



**MAN OF HONOR** — Maj. Drew Dix (US Army, ret., above) addresses members of the workforce during a Nov. 8 observance of Veterans Day at Sandia. Dix is the recipient of the Congressional Medal of Honor, recognized for acts of valor during the war in Vietnam. Sandia, which has been recognized for its support of Guard and Reserve members and veterans, has instituted an active program to hire wounded warriors. Read about the program and about one special veteran who recently joined the Sandia staff in stories on [page 5](#). Also, in a story and photos on [page 3](#), read about Sandia/California's Veterans Day activities. (Photo by Randy Montoya)

# Sandia LabNews

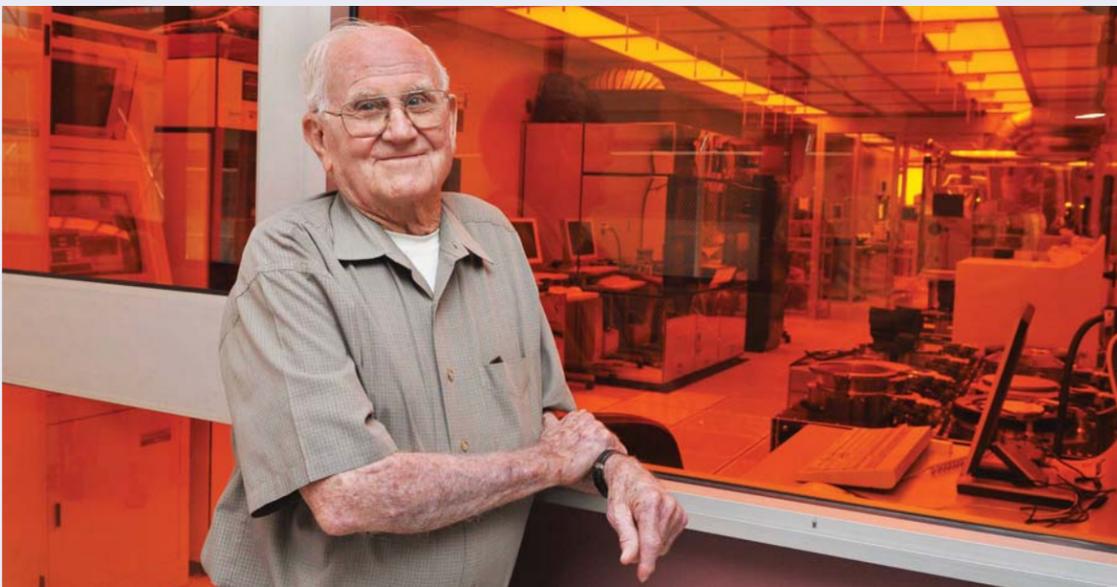
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## Willis Whitfield, inventor of modern-day laminar-flow clean room, passes away



**CLEANROOM INVENTOR** Willis Whitfield, who passed away this week at age 92, lived long enough to see his creation mark its 50th anniversary. Willis, who retired from Sandia in 1984, pauses here during a tour of a cleanroom in Sandia's microsystems fabrication facility. (Photo by Randy Montoya)

By Heather Clark

When Willis Whitfield invented the laminar-flow cleanroom 50 years ago, researchers and industrialists didn't believe it at first. But within a few short years, \$50 billion worth of laminar-flow cleanrooms were being built worldwide and the invention is still in use today.

The retired Sandia physicist, dubbed "Mr. Clean" by *TIME Magazine* at the time, passed away this week at age 92.

The travel, scientific presentations, and accolades didn't change the unassuming scientist, who was always modest about the invention that revolutionized manufacturing in electronics and pharmaceuticals, made hospital operating rooms safer, and

helped further space exploration.

Sandia President and Labs Director Paul Hommert remembered Willis as a Sandia pioneer.

"He represented the very best of Sandia," Paul says. "An exemplary researcher, a physicist who became an engineer's engineer, Willis lived in that sweet spot where the best technical work is always done, at the intersection of skill, experience, training, and intuition. His breakthrough concept for a new kind of clean room, orders of magnitude more effective than anything else available in the early 1960s, came at just the right time to usher in a new era of electronics, health care, scientific research, and space exploration. His impact was immense; even immeasurable. We are proud to have called him a fellow Sandian, and we join with his family to

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## Readers offer insights on Lab News, Daily News

Input from readers of the *Lab News* and *Daily News* who completed a recent survey about Sandia's core employee communications publications shows they are both holding their own in readership and overall satisfaction.

**Sandians rate Lab News on adhering to its principles (5=best) Average score of all votes shown**

	2012	2009	2006
Write honestly/minimum jargon	4.13	4.22	4.20
Reader-friendly style	4.20	4.31	4.26
Discourage preachiness	4.09	3.96	4.01
Avoid buzz words/business-speak	4.08	3.94	3.95
Emphasize substance	4.12	4.06	4.04

For example:

- Ninety-two percent now rate *Lab News* as excellent, very good, or good vs. 94 percent for the most recent previous survey, which was conducted in late 2009.

- Readers gave *Daily News* a 91 percent score for the same question vs. 92 percent in the previous survey.

Countless national polls have shown that reading habits and expectations of workers are evolving as reliance on electronic and social media increase. That's coupled

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## That's that

First things first: Thanks to those – employees and retirees – who participated in the 2012 *Sandia Lab News*/Sandia Daily News reader survey. I know I speak for our entire team when I say that we are gratified to find that 92 percent of respondents rated our publication as good to excellent. We work hard to make it an interesting, informative, and fun newspaper and are glad that lots of you think we succeed. The survey also suggests that we measure up to our own core principles: to write honestly with minimum recourse to jargon; to employ a reader-friendly style that avoids buzz words and business-speak; to discourage preachiness; and to emphasize substance.

As is often the case with surveys, our own reader poll wasn't without its own cautionary messages. While a majority of Sandians – and a supermajority of retirees – find value in a printed version of the *Lab News*, there is a clear desire to see a more robust electronic version of the publication. The bottom line is that the survey has given us plenty of information to digest and act upon. We're looking at the results closely and are already beginning to develop an action plan to make the reader experience a more positive one. You can read more about the survey in a story beginning on page 1.

