California site celebrates 50 years and rededicates
Sandia/California’s contributions to the national interest over the past half century

By Nancy Garcia

Sandia/California’s 50 years of accomplishments were feted in three days of celebration last week, including a rededication ceremony in which Mim John, VP of the California Laboratory, looked to the past and future and welcomed back pioneering employees and four former vice presidents of the site.

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From a couple dozen employees who initially worked in a former Navy barracks, the site grew by the 1960s to a workforce that has stayed at about 1,100. Problems branched from strictly defense to include energy, bioscience, and microfluidics. Sponsors expanded to include the Department of Homeland Security (DHS), and interactions spread to involve industry, academia, and the state and region.

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The time is now to address the devastating effects of increasing water scarcity and declining water quality around the world. This is according to a recently released white paper written jointly by Sandia and the Center for Strategic and International Studies (CSIS), a Washington, D.C., think tank.

The paper, “Addressing Our Global Water Future,” came about following two conferences last year in Washington. These, representatives of high-profile influential companies, government officials, and technical experts discussed US policies in regions of the world where the US has strategic interests. Discussions centered on countries with dwindling fresh water supplies and the technologies needed to help resolve the water problems.

The primary white paper authors are Howard Pessell (6115) of Sandia and Laura Keating of CSIS. Numerous others from both Sandia and CSIS contributed to the document.

Sandia/CSIS white paper discusses how lack of palatable water can destabilize regions and cause security problems for the US.

Global Nuclear Energy Partnership: Another step on a long and winding road

Question: What was Sandia’s role in the president’s announcement of a Global Nuclear Energy Partnership?

Answer: Persistence, consensus-building, and staying on message in a low-key way

By Will Keener

To many citizens, the announcement of a nuclear energy partnership in President Bush’s February State of the Union address was news. For Sandians involved in helping to shape and achieve the vision of an environmentally and politically safe future fueled by nuclear power, it was another step in a decades-long journey.

The start of the journey came in the winter of 1996, when then-VP Tom Hunter made a presentation, embracing a vision he and colleagues Roger Hagemngruber and Joan Woodard had developed, to the DOE’s Bruce Twinning. This was followed by some earnest discussions with Sen. Pete Domenici after what Tom Sanders (6020) describes as “the zeroing of the nuclear energy R&D budget” in Congress in 1997.

Sandia has continued to participate, often quietly in the background, in dozens of studies, meeting, briefings, and collaborations to further the cause of nuclear energy. Tom Sanders, manager of Sandia’s Global Nuclear Futures initiative, stacks dozens of documents and presentations on his desk as he thinks back over the years.

“Basically, if you run through the chronology, we have been urging some of the things that came out of GNEP (Global Nuclear Energy Partnership) since 1996,” he says. “Our concern as a... [Continued on page 3]

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What’s what

It’s March Madness time, which made me think after getting an e-mail from Mark Jaska (8353) that if Sandia was in the market for a fight song, you might hear Reed’s “hit from a few years back — When You’re Hot, You’re Hot —” working its magic.

A little more rummaging in the mailbag turned up an interesting note from Steve Walcott (10322) about Albuquerque’s official altitude, given in this space in the Jan. 6 issue of Lab News as 5,314 feet.

In Sandia’s own hilliness (is that a word?) of the Albuquerque terrain,” he wrote, “how did you pick 5,314 for its altitude?”

“FIFI, the photovoltaic site (where G meets F by the Eubank Gate) lists Sandia’s ‘official’ altitude as 5,456 feet. Meanwhile, the FAA lists the threshold of runway 26 (point closest to us) as 5,355 feet (the official airport altitude). But they list the thresholds of runways 30 and 33 as your 5,314 feet and the thresholds of runways 8 and 12 as 5,312 feet, of runway 17 (along Gibson) as 5,319 feet, and runway as 5,305 feet.

“Then, there is the base of the Tram, and the Rio Grande down by Los Lunas, etc., etc. I’d hate to have to give an elevation for Albuquerque. We ain’t flat Texas!”

Our phone system uses numbers, not letters, but businesses sometimes select telephone numbers whose corresponding keypad keys spell out a special service. Like a travel agency whose phone number is 244-8747, but advertises as BIG TRIP. Or a tire store with the number 227-8473, or CAR TIRE. With enough time and exposure, such gimmicks — called mnemonicsm — can be helpful and useful.

But have they to resound. If they don’t resound, they don’t work.

At Sandia, the Corporate Computing Help Desk mnemonic phone number 845-CCHD works (if you can remember the prefix), because sooner or later, we all have to call CCHD. Some others are a stretch, making sense and not making sense to their intended creators, but leaving outsiders scratching their heads.

So, from a communications point of view, if you’re going to promote your services with a mnemonic phone number address, be sure it works in the wider world — not just in your group.

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

Cell phone lockers being installed at some gates

You may have noticed boxes like the one in this photograph stuck at unannounced entrance into MO308. They are the result of a joint Safeguards & Security and Facilities initiative to help reduce cell phone infractions. Reminder: These lockers are for everyday use; they are to be used when people forget to leave their cell phones in their vehicle or when visitors are accessing the site.

Sandia Facility user expect to complete installation by mid-April. Due to the expense of installation, the plan is to provide lockers at just those locations listed below.

Tech Area 3

Gate 2/Bldg. 801 — 20 lockable slots. Interior vertical installation, west of Gate 2.


Gate 10 — Exterior horizontal fence installation, west side of gate.

Tech Area 2

Bldg. MO308 — 20 lockable slots. Interior vertical wall installation on north wall in lobby.


Tech Area 3

Bldg. MO300 — 10 lockable slots. Exterior vertical installation onto MO300.

Bldg. 6539 — 10 lockable slots. Exterior horizontal fence installation, east side.

Bldg. 6584 — 10 lockable slots. Interior vertical installation, outside of VTP door.

Bldg. 6610 — 10 lockable slots. Exterior vertical fence installation, southwest side of fence, right side mounted.

Bldg. 6620 — 10 lockable slots. Exterior vertical fence installation, north side of fence, right side mounted.

Tech Area 4

Bldg. 960 — 10 lockable slots. Exterior horizontal fence installation, Limited Area gate southeast of Building 960 (planted on the IPA link to Area 5).

Bldg. 6577 — 10 lockable slots. Interior horizontal installation, next to existing phone booth in lobby.

