Since 1949
Managed by Sandia Corporation for the National Nuclear Security Administration

Volume 68, No. 24
December 9, 2016

THE BELOVED TUMBLEWEED SNOWMAN, placed on I-40 each year by employees of the Albuquerque Metropolitan Arroyo Flood Control Authority, greets holiday travelers and city residents alike. Lab News photographer Randy Montoya captured this image just after dusk on a recent wintry evening from a safe location and with special permission granted by AMAFCA. The snowman, placed in the same location every year since 1995, stands almost 15 feet tall and is built using 10 or so giant tumbleweeds. (Photo by Randy Montoya)

Safe, secure, sustainable labs

By Mollie Rappe

A n outbreak is like a wildfire; the sooner it’s caught, the easier it is to fight, says Vips Halkjaer-Knudsen, a project lead and lab design expert in Risk Management Dept. 6824.

To detect an outbreak early — whether Ebola, Zika, or influenza — healthcare workers must have a local, trustworthy diagnostic lab. For the past five years Sandia’s International Biological and Chemical Threat Reduction group has served as a trusted adviser for design of diagnostic labs around the world that are safe, secure, sustainable, specific, and flexible.

Now, Bill Arndt (6824) has developed a new method to speed up the critical initial stages of the lab design process used by Sandia, without sacrificing results. Bill and his team used his Prototype Lab tool in Iraq to support the initial design of the central veterinary lab.

“We have all these laboratory and support space modules and the idea is like going back to when you were a kid with LEGO bricks. We work with the in-country partners to actually put the pieces together to build a functional lab,” says Bill.

The Prototype Lab tool, funded by the Defense Threat Reduction Agency’s Cooperative Biological Engagement

(Continued on page 3)

A grand challenge

Arizona landmark is laboratory for Sandia’s R2R WATCH program

Pages 6-7
Just about the time The Beatles were singing Hello, Goodbye the space
team at MIT’s Lincoln Lab was experiencing a real-world version of the
song’s title. And not in a good way.
The lab’s LES1 satellite, launched in 1965 as part of a US Air Force-
sponsored program to test techniques for satellite communications, worked
swimmingly for a while — Hello! — and then something went very wrong.
The ground controllers lost contact with the satellite in 1967 and after heroic
efforts to reestablish a comms link, program managers came to the very
reasonable conclusion that the LES1 was gone. Goodbye!
Imagine the surprise then, a couple of years ago, when amateur radio
enthusiast Phil Williams from Great Britain detected signals from an
unknown source that he suspected might be the long-lost bird. After
detailed analysis of the signal’s signature and the orbital parameters, it was
just recently confirmed authoritatively to be LES1.
That’s in itself an interesting story, since only broadcasting when its
power solar panels are in direct sunlight; its rechargeable batteries are believed
to have quit working decades ago. It’s not clear to scientists and engineers
just why the satellite “decided” to come back online after a five-decade-
long hiatus, but I think there’s a perfectly good explanation. It’s called
“the perversity of inanimate objects,” a well-known phenomenon we’ve all
experienced in our own lives, even the simplest ones.
Any inanimate object may be expected at any time to behave in a
manner that is entirely unexpected and totally unpredictable
for reasons which are completely unknown or thoroughly obscure.
Surely you’ve experienced it. After years of faithful service, your
car refused to start the morning you absolutely, positively have to get to the
airport by 6:30 a.m. Your oven, actually brand new, decided to quit
testing the day before you’re planning to cook that big Thanksgiving turkey.
Your perfectly reliable airport system goes down the weekend your in-laws
will be staying with you.
Most of the time, as the examples above suggest, the perversity of
inanimate objects seems willfully directed against us poor pitiful humans.
But now and then, it goes the other way, too. Sometimes, when the stars are
aligned, things are built up, only to fall apart. That’s why the farmhouses,
inanimate objects will delight us in surprising and unpredictable ways.
LES1 is a case in point. And I have my own recent mini-example. A couple
of months ago, on one of the weather stations at the New Mexico laboratory
with all kinds of bells and whistles. It worked great for the long time and it was fun to
be able to track and chart things like the highest wind gust of the month or
total rainfall for the years. But after the fading of the season, the
perverse factor kicked in and the darned thing went offline. Without the
battery was, the wireless connection, there was no good explanation; to borrow a
phrase from Mercury astronaut John Glenn, “It just blew.”
Luckily, even though I thought the station was done for, I hadn’t gotten
around to taking it down myself, so I knew what to do: weeks after
its failure it started streaming data to my desktop monitor again. Just like
that, I have no more idea of why it came back online than I do as to why
it went down in the first place. But I’m not complaining, since if you grousse abou
your machines or call them names, they have ways of getting back at you.
They really do.

