



Sandia-designed wave energy converter powers data collection aboard the Pioneer

By Spring Booth



WAVE RIDER — The Ocean Observatories Initiative Pioneer Array coastal surface moorings buoy. Photo by Taylor Mankle and Joshua Bauer, National Laboratory of the Rockies

Off the North Carolina coast, an oceanographic buoy gathers real-time, publicly available ocean data with the help of a first-of-its-kind bolt-on wave energy converter designed by Sandia engineers.

The Pioneer Array comprises a series of coastal surface moorings and other platforms that work together to monitor and analyze interactions between the ocean's surface and deeper waters, contributing to a greater understanding of the ocean.

The challenge

Initially, the coastal surface moorings were designed to use solar and wind energy. However, harsh ocean conditions, such as long periods of fog or low wind, made it difficult for them to generate sufficient power for continuous operation.

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As W88 production ends, Sandia looks to next phase

By Kenny Vigil

Sandia and the nuclear security enterprise completed production of the W88 Alteration 370 and fully transitioned the modernized warhead into the U.S. nuclear stockpile, shifting the program's focus to long-term sustainment.

The last production unit was completed at the Pantex Plant in Amarillo, Texas, in November.

"I remember talking about the Alt 370 when we were just putting together plans," said Troy Savoie, now a manager at Sandia leading the team that oversees stockpile sustainment of the warhead.

Ohio-class ballistic missile submarines as the warhead component of the Trident II D5 strategic weapons system.

Sandia is the design agency for non-nuclear components and is the lead systems integrator for nuclear weapon programs. In addition, Sandia served as the production agency for several components within the weapon.

"Completing the W88 Alt 370 is the latest instance of NNSA delivering modernized nuclear weapons to the Department of War at the pace and scale needed to fulfill our deterrence requirements," NNSA Administrator Brandon Williams said. "Achieving two last production units for the



FROM LAB TO SEA — The W88 Alt 370 program addressed aging issues identified during routine surveillance, enhancing the reliability of a critical element of the sea-based leg of America's strategic deterrent. Photo courtesy of the U.S. Navy

B61-12 and W88 and the first production unit for the B61-13 all within a single year demonstrates our ability to execute NNSA's fundamental production mission."

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Sandia National Laboratories

Albuquerque, New Mexico 87185-1468

Livermore, California 94550-0969

Tonopah, Nevada | Kauai, Hawaii

Amarillo, Texas | Carlsbad, New Mexico | Washington, D.C.

Katherine Beherec, Editor kgbeher@sandia.gov
Ray Johnson, Production rbjohns@sandia.gov
Craig Fritz, Photographer cvfritz@sandia.gov
Michael Langley, California Contact mlangle@sandia.gov

CONTRIBUTORS

Michelle Fleming (milepost photos, 505-844-4902),
 Kristen Meub (505-845-7215), Troy Rummel (505-284-1056),
 Meagan Brace (505-844-0499), Mollie Rappe (505-288-6123),
 Skyler Swezy (505-850-2063), Lea Blevins (lsblevi@sandia.gov),
 Kenneth Vigil (505-537-1528), Luke Frank (505-844-2020),
 Michael Baker (505-284-1085), Valerie Yarberr (vnalba@sandia.gov),
 Magdalena Krajewski (mkrajew@sandia.gov)

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EDITOR'S NOTE: Please send your comments and suggestions for stories or for improving the paper. If you have a column (500-800 words) or an idea to submit, contact the Lab News editor at labnews@sandia.gov.



CATCHING UP — Labs Director Laura McGill takes a moment to check emails in her office. While talking about Sandia's priorities and reflecting on the past year, she said volunteering is important to her. "There are people around us who have real needs," Laura said. "We are members of this community, and we have a responsibility to help our neighbors." She is especially interested in getting students to consider careers in STEM, which can open significant opportunities for them. **Photo by Craig Fritz**

Looking ahead and reflecting on the past

Labs director shares career inspirations, vision for Sandia's future

By **Kenny Vigil**

As Labs Director Laura McGill wraps up her first year leading Sandia, she also received the highest distinction conferred by the American Institute of Aeronautics and Astronautics.

"It's quite humbling when I reflect on the aerospace and defense leaders that have come before me and how I've been

inspired by them," Laura said. "This is not something that I could have foreseen, and I'm overwhelmed by it."

On May 18, Laura was inducted as an AIAA Honorary Fellow during a ceremony in Washington, D.C. Laura is a Lifetime Fellow of AIAA and served as the institute's president from 2022 to 2024.