Bldg. 6585 — 10 lockable slots. Interior vertical installation, 1st Floor, next to existing phone booths, near restrooms.

If you have questions or concerns about these storage lockers, the Facilities point of contact is Matthew Brito, 844-7636.

Donation accounts set up at SLFCU for David Stonebraker, Diana Helgesen

Accounts have been established at the Sandia Laboratory Federal Credit Union for Dave Stonebraker (5416) and Diana Helgesen (5419). Both recently suffered severe injuries in an automobile accident while on Sandia travel in Kodiak, Alaska (Lab News, March 3), resulting in their hospitalization at Anchorage Providence Medical Center. Donations to the accounts will help the families of Dave and Diana as they deal with the issues and expenses related to the accident. Anyone wishing to make a donation can do so using SLFCU account number 210670 and stipulating either the Dave Stonebraker account or Diana Helgesen subaccount.

For more information, contact Earl Creel (844-8355) or eecreel@sandia.gov.
Nuclear power

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national security lab has always been that you can’t influence nuclear safety, security, and proliferation risks at the global level if you’re not in the nuclear business. By that I mean, we, as a country, have to be on the leading edge of research in both the universities and the labs and have an American-based nuclear supply industry that is capable of being a leading supplier across the globe.”

Invisible leadership

With Tom as chief strategist and with help from dozens of Sandians from across the labs, Sandia set in motion a plan to work with non-governmental organizations, other labs, DOE, Congress, and other decision-makers. “Our role has been invisible leadership,” says Tom, “organizing and articulating the arguments for US leadership from the perspective of the national security implications of what might happen, domestically and globally, if we don’t go forward with nuclear energy.”

By 2003, Sandia had established a relationship with the Kurchatov Institute in Russia to develop and articulate an argument for the original nuclear powers providing global nuclear services together. This effort was later expanded at a Vienna, Austria, meeting, chaired by Sandia’s then-Director C. Paul Robinson, to involve seven US and nine Russian Federation laboratories (Lab News, Aug. 20, 2004).

More recently, the effort took on new momentum with growing support of the White House and other leaders. A “kitchen cabinet” made up of high-level private advisors helped press the ideas forward. President Bush’s August signing of the Energy Policy Act of 2005 at Sandia (Lab News, Aug. 19, 2005) further propelled the nuclear power agenda.

GNEP: A better, cleaner, safer world

“For years, there was this sense that we could tolerate a nuclear energy business — fresh fuel and recovery of used fuel — to other nations, which agree to employ nonproliferation strategies to expand emissions-free nuclear energy worldwide by demonstrating and deploying new technologies to recycle nuclear fuel, minimize waste, and improve our ability to keep nuclear technologies and materials out of the hands of terrorists. The concept is to have nations with secure, advanced nuclear capabilities provide fuel services — fresh fuel and recovery of used fuel — to other nations, which agree to employ nuclear energy for power generation purposes only.

The closed fuel-cycle model envisioned by the partnership is tied to development and deployment of technologies to enable recycling and consumption of long-lived radioactive materials. The partnership will demonstrate the technologies needed to change the way used nuclear fuel is managed — to build recycling technologies that enhance energy security in a safe and environmentally responsible manner, while simultaneously promoting nonproliferation.

“If we can make GNEP a reality, we can make the world a better, cleaner, safer place to live,” said Energy Secretary Samuel Bodman in his February announcement.

GNEP will provide opportunities for Sandia to continue its efforts in a number of areas, says VP for Energy, Security, and Defense Technology Les Shephard (6000). “We are uniquely positioned to lead the efforts in nuclear facility safety, security and reliability, nonproliferation, current and future safeguard practices, and the myriad of issues associated with the disposal of radioactive waste.” In addition, Les expects Sandia to be actively engaged with various laboratory, university, and industry partners in modeling and simulation using high-performance computing capabilities, advanced manufacturing, a center for transuranic fuel, and the development of small transportable reactors.

“This is a time for the multi-lab complex to really come together,” says Les.

In fact, a seven-laboratory action plan — produced as a Sandia report in 2003 — set a tone of cooperation among DOE’s laboratories and strongly advocated for measures that are included in the partnership proposal. (Los Alamos, Lawrence Livermore, Oak Ridge, Idaho National Laboratory, Argonne, Pacific Northwest National Laboratory, and Sandia comprise the group.)

One conclusion of that report was that the US needs “a technology leap to the 21st century” to reestablish global influence. Such a leap involves a new generation of large reactors with twice the efficiency of the current generation, with smart manufacturing to:

• reduce wastes by 90 percent,
• provide renewable fuel supplies for several centuries, and
• enable export of long-lived right-sized reactors to developing world markets.

(Continued on next page)

TOM SANDERS
Water

(Continued from page 1)

hydrology Dept. 6115, is that Sandia, as a national security laboratory, has the responsibility to help provide for the security of the US. That includes regions of the world that are of strategic importance to the US and can impact this country's national security.

"The lack of clean water can create conditions that lead to conflict in regions of the world that are already poor and having problems," he says. "Lack of potable water can result in famine, conflict over resources, and poor governance. This threatens the security of those countries and ultimately the security of the US."

Examples can be seen in the instability in the Middle East and Africa — both places where fresh water is in short supply for both consumption and sanitation.

The report expands this theme, saying that "global trends of increasing population, increasing resource consumption, and decreasing natural resource availability — including fresh water — have pushed many human social, economic, and political systems to an important tipping point. . . . We face large-scale future disruptions and crises unless significant action is taken now by leaders in both developed and developing countries."

The white paper made several other findings. They include:

- Water is a foundation for human prosperity. Adequate, high-quality water supplies provide a basis for the growth and development of human social, economic, cultural, and political systems. Conventional economic stagnation and political instability will persist or worsen in those regions where the quality and reliability of water supplies remain uncertain.
- Water problems are geopolitically destabilizing. Water scarcity and poor water have the potential to destabilize isolated regions within countries or regions sharing limited sources of water. There is an increasing likelihood of social strife and armed conflict resulting from pressures of water scarcity and mismanagement.
- Poor governance and poor economies in regions around the world where water is scarce impair the application of innovative technology and innovative policies.
- Solutions must be innovative, revolutionary, and self-sustaining. Traditional technologies for improvement of freshwater availability and quality are inadequate to meet global needs in a timely way.
- Effective water planning and management at national and regional levels require collaboration from a variety of people, including farmers, urban developers, environmentalists, industrialists, policymakers, citizens, and others.
- No single government agency, nongovernmental organization, corporation, international organization, or academic institution can provide all the expertise required to meet the challenges of solving the water challenges. Partnerships are required.
- New ways of funding water projects internationally need to be developed.
- Solutions must be tailored to the socio-economic, political, and geographic conditions of a region.
- Water can be a powerful and effective foreign policy tool. Finding solutions to water problems can significantly support many US strategic objectives.