With the annual holiday season fully upon us, I thought I’d pass along a
cautious tale that my colleague Jim Danneskild shared with me. While
perusing through Leland Johnson’s engaging and fascinating book, 
the AEC, Needless to say, that was the last Beachcombers Ball.

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}
A new method of designing high-quality public health labs faster

(Continued from page 1)

Another important aspect of lab design is biosecurity, including physical security. The Sandia lab design process supports secure access to the building and between public and laboratory space, though it’s not expressly built into the prototype modules themselves.

Buildling labs that are specific yet flexible to adapt to future needs

In addition to being safe and secure, a new lab must meet the needs of international partners and be flexible enough to adapt to evolving diagnostics over the next several decades of operation.

The Sandia lab design process brings all the stakeholders to the table — the end-users, lab design experts, biosafety experts, sponsors, and architects — and determines the activities and needs of the facilities and how best to achieve them. The end-users know the most about the diagnostics and services their labs provide, but often they’re limited by pre-conceived ideas influenced by their old lab. The external experts have a comprehensive understanding of lab design, but they don’t know what dons and does not work in the specific country and environment.

All of the stakeholders meet for three or four intense sessions that last several days each, spread over about six months, and plan everything from defining the general mission of the new building all the way to developing a detailed conceptual layout. Sandia doesn’t advance the designs to full construction-ready blueprints; instead the conceptual designs are turned over to architects for completion.

To guarantee that the final lab is going to actually meet the needs of the users and conform to international best practices, Sandia continues to plan an advisory role by reviewing and providing comments on the construction-ready blueprints. Also, this support builds local design and construction capacities and helps ensure biosecurity and biosecurity best practices are taken into consideration in future design projects, even if Sandia isn’t involved, says Bill.

“Bill’s tool is a very tangible, hands-on, visual tool to help understand and sharpen the dialogue, because very few facilities are actually identical when you begin to grind down, but they all consist of the same blocks in different permutations,” says Vips. Each module comes with a 3-D rendering of what the space will look like, which helps the end-users and sponsors envision the final product.

Beyond meeting the basic facility needs, Sandia’s lab design process focuses on adaptability. Using open labs for activities that are not endangered by cross-contamination or need for specialized ventilation is one way to build in flexibility. Another is to use mobile instead of fixed casework such as benches and cabinets. An open lab with sections for three different bacterial diseases can adapt to a cholera outbreak by scooting equipment over a bit, whereas three small, specialized bacteriology labs lack that surge capacity, explains Vips.

Making sure a lab lasts 30 or 40 years in the relatively volatile climates of tropical and dry environments is a high priority.

Promoting use of local architects, engineers

“You cannot take something we have in the US and just plop it down as copy-paste,” says Vips. “Asia is extraordinarily humid, everything grows mold and fungus. In the Middle East everything is dusty and dry.”

Promote use of local architects and engineers. They know the finishes that can mitigate mold growth and air filters that can handle extremely dry environments. They know the materials and construction methods that locals can use, repair, and maintain, says Bill.

