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B Reactor 70th anniversary event planned

Tri-City Herald
September 13, 2014

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Alcohol will be legally served on Hanford for possibly the first time since Hanford construction camp taverns served up 12,000 gallons of beer a week to workers during World War II.

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[National Nuclear Science Week 2014](#)

Oct. 20-24, 2014

To mark the 70th anniversary of the startup of the world's first production-scale reactor, Hanford's historic B Reactor, an evening of tours and tributes, music and memories is planned Sept. 26 at the reactor.

Tickets are being sold for \$40 and participants must be at least 21.

The event is planned as a reflection on the Tri-City area's community past of scientific achievement and how much work has been accomplished to preserve B Reactor and its stories for generations to come, said Colleen French of the Department of Energy.

But it also is a chance to celebrate where the community is headed, with locally crafted beer and wine and the culinary variety possible in a region of agricultural abundance.

Mission Support Alliance will set the mood for the evening with a multimedia show of iconic images of World War II projected onto the outer wall of B Reactor and the recorded words of those who played pivotal roles in the Manhattan Project, from President Franklin Roosevelt to scientist Enrico Fermi.

The Mid-Columbia Master Singers will provide '40s music, and former workers will tell stories of the nuclear reservation's early days.

Atomic Ale Brewpub and Eatery will serve locally crafted beer and wine, plus dishes that will include Beta Blocker Bratwurst Bites made with Atomic Amber Ale and B Reactor Brownies drizzled with Plutonium Porter chocolate sauce.

The event starts with an optional visit to the Hanford Reach Interpretive Center, 1943 Columbia Park Trail, Richland. A reduced admission rate of \$6, which does not cover the B Reactor event, will be offered. Buses will leave from the center for the drive to B Reactor at 4 p.m.

Visitors will have until the program at 7:30 p.m. to tour the reactor, hear the memories of early workers and eat and drink.

Unlike workers at the site seven decades ago, they won't have to be seated to enjoy a local brew.

According to one early worker, Hanford construction camp workers had to sit to be served in the beer hall, and those who had their fill could sell their seat for \$25 to the next person in line.

Those workers built B Reactor in 11 frenzied months as the United States raced to produce nuclear weapons amidst indications that Germany also was developing an atomic bomb.

B Reactor was finishing and its control rods pulled out to start a nuclear reaction on Sept. 26, 1944. The atomic age had begun, changing the world and the Tri-Cities.

Hanford produced plutonium for the nation's nuclear weapons program through the Cold War and then the Hanford mission shifted to environmental cleanup of

contamination left by wartime production.

Plans called for tearing down Hanford's nine plutonium production reactors to little more than their radioactive cores until they decayed to more manageable levels for future disposal.

But the B Reactor Museum Association had a different vision.

The Tri-City Technical Council, a consortium of local chapters of technical groups, started talking in the late '80s about how to save the reactor, and the museum association was created, said Maynard Plahuta, president of the museum association.

The reactor would not be open for tours today without the vision and perseverance of the museum association members, French said.

"They never gave up," she said.

DOE officials in Washington, D.C., told the Tri-Cities that "DOE is not in the museum business."

But local DOE officials and the Environmental Protection Agency kept wrecking balls away from B Reactor long enough for attitudes to change.

The reactor was named a National Historic Landmark in 2008, and legislation is pending that could make it part of a national historical park focused on the Manhattan Project. It has been approved in the U.S. House but still needs Senate action.

Tickets for the anniversary event are available at ManhattanProjectBReactor.hanford.gov by clicking on "70th Anniversary" or by calling the Tri-City Development Council at 509-735-1000.

Durbin, Risch Announce Senate National Laboratory Caucus During First Ever National Lab Day on Capitol Hill

Sen. Durbin Press Release

September 16, 2014

[LINK](#)

Today, U.S. Senators Dick Durbin (D-IL) and Jim Risch (R-ID) formally announced the launch of the Senate National Laboratory Caucus, which aims to highlight how the national labs help meet the innovation, economic growth, and security goals of the country--making them valuable to states even if they do not host a lab. In addition, the caucus will examine the policy and funding challenges that confront the lab system as a whole. The Senators joined Secretary of Energy Ernest Moniz for the first ever National Lab Day on Capitol Hill to announce the formation of the caucus. The event highlighted several notable research projects from across the National Laboratory system. A photo from today's event is available [here](#). Since forming the caucus, Senators Mark Kirk (R-IL), Chris Coons (D-DE), Tim Johnson (D-SD), Michael Bennet (D-CO), Tom Udall (D-CO), Martin Heinrich (D-NM), Lindsey Graham (R-SC), Lamar Alexander (R-TN), and Mike Crapo (R-ID) have all joined.