"I remember when I was president and making the calls to notify selectees that they were to be inducted as a Fellow or recognized as an Honorary Fellow," she said, adding that it is customary for the president to call each honoree personally. "It's among the most rewarding duties of the president."

In February, Laura was on the receiving

end of that phone call when current AIAA President Dan Hastings called from the Massachusetts Institute of Technology to let her know she had been selected as an Honorary Fellow.

“Even though I know when the notifications are typically made, when Dan called, I assumed that it was about something else that we were working on,” she said. “It was especially memorable to receive the news from a highly respected colleague.”

Career influence

Laura has been a member of AIAA since early in her career.

“I served on a national technical committee and helped develop measurement and other standards for aerodynamic testing facilities, i.e., wind tunnels, that are still in use today. It’s a privilege to have that kind of impact on your industry when you are in low-level engineering roles,” she said. “Through AIAA, I served on teams to help drive advancements that were well beyond my job assignment, while working with aerospace and defense leaders from all over the world.”

Those connections have been invaluable throughout her career, and she reflected that she met many of her leadership role models through the AIAA. “I learned from how they assessed national challenges and developed opportunities to shape the industry,” she said.

Laura said her goal was never to get to a certain level of leadership or to be the director of a national laboratory, but she feels that she is in the right place at the right time to lead the Labs.

“I just wanted to make meaningful contributions as a member of high-performing teams that were developing important leading-edge systems. I hoped to do cool engineering work and build new technical skills, which makes it fun in spite of the daunting challenges. Work should be fun,” she said, smiling.

Systems approach

Now, a year into leading Sandia, Laura said she is applying her systems engineering background as Labs director.

“We have approximately 16,000 exceptional employees, acres of advanced technology equipment and capabilities that don’t exist anywhere else. Sandia is a large, complex system,” she said. “We’re a unique national lab, and the nation calls on us to do work that no other organization can do. Sandia is the premier engineering national laboratory and serves as the lead system integrator for nuclear weapons programs.”

Laura said that systems integration can be applied to all Sandia work, a point she emphasized at a recent all-hands meeting.

“I will continue emphasizing that we are bigger than the sum of all our parts. I want our employees to see how their contributions fit into that bigger system, and how they each help it to work more seamlessly when it’s all pulled together,” Laura said.

Stepping up

Laura credited Sandia’s talented leadership team for helping the Labs navigate the unusually complex challenges that arose during her first year as the director.

“We worked in a very dynamic and

challenging environment in 2025,” she said.

Laura also recognized her predecessor, James Peery, who retired in April 2025, for strongly positioning the Labs, and ensuring that staff focused on critical work for which Sandia is uniquely suited.

She wants Sandia to continue building science and engineering capabilities that contribute directly to the Labs’ deterrence mission, operate efficiently and effectively to accelerate deliveries in all mission spaces and prepare for the future by anticipating the threat landscape. She added that advancing applications of artificial intelligence and maturing quantum computing and sensing devices are important elements of that future.


“Sandia is stepping up to serve the nation in ways that are truly incredible,” Laura said.

A space for connections

Laura makes a point to walk through the tech area to get to meetings, instead of driving, so that she can see and talk to employees along the way.

“It’s been fun to get around, meet more of our people and learn more about their work,” Laura said. “During one of my walks out in the technical area, I had an employee tell me, ‘I’ve never met a Labs director before.’”

Laura said employees provide her with motivation.

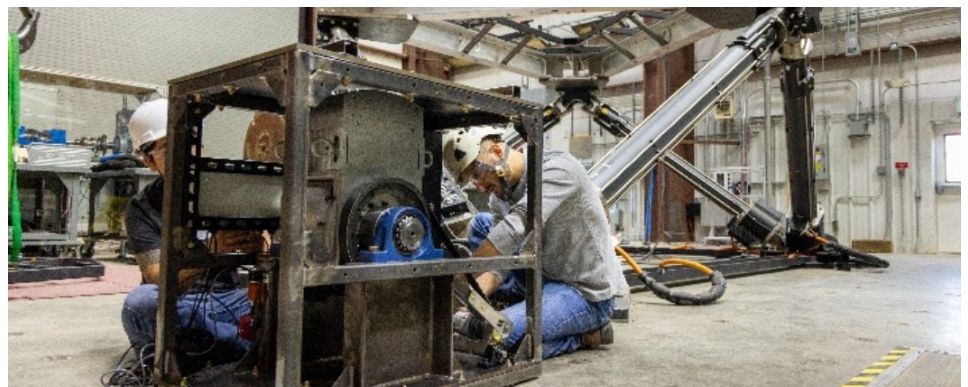
“I’m inspired by the commitment of Sandians to deliver exceptional service in the national interest,” she said. “It’s a privilege to lead this amazing team. I feel that I’m in the right place at the right time.” 