The prototype design tool also helps ensure that the lab is an affordable and sustainable size. Each module has its own entry in a cost estimation spreadsheet that includes the cost to build and equip it. Very early in the design process, well before the lab is laid out, the spreadsheet can generate a quote for a lab built with those modules. The estimation tool can even be adjusted using local construction costs to improve the accuracy of the quote. This gives the sponsors and the end-users a benchmark figure early in the design process, so they can consolidate or adjust the plan as needed.

During outbreaks, foreign donors sometimes fund temporary labs. These labs can be deployed quickly to critical situations, but are often only a short-term solution. They are typically designed and built in a foreign country, under radically different environmental conditions. They are typically designed and built in a foreign country, under radically different environmental conditions. They are typically designed and built in a foreign country, under radically different environmental conditions. Thre, the design process can adapt to hazards and environment. In many developing countries, frequent blackouts and brownouts turn biosafety cabinets and other critical equipment into nothing more than “modern art,” says Vips. Backup generators, uninterrupted power supplies for vital equipment, even solar panels are potential solutions, but only if the generator is readily available and the solar panels can withstand local sandstorms.

Biosafety, biosecurity best practices built in

The primary goal of biosecurity is to make sure infectious pathogens stay contained and “the staff only go home with their salary, and nothing else,” says Vips. Personal protective equipment, standard operating procedures, administrative controls, and engineering controls all help reduce the risks of working with pathogens. And by building in these controls during the lab design process, the work performed in the lab will be safer.

Sandia’s lab design experts and their partner HDR Inc. of Omaha, Nebraska, an international architecture and engineering company, have designed biosafety and biosecurity best practices into each module. This includes putting sinks near the exits so that staff can wash their hands as they exit the lab, placing key laboratory equipment away from high traffic areas so that they function properly, and pre-selecting easy-to-clean floors and benchtop surfaces.

Careful placement of modules is another way to make certain biosecurity best practices are being followed. Two examples include placing breakrooms away from labs with hazardous or infectious materials and ensuring that labs that generate a lot of infectious waste are located close to sterilization facilities.
A place to grow

Sandia Science & Technology Park gives local economy a major boost

By Nancy Salem

The Sandia Science & Technology Park (SSTP) has captured $2.6 billion worth of economic activity and produced more than $103 million in tax revenue for the state of New Mexico and $13.2 million for the City of Albuquerque since it was established in 1998. That’s the conclusion of a new report by the Mid-Region Council of Governments (MRCOG).

Jobs associated with the research park, which houses private companies and some Sandia National Laboratories sites in a collaborative environment, have paid out $4.4 billion in wages, contributing significantly to the local economy, the report said.

In 2014 and 2015, the park’s economic impact was $315.2 million and it produced $13.6 million in tax revenue for the state and $2.3 million for the city. Wages in the two-year period totaled $635.1 million, according to the report.

Albuquerque Mayor Richard Berry announced the report’s findings Friday, Dec. 2, at the National Museum of Nuclear Science & History in the 300-plus acre master-planned SSeTP.

Berry said the park “is a great example of a successful public-private partnership. Its impact on local and regional economic development is a reflection of Albuquerque’s robust collaborative efforts that ultimately result in valuable jobs for our residents. The City of Albuquerque is honored to be an active partner in the SSTP.”

The park is a partnership of Albuquerque Public Schools, Bernalillo County, the City of Albuquerque, DOE/NNSA, Lockheed Martin Corp., the Mid-Region Council of Governments, the New Mexico Congressional delegation, the New Mexico State Land Office, Public Service Company of New Mexico, Sandia National Laboratories, the Sandia Science & Technology Park Development Corp., the state of New Mexico, Technology Ventures Corp., Union Development Corp., and the US Economic Development Administration.

Jobs, economic activity, wages

“Since its creation, the Sandia Science & Technology Park has provided a home where innovation and technology can thrive and grow,” said Bernalillo County Commissioner Maggie Hart Seidel. “The companies located here are committed to the creation of high-quality jobs, stimulating the local economy and establishing long term economic prosperity for our community. Bernalillo County is proud to partner with SSTP in these efforts.”