"Over the past 70 years, the Energy Department's national lab system has been an integral part of American innovation and success. The world-class facilities serve as a meeting place for researchers from around the globe as they work to address our biggest challenges in energy, scientific discovery, and national security," said Durbin. "I am proud to join Senator Risch in establishing the Senate National Laboratory caucus. By working together across the aisle, we can make certain that U.S. labs - like Illinois' own Argonne and Fermi - continue to build on their successes and remain world leaders in cutting edge research."

"Department of Energy national laboratories from coast-to-coast contribute groundbreaking scientific research in a number of disciplines, including energy innovation, national security, and basic science research," said Risch. "In order to conduct this research, our national labs are equipped with unique assets - be it their location, one of a kind instruments or, most importantly, the world's leading scientists. My home state is fortunate to have the Idaho National Laboratory located in Idaho Falls, the nation's lead nuclear laboratory and a world leader in securing the ever-growing cyber network. I am glad to have the opportunity to join with Senator Durbin in co-chairing the Senate National Laboratory Caucus and furthering support of our national labs in the United States Senate."

"The National Labs continue to advance science, clean energy and nuclear security in this country, as they have for decades," said Energy Secretary Ernest Moniz. "The Labs also provide essential capabilities for university and industrial researchers - nearly 30,000 per year - and advance technology frontiers, such as high performance computing and advanced manufacturing."

Directors and representatives from all 17 of the Department of Energy National Labs were also on hand to showcase demonstration projects across five theme areas - energy innovation and environmental sustainability, manufacturing innovations, high performance computing, national security, and discovery science. Among the 14 demonstrations were:

- A "virtual reactor," which accurately simulates the conditions inside a reactor core to help nuclear power plants reduce the costs of operating facilities and potentially use nuclear fuel more efficiently.
- A demonstration of additive manufacturing, showing how this next generation technique can help address the technical challenges associated with product development.
- A small-scale demonstration of multi-core computing called "Tiny Titan" that gives users a hands-on experience of the power of high performance computing. Titan is the most powerful supercomputer in the U.S., and Tiny Titan was designed to help users understand better how such machines work.
- A research reactor fuel mockup to demonstrate the essential role National Labs have played in reducing the use and improving control of highly enriched uranium, thereby improving national security.
- An exhibit featuring DOE's network of scientific user facilities that highlights the unique capabilities available for industry and other researchers, as well as examples of groundbreaking advancements made possible through these tools,

including the tools researchers use to search for dark energy, dark matter, and the Higgs boson particle.

With origins in the Manhattan Project during World War II, the National Labs maintain multidisciplinary research capabilities with state of the art scientific tools and experts focused on some of the country's more important priorities in science, energy and national security. National Lab scientists have won 80 Nobel Prizes in the sciences and generated technological advances that have led to entire new industries.

YUCCA MOUNTAIN: 'Nothing for us to do' on repository project -- NRC chief

Greenwire

September 12, 2014

[LINK](#)

There's a critical hole in the application for the now-abandoned Yucca Mountain nuclear waste repository project in Nevada.

There's no applicant.

So says Nuclear Regulatory Commission Chairwoman Allison Macfarlane. She told reporters yesterday that the NRC is obeying court orders to use its remaining application funds, about \$7.5 million, to continue its review of the project. That could lead to the release of critical safety studies as early as January.

But when the money runs out, there's still work to be done, such as holding hearings on 300 or so "contentions" raised about the project. In light of the Obama administration's dropping of support for the project, Macfarlane said, the Energy Department's seat at those hearings might be empty, a no-no under NRC rules.

"To work through any of these contentions, you need an applicant. That's how our licensing process works," Macfarlane said at an IHS Energy Daily round table in Washington, D.C.

"In this case, there is no applicant. The applicant has pulled back," she said. "Until there is an applicant that actually has resources to go forward, there's actually nothing for us to do."

