Process to name successor ‘well underway;’ smooth leadership transition expected in mid-summer

Sandia President and Laboratories Director Paul Hommert announced to employees on Tuesday that he plans to retire in mid-summer, five years after becoming Sandia’s 13th director.

Under Paul's leadership, Sandia has delivered on a wide variety of national security work and increased its already large economic and community impact on Albuquerque and the region through the Labs’ technology transfer, small business programs, employee volunteerism, and donations.

“The technical performance of our institution on a range of products in the nuclear weapons program has been outstanding,” Paul said. “Sandia has made game-changing technical contributions to a wide range of national security programs, as well as diverse and sustained contributions to international security. Sandia has continued to bring its scientific and engineering depth to solving dynamic challenges in energy security. All these accomplishments and others form the basis of the Laboratories’ future.

“The process to name my successor is well underway and will be complete in time to support a smooth leadership transition,” he said. “The timing for my retirement is consistent with commitments made to the Sandia board of Directors and my family when I accepted this position some five years ago.”

Paul also noted that Sandia has met budget and schedule goals for an unprecedented three major nuclear weapons update projects, including the B61-12 Life Extension Project.

“Under Paul’s leadership, Sandia has excelled in carrying out research and development to ensure America’s economic and technological competitiveness while advancing key initiatives across the nuclear security enterprise,” said Secretary of Energy Ernest Moniz. “Paul has promoted innovative approaches to new and challenging scenarios. I want to thank Paul for his many years of service to Sandia and dedication to our nation.”

In an internal memo to employees, Paul reflected on his years of service at Sandia.

“As I look back on my career, I have been truly blessed to spend so much of it at this great institution, among such talented and dedicated people,” Paul wrote. “Preparing for the next phase in my life, I know that I will take pride in your future accomplishments for I will always be a Sandian.”

Since Paul became Labs president and director in 2010, Sandia has experienced mission growth and a workforce increase to more than 10,000. And employee contributions to the United Way and volunteer work for dozens of worthwhile local causes have steadily increased.

In 2013, Paul was named Laboratory Director of the Year by the Federal Laboratory Consortium for his support of Sandia’s technology transfer activities. The award recognizes federal laboratories and their industry partners for outstanding technology transfer efforts and has become one of the most prestigious honors in technology transfer.

Paul began his career at Sandia as technical staff member in 1976 and moved into positions of increasing program and management responsibility. He later served in leadership positions at the Atomic Weapons Establishment in the United Kingdom and at Los Alamos National Laboratory. He returned to Sandia as VP of Sandia’s California site in 2006 and was named executive VP and deputy laboratories director for the Nuclear Weapons Program in 2009.

Domenici: ‘Government R&D and the shale boom’

In a guest column for the Sandia Lab News, former US Sen. Pete Domenici writes about how smart federal investment in R&D coupled with robust private sector partnerships contributed to the ongoing shale oil boom. Read his analysis on page 6.

Starving a cancer instead of feeding it poison

Simulation offers hope of killing cancers without sickening patients

SUSAN REMPE is part of a multi-institution research team exploring a new approach to fighting cancer that avoids many of the side effects of current treatments. (Photo by Randy Montoya)

By Neal Singer

A patent application for a drug that could destroy the deadly childhood disease known as acute lymphoblastic leukemia — and potentially other cancers as well — has been submitted by researchers at Sandia, the University of Maryland, and the MD Anderson Cancer Center in Houston.

"Most drugs have to go inside a cell to kill it," says Sandia researcher Susan Rempe (8635). "Our method instead withholds an essential nutrient from the cell, essentially starving it until it self-destructs." (Continued on page 6)
That's that

When I heard that Paul Hommert plans to retire later this summer, one of the first things I thought about was the movie Apollo 13.