MRCOG assessed the research park’s economic impact on the local and state economy from its inception through the end of 2015. The report also measured the number of Albuquerque-area jobs created in the park, economic activity in the community, and wage and salary levels.

“The park has elevated the regional economy as a whole, and its impacts are felt at the city, county, four-county, and state levels,” said Dewey Cave, MRCOG’s executive director. “The report draws upon a regional economic modeling tool, the REMI model, which is a widely used and respected analytical tool for measuring local economic impacts.” He said the demographic and employment data in the REMI model are updated annually for the region and state.

The report found that salaries for the full-time employees of companies and organizations in the SSeTP last year averaged $81,100. The park is home to 42 companies and organizations and 2,161 jobs, including about 1,000 Sandia jobs. The park’s activities have created more than 4,000 indirect jobs throughout the regional economy, according to the report.

“This science and technology park is the best example New Mexico has of long-term, high-quality job creation,” said Sherman Newell, chairman and CEO of the SSeTP Development Corp. “We remain excited about the opportunity for future growth.”

Widespread investment in the park

Public investment since the park was established has been more than $89 million, including DOE’s contribution for the Master Development Plan, land from Albuquerque Public Schools and the New Mexico State Land Office, and landfill cleanup by Bernalillo County, the report said. Other federal, state, and local government entities helped the park by providing grants or matching funds, the report said. For example, the US Economic Development Administration provided significant grants for secure fiber-optic communications and security network infrastructure. The City of Albuquerque also contributed to infrastructure improvements in the park.

“Investment in the park has been over $375 million with more than 75 percent coming from private sources,” said Rob Landal, Div. 1000 vice president and chief technology officer. “This kind of public-private partnership has a very beneficial impact on the community, and Sandia is committed to continuing to build the park’s success through collaboration leading to business growth.”

The SSeTP is located next to Sandia Labs and Kirtland Air Force Base, giving companies the ability to collaborate more easily with scientists and engineers from Sandia, the Air Force Research Laboratory (AFRL), and other Air Force units. Many park companies supply Sandia and AFRL with goods and services or have commercialized technologies that originated at the federal laboratories.
TRUTHS AND CONSEQUENCES
REAL CASES AND OUTCOMES

Ethics Advisory and Investigative Services presents *Truths and Consequences*

Truths and Consequences is based on real cases and outcomes. The purpose is to provide an opportunity for employees to learn and better understand Sandia’s values and policies in action. Your management, along with Ethics Advisory and Investigative Services, takes your concerns seriously. Below are case facts and responsive actions taken by Sandia.

**ISSUE: MISUSE OF CORPORATE CREDIT CARD**

**Background:**
Approximately 7,000 Sandia employees use a corporate credit card (previously corporate travel card) for business-related travel and other approved business purchases. When applying for a corporate credit card (CCC), each applicant signs an agreement to abide by the policies for its use. In FY16, there was an increase in issues related to the inappropriate use of Sandia's CCC, and the Ethics office was asked to investigate a number of those issues. The following details are based on real cases and outcomes.

**Facts:**
The Ethics office found that, while the investigated employees had some legitimate business travel expenses, they also:
- Used their corporate credit card for personal expenses (e.g., utility bills, personal travel expenses, and household items)
- Obtained cash advances for personal use
- Failed to make full payment each month as required
- Failed to submit expense reports for CCC charges in a timely manner

**Resolution/Discipline:**
Based on the facts and severity of each individual situation, a variety of actions were taken that ranged from coaching and counseling to termination.

**Resources:**
- Relevant corporate policies and procedures
- Line manager
- *Treasury & Travel Quick Links*
  - Corporate Credit Card FAQs
  - Travel FAQs
  - Sandia Travel Page
  - Treasury & Travel POCs

**Applicable Policies:**
Employees violated the following:

CG100.4.1 Comply with the Code of Ethics and Standards of Conduct and Sandia’s Corporate Values: Code of Ethics and Standards of Conduct: You are also responsible for properly accounting for labor, travel, material, and other costs, and ensuring these costs are recorded and charged promptly and accurately.