\* \* \*

Staying on the subject of the *Lab News*, no one at Sandia is more aware than I am of what we don't cover in any given issue. There is so much great and important work, so many interesting people who do interesting things, so many worthy and compelling work/life initiatives around the Labs, that no single issue of the newspaper could possibly convey it all, any more than a half-hour network news program can really give a complete picture of what's going on in the world.

I love my job, but there are aspects I don't relish: I really don't like to say no to individuals who come to us requesting that the *Lab News* cover a particular activity or accomplishment. I try to say no as infrequently as possible, but sometimes we just don't have the resources available at the right time and place, sometimes prior commitments don't leave us enough space to accommodate the request, and frankly, sometimes the requested story or photo op just isn't a good match (in my judgment) for the *Lab News*. Having said that, I always welcome ideas for stories; some of our best *Lab News* pieces over the years have had their origins in reader suggestions. So keep 'em coming.

\* \* \*

Still more on the *Lab News*: I was reading through some back issues of the newspaper the other day and happened upon the copy from Jan. 1, 1954. That was the issue where the name of the publication was officially changed from *Sandia Bulletin* to our now familiar *Sandia Lab News*. In a note to readers, editor Robert Gillespie said the name change "came about after nearly six months of discussions. Suggestions, scores of them, have been made – among them: 'Fission Chips' and 'Up and Atom.' Hmmm . . . I think Mr. Gillespie and Co. made the right call.

I always enjoy looking at those old issues; the *Lab News* was a very different sort of publication back then, just as Sandia was a different place. For example, a recurring feature of the paper was a section called "Around the Departments." In it were several dozen one- or two-sentence items talking about who was taking vacation, where they were going, who was coming to visit them, how their kids were doing in school, and so on. Here's a typical item (with the asterisks added by me): "John \*\*\*\*\* has moved into his new home at 7903 \*\*\*\*\* Ave. His mother, who has resided in the east, arrived here before the holidays and will make her home with him." And another one: "Vic \*\*\*\*\* is the proud owner of a new blue Mercury and Harry \*\*\*\*\* is driving a new Cadillac." And this: "Truman \*\*\*\*\* and his wife entertained members of [his organization] at a cocktail party and buffet supper at their home, 9003 \*\*\*\*\* Ave. prior to Christmas. The evening was spent playing bridge. Truman and his wife visited Oklahoma over the holiday weekend."

Fun, upbeat stuff, for sure, but it seems to me this is the kind of information that would give our OPSEC folks heartburn.

Finally, on the subject of old issues of the *Lab News*: We are working on a project with Sandia archivist Myra O'Conna to have every issue of the paper, going all the way back to 1949, digitized and saved in a text-searchable PDF format. There will be an obvious historical value in being able to search the *Lab News*, but I think you'll just enjoy reading about our early days. I find it fascinating. I'll pass along more info as it becomes available.

In the meantime, thanks again for participating in the reader survey.

See you next time.

Bill Murphy (505-845-0845, MS0165, wtmurphy@sandia.gov)

## Sandia News Brief

### Mark Herrmann honored for high-energy-density physics work

Senior manager Mark Herrmann (1640) has garnered two national awards for his work in high-energy-density science.



MARK HERRMANN

In September, the American Physical Society elected him a Fellow, an honor limited to 0.5 percent of the society's membership in any given year. The citation, formally presented at the annual November meeting of the Division of Plasma Physics, reads: "For innovative technical advances and exceptional leadership in the areas of inertial confinement fusion target design and magnetically driven high-energy-

density science." The citation will also be published in the March 2013 issue of APS News.

Mark was also selected by Fusion Power Associates (FPA) to receive its 2012 Excellence in Fusion Engineering Award, to be presented at that group's annual meeting Dec. 5-6 in Washington, D.C. The award is for Mark's "many technical contributions to inertial fusion capsule design, his leadership of the Sandia high-energy-density physics program, and his earlier contributions to magnetic fusion while at the Princeton Plasma Physics Laboratory."

According to the group's website, FPA is a nonprofit research and educational foundation that provides information on fusion and fusion research. Its awards are presented annually to individuals in the early stages of their careers "who have shown both technical accomplishment and the potential to become exceptionally influential leaders in the fusion field."

"I have been incredibly fortunate to work with exceptional mentors and fabulous scientists during my career," Mark says, "This recognition by the leaders in my field means a lot to me."

— Neal Singer



### NMSU recognizes achievements of Jackie Kerby Moore

Sandia's Jackie Kerby Moore was named a 2012 Distinguished Alumni at New Mexico State University.

Jackie, manager of Technology & Economic Development Dept. 1933, is the distinguished alum for the NMSU College of Business, where she earned her bachelor's degree in marketing and management.

Jackie is executive director of the Sandia Science & Technology Park (SS&TP). The 340-acre park houses 30 companies and organizations employing about 2,500 people. Total investment in the park tops \$350 million. SS&TP has earned several awards from national organizations in the field of technology, including Outstanding Research Park of the Year from the Association of University Research Parks (AURP).



JACKIE KERBY MOORE

Jackie also manages the New Mexico Small Business Assistance Program at Sandia, a \$2.5 million program that allows scientists and engineers to provide technical help to New Mexico small businesses free of charge.

Jackie is past president of the board of directors of AURP, an international organization. She chaired AURP's first Washington Summit and led the effort to get the first science park legislation introduced in the US Senate and House. She serves on the board of the Arrowhead Center at NMSU and the Santa Fe Business Incubator.

The Distinguished Alumni Award is given to graduates who have demonstrated great achievement in their field of work. It is the highest award given by the NMSU Alumni Association. Jackie was honored at a dinner during Homecoming Week.

— Nancy Salem



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### Retiree deaths

Francis J. Wyant (age 63) .....	Sept. 10
Milo M. Harcourt II (69) .....	Sept. 12
Ira J. Honeycutt (90) .....	Sept. 14
Betty J. Mathis (74) .....	Sept. 15
Rupert K. Byers (72) .....	Sept. 20
Henry F. White Jr. (74) .....	Sept. 20
Sheldon R. Tieszen (55) .....	Sept. 28
Robert J. McConkie (91) .....	Sept. 29
Irwin W. Janney (85) .....	Sept. 30
John K. Nakayama (87) .....	Oct. 3
Alvin F. Baker (73) .....	Oct. 10
Leon Dale Smith (92) .....	Oct. 14
Donald P. Peterson (83) .....	Oct. 16
Aquiles Trujillo Jr. (80) .....	Oct. 18
Thomas Starr (85) .....	Oct. 19

### Lab News Reader Service

The *Sandia Lab News* is distributed in-house to all Sandia employees and on-site contractors and mailed to all Sandia retirees. It is also mailed to individuals in industry, government, academia, nonprofit organizations, media, and private life who request it.