That may seem like an odd bit of free association, so let me explain. Or rather, let me tell you about Paul Hommert, the Apollo 13 flight director (as portrayed by Ed Harris in the movie) set the stage: Three astronauts are stranded in a seriously damaged spacecraft a quarter of a million miles from Earth. It looks like their life support systems are failing; if they don’t get home before the day turns, looks at him, and says, “With all due respect, sir, I think this is gonna be our finest hour.”

So what does this have to do with Paul?

Well, I was thinking about his leadership over the past five years and his many significant accomplishments; he has overseen the largest weapon development program in three decades; he has sharpened the Labs’ strategic focus through the development of the Laboratories Framework, with its clear articulation of Sandia’s mission areas; he has made it a personal priority to ensure that Sandia fosters an inclusive environment. These highlights just skin the surface of a profoundly consequential term as Labs director during “interesting times.” To me, it’s telling, and almost certainly no coincidence given Paul’s priorities and his leadership acumen, that over the past five years, Sandia has grown to be the nation’s largest Federally Funded Research and Development Center – the largest by a very wide margin.

But I will always consider Paul’s finest hour to be his leadership during one of the most challenging periods in the 20 years I’ve been at the Labs. Here’s the scene: It was the fall of 2013. The budget battles in Washington were more difficult than usual. Congress had reached an impasse over whether to increase the nation’s debt ceiling and had not passed an FY2014 budget or a continuing resolution. In that environment, it appeared very likely that Sandia, along with federally funded facilities across the nation, might have to shutter its windows, lock its doors, and furlough its employees.

The Lab News headline for Oct. 18, 2013, was: “Sandia prepares for federally directed shutdown with a subheadline reading: ‘Paul Hommert briefs Labs staff at all-hands on call for orderly transition to ‘warm standby’ status.’”

do have the space here to re-tell the entire story, I hope it suffices to say that many of us were convinced we were some the most successful outcomes.

Lab News Staff

That last phrase — “We’re all in this together” — is the perfect expression of Paul’s leadership philosophy: he lives it, breathes it, embodies it, practices it. Ultimately, as many will remember, the shutdown didn’t occur. The issues in Washington were resolved (sort of) and we employees were never furloughed. But we were also convinced, thanks to Paul’s communications efforts, that he and his leadership team were doing everything they could to minimize the impact on employees while ensuring that essential functions, in particular those related to the most urgent national security concerns, were kept online. We were convinced, that is, that Paul’s principle-based leadership our management had our backs.

Let me quote from that Lab News article:

“…What I don’t want,” Paul said, “is for the Labs to send some people home while others continue to work, depending on the specific amount of carryover funds in their particular projects. We’re trying to keep the enterprise as whole as possible for as long as possible; we’re all in this together.”

… “And in this job, this is the perfect expression of Paul’s leadership philosophy: he lives it, breathes it, embodies it, practices it. Ultimately, as many will remember, the shutdown didn’t occur. The issues in Washington were resolved (sort of) and we employees were never furloughed. But we were ready; thanks to Paul’s insistence that everybody be kept in the loop, we knew what the plan was and knew where we fit into that plan. We all drew a lot of confidence in knowing that Paul’s steady hand was at the helm navigating us through those treacherous waters. We knew that come what may, we couldn’t ask for a better captain. That is why, if anyone asks, I’ll always say: ‘With all due respect, sir, that was Paul’s finest hour.’”

See you next time. – Bill Murphy (MS 1468, 505-845-0845, wtmurph@sandia.gov)

1. See you next time.
Sandia researcher Christopher Kliewer (8353) has won a DOE Early Career Research award that will fund the development of new optical diagnostic tools to study interfacial combustion interactions, which are major sources of pollution and vehicle inefficiency.

“I’m interested in interfacial combustion phenomena, like when a flame interacts with a wall. These heterogeneous processes dominate some of the most stubborn and technologically critical problems in combustion, yet they are not well understood,” says Christopher. “This is due in part to the lack of experimental approaches capable of probing locations very close to an interface, especially in the hostile environment of combustion.”