FIN100.1.TNT.1 Obtain and Use a Corporate Credit Card: Ensure that personal items are not charged to the CCC; Pay the CCC in full each month.

FIN100.1.TNT.2 Submit an Expense Report: Submit an expense report as soon as possible after incurring the cost in order to accurately reflect costs to projects.
From Rim to Rim

Sandra’s R2R WATCH project collects data to study the health, performance of Grand Canyon rim-to-rim hikers

By Patti Koning and Michael Padilla

The R2R WATCH Rim-to-Rim Wearables at the Canyon for Health study drew together a diverse Sandra team from across four divisions in partnership with the University of New Mexico’s Health Sciences Center and the National Park Service. To capture the unique nature of this ongoing project, Lab News reporters Patti Koning and Michael Padilla (both 8524) traveled to the Grand Canyon to witness the R2R WATCH team interacting with rim-to-rim hikers at the start and end of their journeys. This article gives Patti’s perspective from the hike start at the Grand Canyon’s South Rim and Michael’s from the trail end at the North Rim.

Pre-dawn at the South Rim

By Patti Koning

When the hikers express shuttle rolls up to the South Kaibab Trailhead at 5 a.m. on Friday, Oct. 14, some two dozen hikers pile out into the pitch black to face the South Rim of Grand Canyon National Park. They have no time to waste; their destination — hikers for a few precious minutes to participate in a study.

“Rim-to-rim hikers are the equivalent of a marathon in distance, with a 1 mile change in elevation and temperatures that range from below 30 degrees Fahrenheit to more than 110 degrees. In addition, the Grand Canyon rim-to-rim hike is an inverse challenge: the first half is easier than the second,” says Dr. Risa Garcia, Sandra’s principal investigator for the R2R WATCH study.

The R2R WATCH project has three levels: survey, only which includes basic medical data like blood pressure, oxygen saturation, and vital signs; survey and blood samples, and wearable devices; and survey, blood samples, and wearable devices.

The University of New Mexico (UNM) manages the collection of nutritional data, and blood samples, while Sandia oversees the wearable device study. As this research project grows, UNM and Sandia are assessing their efforts by sharing data to answer questions from various research domains, from medical assessments to performance in extreme environments.

An extreme challenge

“Most challenging hikes, like Mount Whitney in California, if you become exhausted, you can turn back,” says Dr. Kristin Anchors (far right), from the University of New Mexico’s Health Sciences Center and the UNM-New Mexico Veterans Affairs Medical Center.

The team focused on devices that measure physiological and cognitive markers that are best related to measuring aspects of physical fitness and nutrition. The R2R WATCH study is in its determine which commercial off-the-shelf devices work best in extreme environments.

One of the study’s goals is to determine which commercial off-the-shelf devices work best in extreme environments and to identify the physiological and cognitive markers that provide the earliest yet reliable indication of health decline.

The Grand Canyon is an incredible place, but it can also be extremely dangerous. Access to water is limited on the Bright Angel and North Kaibab Trail and nonexistent on the South Kaibab Trail,” says Pearce. “Our goal is to help visitors stay safe while meeting this natural challenge.”

The results of the UNM/NPS rim-to-rim study have already revealed some early warning signs of the challenges of the Grand Canyon. “We gathered a lot of useful data the first time we did this study, and rangers have now integrated much of this data into their education of visitors,” says Pearce. “When rangers tell hikers that the average time rim-to-rim is 12 hours, people think twice. The physical challenges of a rim-to-rim hike — extreme heat, steep terrain, lack of water — apply to other scenarios of interest to Sandra, particularly those relevant to the nation’s armed services.

Physiological, cognitive effects of extreme hiking

At first, most of the hikers decline to participate in the R2R WATCH study. They don’t want to delay the start of their extreme trek. But later be a hard mental mess to set in. Once the researchers explain what they are trying to do, a few hikers agree to participate because they think the study is important. They even join in.