#### 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.

# Sandia/California commemorates Veterans Day

By Patti Koning • Photos by Dino Vournas

On the morning of Nov. 8, about 150 members of the Sandia/California workforce gathered to commemorate Veterans Day, the site's third annual celebration of this day.

"We are gathered here today to express our gratitude to military veterans who are defending our country. For all the military and veterans, thank you for your service. For all the families, thank you for your service and your strength to stand behind the men and women who serve in the armed forces," said Jim Berry, a retired Sandian and U.S. Army veteran.



JIM BERRY

The Monterey Presidio, Joint Color Guard Defense Language Institute Foreign Language Center (DLIFLC) presented the colors. Protective Force members Tate Taylor, a veteran of the US Navy, and John Mcelrath, a veteran of the US Army, (both 8511) then raised the flag.

The Sandia Thundertones — Casey Deccio (8966), Seanna Crouch (8942), Rachael Gupta (8120), Kevin Krenz (8135), Lindsay Baxter Schuster (8532), Levi Lloyd (8966), and Todd Plantenga (8958) — sang the National Anthem.

Justin Pack (21), a veteran of the U.S. Army, gave a brief history of Veterans Day. The day was first recognized as Armistice Day to commemorate the cessation of arms at the end of the Great War, World War I, on Nov. 11, 1918. In 1958, the 83rd Congress amended Armistice Day to be named Veterans Day to recognize all veterans.



JUSTIN PACK

"Today Veterans Day remains a day to celebrate the love and sacrifices of those who have served as well as those who are currently serving. Today our Armed Forces have a much more complicated mission to not only serve as defenders of US national security, but also as diplomats, educators, and mentors for developing nations," he said.

"Simultaneously, our service members must deal with near real-time press coverage and increasing political pressure for risk-free results. However, through all this, our veterans past and present share one common bond: the source of their sacrifice. The quintessential warrior serves to defend what he or she believes in — a

love of nation, God, family, and friends."

Dan Fonte (8942), a veteran of the U.S. Air Force, shared his insights into how employing veterans strengthens Sandia. He spoke about Sandia's major thrusts that relate directly to the military: enduring work with the nuclear stockpile; counterterrorism; preventing the spread of weapons of mass destruction; and providing capabilities to the Armed Forces.

"The military is either a direct customer or mission partner for most of the work we do," he said. "We have always valued diversity as a principal at the Sandia. I think having a strong veteran perspective will help us deliver better products and offer better services to our customers."



DAN FONTE

He notes that his group has about 30 veterans out of 81 FTEs. "I am very proud of that. I'd like to add that the veteran perspective has led to many of the successes we have seen to date. I challenge all of you to consider hiring more veterans. Their unique perspective and skills can help you develop better products, offer better service, and make us a better lab," he said.

To close out the ceremony, Jim read the poem My Name is Old Glory by Howard Schnauber on behalf of Michele Clark (8005), co-chair of the Veterans' Outreach Committee and veteran of the U.S. Air Force. She was unable to attend the ceremony because she was

participating in an Operation Boss Lift training exercise in southern California.

Jim closed out the event by encouraging everyone to get involved with helping to support veterans. He is currently working with a local nonprofit, East Bay Youth & Family Initiatives ([www.eastbayfi.org](http://www.eastbayfi.org)), to lead their expansion into Veterans services. Those interested in participating can contact him at [jberr@eastbayfi.org](mailto:jberr@eastbayfi.org) or 925-455-1551.



VETERANS AND EMPLOYEES gather and salute during the National Anthem and raising of the flag at the start of the Veterans Day commemoration.



VETERANS AND PROFORCE MEMBERS Tate Taylor and John Mcelrath raise the flag at Sandia/California's Veterans Day event.

## Sandia California News

### Craig Taatjes and David Osborn receive David A. Shirley Award



COMBUSTION RESEARCHERS Craig Taatjes, left, and David Osborn (both 8353) discuss data found from the detection and measurement of Criegee intermediate reactions. The two Sandians have won the David A. Shirley Award for Scientific Achievement.

(Photo by Dino Vournas)

By Patti Koning

At the 2012 Advanced Light Source (ALS) User's Meeting, Combustion Research Facility researchers Craig Taatjes and David Osborn (both 8353), Carl Percival of the University of Manchester, and Dudley Shallcross of the University of Bristol were awarded the David A. Shirley Award for Scientific Achievement. The award recognized their accomplishments in making the first direct measurements of the reactions of Criegee intermediates, and showing that their impact on tropospheric chemistry and climate may be substantially greater than previously assumed. The research team conducted studies of gas-phase Criegee intermediates using a multiplexed photoionization mass spectrometer (MPIMS) at the ALS. Percival

explained in a research presentation that "scientists have always postulated that Criegee intermediates play a major role, but this was the first direct measurement of rates of reaction and product."

This work was described in an article titled Direct Kinetic Measurements of Criegee Intermediate (CH<sub>2</sub>OO) Formed by Reaction of CH<sub>2</sub>I with O<sub>2</sub> that was published in the Jan. 13, 2012, issue of *Science*. For more, see the Jan. 27, 2012, issue of *Sandia Lab News*.

David Shirley (now retired) was a professor of chemistry at the University of California, Berkeley, and director of Lawrence Berkeley from 1980 to 1989, and was instrumental in having the ALS built. The David A. Shirley Award is given for Outstanding Scientific Achievement at the ALS.

# Helping solve unique problems

**Technologist Richard Simpson gets deeply involved in wide range of experiments**

By Sue Major Holmes

Sandia technologist Richard Simpson (1384) has filled a canyon with soap bubbles, shot photos of liquefied natural gas (LNG) fire tests from a helicopter, floated balloons hundreds of feet in the air to calibrate cameras, chopped out pieces of a Cape Canaveral launch pad to haul back for tests, and hoisted a beer with Paul Tibbets, pilot of the *Enola Gay*, the B-29 that dropped the first atomic bomb on Japan in World War II.

He also has been audited for buying such things as party bubble juice on his procurement card. "You buy 20 party bubble machines, they kind of wonder why. You buy 50 gallons of party bubble juice, and they really wonder why," he explains.

