Sandia and Los Alamos National Laboratory. He earned his BS in chemistry and mathematics from Penn State University in 1978 and a PhD in chemical physics from the Massachusetts Institute of Technology in 1983.

After earning his PhD, he performed research as a postdoctoral fellow of the National Research Council with the National Institute of Standards and Technology. In 1985, he joined Sandia as a Senior Member of the Technical Staff to lead Sandia's research and mission-related programs at the National Synchrotron Light Source (NSLS).

Neal is also an adjunct professor in the Physics Department of Utah State University and serves on external advisory committees for the College of Engineering at Penn State University, the Biomedical Engineering Department at Ohio State University, and the Physics Department of New Mexico State University.

NEAL SHINN

Neal's 18 years of AVS service began with the AVS New Mexico Chapter Executive Committee and local symposium program committee positions. At the national level, he was program vice-chair for the AVS International Symposium in 1987. He also serves as the US representative to the international Surface Science Division of the IUVSTA (international parent to AVS), was elected division secretary (2001-2004), and subsequently was elected division chair for the 2004-07 triennium. He has published more than 85 scientific papers and edited two books.

Founded in 1953, AVS promotes communication through its major annual symposium and conferences. AVS also publishes through the American Institute of Physics (AIP) the *Journal of Vacuum Science and Technology* (JVST A and B) and *Surface Science Spectra*. The AVS also works to recognize scientific and technical excellence and presents awards to outstanding innovators in technical research.

Manager Promotions

New Mexico

Mary Adams from PMTS, CSU Operations Dept. 4343, to manager, ES&H Information Systems and Middleware Services Dept. 4528.

Mary joined Sandia in 1983 and rehired in 1998 following an educational leave. She has worked in the area of application development and desktop computing in the Integrated Information Community and Environment (IIC/E). She worked on nuclear weapons engineering applications in the mid 1990s and has worked with groups across the nuclear weapons complex to support intersite computing. She also served as the acting manager of the Technical Library from August 2004 through November 2005. Her latest assignment was as a project manager in the computer support units.

MARY ADAMS

Mary has a two-year degree in management information systems and a BS in psychology with a minor in biology from the University of New Mexico Honors Program. She will complete her MS in national security information protection and security from the University of New Haven in 2007.

Avoid frustration by understanding 'phone tree' structure

UnitedHealthcare and CIGNA phone trees deliver callers to appropriate resources

We've all been there: You need information fast about a health benefits-related question. When you call the number for your insurance carrier, UnitedHealthcare or CIGNA, you don't get a real person on the line — do you ever these days? — but are entering the trunk of a somewhat complex "phone tree."

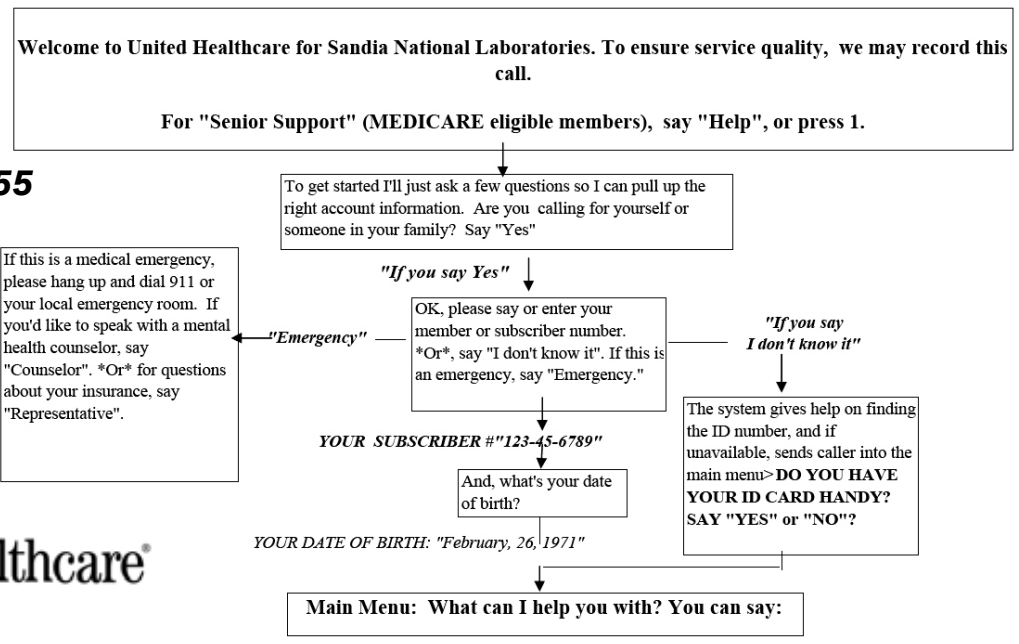
While the branches of the phone tree appear cumbersome, there is a logic to them; they are designed to provide access to the the widest range of options in the fewest amount of button pushes. The phone trees are presented here at the request of Sandia's Health, Benefits, and Employee Services Group. The intent is that by presenting these phone tree diagrams, users may avoid the frustration of feeling that they will not get the answers they need.