In engine and power generator combustors, flames interact with metal walls during the combustion process. These interactions are a major source for pollutant emissions, such as unburned hydrocarbon and particulate emissions, and cause aging and failure in engines and generators. Christopher’s project will develop a new nonlinear optical surface scattering technique to capture the dynamic chemistry of the flame-wall interactions.

This tool will be further developed to correct a deficit in existing experimental techniques for studying soot particles collected from flames. Nearly all these techniques require ex-situ analysis — meaning a sample must be removed from the flame to be studied. The act of removing the soot changes both the sample and the surrounding combustion, limiting the accuracy of results.

Ultimately, new insights into the chemical mechanisms of flame-wall interactions and soot growth and oxidation will inform combustion chemistry models that increase the fidelity of predictive numerical simulations of combustion devices, chemistry, and processes. Better simulations can help designers optimize engines and other devices to reduce pollution formation and increase efficiency.

The project builds on and uses other recent advances in Christopher’s lab, such as two-dimensional gas-phase coherent anti-Stokes Raman spectroscopy (2D-CARS). The technique, developed by Christopher and Sandia researcher Alexis Bohlin (8353), increased the capability of this optical diagnostic tool from capturing a CARS spectrum at a single point in space to a planar array of thousands of points within a single laser pulse.

“We developed that technique for gas-phase combustion,” he says. “Now we’re applying that technique to better measure and define the chemistry occurring at the interfaces.”

Christopher joined Sandia in 2009. He has received two distinguished paper awards from the Combustion Institute for papers presented in optical diagnostics at the 2010 and 2014 International Symposium on Combustion. His paper on 2D-CARS was the most read paper in *Journal of Chemical Physics* for June 2013. He has a doctorate in physical chemistry from the University of California, Berkeley, and a bachelor’s degree in chemistry from George Fox University in Newberg, Oregon.

Christopher is one of 44 winners from DOE labs and US universities chosen by peer review. The Early Career Research Program, now in its sixth year, is designed to bolster the nation’s scientific workforce by providing support to exceptional researchers during the crucial early career years, when many scientists do their most formative work.
T hree years of designing, planning, and preparing came down to a split second, a loud<br>boom, and an enormous splash in a successful impact test of hardware in the nose<br>assembly of a mock B61-12 bomb.

The Sandia test also captured data that will allow analysts to validate computer models<br>for the bomb, part of Sandia’s decade-long effort in the B61-12 Life Extension Program (LEP).

The B61-12 LEP is an $8.1 billion NNSA program coordinated across the nation’s nuclear secu-

High-speed camera data and video footage captured a split second of the dynamic testing of the B61-12 nose assembly.

"The B61-12 LEP has performed several impact tests of various target types and velocities over the last two years in support of the B61-12 design," Tyler said. "The DAVIS gun as part of experim-

"It was awesome," Tyler said after the shot. Tyler, who worked toward the test for more than three years, brought members of the team to EMRTC so they could watch a highlight of their work: dropping a bomb out of the cannon-like gun. Warner said it meant waiting until the next day to recover test data, and Tyler joked, "I don’t know how happy I really am" after seeing the data from the reporter-crew and built by Ryan Layton (9113) and a separate

"We’ll then repeat the tests on the new design to verify that the changes were successful," Manager Doug Dusenberry, whose Terminal Ballistics Technology Dept. (5431) conducted the test, explained how the gun works: Imagine the barrel as a straw, open at both ends, with an explosive charge sandwiched between the test nose assembly and a 2,000-pound steel slug, called the reaction mass. The test component and reaction mass are positioned to simultane-
ously blow out opposite ends of the barrel, the projectile slamming into the water of the adjac-

test pool — Workers from Sandia and the Energetic Materials Research & Testing Center (EMRTC) at New Mexico Tech gather around an 8-foot-deep water pool as they discuss preparations for a test at EMRTC. Sandia’s Davis gun shoots test articles into the pool in tests of a so-called soft target.