Richard Simpson has a pretty interesting job.

"You've got very smart people you work with, people who are fun to work with, rewarding work itself, supportive and understanding management," he says. "I've been really blessed to have the career I've had during my time at Sandia."

Like many of Sandia's technicians, Richard has a broad technical skills background "to where I can contribute in numerous ways to most any project." A Sandian for 27 years, he's been deeply involved in some experiments from conception, design, and fabrication all the way through to test and analysis. Other times he's called for only a particular expertise.

He says there are good days and not-so-good days in field testing, like freezing one February morning waiting for a test to go off. "There are times when we're digging a trench for instrumentation lines. . . . Or, oops, this fitting over here leaks, followed by then conducting a once-in-a-lifetime internationally recognized large-scale experiment. So it's from totally unglamorous to very exciting and technological."

## Joined Sandia after the Navy

Richard was born in Arizona to an Air Force family. He's lived all over the world, but considers Albuquerque his hometown and wanted to return after six years of active duty in the Navy. He registered for the laser electro-optic program at what's now Central New Mexico Community College before his last overseas deployment, knowing the course had a long wait list. He was discharged in 1981, just in time to start the program. When he graduated with honors, he was hired by Lovelace Inhalation Toxicology Research Institute, then joined Sandia and also the Navy Reserves.

He has worked on numerous projects over the years, including supporting Sandia's reactor safety experiment programs, the Hot Cell Facility, and rocket propellant fire tests. Last year, he was given the responsibility of obtaining slabs of a Cape Canaveral launch pad and nearby asphalt for upcoming studies into the effect of burning rocket propellant impacting those surfaces in a launch accident scenario. Because every region uses different aggregate in cement batches, project leaders wanted concrete from Cape Canaveral to make sure tests accurately represent the likely fire environment.

Richard, who'd successfully coordinated with multiple agencies during tests in the past, went to Florida on a fact-finding trip. There, a buddy who worked in the area gave him a name to call. The man he contacted turned out to be the chief of civil engineering at the Cape, and within minutes Richard had permission to cut up part of a retiring launch pad. "Nothing beats starting at the top," he says.

He worked with NASA, DOE, United Launch Alliance, the Air Force, and others at Sandia and Cape Canaveral to finalize agreements, set up heavy equipment, and finalize training and approvals. Then he had to find someone to cut 4- by 4-foot by 6-inch slices of concrete from Launch Pad 17A and others to package and transport it to Sandia and Johns Hopkins Applied Physics Lab in Maryland, which collaborates with Sandia. He also got samples of asphalt from a road around the complex. "I asked them for permission, 'Can I cut the end of your road off there?'" Richard says.

## Bubble tests aimed at helping computer models

The bubble experiments were aimed at helping with computer modeling of jet fuel fire tests.

"Sandia had developed great models of fire, but in a computer model you must have boundary conditions," Richard says, marking an imaginary boundary



TECHNOLOGIST AT WORK — Richard Simpson (1384) places an acoustical sensor at a small lake Sandia built several years ago to do LNG fire tests on water. He has worked on numerous tests at the Labs in his 27-year career. (Photo by Randy Montoya)

with his hands. "You have to tell the computer where to stop its computations; otherwise your fire's going all over here" — waving his hands out of bounds.

But fire is subject to wind, and experts wanted to measure the swirling wind patterns in three dimensions in an area 20- by 20- by 1-foot thick, far larger than a conventional flow visualization field. "We wanted to be at a very large scale, so the engineers thought 'bubbles,'" Richard says.

He started with his usual cost-effective method, modifying something off-the-shelf for Sandia's needs. In this case, that led to a battery of party bubble machines on towers in a canyon where Sandia does burn tests. Then he shone a large spotlight, the kind the Olympics uses to follow ice skaters, into a large spinning mirror he built. That technique reflected back a foot-thick wall of white light so flow patterns were visible to 3-D cameras shooting the region of interest.

"Stuff was happening way beyond that, which was captured on the wide-view cameras," Richard says. "We had bubbles all over the canyon."

The tests went off between midnight and 4 a.m. when wind conditions were ideal and the background was black. "So in the middle of the night I'm up there spinning up the large 1,000 rpm mirror, turning on the light, creating this wall of white light, starting up the party bubble machines. . . . Quite a beautiful sight," he says.

## Camera techniques developed for different jobs

Nowadays, because he's developed specialized camera techniques, much of his work is macro, time-lapse, and high-speed video. Project engineers call him when they need imagery in a thermally harsh environment, such as documenting an experiment in Sandia's solar furnace or weapons component burns. For such situations, Richard fabricated cooling housings for cameras.

He shows a video of a test item engulfed in flames. "We actually had a camera in this environment, right down in the bottom of a 1,000-degree Celsius test cell," he says.

"Sometimes it's not just a harsh environment, but a long-term harsh environment," he says. Richard works with filters, mirrors, or different camera speeds — whatever's needed. "If you can't do it with filters or mirrors or jacked-up frame rates, you have to just understand a situation and put enough cameras on it that you can get the footage," he says.

He shows a composite video, shot from different angles, of another test to study radiant energy and determine the hazard distance around a large LNG fire on water. He again worked with numerous groups to help set up imaging, including Kirtland's Special Operations Command for two helicopters to fly photographers and Sandia Video Services videographers to doc-

ument the tests. He also coordinated with Sandia photometrics experts in staging high-definition and high-speed cameras at various points on the ground — from spokes running east, west, north, and south from the test pool; from a control bunker a mile away; from a site 4 miles away off Kirtland. Thermal instrumentation was set up close to the pool and at various distances along the spokes.

Sandia built the pool for the tests, scraping out a shallow hole the size of a football field, using the dirt to build a reservoir to hold the fuel, covering the reservoir with concrete-capped aluminum, and running a concrete pipe from the reservoir to the pool, Richard says.

A cold snap froze the pool two nights before the large test, and technicians had to go out in a rowboat to break up ice. "These guys truly had the Sandia can-do attitude, doing whatever it took to get the test off," Richard says. He tried to help by breaking up ice along one edge, taking the opportunity to shoot some video of them power-rowing while breaking through a field of ice. He laughs at the memory.