We’re looking for signs of fatigue, like muscles activating more slowly,” says Bob Madsen (1463), a computer scientist in the Cognitive Sciences and Systems department.

R2R WATCH study team

The study is supported by nearly 75 volunteers from UNM and Sandra.

"Both our procurement and medical staff were extremely helpful and as we are grateful for their assistance," says Sandra project manager Cathy Branda.

Data analysis underway

The team is in the process of evaluating the devices, extracting the data from each wearable, and analyzing the data. They are looking for relationships between physiological and cognitive markers, as well as performance and health outcomes. They will also determine which devices were the most effective in measuring physiological activity, functionality, and the ability to accurately capture physiological markers.

These results will feed into the next round of data collection for the R2R WATCH study, scheduled for mid-May 2017.

"This initial study of both physiological and cognitive markers was a great success. We collected wearable device data from 50 people, and over 100 people participated in the overall study in one weekend," says Cathy. "But this is just the beginning. This unique single and our partnership with UNM and the NPS create the opportunity to learn a great deal about predicting medical events. We expect to have more participants and be more targeted in the data we collect in May.”

Real-time data collection

The team set up 75 wearable packages that included iPod Touch units loaded with cognitive tests and more than 30 wearable devices — typical fitness gear like watch, chest straps, foot pods, and hats with sensors.

"The wearables we’re using are non-intrusive fitness devices that can capture the hikers’ physical state while engaged in physical activity,” says Glory. "GPS was introduced in this funding this study because not only do its turn which wearable devices are best related to measuring aspects of human performance, but, at the basic research level, it also examines the underlying relationships between cognitive, physiological, and biological markers.

The team focused on devices that measure multiple markers, while considering prior and performance reviews. “A device that is really good at measuring heart rate but could not be going to the feasible brightness,” says Glory. “And we can’t disturb hikers’ experience at the camera by having them each wear seven to 10 devices.”

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Tracking wearable devices

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"Our procurement and medical staff were extremely helpful and as we are grateful for their assistance," says Sandra project manager Cathy Branda.
The ALT940 Design Team. The team is recognized for completing the conceptual design phase of the ALT940 Warhead. The team’s work resulted in the first implementation of weapon surety on a Navy warhead, a significant advancement in weapon surety. The team’s dedication, efficiency, and effective engineering enabled the NNSA complex to deliver on a rare and valuable opportunity, addressing the presidential directive to improve weapon surety. This team has members in both New Mexico and California and is receiving this award under the exceptional achievement category.

EDWIN MOBLEY for his leadership in flexible circuit design, leading to successful product delivery. Ed’s professionalism and selflessness have been integral to his participation in high-consequence situations and enhanced the value of his technical contributions. Ed’s integrity and commitment to delivering high quality designs and design definitions, within the challenging constraints of Sandia development programs have resulted in Ed enjoying a reputation for being reliable and a recognized expert in his field.

EDWIN PHILLIP CHAMBERLIN for leadership on the Cost Estimating Analysis Group B61-12 Baseline Cost Report Review. Phil effectively led a team of technical experts with participation from all of the NSE sites to provide a high level, value-added report to the Federal Program Office.

The Tonopah Test Range Ops Team. The team at Tonopah Test Range faced unique hurdles in integrating new program requirements, safety, and recovery considerations, and a 300 percent increase in test event logistical arrangements. This team, composed of both organic and matrixed staff, performed under stringent time constraints and successfully enabled the Labs to stay on critical programmatic timelines.

The FY17 SSMP EMAC SCORE Team. This team’s quantum leap in the quality, processing, and computation of LEP data from each of the NSE sites led to an unparalleled understanding of knowns and unknowns associated with the current and future stockpile as a result of improving the SCORE process. This work set precedence for NSE site collaboration, FPMs, and NA-14 staff and leadership to provide the most definitive, well-informed cost estimates for the SSMP to date. The collaboration resulted in a new depth of relationships across the NSE sites and NNSA, characterized by trust and mission focus. The FY17 SSMP EMAC SCORE Team has members in both California and New Mexico.