To help resolve many of the world’s water issues, the white paper recommends the US government develop a long-range strategy for how it engages international water-related policy issues.

The paper also says the US should carry out an inventory of existing international water-related policies and projects, identify a lead agency to coordinate the development of an integrated strategy, undertake a region-by-region review of resources, and engage regional experts, third-party groups, and the community to come up with solutions.

"Ultimately, what the report says is that we must acknowledge that US international water policy has implications that transcend traditional humanitarian and foreign assistance interests," Finley says.

Nuclear power

(Continued from preceding page)

Many roles to play

Some possible roles for Sandia include:

- Demonstrating new, smaller reactor systems for a substantially smaller market. By teaming with Los Alamos, Argonne, and others, Sandia can leverage its small-reactor design experience to support development of a new US nuclear supply industry.
- Using Sandia’s Power Tower to study processes for hydrogen generation, Sandia can create a fast-track, large-scale demonstration of the feasibility of hydrogen production in a nuclear reactor.
- Developing, testing, and qualifying new materials and electronics for the extreme radiation and thermal environments of next-generation nuclear reactors.
- Contributing to the management and integration of a repository science supporting Yucca Mountain, and in security, safety, and licensing efforts.
- Using science-based engineering to model and simulate the ability to improve the process of moving from raw materials to fuel to reprocessing and developing the technology for process controls and transuranium operations.
- Using Sandia’s materials know-how to develop new fabrication techniques for specialty reactor components, providing a competitive advantage to the US industry.
- Finding new approaches to physical security systems and new technologies needed to ensure control of materials in all phases of the nuclear energy process.

Far to go, but future is bright

While there is far to go along the road, Tom Sanders is optimistic that the vision of a nuclear-powered world is not only achievable, but it is inevitable.

"There’s no way that there’s a future without global nuclear energy. You can’t ignore the energy achievable from fission and fusion resources. It is renewable and sufficient to supply mankind for thousands of years," he says. In the short term, however, he says he has been "doing — staying on message, building an expanding constituency, leading from behind the scenes. “Leadership is earned not delegated,” says Tom, “and we must keep moving forward, lead-by-doing.”

Region-by-region water review to begin

As recommended in the white paper “Addressing Global Water Futures,” Sandia and the Center for Strategic and International Studies (CSIS) will be conducting a region-by-region study of water needs and issues in the Middle East, Africa and China over the next two years. These are areas places considered important to US security.

Starting with the Middle East, they will meet with region authorities to identify region-specific water problems. They will then have workshops with government officials, technical experts, and representatives of financial institutions to see how US policies can be revised to help with a region’s water issues and ultimately lead to enhanced security for the US.

White paper: 2.6 billion people don’t have access to basic sanitation

More than one billion people on Earth — about one-sixth of the global population — rely on water sources that are unsafe, inadequate, or difficult to access for their daily washing, drinking, cleaning, and cooking.

Nearly one-third of the world’s population, or about 2.6 billion people, does not have access to basic sanitation. As a result, millions of people, most of them children, are suffering and dying annually from diseases related to poor water quality.

Experts believe the scale of this challenge could double in the next two decades.

In addition, with a region’s water issues and ultimately the security of the US.

Help for you, and fun: IES Mercado, a service info fair, is March 22

The Integrated Enabling Services (IES) 9MU is having its second IES Mercado, a service information fair, on Wednesday, March 22, in front of the Thunderbird Cafeteria from 11 a.m. to 1 p.m. It is the latest in a series of fairs for all things operational — from the simplest financial reporting areas.

The IES white paper, "Addressing Our Global Water Futures,” was published in late 2005 by the CSIS and in March 2006 by Sandia. It was developed in response to the CSIS’s White Paper Initiative on "Global Security: Power, Growth, and a Changing World." The CSIS white paper was subsequently adopted by the US government as its national strategic water plan

IES has expertise in all of these operational areas and is the Labs support team for all things operational — from the simplest to the most complicated of issues.

The integrated enabling services (IES) is a cross-functional team that provides technical and professional support to the Labs’ labs. The IES has expertise in human resources, financial management, information technology, and security, safety, and health. The IES is responsible for all things operational — from the simplest financial reporting areas.

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California site

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ities and responds with agility to opportunities, expertly melding science and engineering.

‘Pound for pound you’re the best’

Keynote speaker Johnny Foster, retired director of LLNL, also lauded that uniqueness, saying, “Pound for pound, you’ve outperformed the other labs.”

He recalled the question posed to him by the director of Los Alamos National Laboratory in 1962: whether LLNL should concentrate on nuclear work and LANL should focus on science? He responded after a moment that he believed both should continue competing and cooperating.

Foster said he still believes competition is critical for technological leadership in the face of new potential adversaries.

As nuclear weapons age and are retired from the stockpile, he said, the deterrent threat must still be viewed as credible. There are less than one-tenth the number of active warheads and warhead types in the current stockpile than during the Cold War. With approval of the Reliable Replacement Warhead (RRW) program, new components and features may be introduced, but the possibility that unknown failure modes would be introduced requires a higher standard of reliability, Foster said.

He offered four suggestions:

• Create an improved process for learning from past failure modes and competitively develop a new learning process.
• Apply the new process to the design and production of refurbished weapons and the RRW.
• Provide additional assurance of reaching targets by using two different warhead types for each weapon system.
• Introduce an incentive reward system for Red and Blue teams during the annual certification of the stockpile.

He said ensuring the stockpile is safe, secure, reliable, and credible is so important that Sandia’s California and New Mexico laboratories should compete in addition to LANL and LLNL and directors of all four laboratories should be called upon when certifying the stockpile.

“This is a first-class lab in a beautiful setting,” Foster concluded. “I give great credit, particularly to all the folks who have worked here over the years.”