## Balloons become calibration image

Richard also came up with a way for the photometric team's cameras to measure the height of the flames. "We had to have a calibration image for them," a giant yardstick to scale the camera lenses in advance. Anything higher than 500 feet has to be cleared with the Federal Aviation Administration, so Richard came up with a balloon array that tethered at 499 feet, with an 8-foot diameter yellow balloon at the top and smaller red balloons attached at 100-foot divisions along the line. "I talked to the (FAA) guy on the phone; he was OK with it. He goes, 'Nope, 499, I don't even want to talk to you,'" Richard says.

Then there's drinking a beer with Paul Tibbets. Richard helped with media relations when what's now the National Museum of Nuclear Science & History hosted the 509th Composite Group reunion on the 50th anniversary of the 1945 atomic bombing of Japan. Tibbets asked Richard if he planned to come to the crew's suite for a drink afterward. Richard remembers his response as "Yes, sir, General." At one point everyone went quiet while watching television coverage of the anniversary, complete with a classic photo of the crew in World War II next to the *Enola Gay*. "Seeing these guys 50 years ago, and standing next to them, I was just so humbled and honored to be there," Richard says.

He recalls some griping once during the hard work of setting up a test. "I go, guys, guys . . . later on you're going to look back on it and you're going to say, 'That was pretty cool.' That's it with a lot of the programs. It's rewarding, very rewarding, to know the data that you're producing has national and at times worldwide significance in the scientific and engineering communities."

# A soldier's life

## Legacy of service led injured vet to a Sandia career

By Nancy Salem

Sean Christopher comes from a military family. His mother worked in US Army personnel. His father served 5½ years in the infantry in Vietnam.

"As a kid growing up my dad took me to school every single day. And every single day he told me stories of the Army," Sean (0098) says. "Every man in our family served in the military. I knew I would be a soldier. I wanted to be just like my dad."

Sean graduated from high school in his hometown of Copperas Cove, Texas, and was recruited to play football at the University of New Mexico (UNM). He was a punter and kicker for one season, studied political science three years, then took a break in 2005 to join the New Mexico National Guard. Sean came back to UNM after basic training and in 2009 his unit asked for volunteers to deploy to Afghanistan.

"I volunteered to go," Sean says. "I was there a year. It was a long, rough year. Afghanistan was a difficult place to go for a first combat deployment."

Sean was injured in combat and returned to Albuquerque in 2010. He completed a bachelor's degree in political science while on full-time orders with the National Guard. He heard about Sandia's Wounded Warrior Career Development Program (WWCP) in December 2011 while receiving treatment at the Veterans Administration Hospital in Albuquerque.

"I was in the right place at the right time," Sean says. "A VA staffer mentioned it to me and I pulled out my iPhone



SEAN CHRISTOPHER (0098) is a Sandia security specialist working toward a master's degree in national security. His goal is to earn a law degree and work in the legal arena. (Photo by Randy Montoya)

right there and sent an email from the waiting room."

Sean became Sandia's second Wounded Warrior hire, joining Physical Security Services in March.

"It has been awesome," he says. "It's been one of the best experiences of my life. The people I work with are the best — a big family — and always helpful. And it's great to have mentors checking on me. They take the time to show me around the campus and see how I'm doing. I can reach out to them whenever I need to."

John Larson, senior manager of FIE Operations & Assurance Dept. 0090 and a co-chair of the WWCP Working Group in Sandia's Military Support Committee, says Sean was immediately accepted into his group because of his ability to work in a team environment, "something deployed soldiers must do as they depend on their buddies for survival."

"Sean brings that same mentality as a member of our security team," John says. "He comes in during off hours and interacts well with the team during and after work. Sean has a great sense of humor and passion for national security. Sean is exactly the type of individual we were looking for when we started the Wounded Warrior career program."

Sean says WWCP has helped him get into the workforce and develop job skills. He's working on a master's degree in national security from the University of New Haven and hopes to earn a law degree.

"I will always have a connection to the Wounded Warrior Career Development Program," Sean says. "I want to help and guide the people who follow me."

Sean still serves in the National Guard. He recalls the day seven years ago when he became a newly minted infantryman, receiving his Infantry Blue Cords at a "Turning Blue" ceremony at Fort Benning, Ga.

His dad, the former infantryman, pinned them on. "It was a huge moment for both of us," Sean says. "It was the passing of the family legacy from my dad to me."

## 'They've earned the right to work here'

### Hiring program helps wounded veterans get back in the game



By Nancy Salem

Combat veterans often return with wounds — some visible, some not.

Sandia has launched a hiring program with the simple goal of helping those wounded warriors get into the workforce and develop career-based skills and experience.

"We want to give back to those who have given so much to our country," says James Peery, director of Information Systems Analysis Center 5600 and champion of Sandia's Wounded Warrior Career Development Program (WWCP). "They've earned the right to work here."

The program helps combat-injured veterans catch up to their peers who entered the civilian workforce, not the military. "It can be hard for someone who's been in the infantry or behind a rifle to develop technical skills and a resume," says H.E. Walter II (4232-1), a co-chair of the Wounded Warrior Working Group, part of Sandia's Military Support Committee. "They are trained, experienced leaders, but their skills don't always translate into a civilian resume."

The WWCP opens specific required jobs at the Labs only to military veterans injured in combat. Successful applicants are hired for a term of one to three years with the potential for permanent employment. An applicant can be out of the military for any length of time. And a college degree is not required, but those hired are expected to pursue higher education while working at Sandia.

FOR MORE INFORMATION on Sandia's Wounded Warrior Career Development Program go to [woundedwarrior.sandia.gov](http://woundedwarrior.sandia.gov). To contact the program send an email to [woundedwarrior@sandia.gov](mailto:woundedwarrior@sandia.gov).

"We are looking for highly motivated people who want to continue serving the nation and national security and have a passion to continue to improve themselves in skills and education," James says. "Through their job, they gain training and experience while making contributions to national security."

#### People to identify with

A key component of the program is mentorship. Wounded Warrior hires are assigned executive, technical, and veteran mentors who help them adjust to the civilian workforce and to Sandia, and steer them toward the work they really want to do. Mentors serve as role models and peers the veterans can learn from and identify with. "The executive is there for career counseling, the technical to get skills up to speed, and the veteran to help with assimilation to civilian life," James says. "It helps to have someone who's been there."

The mentee "graduates" in one year to become a mentor to new Wounded Warrior hires, but still has access to mentors. "You never really lose your mentors," H.E. says. "Once in the program, always in the program. There are all kinds of additional roles to be a part of."