Assessment of an NNSA Asset for Potential Use in Planetary Defense team. This tri-Lab team provided an assessment of the applicability of an NNSA asset for potential use in planetary defense. The team performed valuable technical analyses to inform decisions on the fate of the asset and arrived at valuable conclusions that enabled NNSA to make an informed and risk-based decision. This team also has members in both California and New Mexico.
NNSA Defense Programs Awards of Excellence

Team winners (continued)

The B61-12 Hardware, Assembly, and Lab Operations Team. This team epitomized safety, security, and engineering excellence while executing meaningful improvements to all facets of its mission in 2015. This team worked across the enterprise and enabled nearly all the LEP’s development and qualification testing efforts. The team expertly managed very large hardware stores and assembled and disassembled large unit quantities. The team significantly contributed to the value and accuracy of test data — critical to advancing the LEP.

The Powerflow Development on the Z Machine – Next Generation Containment Team. This diverse team of scientists, engineers, and technologists worked beyond expectation in conceptualizing, designing, analyzing, and creating the experimental hardware that solved a challenging problem that has plagued the Pulsed Power Science Center for a number of years. This team worked with innovation and fostered a supportive and collaborative teaming environment to the success of the mission.

The WETL Centrifuge Restart Team. After a centrifuge drive caught fire at the Sandia National Laboratories Weapons Evaluation Test Laboratory facility at Pantex, WETL’s capabilities were significantly reduced. This integrated project team, consisting of Pantex and Sandia personnel, partnered to accomplish the replacement of the centrifuge drive and complete the equipment commissioning and restart. Through excellent communication, cooperation, and determination, the project’s completion was delivered on time in spite of the challenges of an extremely aggressive schedule.

The B61-12 Flight Test Team. This team successfully completed the flight test that marks a major milestone for the B61-12 Life Extension Program, demonstrating end-to-end system performance under representative delivery conditions. This team’s dedication, diverse teaming, and get-it-done culture resulted in delivering the first complete B61-12 flight test, reinforcing the nation’s continued commitment to maintain the B61 and provide assurance to our allies.

The W87/ML21 W88 ALT 370 MCM Electro Mechanical and Qualification Team. This team crafted an improved Printed Wiring Board and Assembly test and storage approach to the W87/ML21 and W88 ALT 370 Missile Interface & Controller Module. The design includes a reusable in-capture system that resulted in significant cost savings in multiple programs.

The Pioneering New Frontiers in Hostile Environments Research Team. This team successfully worked to push the frontiers in hostile environments research, accomplishing several remarkable feats, one of which enables the first use of tritium on the Z facility. Through their notable dedication, they have made truly pioneering improvements to the hostile environments research capabilities of Z whose value will have impact in years to come. This team has members in both New Mexico and California.

The WELE Centrifuge Restart Team. After a centrifuge drive caught fire at the Sandia National Laboratories Weapons Evaluation Test Laboratory facility at Pantex, WETL’s capabilities were significantly reduced. This integrated project team, consisting of Pantex and Sandia personnel, partnered to accomplish the replacement of the centrifuge drive and complete the equipment commissioning and restart. Through excellent communication, cooperation, and determination, the project’s completion was delivered on time in spite of the challenges of an extremely aggressive schedule.

The Presidential Policy Directive Team is recognized for establishing the Nuclear Command and Control, Safety and Security Policy. This team, comprised of only one Sandia employee, Luke Purvis, among a host of NNSA employees, completed a high-risk project with significant impact to the nuclear security enterprise.