Gayle Cain, one of the 82 Sandians who worked at the California site in 1956, marveled at the tremendous growth. He said the city had 6,000 residents and he had to wait two months for a house to go on the market, buying one of the two that went up for sale. Also present at the ceremony were Sandia pioneers Frank Murar and Pat Gildea, as well as about 900 employees or retirees and guests.

The audience heard remarks from LLNL’s Bruce Goodwin, associate director for Defense and Nuclear Technologies; Jerry Paul, principal deputy administrator of the National Nuclear Security Administration; Jim Decker, principal deputy director of the DOE Office of Science; and Garry George, head of the Engineering and Systems Division of the United Kingdom’s Atomic Weapons Establishment.

Forming a vision for the future

Former California Laboratory VP Tom Cook commented that he was particularly proud of the slate of speakers made so much mention of the role of science. His successor to head the site, retired Dick Claassen, said he was gratified by the interaction with all the outside groups (for instance, the Alameda County Board of Supervisors had a proclamation presented at the event). “It was a time to look back at both the people and the challenges that frame this laboratory,” commented Tom Hunter, who was vice president of the site just prior to Mim. “Now it’s really important to take those and form the vision for the future. We see Sandia California as an important part of that. The strong relationship with Lawrence Livermore was recognized by all the speakers. It’s deeper than the mission in how people engage each other; there is camaraderie as they collaborate and compete.”

Added John Crawford, “So many organizations recognized the value of this laboratory over a long period of years. It confirms they are adding a lot of value. Hopefully these kinds of comments will make people understand their work is appreciated.”

Mim summed up factors in that success: exceptionally committed staff, leadership, outstanding partners, and a very supportive set of sponsors.
Pulitzer Prize-winning historian honors Sandia's contributions to global peace, says 'your work helps hold world together'

By Nancy Garcia

Author Richard Rhodes, commemorating Sandia/California's 50th anniversary in a talk titled "Sixty Years of Living with the Bomb," noted Sandia's historically low profile and offered congratulations for "a hell of a story." His book The Making of the Atomic Bomb received a Pulitzer Prize. He went on to write Dark Sun: The Making of the Hydrogen Bomb, and is working on a book about the end of the Cold War. Trained as a historian, he is currently an affiliate at Stanford's Center for International Security and Cooperation.

"People talk casually about the remarkable safety and security of America's nuclear weapons down through the decades," Rhodes said, "without realizing the enormous amount of creative work that went into making them safe. I know you've done and are doing much more than that."

He segued into reflecting upon 20th century advances, particularly two he termed mature technological revolutions — nuclear energy and public health.

"Public health," Rhodes said, "saved more lives in the United States alone than were lost throughout the world in all the terrible wars of the 20th century — losses of combatants and civilians estimated to total approximately 120 million lives."

Saying the world needs "more energy, not less," he believes opposition to nuclear power is immoral because it offers essentially unlimited energy that could help level the quality of life that follows from disparities in distribution of material resources.

He lauded the nuclear deterrent, saying the knowledge of how to release nuclear energy put an end to world-scale war, so that, since 1945, the number of deaths from wars annually has ranged from 1 to 2 million, fewer than the World Health Organization's estimate of 3 million deaths a year from tobacco.

"People talk casually about the remarkable safety and security of America's nuclear weapons down through the decades," Rhodes said, "without realizing the enormous amount of creative work that went into making them safe."

Rhode Rhodes

Secretary Bodman showcases Z machine — and famous Z photo — in his D.C. office

WHEN DOE SECRETARY SAMUEL BODMAN made his first visit to Sandia, he was briefed on the Lab's break-through research on the Z machine. He was impressed with the work — and with the Z machine photograph by Randy Montoya, which has probably been published more often than any other image in Sandia history. Bodman asked Randy to provide a large print of the photo for display in his Washington offices. The secretary promised to send us a photo commemorating the display. Here it is.

RHODES REFLECTS — Looking back on 50 years and more of innovation, author Richard Rhodes drew parallels between nuclear know-how and public health advances.

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He lauded the nuclear deterrent, saying the knowledge of how to release nuclear energy put an end to world-scale war, so that, since 1945, the number of deaths from wars annually has ranged from 1 to 2 million, fewer than the World Health Organization's estimate of 3 million deaths a year from tobacco. His talk kicked off the observance of Sandia/California's 50th anniversary.

The Making of the Atomic Bomb

Richard Rhodes

Recalling the Acheson-Lilienthal Report

"I have the sense that we're still sort of celebrating victory and haven't begun to think through the new world now."

"When, in the years ahead, the declared nuclear powers come to trust that deterrence will work even better with three months' delivery time from factory to target than it worked with 30 minutes delivery time from submarines and missiles," Rhodes said, "then the vision of distributed virtual deterrence that the Acheson-Lilienthal Report described in 1946 will be fulfilled."

About the end of the Cold War, he observed, "I have the sense that we're still sort of celebrating victory and haven't begun to think through the new world now. He said that Hans Blix had commented about the nuclear arms race that it looked as though the US were racing with itself. "The question is, in fact, what do we need and why?" Rhodes opined.

While acknowledging the concern of having two or three new nuclear powers after the Cold War concluded, he said the marvel is that there are not 30 or 40 and added that he would like to see the administration reduce the nuclear arsenal. "I hope you'll pause occasionally to recall the value of the virtue of your work," he said. "I hope you'll remind yourselves that the wholly honorable purpose of your enterprise is nothing less than the alleviation of human suffering. Your work helps hold the world together."

California Site historical posters showcase 50 years

In commemorating Sandia/California's 50th anniversary, graphic artist Ken Ball (8528), with research and writing from Lab News California reporter Nancy Garcia, produced a display featuring the previous decades with pictures, text, and a timeline. On the ensuing pages the Lab News publishes five of those six posters (we'll try to publish the sixth in a later issue). The display is currently mounted in the lobby of the Combustion Research Facility auditorium (Bldg. 890). Much of the research built upon a collection of recollections that had been prepared for future publication. Ken and Nancy would also like to thank all their colleagues, members of the event planning committee, and the retirees who assisted in gathering and nowing down the historical information.
The Beginnings

Sandia/California officially opened in March 1956 as a partner to what was then called the University of California Radiation Lab to design, engineer, and deploy the nation’s nuclear weapons. Sandia National Laboratories became an independent laboratory in 1949 in Albuquerque, and can trace its early roots back to the Z Division of the Manhattan Project. Since the early 1950s, Los Alamos National Laboratory and Lawrence Livermore National Laboratory competed to design the “physics package” of nuclear weapons in the growing stockpile. Sandia’s role has been to design, engineer, integrate, and test the thousands of parts that make the device functional, safe, secure, and reliable.