At issue is President Obama's decision to kill the repository program in 2010, saying the project was not an attractive solution for storing U.S. nuclear waste. At that point, DOE had been pursuing a licensing for Yucca Mountain for at least two years. The administration proceeded to zero out funding, slash jobs and contractor activities, and dispose of Las Vegas properties associated with the project.

Macfarlane's comments surprised project backers who disagreed with the NRC chief.

"The DOE still is an applicant," said Jay Silberg of Pillsbury Winthrop Shaw Pittman LLP, a lawyer for the Nuclear Energy Institute.

Silberg pointed to DOE's failed attempts to pull its NRC application for the project. In 2010, the NRC's Atomic Safety Licensing Board ruled that DOE couldn't yank the application without congressional consent.

DOE appealed the board's decision to the full NRC panel, but the five-member commission split 2-2, with former Commissioner George Apostolakis recusing himself from the vote because he had done work on the site. A federal appeals court last year ordered the NRC to use what funds it has available to continue the review.

Silberg acknowledged that the agencies are working with limited funds but said a missing applicant is not an obstacle for the project.

"As a matter of law, they still have a pending application," he said. "To say there is no applicant is factually and legally incorrect."

The NRC has been under pressure from the courts and on Capitol Hill to reveal the fate of the Yucca Mountain project, but the agency has repeatedly maintained that its hands are tied as long as Congress doesn't fund the review.

Republicans -- notably, Rep. John Shimkus of Illinois -- have pressed the NRC in hearings to request funding for the project -- a proxy fight between Republicans who support Yucca Mountain and Senate Majority Leader Harry Reid (D-Nev.), a strident foe of the project.

'Purview of Congress'

Despite the ongoing debate over the Nevada site, Macfarlane made clear that the United States needs to find a waste solution.

But that, she stressed, is not the NRC's job.

"The NRC is not charged with finding a final solution [for] this material; that is the purview of Congress and the administration," she said. "We have basically backed off of predicting when a repository will be available."

Macfarlane pointed to the agency's recent approval of a new "continued storage" rule dealing with the environmental effects of storing hot, radioactive waste at reactors.

The rule accepts the premise that radioactive waste generated by reactors producing electricity can be stored safely for up to 60 years after a plant is closed -- or indefinitely if a permanent repository isn't built. That finding will be used in subsequent licensing decisions (Greenwire, Aug. 26).

In casting her vote for the rule, Macfarlane took issue with the staff's conclusion in the general environmental impact statement that adverse effects of storing waste for any period of time are "small," adding that such an assertion would indicate that a deep geological repository is not necessary -- when in fact it is.

"I didn't want this rule to be an excuse not to actually find a final solution for this material, so that was the source of my concern," Macfarlane said yesterday. "I still strongly believe that the nation needs to grapple with the issue of developing

a repository or some kind of geologic storage for this material."

Also in her vote, Macfarlane called on the agency's staff to take a deeper look at the possibility for nuclear waste to be stored at reactors across the country indefinitely -- a nod to the politically divisive and stalled process on Capitol Hill surrounding the Yucca Mountain site. She also said such an environmental analysis should be reviewed every decade.

Macfarlane also called on NRC staff to include a "worst case" scenario should no repository be found and all legal and administrative controls fall by the wayside. Without speculating about future institutions or societies, the NRC can hypothesize on the failure of casks -- large concrete and metal containers -- holding the waste, she said.

But Macfarlane confirmed yesterday that her recommendations, which were not the majority vote, will not move forward.

The chairwoman in recent weeks has called for a new rule specifically for closing plants, a critical step as many of the country's 100 nuclear plants reach -- and surpass -- four decades of operation and begin to close.

Reid: If I'm around Yucca nuclear dump will stay dead

The Hill

September 16, 2014

[LINK](#)

Senate Majority Leader Harry Reid (D-Nev.) said as long as he's around there will be no nuclear waste dump in Nevada.

But as November draws closer, and Republicans weigh their chances of gaining a majority in the Senate, the party is talking about reviving the Yucca Mountain nuclear waste site, which the administration stopped work on.

To guard against such action, Reid pushed fast votes on two administration nominees to the Nuclear Regulatory Commission, ensuring the majority of those sitting on the board have been appointed by Democrats.