A member of the team looks through a periscope at Sandia’s Davis gun, which fired the test assembly into a pool in one of a series of impact tests.

MANY IMPACT — A test B61-12 nose assembly fired from Sandia’s Davis gun splashes water from an 8-foot-deep pool as a 2,000-pound reaction mass sails into the air from the other end of the gun in a successful impact test at New Mexico Tech’s Energetic Materials Research & Testing Center. The reaction mass eliminates the recoil load in the gun chassis during firing.

THE FOGG — A member of the team fires a mock B61-12, mounted on an aluminum tube to replicate the body of the actual bomb, in a controlled experiment to move toward Sandia’s Davis gun, which fired the test assembly into a pool in one of a series of impact tests.

NOSE ASSEMBLY — The nose assembly of a mock B61-12, mounted on an aluminum tube to replicate the body of the actual bomb, in a controlled experiment to move toward Sandia’s Davis gun, which fired the test assembly into a pool in one of a series of impact tests.
Government R&D and the shale boom

Note: Pete Domenici, who served in the US Senate from 1973-2009, remains active in the public policy arena as a senior fellow at the Bipartisan Policy Center. In this guest column for the Lab News he makes a case for targeted public investment in R&D coupled with leadership in the private sector. The views here are his own.

By Pete Domenici

When it comes to the oil and gas production boom in the United States, few people want to give credit to the essential role of government research and development (R&D). But the shale boom is a story of early government R&D paired with critical efforts in the private sector, particularly those of Mitchell Energy.

“We must also recognize that taking chances is a fundamental part of the R&D process — not every theory, experiment, or emerging technology will yield results in the way researchers hope. However, every now and then, these efforts strike on something truly extraordinary…”

The shale boom is important for a variety of reasons, not the least of which are the economic and trade benefits it brings. The United States has spent — and continues to spend — a significant sum on crude oil imports. For just one example, between 2010 and 2014, this total amounted to over $1.4 trillion¹ — a transfer of wealth to other nations that could have otherwise been used for our own growth and prosperity. However, thanks to dramatic technological breakthroughs, US crude oil production has rebounded in each of the previous two years. In fact, the increase in 2014 was greater than it has been in any year since recordkeeping began in 1900 — a period of more than a century.² This is in sharp contrast to a declining trend that spanned more than two decades from 1985 to 2008, during which production fell in every year since 1985.³

This reversal is a testament to the potential power and sweeping impact of directed public R&D combined with significant private sector action. But in addition to noting these dramatic successes, we must also recognize that taking chances is a fundamental part of the R&D process — not every theory, experiment, or emerging technology will yield results in the way researchers hope. However, every now and then, these efforts strike on something truly extraordinary, and in the case of domestic oil and natural gas production, new technological innovations are leading to unprecedented increases in crude oil sales.⁴

Overall, the reversal in oil and natural gas production has not only benefited a particular industry, it has reduced the US burden of significant energy imports, diversified world energy supplies, and added energy security for both the United States and its allies. These great benefits illustrate the critical role of targeted public R&D coupled with leadership in the private sector; we must be willing to take chances on key technologies, because breakthroughs like these pay themselves back many times over. It would have been nearly impossible to imagine these energy developments a decade ago, let alone two or three decades ago, but these great benefits are now a reality, and we must continue to expand and refine the efforts that led us to where we are today. None of this would have been possible without the federal government.

Domenici served in the US Senate from 1973 to 1997 and is a senior fellow at the Bipartisan Policy Center. Stuart Ramquist is executive director of the Center, assisted in writing this article.

3. Ibid.
5. Ibid.

Cancer

(Continued from page 1)

The removed nutrient is called asparagine, which cancer cells can’t produce on their own. But there’s more to the story.