What does the future hold for Sandia/California?

We expect our core to remain focused on nuclear weapons because of the clear commitment of many existing and potential nuclear states and subnationals to maintain and advance their capabilities. At the same time, the nature of the threats facing our nation today is becoming more complex. Countering chemical or biological terrorism is likely to be an abiding part of our future, so perhaps not surprisingly, we are moving into the biowarfare and homeland security areas and expect to see that part of our mission space expand even further in the coming years. As in the past, energy is again considered a key issue underpinning global security, and this increased national focus, building on our excellent foundation in combustion research, is part of the vision for the site’s future over the coming decade. As in the past 50 years, Sandia scientists, engineers and researchers will continue to play a vital role in keeping the nation safe and secure. Here’s to the next 50!
Across the decades, ‘exceptional service’ is a constant
The emphasis in this decade changed from designing and building the nuclear stockpile to dismantling and disposing of nuclear weapons and managing aging systems. One of the important Life Extension Programs, initiated in 1993, modified W87 warheads from retired Peacekeeper ICBMs for deployment on Minuteman III missiles. In the 1990s, Sandia, California, also had responsibility for designing weapon transport containers, maintaining and improving weapon systems and vehicles, and supporting high-performance computing. Systems studies activities began in the 1990s to provide analysis to strategic planners about policy outcomes, programs, were consolidated into a single department, Congress, in 1989, created legislation that enabled national laboratories to partner with U.S. industry. Meanwhile, wisdom gleaned from experience designing weapons was collected through interviews in the Knowledge Preservation Project. By the end of the decade, the Cold War had ended and nuclear testing was halted.

The new Integrated Manufacturing Technologies Laboratory was dedicated in 1992. The facility was later renamed the Muscle and Bone Technologies Laboratory.

In 1992, Congress created Cooperative Research and Development Agreements for labs to partner with industry.

In 1993, Los Alamos mannequin leads over from NBS as manager of the Labs.

In 1994, the Tritium Lab was decommissioned as a step toward becoming the Chemical and Radiological Detonation Laboratory.

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Livermore's favorite historian (and Sandia retiree) Barry Schrader recalls some choice Sandia/California moments, big and small

Editor's note: This column by retired longtime Sandia Corporation, public affairs head Barry Schrader, a historian of the Livermore area, appeared in last Thursday's Tri-Valley Herald and is printed here by permission.

March 8 marked the 50th anniversary of the arrival of a small contingent of engineers and support personnel in Livermore, mostly from Sandia Corp.'s laboratory in Albuquerque, N.M.

The two dozen staffers were first housed in the pink barracks across East Avenue at what then was known as the University of California Radiation Laboratory (now Lawrence Livermore National Laboratory) so they could provide increasing support for the design and testing of the new nuclear weapons being developed by the UC lab since 1952.

The reason there were two separate organizations working on the same weapons goes back to the days of the Manhattan Project. After the end of World War II, the University of California was given the contract by the new Atomic Energy Commission to operate the nuclear weapons program that had started at Los Alamos.

But when asked to take over the engineering arm that was called Sandia (created out of Los Alamos' Z Division), UC management balked, saying it preferred to stick to the pure science part of the project.

So in 1949 President Truman wrote a letter to AT&T asking its president to assume oversight of Sandia "to render an exceptional service in the national interest." AT&T accepted with the proviso it would operate the engineering organization for $1 a year and take no profit from it.

So Sandia has remained independent from Los Alamos and Lawrence Livermore national labs to this day. And Sandia management was smart in making the early decision to tear down the old Navy WAVe barracks on their new site, thus constructing all new facilities, while Lawrence Livermore has had to contend with the old Naval Air Station buildings to this day.

First collaborations were B27, W27

Talking with Clif Selvage, a retired Sandian who actually arrived in town six months ahead of the formal startup date along with another Sandian, Grover Hughes, I learned that the first project the two organizations collaborated on was the B27 bomb and its counterpart for the Regulus guided missile, the W27.

He even produced a photo showing him and LLNL colleagues on a barge at Eniwetok working on Project Redwing in the Pacific. He thinks those in the photo were Alan Work, Joe Livingston, Bud Loveland, Roy Higgen, Harry Perl, Dean Cristensen, Fred Warren, Bill Lawrime, Hank Otsuki, and Roy Tidwell. He wonders if any of them are still around here today.

Clif was then asked by Sandia management to be a part of the startup operation in 1956, but due to the loud protest of his wife at the time, she decided to stay on the west coast and thought Livermore must be at the end of the world, he declared.

But by 1967, circumstances had changed and he accepted a later offer to transfer to Livermore and, except for some overseas International Energy Agency assignments, has stayed ever since.

Another perk from Albuquerque that first year was Lorena Schneider, who was brought to the loud protest of his wife at the time, since she didn't know he was an amateur equestrian!

They moved to Livermore and purchased their first house on the first day of the week when there was no air conditioning. After 37 years at Livermore and five prior to that at Sandia Albuquerque, Lorena retired and now lives in Florida.

Sandia's Livermore Branch grew to 1,000 people in just a few years, but never grew beyond 1,100 because growth control was exercised by the headquarters in New Mexico.

Sandia Anthology, Remember When

Over the years there were some lighter moments, as reported in a 1996 book called Sandia Anthology, Remember When, assembled by Cindy English and her boss Cliff Yokomizo.

Inside those 125 pages are great stories, remembrances, old memos, cartoons, and humorous photos collected from desk drawers, filing cabinets, and walls from across the site.

The book includes some instances of frivolity I still recall. One day in 1986 the directors decided to smuggle a horse on site after then-Vice President Dick Claassen threatened to rid the site of unsightly and illegally parked bikes. They offered this hoofed alternative to the VP and he surprised them by mounting the steed and riding it. They didn't know he was an amateur equestrian!

In 1992, then-VP John Crawford was holding a Teamwork Celebration Day. We found out it was also his birthday, so colleagues hired the Earl Avenue Middle School Band, led by Bernie Berke, to be bused to the lab and hidden until the appropriate moment when we could surprise John.