Four people have been hired so far, in Orgs. 90, 5300, and 5600. Three more hires are in the pipeline, in Orgs. 2900, 4020, and 9300.

The program is modeled after one at Oracle that James learned about at an October 2010 Sandia Fall Leadership Forum. Oracle's Bud Langston talked about their program's focus on helping wounded veterans who joined the military after high school catch up with their peers who went to college. "They lost ground because they served our country," James says. "It was quite moving. I was sitting there and could sense that this was something Paul Hommert would get behind."

After getting a green light from Paul, a Wounded Warrior working group in 2011 began the process of emulating the Oracle program with a Sandia flavor.

#### Hiring managers, volunteers needed

The WWCP is looking Labs-wide for hiring managers who will sponsor an injured combat veteran with a real job need, and executives, members of the workforce, and veterans who can be mentors. Today more than 20 people volunteer their time to the program in some capacity.

"We're constantly looking for more veterans, especially those with combat experience," H.E. says. "We try to match up the mentee and mentor with the best possible fit, so it's very important to have as broad a pool as possible."

Hiring managers and volunteers can contact James or H.E. for information. Wounded veterans interested in working at Sandia can go to the [woundedwarrior.sandia.gov](http://woundedwarrior.sandia.gov) website, click on "View All Jobs" and enter the keyword "Wounded." That will bring up current Wounded Warrior job openings.

James envisions bringing six to 10 combat-injured veterans to Sandia each year. "For every hour I put into this program, the Wounded Warriors give me 10 back," he says. "These are people who have faced a bullet, likely lost buddies, and survived horrific conditions. They bring to us incredible passion, loyalty, honor, commitment, sacrifice, integrity, and maturity beyond their years."

"They bring a presence unlike most people, having gone through that experience of serving our country without question and putting their lives on the line every day. They get up every day and want to do more. I'm inspired by their desire to get back in the game. We have so much to learn from them."

## Survey says

(Continued from page 1)

with one theme emerging from comments from workers who took the survey: They seem to have less time to read the *Lab News*, and to take surveys, as only half as many employees took part this year as did three years ago.

For example:

- In 2009, 72 percent of those surveyed said they read at least half of each *Lab News* issue; in this year's survey that dropped to 62 percent.
- However, *Daily News* was essentially unchanged with 89 percent reporting in 2009 they read at least half of each issue vs. 88 percent now.

Despite a number of comments urging Sandia toward increased use of web-based and social media communications tools, survey-takers haven't yet latched on to regular use of *Lab News Interactive*, which has been on Sandia's internal Techweb at <http://www.sandia.gov/news/publications/LabNews> since 2007. In fact, a significant number said they were unaware of its existence.

For example: Four percent reported they refer to *Lab News Interactive* several times a week, 39 percent said several times a month, but 57 percent said "I do not use it." Results from the 2009 survey were about the same.

This points out a communications challenge because more workers are saying having a printed copy of the *Lab News* is not important to them. In 2009, 63 percent said having their own printed copy was important. That's now 59 percent, and among workers who have been at the Labs less than five years the figure is 47 percent.

## Readers have their say in *Lab News* survey

A number of questions in the surveys — current worker and retiree versions — invited comments about the *Lab News*, *Daily News*, and *Lab News Interactive*. There were several hundred such comments. Here's a very small, but representative sample.

### Comments about *Lab News*

- Amazing photography. Inspirational really.
- Labs Accomplishments is a powerful marketing tool.
- I think the printed version is a waste of paper.
- I am on a computer 80 percent of the day and enjoy having this [a printed copy] to rest my eyes, body, mind. I do recycle my copy.
- I scan online, but actually read the print versions. However, I refer to the online version to search for past articles on a certain topic or to share articles with others.
- Why do you insist on killing trees? Why not go digital only?
- In general, the *Lab News* . . . has too much of a focus on compliance, not performance.
- The *Lab News* tends to be sort of a "party organ" in that it presents Management's position at any given moment. I suppose it is too much to wish that there might be a little bit of questioning or independent analysis in the *Lab News*.

### Comments about *Lab News Interactive*

- Poll question comments provide a unique insight on some of my co-workers.
- I wish it was easier to find. I would probably go to it more often.
- I use it primarily to look up, "Didn't the *Lab News* say that . . . ?"
- I stumbled upon the iPad blog. I have a personal iPad but the apps they reviewed

## Retirees also had their chance to comment about *Lab News*

Results submitted by retirees provided some significant differences from readers still on the job.

Simply put, retiree readers generally are more pleased with *Lab News*. They read more of it and they give it higher scores on readability, credibility, relevance/usefulness, thoroughness, photo quality, and even timeliness.

Retirees also scored the paper higher on following

Dating back to the mid-1990s, readers have been pretty consistent about where they focus their *Lab News* reading time.

This year, for example, the top five most-read features, in order, are: classified ads, employee service award/retiree photos, technical stories, historical stories, and the "Labs Accomplishments" special issue. The only significant difference from three years ago is the absence of "Feedback," which has not been appearing regularly in the paper. Instead it can be found at <https://info.sandia.gov/corpdata/feedback/index.php>.

A significant difference between this year's survey and the one in 2009 is participation. Three years ago 738 workers completed the survey. This year it was just 365. Nonetheless, those responding this year mimic the total Labs' population to an encouraging degree.

As an example, participation by division was within 2 percent of actual percent-of-population for 2000, 4000, 5000, 6000, 9000, 10000, and 11000. Divisions 1000 and 8000 were under-represented; 3000 and executive management (organization numbers below 1000)

its stated principles of writing honestly, with a minimum of jargon, in a reader-friendly style, and emphasizing substance.

And, 84 percent said having a printed copy of the paper arrive in the mail at their homes is important to them.

More retirees — 442 — responded to their survey than did current workers.

### Sandians Rate *Lab News* on these attributes (5=best) Average score of all votes shown

	2012	2009	2006
Readability	4.19	4.39	4.21
Credibility	4.34	4.39	4.25
Relevance/Usefulness	3.81	3.85	3.82
Timeliness	4.03	4.02	4.03
Thoroughness	3.97	3.96	3.88
Photo Quality	4.39	4.41	4.28

were over-represented.

Any current worker or retiree interested in a copy of the full survey should contact Darrick Hurst at 505-844-8009 or send an email to [labnewssurvey@sandia.gov](mailto:labnewssurvey@sandia.gov).