It’s well-known that chemical attempts to kill cancer cells often sicken the patient. In the case of the cancer drug L-asparagine type X (L-ASN2), whose primary effect is depletion of asparagine, side effects are generally attributed to the corresponding depletion of a chemically similar molecule called glutamine. All human cells need asparagine and glutamine to survive because each is essential to biological processes. While most normal cells can synthesize their own asparagine, certain cancer cells cannot. So the ideal nutrient-deprivation strategy for cancers often sicken the patient. In the case of the cancer drug L-asparagine type X (L-ASN2), whose primary effect is depletion of asparagine, side effects are generally attributed to the corresponding depletion of a chemically similar molecule called glutamine.

That’s because, she says, “we used high-resolution computational methods to redesign the cancer drug to act differently, in this case to act only on asparagine.”

That’s because, she says, “we used high-resolution computational methods to redesign the cancer drug to act differently, in this case to act only on asparagine.”

Laboratory tests showed that the predictions worked for cancers often sicken the patient. In the case of the cancer drug L-asparagine type X (L-ASN2), whose primary effect is depletion of asparagine, side effects are generally attributed to the corresponding depletion of a chemically similar molecule called glutamine.

That’s because, she says, “we used high-resolution computational methods to redesign the cancer drug to act differently, in this case to act only on asparagine.”

Lab News | May 15, 2015 | Page 6

In A QUIET MOMENT during the rededication in 2011 of the then-relatively new Weapon Integrity Facility building as the Pete V. Domenici National Security Innovation Center, former New Mexico Sen. Pete Domenici pauses in front of the building named in his honor. Domenici remains active in the public policy debate as a senior fellow at the Bipartisan Policy Center. (Photo by Randy Montoya)
Ken Holley honored by state Office of African American Affairs

Outstanding Service Award recognizes contributions to community, education

Long-time Sandia recruiter Ken Holley (3555) has been named a recipient of a 2015 Outstanding Service Award from the New Mexico Office of African American Affairs (NMOAAA). Ken is being honored for his contributions to educational advancement and economic empowerment in New Mexico’s African American community.

According to the nomination package put together by Ken’s supervisor, Jan Larson (4249) and other colleagues and submitted on Ken’s behalf to NMOAAA, “Kenneth Holley is an icon at Sandia National Laboratories in recruiting and in supporting African American employees, as he attracts to personnel after being hired at Sandia with the assistance of Mr. Holley more than 12 years ago.”

Says Ken, “I am humbled by this award because it is from the community. There are so many other deserving people. I seldom think of the activities we are involved in outside of work. We just do what we do. It is good that someone makes it a difference for them.”

Ken graduated with a B. degree from Winston Salem State University in North Carolina and earned his MBA from Oral Roberts University in Tulsa, Oklahoma, where he worked for the US Department of Energy for 20 years and thanks his cell phone, and Dow Chemical before joining Sandia in 1985, where he immediately began to make his mark. During 20 years at the Labs, Ken drove and implemented Sandia’s Historically Black Colleges and Universities Program, which has proved to be a very effective vehicle for attracting talented African American students.

Ken was assigned to Sandia’s Education Outreach Department to run the DOE Science and Technology Alliance to promote the development of STEM programs at historically black colleges. He also has served as chair of the Labs’ Black Lead Scholarship Committee and Outreach Committee, a group that focuses on retaining and attracting African American employees.

In his community outreach efforts, Ken has been closely involved with HMTech — previously called the Hands on Minds on Technol- ogy program — for more than 20 years.

HMTech focuses on improving educational outcomes in New Mexico at the K-12 level and challenges youth to enrich their minds in the STEM disciplines. He is a member of the Alpha Phi Alpha fraternity, which, among its other missions, focuses on encouraging academic excellence. He also served on the Albuquerque Academy Board of Directors for six years, promoting the fiscal and academic programs at the school.