Wave energy converter

CONTINUED FROM PAGE 1

Sandia’s Hydrodynamic Energy Systems department, led by Peter Kobos, collaborated with the Ocean Observatories Initiative to create design requirements for a WEC that would not disrupt mooring dynamics or compromise data collection integrity.

This multiyear endeavor culminated in a novel system developed through



FINAL TOUCH — From left, Damian Gallegos-Patterson and Jantzen Lee adjust the Pioneer Wave Energy Converter before it is sealed in a box for deployment in the Atlantic Ocean.

Photo by Taylor Mankle and Joshua Bauer, National Laboratory of the Rockies



OUT TO SEA — The Pioneer Array coastal surface moorings buoy and research vessel Neil Armstrong. **Photo by Taylor Mankle and Joshua Bauer, National Laboratory of the Rockies**

a co-design process to meet Ocean Observatories Initiative design needs. The WEC is fully enclosed, so only electricity and data are exchanged, significantly reducing the risk of mechanical failure and harmful ecological impacts.

The deployment

The first Pioneer WEC prototype was constructed at Sandia's New Mexico

site and then shipped to the Woods Hole Oceanographic Institution. There, project team members partnered with the Sandia team to perform final testing and assemble the WEC with the Pioneer coastal surface mooring buoy.

The research vessel Neil Armstrong deployed the buoy at a site roughly 50 nautical miles off the coast of Nags Head, North Carolina, just north of Cape Hatteras. The location meets Ocean Observatories Initiative's goals and has a seasonal mix of wind and waves, along with occasional strong storms that offer an ideal environment for testing the efficiency and power output of the WEC. Ryan joined the deployment cruise, during which the Woods Hole Oceanographic Institution team successfully deployed the coastal surface mooring buoy with its newly attached WEC.


Initial results

Initial data from the WEC shows promising results. The overall project goal is for the WEC to generate 10-20 watts with minimal variability. In the first six weeks of deployment, the WEC produced a median output of 10.2 watts and operated

99% of the time. This performance is particularly encouraging, as it validates Sandia's numerical models and the WEC's potential to provide a stable power source for the Ocean Observatories Initiative surface mooring system. The integration of wave energy technology into oceanographic research has the potential to improve data collection and offers innovative ways to power remote oceanographic systems and sensors.

The future

Deployment of the first prototype is just the beginning. Data collected during this initial phase will inform the development of a second version, which is planned for deployment in 2027. This iterative design process is crucial for optimizing the performance and reliability of WECs and improving their viability for commercial use.

This project demonstrates that wave energy can enhance the operational efficiency of oceanographic buoys, increasing the continuity of data delivery, allowing for longer periods of operation between maintenance trips and reducing overall costs. 

W88 production

CONTINUED FROM PAGE 1

The W88 first entered the U.S. nuclear stockpile in 1988. The Alt 370 modernization program addressed aging-related issues identified through routine surveillance and refreshed key non-nuclear components to extend the warhead's service life. The effort reached full-rate production in 2022.

Warhead modernization

Michael Steward, who served as W88 Alt 370 system production manager, said his team was responsible for the design, development and qualification of the Alt 370. Most recently, the team has focused on supporting rate production of components and the system as the program moved toward completion.

His job entailed working closely with NNSA, the Navy, the Kansas City National Security Campus, Los Alamos National Laboratory, the Pantex Plant, Lockheed

Martin and other partners across the enterprise to address technical challenges and ensure on-time delivery of warheads to the customer.

"The key to overcoming them was working with subject matter experts here at Sandia, at our peer labs, at the production agencies, NNSA and the Navy," Michael said. "Leveraging all the partnerships and relationships across the nuclear security enterprise ensured that we delivered to the customer."

At Sandia alone, hundreds of employees played a role in the modernization. "The W88 is the backbone of the sea-based leg of the U.S. nuclear triad," Michael said. "It provides the president with a highly survivable strategic deterrent against attacks on the U.S. and its allies."