- in the blog have made my personal iPad more useful for business travel.
- This can be a valuable tool. Unfortunately, it gets lost in the fog of other information and options. Information and learning choices have become overwhelming for me to keep up.
- Until this survey, I didn't know this existed! Market this!!
- This requires me to stay at my computer too long, which is why I like the print edition.

### Comments about *Daily News*

- Information overload. I used to read this when it was far more sparse. Now I fear that I miss important announcements hidden amongst all the fluff.
- Balancing these characteristics, I believe you make the right choice in giving up a little in Readability and Grouping for Timeliness and Thoroughness. The latter, being far more important qualities.
- Great place for all seminar announcements, HBE info, all of the many corporate requirements reminders.
- Please restructure it and make more groupings so it is obvious what category something is about. Personally, I have no interest in pet adoptions, theater tickets, etc.
- Would be nice if the reminders and events could be made into Calendar items to add to our Outlook Calendars easily.
- While it's more timely than other news options, it's definitely not brief. I only have a couple of minutes to scan.
- Too many acronyms.

## Lovelace/ABQ Health Partners contract dispute effect on Sandia/NM employees, retirees

Sandia is in its Medicare open enrollment season for healthcare benefits through Dec. 7

**Note: You may disregard this notice if you are not located in New Mexico.**

On Tuesday, Oct. 9, Lovelace Health Plan and ABQ Health Partners announced that they have broken off negotiations on a new contract. Their current five-year contract expired Nov. 8.

Lovelace Health System includes Lovelace Medical Center, Lovelace Rehabilitation Hospital, Lovelace Women's Hospital, Lovelace Westside Hospital, Heart Hospital of New Mexico at Lovelace Medical Center, Lovelace Regional Hospital-Roswell, and 11 retail pharmacy locations.

ABQ Health Partners is the largest multi-specialty independently owned medical group in New Mexico.

### Active employees and PreMedicare retirees

This contract impasse does not affect active employees and PreMedicare retirees enrolled in Sandia Total Health administered by Blue Cross Blue Shield of New Mexico (BCBSNM). Enrollees and their covered dependents will still have access to all BCBSNM providers at the in-network level of benefits. In addition, you still have access to ABQ Health Partners and all other Sandia Health Partner Network (SHPN) providers at the higher benefit level. Sandia offers a self-insured medical plan to our employees and not Lovelace Health Plan, the medical plan that is affected by their failure to reach an agreement.

### Medicare retirees

Sandia Medicare retirees enrolled in the Lovelace Medicare Plan will not be able to visit ABQ Health Partners providers after Nov. 8. If you are currently enrolled in the Lovelace Medicare Plan, you can:



- Stay with our group-sponsored Lovelace Medicare Plan (which offers more than 4,000 Medicare-approved providers in Albuquerque and the surrounding areas, including 790 Primary Care Providers),
- Switch to our Presbyterian Medicare PPO Plan, or
- Choose healthcare dollars (through the Your Spending Account or YSA) provided by Sandia to buy an individual Medicare plan — Medicare Advantage or Medigap — through Extend Health to continue seeing ABQ Health Partners providers under another plan.

For more information on the YSA, refer to your 2013 Benefits Choices and Enrollment Guide for Medicare Retirees.

Sandia is currently in its Medicare open enrollment season for healthcare benefits through Dec. 7, so Medicare retirees have the option to make changes to their health insurance plans now. Lovelace Medicare Plan has established a proactive process to help our members find a new provider if they wish to stay in the Lovelace Medicare Plan. Any Sandia retiree currently enrolled in the Lovelace Medicare Plan and has an ABQ Health Partner provider can call the Lovelace Medicare Plan to find a new provider at 855-730-5683 Monday-Saturday from 8 a.m.-8 p.m., or visit them at 4101 Indian School Rd. NE.

# Inventing the cleanest air on the planet

## Remembering Willis Whitfield, a Sandian's Sandian

(Continued from page 1)

mourn his passing.”

Willis, the son of Texas cotton farmers who learned to do for themselves by fixing their own equipment, was in the Navy working on radar and then worked with rocket propellants out East before coming to work at Sandia, his son, Jim Whitfield, says. By the time he came to Sandia in 1954, his motivation set the stage for the invention because he felt like he was behind his co-workers and needed to do something catch up, he says.

In 1959, Willis was asked to solve a manufacturing problem for Sandia, so he invented the laminar-flow cleanroom, which, with slight modifications, is the industry standard today.

“He built it, found out no one had done it that way before, and said, ‘I don’t understand why [no one had invented it]. It’s so simple,’” recalls Jim Whitfield, who was a young child at the time. “I heard someone ask him how long did it take him to think of that idea and he said, ‘Five minutes; I just did the obvious thing.’”

Shortly after the invention was publicized, Jim Whitfield recalls his father coming home and telling his mother he got a “raisin.”

Puzzled about her joyful reaction about a food found in the family pantry, the boy then saw his dad’s appearance on a television news program and “at that point, I knew something was very different about that raisin.”

But a higher salary was a small part of the story. Jim Whitfield recalls practically living in airports while he father flew all over the country presenting his inventions at conferences and to companies that wanted to use the technology.

### Solving a problem

In 1959, nuclear weapons components — mainly mechanical switching parts — were becoming smaller and microscopic dust particles were preventing manufacturers from achieving the quality Sandia needed, so Willis’ supervisors asked his group to find a solution, Sandia historian Rebecca Ullrich (9532) says.



WILLIS WHITFIELD steps out of a mobile cleanroom facility, which could be transported to remote sites.

While Willis might have come up with the idea quickly, months of research and talking with people led up to that moment of discovery, Rebecca says.

Willis discovered the practice at the time was to tightly seal cleanrooms, wear protective clothing, and vacuum often. Still, the airflow was turbulent in existing cleanrooms and particles introduced were not removed. These measures didn’t create the necessary conditions for close-tolerance manufacturing, she says.

Rebecca says Willis looked at blowers, vents, grading, and the cost per square foot to build his invention, so that it would be something people could afford.

By the end of 1960, Willis had his initial drawings for a 10-by-6 cleanroom. His solution was to constantly flush out the room with highly filtered air. In that first model, Willis designed a workbench along one wall. Clean air entered the room from a bank of filters that were 99.97 percent efficient in removing particles larger than 0.3 microns. For example, cigarette smoke blown in one side comes out the other as clean air, according to a 1962 *Lab News* article.