Ken is actively involved in his church as a Sunday school teacher and was a co-founder of its couples ministry, among other roles.

In the nomination package submitted to NMOAAA, one Sandia employee on temporary assignment described Holley’s contributions to HMTech — previously the Hands on Minds on Technology program — as follows: “Ken has been closely involved with HMTech — previously called the Hands on Minds on Technology program — for more than 20 years. Holley has been a key leader of the program and has convinced them that African American students can thrive when given encouragement and a chance to prove themselves.”

In another letter of recommendation, a former colleague of Holley’s said, “Since Ken’s retirement, the program has benefited greatly from his expertise and continued the excellent work he has done in the past.”

Ken layed cornerstone for the program when he was a professional recruiter. He laid the groundwork for the program and continues to do the work that African American students can thrive when given encouragement and a chance to prove themselves.”

The New Mexico Office of African American Affairs (NMOAAA) is a state program established under state law to develop and implement programs that will improve the quality of life for African American New Mexicans and that will increase the opportunity for advancement in the state. The office's mission is to develop and implement programs that will improve the quality of life for African American New Mexicans and that will increase the opportunity for advancement in the state.
His parents, Mike (2735) and Terry Lovejoy, welcomed the opportunity to talk about the person and soldier their son was. “All he ever wanted to be was a soldier,” Mike says. “He loved life, he loved the Army, and he loved working out, so it’s fitting that he be honored in this way.”

About 100 people from the military and law enforcement communities participated in the event, named after Air Force Master Sgt. Michael Maltz, a member of the elite pararescue team known as “PJs.”

In 2007, Drug Enforcement Administration (DEA) Special Agents Keith Billiot, Todd Gregory, Chuck Noonan, and Carson Ulrich began the Maltz Challenge. The four men worked with Derek Maltz, Michael’s brother and the DEA’s Special Operations Division special agent in charge. The event honors Maltz and five other PJs who were killed March 23, 2003, while on a mission to rescue Afghan children. Each year event coordinators choose another service member to honor. Zach was selected after a family member submitted his name to the DEA Albuquerque District Office. The event is a CrossFit-style physical challenge — often called the Workout of the Day, or WOD, and consists of the following:

- 400-meter run
- 50 pull-ups
- 100-meter fireman’s carry or 200-meter farmer’s walk with 50- or 25-pound dumbbells
- 50 push-ups
- 50 knees to elbows
- 100 sit-ups
- 400-meter run

Mike and Terry spend much of their personal time organizing and attending events in Zach’s honor. They sponsored the 2015 UNM Ultimate Ski and Snowboard Competition Jan. 17 in Red River. “Zach, his sister, and I used to compete in it every year, so it has a special meaning to us to be able to sponsor it in his name,” says Mike. “Any and everything we can do to make sure Zach is not forgotten — and all of our fallen service men and women are not forgotten — we will do it.”

Mike says strong support from his management team makes attending events like the Maltz Challenge easier for him and Terry. “My manager [Shawn Dirk] has been absolutely, 100 percent supportive of everything that Terry and I have done in an effort to keep Zach’s memory alive.

“We miss him every day and some days are harder than others, but we will always remember the life Zach lived and the love he had for his family and friends, for the Army, and for life. It’s important that we remember all of our fallen heroes because they, and their families, sacrificed so much.”

Mike, a member of Sandia’s Military Support Committee, says he is happy with the opportunities Sandia provides to military members through initiatives like the Wounded Warrior hiring program.

The DEA Maltz Challenge is held every year in March throughout the United States. Each location has an opportunity to select its own honorees. This year, according to the event’s website, a fallen service member from each branch was honored. The full list is available at www.deamaltzchallenge.com online.

Employees interested in joining the Military Support Committee, formerly known as the Veterans Group or Sandia Armed Forces Employee Networking Group (SAFEs), should contact Clark Highstrete (1729) at (505) 284-8702 or chighstrete@sandia.gov.