The notes embedded within each chart offer specific information relevant to that chart and users of that particular insurer.

And note that while in both trees, where many of the services are automated, at the end of the process there is often a real person to help you with a specific need.

HBE
Health
Benefits
Employee Services

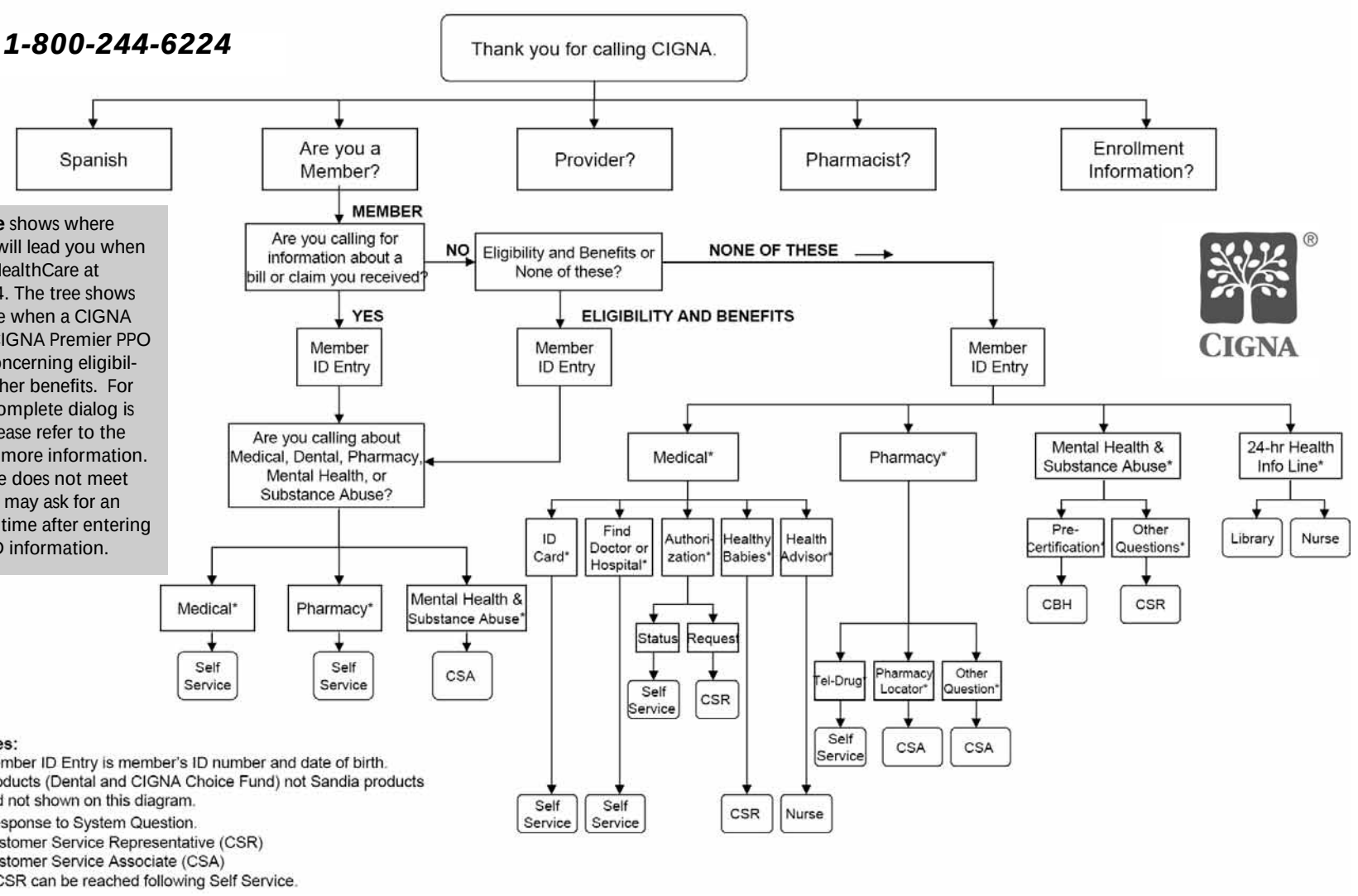
UHC — 1-877-835-9855



UnitedHealthcare®
A UnitedHealth Group Company

The diagram here is designed to help UHC members access services and resources within a complex "phone tree." The UHC Sandia line is 1-877-835-9855. By understanding the logic behind the phone tree structure and following the tree guidelines, members should experience less frustration and confusion. **IMPORTANT:** Do NOT press "0" at the beginning of your call to try to reach a live person. By doing this, your call will be sent to a generic, non-Sandia call center. Once you reach the Main Menu, you will be able to press "0" within one of the five categories (Claims, Coverage, Find a Doctor, Health Resources, or Care Coordination).

CIGNA — 1-800-244-6224



This phone tree shows where your responses will lead you when calling CIGNA HealthCare at 1-800-244-6224. The tree shows services available when a CIGNA In-Network or CIGNA Premier PPO member calls concerning eligibility, claims, or other benefits. For simplicity, the complete dialog is not included. Please refer to the notes below for more information. If this phone tree does not meet your needs, you may ask for an associate at any time after entering your Member ID information.

CIGNA®

Notes:
- Member ID Entry is member's ID number and date of birth.
- Products (Dental and CIGNA Choice Fund) not Sandia products . and not shown on this diagram.
- * Response to System Question.