Then there was the farewell for VP Tom Hunter, when we bought him a fancy belt buckle, even bigger than the one worn at the party by Lawrence Livermore Labs' Bob Kuckuck, who had beaten Tom in the rodeo Week greenhorn calf-penning event. We didn't want Tom to leave town feeling second-rate. It must have boosted his ego, because now he is president/director of Sandia.

There will be a lot of reminiscing like this when retirees and longtime employees gather to celebrate the Livermore Branch's 50th anniversary, which occurs on the first day of March 6. But don't let anyone dig up the time capsule that was buried there in 1996 when Sandia Corp. observed its 50th. The plaque clearly states it is not to be unearthed until 2024.

Barry Schrader can be reached via e-mail at history@historydetectives.info or at Box 446, Livermore, CA 94551. His website is http://www.historydetectives.info

Barry Schrader is the retired head of Sandia Corporation's public affairs office in Livermore, a history of the Livermore area, and a frequent contributor to Sandia Anthology, Remember When.
Manager promotions

New Mexico

Jim Aubert, from PMTS, Organic Materials Dept. in 2006 to Senior Manager, Materials and Physics Research Div. Jim has been at Sandia since 1982. His work with Sandia has encompassed foams, coatings, adhesives, rheological measurements, supercritical fluids, and materials for high-energy physics targets.

He has received the DOE Award of Excellence for materials development a number of times, including one in 2002 for a team that developed removable encapsulants.

Jim holds six patents and is the author of numerous publications. He was previously the division supervisor of the target fabrication division and the manager of the organic materials department.

Jim has a BS in chemical engineering from the University of Michigan and an MS and PhD in chemical engineering from the University of Minnesota.

Shack Burns, from DMTS, Information Systems Development Dept. in 2006 to Manager, ICADS/GNT Project Management Dept. 5746. Prior to joining Sandia, Shack was an Air Force pilot for eight years, flying F-4s and F-38s. Then he developed cockpit display software for the F-15E at Eglin Air Base. He moved to Honeywell in Albuquerque where he led software teams developing avionics software.

Burns joined Sandia in 1995 on the Integrated Correlation and Display System (ICADS) project. He has worked for the last nine years as the lead of the architecture team, defining the high-level design of the next generation of ICADS ground station. ICADS successfully completed system verification testing in December 2005 and is scheduled to be accepted by the Air Force in November 2006.

Shack has a BS in computer science from the United States Air Force Academy.

Bill Cook, from Manager, Knowledge Discovery and Extraction Dept. 5631, to Senior Manager, Advanced Concepts and Systems Analysis Dept. 5630. Bill first joined Sandia in 1981 to work in the central computing organization as an MTS developing network and security software systems. He then became involved in work for other programs where he developed software and led software development teams in the areas of facility management, telecommunications, command and control, networking, network management, information security, database, and operating systems.

He worked as an assistant to the director of the Information Technologies and Security Center and International Security Programs. Bill was the IT and program operations deputy for the information technology assurance program with primary involvement in international safeguards, proliferation detection, IAEA, DOE/NN, and IAEA.

Bill also managed a group doing software and physics-based modeling and analysis of nuclear weapons, as well as the Sandia fusion science and technology program. He led the Sandia team that submitted the successful proposal for the OASIS (Optical Advanced Sensor) program.

He executed the information technology computer science-retraining program, a corporate-level retraining program to provide people trained in computer science and system administration.

He managed several departments concerned with knowledge discovery and management and developed software systems for a variety of customers to apply advanced technology to the process of making decisions.

Bill has a BS and MA in mathematics from the University of Missouri and an MS in electrical and computer engineering, an MS in chemistry, and a PhD in chemistry from the University of New Mexico.

Roy Fitzgerald, from PMTS, Energy Service Management, Homeland Security & 5MU Business Office Dept. 10542, to Senior Manager and Deputy Chief Financial Officer in 2002. He has been with Sandia since 1989, serving in a variety of staff positions including that of contract auditor, price and cost analyst, and Sandia Contracting Representative.

As an international contracting representative, Roy was responsible for coordinating technical and cost estimates, reviewing and analyzing proposed costs on these proposals, and negotiating contracts on Sandia’s behalf.

In 2001, he was promoted to DMLS and in 2002 was promoted to manager of International Contracting and Export/Import Control Dept. 10245. He worked with customers, external stakeholders, and outside counsel to identify and codify the best guidelines for use in international contracting at Sandia.

Roy implemented the internationally recognized principle of the ISO 9001:2000 standard for Quality Management Systems in 2003. Sandia’s International Procurement Team (10245) was the first procurement organization within the DOE complex to be registered to this standard.

In 2004, he became business manager of a team selected to create a new Homeland Security Initiative and management unit at Sandia. He developed and implemented operational and strategic business models, systems, and processes for the unit.

Before coming to Sandia, he worked with several public accounting firms.

He graduated from New Mexico State University in 1987 and was licensed as a Certified Public Accountant by the New Mexico State Board of Public Accountancy.

Steve Kleban, from PMTS, Critical Infrastructures Modeling and Simulation II Dept. 6222, to Manager, National Systems Modeling and Simulation Dept. 6226.

Steve began working for Sandia in 1983. He initially worked on environmental impact analysis systems for manufacturing goods. He developed the reasoning component of SmartWeld, a design analysis environment for welding. He worked with several expert advisor systems for manufacturing including a materials selector and jointing advisor.

Steve also developed a general web-based approach to knowledge management and most recently he has worked on distributed simulation, data management, and knowledge management for efforts on DHS projects.

He specializes in knowledge management, distributed architectures, collaborative systems, knowledge-based reasoning systems, and supercomputer performance analysis.

Steve has a BS in computer science from the University of California, San Diego, and an MS in computer science from the University of New Mexico.

California

Art Pontius, from Manager, Microfluidics Dept. 8334, to Senior Manager, Materials and Energy Sciences Group 8750. Art has been with Sandia since 1978 and spent his first 17 years in Dept. 8347, first as a staff member, then as manager of the Physical Research Division. He undertook multi-year research programs in hydrogen and helium in materials, plasma-materials interactions, and accelerator-based analysis of materials. Sponsors for his work included Defense Programs, the Magnetic Fusion Energy program, the Strategic Defense Initiative, and DOE Non-Proliferation. Partnerships were a large part of the department’s efforts and led Art to work on Sandia’s behalf in Germany for more than a year in the mid-1980s.