The air was circulated in the room at a rate of 4,000 cubic feet or about 10 changes of air per minute, an amount of air movement barely perceptible to the workers inside. The linear speed of air was slightly more than 1 mph, about the same as that felt walking through a still room, according to the article.

In a later modification, the air was passed down over the work area instead of across, getting an assist from gravity in carrying troublesome particles into the floor, which was covered with grating. Filters underneath cleaned the air and it was circulated back around to re-enter the room. The constant flow of clean air performed a sweeping function.

When the first cleanroom was tested “the dust counters went to nearly zero. We thought they were broken,” Willis said in a 1993 videotaped interview.

The laminar-flow cleanroom created a work environment that was more than 1,000 times cleaner than the cleanrooms that were in use at the time.

According to tests at the time, the laminar-flow cleanroom’s work area contained an average of 750 dust particles one-third of a micron in size or larger per cubic foot of air. (A micron is equal to 40-millionths of an inch.) That’s compared to average dust counts of more than 1 million particles per cubic foot of air in one of the best conventional cleanrooms in use at the time.

### Bringing the cleanroom to the world

Willis gave his initial paper at the Institute of Environmental Sciences meeting in Chicago in 1962.

“While he’s in Chicago the *TIME* article hits and his phone just does not stop ringing,” Rebecca says. “Industry jumped all over it.”

But at a standing-room-only talk about a year later at the American Society for Contamination Control in Boston, manufacturers challenged the invention’s claims, accusing Willis of perpetuating a hoax, Rebecca says.

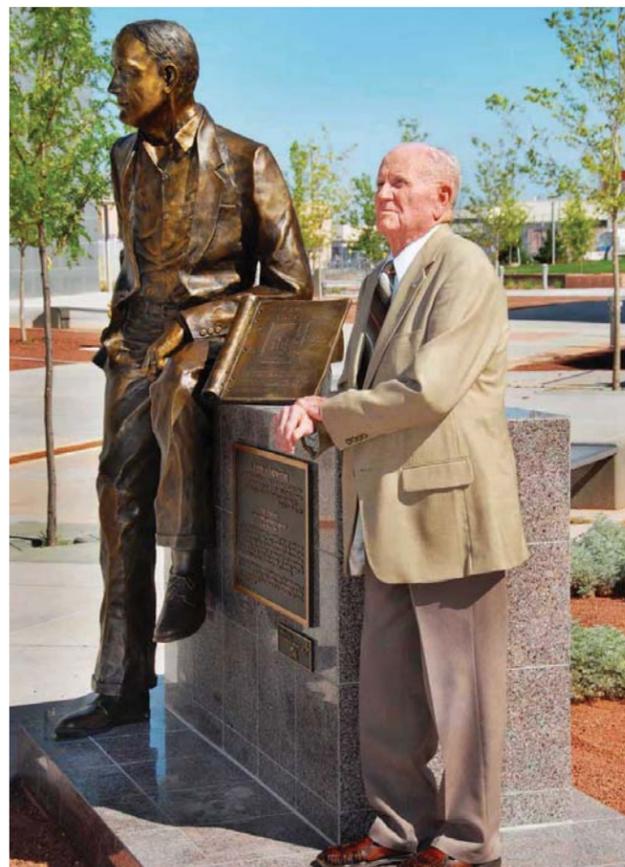
Jim Whitfield remembers his father’s story: “The numbers he was showing were unbelievable. At this conference, people were telling him that can’t be right. Then one of his colleagues [from Bell Labs] got up and said he thought Whitfield was wrong. His numbers are 10 times too conservative. So, he knew at that point that it was a dramatic shift in the technology.”

Others recognized it too.

Within a couple years, \$50 billion worth of cleanrooms had been built worldwide.

### ‘They come to you’

“When you have something that everyone wants, they come to you,” Willis said in the videotaped interview. “The desperate need for this accelerated the gap between development and production drastically.”



CLEANROOM inventor Willis Whitfield stands beside a statue of himself in the courtyard of Sandia’s MESA complex. The statue, dedicated in 2008, is a tribute to Willis and to the profession of engineering.

(Photo by Randy Montoya)

RCA and General Motors were early adopters of the cleanroom and the invention revolutionized the pharmaceuticals and microelectronics industries, Rebecca says.

MD Anderson Hospital in Houston built 22 cleanrooms to prevent infections in leukemia patients undergoing chemotherapy, Willis said in the 1993 interview. And Bataan Memorial Hospital, which later became Lovelace Hospital, was the first hospital to use laminar-flow cleanrooms in their operating rooms to prevent infections, Rebecca says.

### ‘He would always do the right thing’

Willis eventually worked with NASA to provide planetary quarantine efforts during missions to the moon and Mars and spacecraft sterilization techniques, Rebecca says.

But fame did not change Willis.

“He was a nice guy, very honest, very straightforward,” Rebecca says. “He was very modest about it. His values meant he would always do the right thing, even if it cost him personally. He made sure other people shared credit for things.”

The cleanroom design also made it possible to standardize cleanrooms for the first time, and a group of Sandia employees contributed to establishing federal standards for the government in 1963.

Had he invented the cleanroom today, Willis Whitfield might have become a very wealthy man. But back in the 1960s, the predecessor to DOE, the Atomic Energy Commission, held the patent in the public domain, Rebecca says.

During his career, Willis accrued many awards and honors, including the Holley Medal, presented by the American Society of Mechanical Engineers. Other recipients of the medal have included Henry Ford, Edwin Land (for the Polaroid Land Camera), William Shockley (for the invention of the transistor), Elmer Sperry (for the gyrocompass), and many others.

After his retirement from Sandia in 1984, Willis continued to consult with all who would call him. He remained active in the Hoffmantown Baptist Church in Albuquerque, where he served in many capacities.

Willis is survived by his wife, Belva; son Joe Ray and wife, Joy, of Portland, Ore.; son James Donald of Albuquerque; a brother, Lawrence Whitfield; and sister, Amy Blackburn, both from Dallas, Texas.

Willis Whitfield lived to see his invention turn 50 this year, but was unable to give one last interview, so his son spoke for him, saying, “I’m sure in his heart, he was very satisfied that he made such a big and positive impact on society.”



STANDING in an early version of his cleanroom design, Willis Whitfield checks air quality monitoring equipment.