Sustainment role

Michael and his team worked closely with the sustainment team throughout production to ensure a smooth transition to the stockpile. The teams are co-located and shared

knowledge and lessons learned through daily in-person interactions and formal reviews.

"Sandia's role in those sustainment activities as the systems integrator will remain just as important," Troy said.

That will include annual assessment of the W88's state of health in the stockpile, maintaining and extending the underlying technical basis for those assessments and supporting logistics operations, field operations and production operations for surveillance rebuilds, or units taken out of the stockpile for inspection.

Forward-looking activities include assessing compatibility with the next version of the delivery platform and refreshing the surveillance flight test body when it reaches the end of its life. As most production work wraps up, teams at Sandia are ready for the next chapter. "It's not the end. It's basically the beginning of stockpile life for the W88 Alt 370," Troy said. "There's W88 work at Sandia for years to come." 



NNSA defense programs administrator visits Sandia

TOUR DAYS — NNSA Deputy Administrator for Defense Programs Dave Beck, right, visits the Microsystems Engineering, Science and Applications complex on a tour led by senior manager Catherine Green, left, and joined by, from left, Nuclear Deterrence Chief of Staff Steve Handy and MESA Director Reno Sanchez. During his visit to the Labs, Beck received briefings on Sandia's work in quantum, artificial intelligence, Laboratory Directed Research and Development for defense programs, mobile guardian transport and more. In addition to MESA, he toured the mobile vault, the Center for Advanced Manufacturing and Innovation, the neutron generator and vibration test facility.

Photo by Alicia Bustillos

Labs leaders report on future ready goals



FUTURE PLANS — From left, Deputy Labs Director David Gibson, Executive Director and Chief Human Resources Officer Brian Carter, Deputy Labs Director Rita Gonzales and Labs Director Laura McGill answer questions from staff following a presentation about progress on Sandia's goals during an all hands, May 11 in the Steve Schiff Auditorium. Communications specialist Myles Copeland, far right, emceed the event. The Art of the Future event offered updates on the Labs' pursuit of Future Ready Engineering, Future Ready Operations and a Future Ready Workforce, which were **introduced in January** as Labwide goals. Sandia staff can watch the [recording](#).

Photo by Craig Fritz

Sandia NM goes exactly one mile



EVERY SECOND COUNTS — Grace Driskill crosses the finish line first in the women’s race at the Sandia New Mexico DOE Mile event on May 13. The DOE Mile began 11 years ago at Sandia California and has evolved into an event that spans all 17 national labs. **Photo by Craig Fritz**



RUNNING CREW — Runners participate in the annual DOE Mile event at Sandia New Mexico on May 13. The Sandia California DOE Mile event is May 27. Staff can participate virtually by [logging their mile in the DOE Mile app](#) by May 31. **Photo by Craig Fritz**

Sandia's National Day of Prayer celebration

By **Amy Treece**

People from Sandia, Kirtland Air Force Base, Lawrence Livermore National Lab and other community members gathered to worship and pray for the country on May 7 at the National Day of Prayer event.

The 250th anniversary of the United States “invites us to reflect on the spiritual heritage woven through American history and the long tradition of national prayer,” said Mission Services Associate Labs Director Josh Parsons, who led a prayer. “As we reach this anniversary, we have an opportunity to renew that foundational American practice: to come together, reflect and pray for our country.”

The event, sponsored by the Christians in the Workplace Networking Group Committee and co-hosted by Kirtland Air Force Base Chaplain Corp, featured

prayers for the military, New Mexico and Albuquerque, families, Native Americans and more.

Pastor Steve Stucker, known to many for his long tenure as KOB’s meteorologist, spoke briefly at the National Day of Prayer. When asked why he chose to participate, he said, “I see many of the employees here as community leaders — intelligent, hardworking folks who will take God’s message into their areas of influence. It’s an honor for me to be able to speak into their lives in some small way.”



PRAYER — Sandians and members of the community gathered to pray during the National Day of Prayer. **Photo by Craig Fritz**

Other guests from the community included retired New Mexico State Police Deputy Chief Dominic Aragon, who led a prayer for first responders, and the worship team from Citizen Church. [@](#)

Connecting science and community through hydrogen exploration

California Community Involvement helps shape future at Tri-Valley Innovation Fair

By **Michelle Walker-Wade**

Sandia joined Quest Science Center to help create a vibrant hub of curiosity, creativity and collaboration at the eighth annual Tri-Valley Innovation Fair.