"Yucca Mountain is all through," Reid told reporters on Tuesday. "As long as I'm around there's no Yucca Mountain. It's been through two presidents."

"Clinton opposed it. Obama opposed it. The place is mothballed out there. It's all through," he added.

Last week Rep. Fred Upton (R-Ky.) admitted that Reid was the main hurdle for Republicans to get the project moving again.

"We knew Mr. Reid being majority leader, it wasn't going to see the light of day," Upton told reporters.

If the Senate flips, Upton said, then Yucca is a "priority" for Republicans.

U.S. Senate confirms 2 new NRC commissioners

Las Vegas Review-Journal

September 16, 2014

[LINK](#)

WASHINGTON -- The Senate on Tuesday confirmed two new members to the federal body that regulates the nuclear power industry and has played a role in reviewing Yucca Mountain in Nevada as a repository for nuclear waste.

The addition of Stephen Burns and Jeffrey Baran brings the Nuclear Regulatory Commission to its full complement of five members and reasserts Democrat control of the independent body. The two newcomers were Democrat-chosen and will couple with Chairman Allison Macfarlane to form a majority on the panel.

Kristine Svinicki and William Ostendorff, both Republican choices, round out the commission.

The NRC has jurisdiction over nuclear waste matters but its work on the Yucca Mountain Project has been minimal in recent years after the Obama administration withdrew its support and funding for the controversial site opposed by Nevada top leaders. The agency is under court order to continue carrying out tasks related to the project at least until its nuclear waste funding is exhausted, likely next year.

Burns and Baran were not questioned directly on Yucca Mountain during their Senate confirmation hearing, and have not publicly given a position on the project. Neither met personally with Reid during the process, according to Reid spokeswoman Kristen Orthman.

Baran is former Democratic staff director for energy and environment on the House Energy and Commerce Committee. His boss was Rep. Henry Waxman, D-Calif., who has voted against Yucca Mountain and backed the Obama administration's moves to shut it down.

Burns is a former longtime executive at the NRC, rising to the post of general counsel from 2009 to 2012 when he retired from the agency. He was the NRC's top lawyer during the controversial chairmanship of Gregory Jaczko, who was criticized for using strongman tactics to halt Yucca licensing in 2010.

Burns was confirmed by a 60-40 vote. The vote on Baran was 56-44. Sen. Dean Heller, R-Nev., voted for the nominees, as did Reid.

With Republicans believing they are poised to win control of the Senate in the November elections, some have raised the idea of resurrecting the Nevada project.

Reid, the Senate majority leader who has used his influence to slow or halt the Yucca Mountain Project over the years, said Tuesday he was not concerned with the GOP comments.

"Yucca Mountain is all through, and it is all through, exclamation and all sorts of underlining," Reid told reporters. "As long as I'm around there is no Yucca

Mountain."

LANL identifies another drum similar to one that caused radiation leak

Current-Argus
September 16, 2014
[LINK](#)

Los Alamos National Laboratory scientists have identified another nuclear waste drum, similar to the drum that caused the February's radiation leak at the Waste Isolation Pilot Plant.

Terry Wallace Jr., the LANL WIPP recovery leader and principal associate director for global security, testified that the chemical reaction was likely caused by a discarded glovebox glove on Tuesday in front of the New Mexico Legislature's Radioactive and Hazardous Materials Committee in Carlsbad.

Because scientists have not been able to recreate the chemical reaction, Wallace said he was unsure about the future of the second drum that currently sits underground in Panel 6.

"I cannot guarantee that second drum won't go (have a chemical reaction), nor can I guarantee that all conditions are likely to make it go," he said.

Wallace said the radiation leak occurred in a LANL waste drum numbered 68660 because of a chemical reaction and after continued investigations, LANL has narrowed down the potential problematic waste drums to just two.

Temperatures inside of waste drum 68660 would have to hit around 572 to 662 degrees Fahrenheit, to cause a similar chemical reaction to the leak, Wallace said.

To date LANL scientists have not been able to replicate the exact conditions that could have led to the chemical reaction, a problem Wallace called "frustrating."

"We've investigated a large number of reactions and it's very difficult to make these drums react," he said. "The typical reaction that people are focused on - the headline of 'kitty litter and nitric acid' is true but it requires very high temperatures to initiate that, just like we had talked about at the World Trade Center."