The MGT Analysis of Alternatives Study Team. This joint Sandia/NNSA Office of Secure Transportation team completed a first of its kind analysis, setting future standards for similar work. The team began its work well before any formal guidance or process existed for this type of study, and it was the first such effort to fully implement new cost-estimating procedures. The team’s evaluations enabled NNSA to make an informed decision in selecting the nation’s third-generation secure transportation system.
The Ultra-Fast X-Ray Imager ASIC Development Team. The first in-situ diagnostic images were captured in 2015 at both the Sandia National Laboratories Z Pulsed Power Facility and the Lawrence Livermore National Laboratory National Ignition Facility — using Sandia’s ultra-high-speed, high-resolution, digital X-ray framing camera. Sandia’s Ultra-fast X-ray Imaging — UXI camera system — has been identified as the leading transformational diagnostic capability for high-energy-density (HED) physics within the National Plan. This team, earning this award in the exceptional achievement category, enabled the HED and inertial confinement fusion research needed for the future, and provides a truly transformational capability for HED science at Z and NIF.

The HERMES III October 2015 Team. The HERMES III team of researchers came together as part of an international, multi-mission, multi-agency campaign hosted by Sandia at the HERMES III facility. Two years of investment and commitment by this team resulted in an extremely valuable contribution the nuclear security and nuclear forensics mission. In New Mexico, both Sandia and DTRA members are present, as well as members in California.

The ELNG Rapid Tooling Team. The ELNG Rapid Tooling and Process Engineering team’s commitment to the quality of NW products and significant yield improvement is the result of an innovative and out-of-the-box solution. The team’s success was the direct result of the team’s diversity and commitment to a highly effective partnership. Through their work, this small team has fostered a culture change in product design and development — ensuring future innovation and efficiency.

The Dropkinson Bar Test Team. This team invented an experimental apparatus that demonstrates a significant leap forward in Sandia’s ability to develop and validate structural mechanics computational simulation capabilities. The Dropkinson Bar experimental apparatus is unique in its ability and the success of a highly integrated and committed team.

Combined Credible Abnormal Environments Team. The B61-12 Combined Credible Abnormal Environments team demonstrated technical excellence and outstanding inter-agency teamwork to deliver both a product and a new methodology in assessing nuclear weapons safety performance. This team’s multi-agency teaming and successful project delivery have significantly contributed to the success of the B61-12 program and the nuclear security enterprise.
is a champion at operational excellence,” Rick says.

Leverage:

The Operational Innovation Program, established in 2012, is a corporate-wide effort to capture, evaluate, share, and report on efficiencies at Sandia as required in the Performance Evaluation Measurement Plan. Organization 710 hosts an annual Operational Innovation Recognition Ceremony to recognize the top teams and individuals who contributed to the program during the year.

This year’s recognition ceremony was conducted Nov. 9 in a State Fair-like, 4-H format where project highlights were presented on posters and first, second, and third place ribbons were awarded to winning efficiencies.

Operational Innovation program manager Rick Sherwood expressed his appreciation to this year’s contributors for their efforts in achieving $155.9 million in cost saving and cost avoidance initiatives in FY16. “It’s clear that Sandians have demonstrated to our executives and NNSA that Sandia National Laboratories is a champion at operational excellence,” Rick says.
Students zip through NM electric car challenge

Berrendo Middle School in Roswell took first place in the annual Electric Car Challenge sponsored by Sandia, Los Alamos National Laboratory, PNM, and Intel. The challenge, held Nov. 19 at Albuquerque’s Van Buren Middle School, attracted some 150 middle school students from across the state.

In the challenge, now in its 10th year, students formed five-person teams at the beginning of the school year and were provided basic materials—a lithium-ion battery, a direct-current motor, and other materials such as a chassis and wheels—needed to build their cars.

“Our goal is to expose students to basic engineering. This allows them to see how math and science intersect,” says Sandia Community Involvement Dept. 3652 Manager Amy Tapia.

The teams discussed the designs of their cars, as well as the challenges they faced while constructing and running them. Teams also presented their research about using batteries as a power source.

Other top finishers included the sixth grade academy at Alta Vista Middle School in Carlsbad, which took second place for the second year in a row, and Carlsbad Intermediate School, which came in third.

Story and photos by Lindsey Kibler