Held on April 18 at the Alameda County Fairgrounds in Pleasanton, California, the event united over 70 local organizations including schools, nonprofits and leading research institutions like Sandia, Lawrence Livermore

National Laboratory and NASA to ignite a passion for STEM education throughout the community.

From enthusiastic kids and high schoolers to curious parents, college students and staff, the fair showed how community-driven efforts can spark innovation and learning.

Sandia provided an opportunity for kids to interact with Chip Watson, the friendly robot dog, and a group of researchers offered a hydrogen research activity.



INNOVATION INQUIRIES — Liam Taylor engages attendees during the hydrogen activity. **Photo by Michelle Walker-Wade**

Led by postdoctoral researcher Liam Taylor, with support from Technical Business Development Specialist Matt Meyer and Community Relations intern Amelia Harrison, the hands-on water electrolysis demonstration invited participants to learn about the process

of splitting water into hydrogen and oxygen and showed how hydrogen can be harnessed as an energy source.

Liam guided attendees through the energy cycle of converting water to hydrogen and back, explaining Sandia's work on **hydrogen-powered technologies** like the SF Breeze high-speed ferry.

Attendees of all ages asked thoughtful questions about hydrogen production, storage and advances shaping the future of fuel. Some discussed how they might one day ride on a hydrogen-powered vessel, connecting science to real-world possibilities.


"Working in the H2 exhibit provided me the opportunity to take a complex concept like hydrogen and translate it into an engaging activity for a younger

audience," Amelia said. "Through collaborating with Liam, we sparked curiosity among students and showed them how hydrogen is evident in the world around them."

The Tri-Valley Innovation Fair demonstrated the impact of bringing researchers, educators, business professionals and families together to foster a culture of innovation and learning. Through experiences like these,



GOOD DOG — Amelia Harrison, right, shows Chip Watson, the robot dog, to fair attendees. Photo by Michelle Walker-Wade

Sandia and its partners are advancing science and building a stronger, more engaged community ready to shape the future of energy. 

Recent Patents

January-March 2026

- **Philip Rocco Miller, Matthew W. Moorman and Joshua Jonathan Whiting:** Chemical lanterns as miniature spectrometer dopant source. Patent #12517089
- **Shashank Misra, Scott William Schmucker and David R. Wheeler:** Area selective deposition templated by hydrogen and halogen resists. Patent #12518967
- **Robert Meagher:** Multiplanar planar electromagnetic array. Patent #12523654
- **Kenneth Alexander Brown:** Systems and methods for optimal phase shift between dynamic control actions for wind turbine. Patent #12535055
- **Erik Matthews Brubaker:** Single light photon counting radiation detector and data transmission methods. Patent #12535604
- **Daniel Villa:** Water and heat hub micro-system and method. Patent #12540457
- **Christopher Michael Katinas, Thomas Andrew Reichardt and Jerilyn Ann Timlin:** Processing short video to obtain frequency information. Patent #12557996
- **Hongyou Fan:** Pressure-induced crystallization and topochemical cross-linking of conjugated polymers. Patent #12570808
- **Nicholas Andrew Anderson, Jeffrey Daniel Engerer and Lindsay Elise Lawless:** Concentrated solar irradiation of targets in plasmas. Patent #12573587
- **Christopher Ryan Riley:** Multi-cationic aluminate spinels. Patent #12582967
- **Paul Alexander Adamczyk and John Michael Gladden:** Modified microorganisms to increase yield of xylose-derived products. Patent #12584151
- **Wei Pan:** System and method for electronic devices. Patent #12593619

Note: Patents listed here include the names of active Sandians only; former Sandians and non-Sandia inventors are not included.

Following the listing for each patent is a patent number, searchable at the U.S. Patent and Trademark Office website ([uspto.gov](https://www.uspto.gov)).

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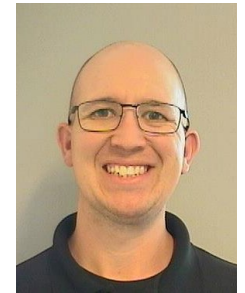
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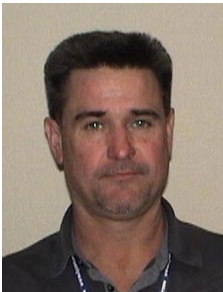
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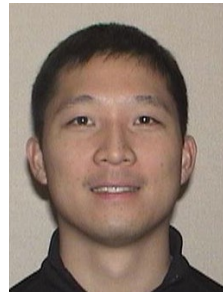
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