In the late 1990s, Art worked in four different jobs, directly supporting Sandia VPs. Following that era, he went on to manage the Microfluidics Department, where basic microfluidics research is conducted, the liquid-phase MicroChemLab bioagent detection and developed, and insulator-based dielectrophoresis (DEP) was developed for bio-sample processing.

Art has participated in several teams that have created leadership development programs for the Labs.

Art has a BS in physics and mathematics from the University of California, San Diego, and a master’s and PhD in physics from the University of Illinois at Urbana-Champaign.

Recent Patents


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Sandia News Briefs

Jackie Kerby Moore elected president of Association of University Research Parks Jackie Kerby Moore (10105), executive director of the Sandia Science & Technology Park, has been elected president of the board of directors of the Association of University Research Parks (AURP). The move came at the recent annual AURP conference in Raleigh, N.C. Jackie has served on the board since 2002. Currently 108 operating research parks and 35 planned research parks in the US are members of AURP.

Retiree deaths

Edward W. Roche (age 69) ....... February 1
Gloria R. Toland (74) ....... February 1
Everett R. Gourley (89) ....... February 9
William W. Rowe (83) ....... February 10
Rocco T. Williams (78) ....... February 12
Mary D. Wallace (82) ....... February 13
Gordon E. Cheek (90) ....... February 15
Charles Henry Malik (68) ....... February 16
Omar M. Candelaria (79) ....... February 17
Doris L. Poudair (81) ....... February 20
Richard A. Miller (86) ....... February 28
Top 5 causes of injuries requiring more than first aid in CY05:

- Keeping eyes on path and task
- Avoiding repetitive motion (taking breaks)
- Staying out of the path of moving objects
- Using good body alignment
- Getting help

What would have prevented these injuries?

<table>
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<tr>
<th>Injury</th>
<th>Prevented by</th>
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<tr>
<td>1.</td>
<td>Keeping eyes on path and task</td>
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<td>2.</td>
<td>Avoiding repetitive motion (taking breaks)</td>
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<tr>
<td>3.</td>
<td>Staying out of the path of moving objects</td>
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<tr>
<td>4.</td>
<td>Using good body alignment</td>
</tr>
<tr>
<td>5.</td>
<td>Getting help</td>
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724% of the injuries in CY 05 that required more than first aid were from these five causes.

62% of all CY 05 injuries could have been avoided with these five causes.

Proactive, success-focused Behavior Based Safety identified as essential to reducing accidents

By Iris Aboytes

Three words—Behavior Based Safety, or BBS—may hold the key to a safer Sandia population, say Labs executives. What is Behavior Based Safety? It is a systematic way to study the behaviors that prevent accidents; remind, reinforce, and re-educate workers about these behaviors; and measure and manage these behaviors proactively as leading indicators of accidents.

You’re going to hear a lot more about a new program called Behavior Based Safety from now on, Sandia has contracted with ProAct Safety, a Woodlands, Texas, firm, to help implement BBS. “Sandia can expect a 60 to 85 percent reduction in injuries over a three-year period after implementing BBS,” says Terry Mathis, president of ProAct Safety, “based on our experience in helping to implement BBS in more than 800 organizations during the past 15 years.”

Piloted in Division 10000 in 2005, early results indicate a trend toward fewer accidents. BBS supplements, but does not replace, traditional safety programs and efforts. Prerequisites such as no punishment for at-risk behaviors, fast action to barriers to doing work safely, workers managing/running the process, and anonymous observations are mandatory to make it work.

To launch the BBS pilot, Division 10000 created a Strategic Planning Team, with three members of management, three union officers, and one BBS advisor. They have trainer facilitators in construction, facilities operation, and office work. Three steering committees designed and managed the BBS for the three types of work done in the division — construction, facilities operation, and office work. More than 120 Sandians in the division have been trained to be observers.

Traditional safety data are looked upon as reactive. BBS is proactive. Traditional safety has complacency, BBS has cooperation. Instead of punishment, BBS has positive reinforcement.

“Behavior is simply an observable act,” says ES&H Assurance, Planning, & Behavior Based Safety Manager Al Bendure (10312). “Perceptions, habits, and barriers all create behaviors. In BBS, employees actually manage and run the BBS process. Peer observers identify concerns and ask why. ‘BBS fixes the problems, not the blame,’” says Al. “We hope to introduce all Sandians to BBS by the end of September.”

Observers watch their peers perform their work. They look for a critical few precautions that would prevent the majority of the injuries experienced by members of their group. Observers reinforce safe performance and offer suggestions for keeping out of harm’s way. They coach colleagues on perceptions or habits and identify barriers. Data from observations are anonymous and are entered into a database and analyzed by the steering committees. The committees bring concerns to management’s attention for addressing identified barriers.

Traditional safety measures failure rates. BBS measures success rates. Traditional safety has complacency. BBS has cooperation. Instead of punishment, BBS has positive reinforcement.

“Many injuries are the result of the unsafe actions of employees,” says ES&H Director Phil Newman (10300). “This is why BBS is the key to our success in driving down accidents.”

Across the country companies are recognizing the need for a different approach to safety and innovation to safety issues such as the problems inherent in accidents and the aircraft mechanic being sucked into a jet engine are examples of accidents. Say Sandia’s union representatives. They say they are pleased with the great strides Sandia has made toward changing the safety culture at all levels. In BBS, observers are trained in safety. Their concern is not about being right or wrong, but about keeping Sandians safe. “When I came to Sandia and was at a grocery store wearing my badge,” says Al, “a Sandian whom I did not know came and told me I was wearing my badge (which is not the thing to do in public). I did not hesitate as I put my badge in my pocket. That is the kind of trust we hope to build among employees.”

In the Kevin Spacey movie Pay It Forward, a boy responding to a class assignment comes up with an idea to improve life. He determines to help three people in a “special, life-changing” way.

Instead of having them pay him back for his kindness, he tells them to pay it forward, that is, to help three people. Then they require the same pay it forward philosophy. Getting a coworker out of harm’s way can be “special, life-changing.”

“Individuals have little control over conditions,” says Sandia VP and ES&H champion Frank Figueroa (10000), “but do have control over behavior. We need to look out for each other — remove the obstacle, hold a hand, caution a colleague. Each one of us has the power to make a difference. Use that power.”

You must update dependent info for UHC/CIGNA

Sandia’s Benefits Department reminds employees to update your dependent Coordination of Benefits (COB) information for UnitedHealthcare and CIGNA.