- Customer Service Representative (CSR)
- Customer Service Associate (CSA)
- A CSR can be reached following Self Service.

Big Brothers Big Sisters gearing up for school year

200 kids are on waiting list for an adult friend and role model

By Iris Aboytes

Some of us may have big brothers and big sisters; some of us have little brothers and little sisters. That type of relationship is what Big Brothers Big Sisters of Central New Mexico wants for children so that they can reach their potential.

According to Public/Private Ventures, an independent research firm, children who meet regularly with their Big Brother or Big Sister are 27 percent less likely to begin using alcohol, 33 percent less likely to engage in violent behavior, 46 percent less likely to begin using illegal drugs, 52 percent less likely to skip school, and 37 percent less likely to skip class.

Big Brothers Big Sisters has a variety of programs for children between the ages of 6 and 15. A Big Brothers Big Sisters staff member helps with each "match" by introducing a volunteer to his or her Little Brother or Sister. Couple matches are also available.

Photos courtesy of George Wagner

BEST PALS — George Wagner and his "little brother" Cody, who's just entered sixth grade, play games and spend time on Cody's schoolwork. In the photo at right, George spends time with his other little brother, Jonathan. George, whose own children are grown, has been involved in Big Brothers Big Sisters for several years.

Site-based program volunteers meet with children during the school day for an hour each week at school. George Wagner (6441) has two Little Brothers: Cody, who just completed fifth grade, and Jonathan, a second grader. He has been Cody and Jonathan's Big Brother for two years.