If you haven’t already done so, visit www.UnitedHealthcare.com or www.cigna.com to make sure that all of your information is current and accurate. If you are enrolled in a CIGNA medical plan, you must provide this update even if your dependents do not have other insurance.

Medicare drug coverage talk for Sandians, retirees March 27

Michael Parks, an attorney at the Senior Citizens Legal Office, will host a Medicare drug coverage forum on Medicare Drug Coverage on Monday, March 27, from 12 noon to 1 p.m., in the Steve Schiff Auditorium (Bldg. 825, Technology Transfer Center). A nuts and bolts Q and A session will follow his remarks.

Parks’ address is being hosted by the Sandia Ancestral Group, is open to all Sandians who are caring for an aging loved one. Attendance at the briefing does not require a badge so all are welcome.

If Sandians or their loved ones have immediate concerns about Medicare drug coverage, they are encouraged to contact the local Hot Line at 830-3096. Direct questions about the presentation to Dick Stee1 (10004) 284-4353. Medicare drug coverage talk for Sandians, retirees March 27

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As the team, now without Kevin, continued the long ascent, they began to experience unwelcome symptoms, and there was no doubt about the cause: altitude. The physical burden of lack of oxygen slowed the team’s pace and required frequent breaks. At camp that night, the temperature dropped to 15°F, and some team members resorted to lining their socks with hand warmer packets in an attempt to ward off the biting cold.

As the eve of the team’s summit day dawned, everyone, including Kevin, reluctantly conceded the obvious: Kevin was too sick to continue on the trek. He was evacuated the next day, accompanied by a guide and several porters. (Months after the expedition, Kevin’s condition continued to deteriorate until a doctor ordered an emergency appendectomy near Christmas time. During the operation, it became clear that Kevin’s failing health was the result of his appendix rupturing that night on Kilimanjaro. Doctors say he is incredibly lucky to have survived.)

In Kevin’s account of the journey, he found himself tested in a profound way on all levels: “physically, mentally, and emotionally.”

The group can’t praise their guides highly enough, crediting them for the success of the climb and the safety of those who participated. "The Tanzanians are among the most courageous, proud people I’ve ever encountered... they really went to great lengths to take care of us on the hike,” says Pauline. “I didn’t feel I came away with the same kind of life-altering experiences some people come away from Kilimanjaro with, but looking back on my trip, you see that you can’t always take the small things too seriously.”

As the team looked out on the glaciers and plains from the summit and recalled how much they had to overcome to make the journey, they found a rewarding sense of accomplishment. As Pauline puts it, “Although it was the most mentally and physically challenging thing that I’ve ever done, I returned home more relaxed – or maybe serene is the word — than ever.”

Serene — like the view from atop Africa’s mighty Kilimanjaro.
t 8 a.m. last Sept. 9, Pauline Ho, Rick Buss, Ellen Meeks, and Mike Coltrin stepped triumphantly onto the highest summit on the African continent. As the team gazed upon the glaciers and plains stretching out below them, they reflected on how much they had overcome in reaching this serene vista. Together, they had just endured the most mentally and physically challenging thing they had ever done — conquering Mount Kilimanjaro.

This unlikely team of hikers became friends years earlier through their work at Sandia’s New Mexico and Livermore sites. Spouses Rick (1517) and Pauline (6245) met the couple Kevin McCarty (8756) and Ellen Meeks (formerly 8757, on entrepreneurial leave with Reaction Design) at Livermore through coworker Mike Coltrin (1126). The idea to climb Kilimanjaro came one day while casually discussing climbing distant mountains, and soon the group began making plans to reach the peak.

‘Conceivably’ is key term here

Climbers describe Kilimanjaro as a “nontechnical” climb because, conceivably, any fit person can climb it. “Conceivably” is the key term here. The 19,340-foot ascent to Kilimanjaro’s highest peak (called Uhuru) is rife with dangers and obstacles. Of the nearly 15,000 people who attempt to climb Kilimanjaro every year, fewer than 40 percent reach the summit. Even though the team members are all experienced hikers, they agreed that reaching the summit of Kilimanjaro was tougher than they expected, pitting their stamina and abilities against Tanzania’s great mountain.

Over the course of the eight-day climb, Mike, Pauline, Rick, Ellen, and Kevin transitioned through six distinct climate zones — from steamy, fertile grasslands to Kilimanjaro’s barren, arctic summit. The mountain’s equatorial location and incredible height create the extraordinary conditions for experiencing almost every climate type on Earth during the journey to the top.

Eight days before “summit day,” the expedition began, venturing out into the forests of Tanzania early on the morning of Sept. 2. Spotted monkeys and exotic birds watched curiously as the team rambled through the lush Tanzanian vegetation, led by guides Elias (pronounced “el-LEE-as”) and Charles Malisa. Energized by the excitement of the journey, the Americans and Tanzanians conversed about where they were from and the jobs they did when they weren’t climbing massive mountains. At this stage of the adventure, talk — and breath — came easy.

As the team settled into camp that first evening, they carefully took note of their vital signs and oxygen levels, a practice they would observe religiously on the trek. One of the greatest obstacles facing them would be the harsh effects that extreme altitudes would have on their bodies. Ultimately, every member of the ascent team experienced some degree of altitude sickness.

In the worst cases, altitude sickness can quickly become a disorder known as acute mountain sickness — a familiar affliction of experienced climbers. At high altitudes, the lack of oxygen can inflict severe headaches, nausea, dizziness, disorientation, muscle pain, and even death among its victims.

On Day 2, emerging out of the rainforest, the group was rewarded with their first glimpse of their destination: the Kibo volcano. As cloud cover lifted from around the summit, the team stopped to relax, and using Rick’s binoculars, looked across the Shira Plateau to the Lava Tower, the trail to Arrow Glacier, and the Western Breach — the landmarks that would serve as mileposts for the rest of the trek.

Commotion on the fifth night

The climb progressed remarkably well until the camp awoke in a commotion on the fifth night. Kevin McCarty, who had been experiencing heartburn and digestive troubles the last couple of days, had suddenly taken a turn for the worse. His body temperature was plummeting, and he had begun vomiting uncontrollably. The team’s guide, Elias, fed him hot water and honey in an attempt to bring his temperature back to normal.

The team was deeply concerned about Kevin’s health. No one knew what was wrong, but it seemed clear it wasn’t altitude sickness.

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