George's experience with Big Brothers Big Sisters began in 1977. A television ad motivated him to volunteer. "I was really impressed by the Big Brothers organization," says George. With his children all grown, George decided to do it again. He participates in the on-site program at Sandia Base Elementary where his Little Brothers attend school. He meets with them twice a week either at lunch or late in the afternoon for an hour. Half of the time is devoted to school work and the other half is social.

GEORGE WAGNER and Jonathan.

Big Brothers Big Sisters seeks mentors who want to make an impact on a child's life. About 200 children are on a waiting list. "These are children who could really use a caring adult in their lives," says Rose Garland, Big Brothers Big Sisters' partnership manager. Rose also expresses her appreciation of Sandia volunteers. Sandia is the third-largest volunteer partner in the area, with more than 20 Bigs participating each year.

Jason Cook (6863) has a friend who is a Big Sister and told him about the program. He thought it sounded great and like something he wanted to do for the community.

He became a mentor in the Crossroads program. It offers several group activities that Bigs and Littles can choose from. His Little Brother is Andres, 12. They have toured the fire academy and the base, checking out the planes. "We hang out and play computer games," says Jason. "I enjoy sharing my experiences with a young person. I like to think I am making a difference in a child's life."

"The most rewarding part of being with my Little Brothers is a smile or a unique statement that comes out of nowhere," says George. "It makes me think and smile."

For information on Big Brothers Big Sisters visit www.bbbs-cnm.org.

Sandia Back to School volunteer opportunities

A280 time is available for Sandia employees; retirees and contractors are welcome to volunteer too but are not eligible for A280

CroSSlinks — Volunteers share their love of science in local elementary school classrooms using provided inquiry-based science kits. Frequency is negotiated between volunteer and teacher. Amy Tapia, 284-5207, astapia@sandia.gov.

Valle Vista Math Tutors — Volunteers tutor fourth and fifth graders once a week for one hour at Valle Vista Elementary School. Training and materials are provided. Norb Tencza, 284-5450, nftencz@sandia.gov.

Amy Biehl Math Tutors — Volunteers tutor 2-3 high school students every Monday from 4-5 p.m. in algebra, pre-calculus, and trigonometry at Amy Biehl High School. Math is taught using an interactive math program where students "discover" math concepts from real-world situations. Wendy Aaker, aaker1@msn.com.

Junior Achievement — Volunteers teach K-8 business concepts to local elementary and middle school students using a prepared curriculum. Most units include five 30-minute sessions and all materials/instructions are included. Junior Achievement, 344-0861, office@newmexicoja.org.

Mentoring — Big Brothers Big Sisters and Wise Men and Women: Volunteers meet once a week for one hour with a child during the school day at local schools to promote self-esteem and problem-solving skills and provide a positive adult role model. BBBS, 837-9223 or visit www.bbbs-cnm.org, or Wise Men and Women, 271-2066.

Albuquerque Reads — Volunteers tutor kindergarten students at Bel-Air, Wherry, and Atrisco elementary schools once a week for one hour to help them learn to read. Patty Zamora, 844-2146, pgzamor@sandia.gov.

Rocket Reader — Volunteers tutor first- and second-grade students at Montezuma, Sierra Vista, and Onate elementary schools once a week for one hour to help them learn to read. Peggy Mahon, pmahon@campfire.org.

MentorNet — Volunteers fill out questionnaires and are matched with a university student pursuing a technical degree (undergraduate, graduate, or post graduate) to mentor. Mentoring occurs via e-mail and/or phone. Frequency of contact is negotiated between the volunteer and the university student. Diane Kozelka, 284-3280 mkozel@sandia.gov, or see www.mentornet.org.

200 Sandians help make a house a home

VP Frank Figueroa, right, joins Greater Albuquerque Habitat for Humanity Board President Fem Lucero and the Quiñones family as they dedicate their new home. Community Involvement Dept. 3652, which coordinates Sandia volunteer activities, expresses appreciation to the more than 200 Sandia Serves volunteers who built the home. For more information about how to get involved in the community, check out the Community Involvement website on Sandia's internal web. (Photo by Amy Tapia)