LANL drum 68660 was filled with transuranic nuclear waste that dates back to around 1985 from the Rocky Flats Plant in Colorado.

The original waste drum, or parent drum of 68660, was remediated and packaged on Dec. 4, 2013.

The waste was split up into two drums: 68660 and a second drum currently held in Panel 6 at WIPP.

Wallace said there were originally 14 items that were repackaged into drum 68660 and its contents included bags of liquid and nitric acid, which was a byproduct of an evaporative process to reclaim plutonium scraps back in 1985.

Gloves were also added to the drum when it was repackaged and if they contained lead, the reaction could have helped initiate the radiation leak, Wallace said.

"We also see that there are other reactions that could have taken place on a smaller scale," Wallace said. "For example, nitric acid interacts and reacts with lead at a much lower temperature. So there's a series of these reactions that could have taken place that all together could have heated this drum up to the point where you would begin to have a reaction with the organic absorbent."

State Rep. Cathrynn Brown, R-Carlsbad, said she was "comforted" that it appeared only two of the waste drums from Los Alamos National Laboratories were potentially a problem.

"I think it's good news that they have isolated it to only two drums. I would have thought there would have been more," Brown said.

The DOE originally identified a total of 678 waste drums from LANL that matched the signature of the drum that caused the radiation release.

Of the total, 113 drums are currently being held at the Waste Control Specialists facility in Andrews County, Texas, 55 are in Panel 7, Room 7 at WIPP, 453 are in Room 6 at WIPP, and 57 still require additional processing at LANL.

LANL drum 68660 was placed underground at WIPP in Panel 7, Room 7 on Jan. 31, 2014 according to Wallace and 14 days later the drum released trace amounts of americium and plutonium on Feb. 14.

The DOE is currently assembling a large device that will be taken underground to further analyze damage to the waste drums that are not in clear view in Panel 7, Room 7 according to Dana Bryson, the deputy manager of the DOE Carlsbad Field Office.

Bryson said the agency hopes to begin that step of the investigation in the first few weeks of October.

DOE watchdog to look into why Los Alamos scientist was fired

Science Magazine

September 15, 2014

[LINK](#)

An independent watchdog at the U.S. Department of Energy (DOE) will investigate whether political scientist James Doyle was booted out of Los Alamos National Laboratory this summer after writing about the futility of nuclear weapons as a deterrent.

In a letter today to Doyle's attorney, Mark Zaid, DOE officials rejected Doyle's petition to reverse or modify his dismissal this summer. Doyle had argued that the lab's decision to classify the scholarly article--"Why Eliminate Nuclear Weapons?"--after it had appeared in the February-March 2013 issue of *Survival: Global Politics and Strategy* violated federal guidelines and that he was wrongly punished. Los Alamos officials have said that Doyle was laid off for budgetary reasons.

It's no surprise that DOE stands by that decision. But what has raised eyebrows is that the head of the National Nuclear Security Administration, retired Air Force Lt. Gen. Frank Klotz, has asked the department's inspector general to determine "whether Mr. Doyle's termination resulted, in whole or in part, from the publication of his article ... or the views expressed in it."

The letter, from the director of DOE's Office of Hearings and Appeals, explains the rationale: "The Department's senior leadership takes the issue you raise seriously, and will not tolerate retaliation or dismissals of employees or contractors for the views expressed in scholarly publications." Zaid calls DOE's decision "a smart move on their part."

Gregory Friedman, DOE's longtime inspector general, has been outspoken over the years in criticizing what he sees as lax security, wasteful spending, or inappropriate conduct by DOE lab officials. So outsiders are eager to see what conclusions Friedman might draw from the Doyle case.

US NRC approval of GE Hitachi reactor boosts its prospects: CEO

Platts

September 16, 2014

[LINK](#)

US Nuclear Regulatory Commission certification of GE Hitachi's Economic Simplified Boiling Water Reactor design for construction and operation in the US will provide a boost for the reactor in overseas markets, the company's CEO said Tuesday.

The commission voted Tuesday to approve a final rule certifying the design as acceptable for operation in the US. NRC staff completed its technical safety review of the ESBWR in April.

GEH said in a statement that "the ESBWR employs advanced, true passive safety systems and a simplified design using natural circulation. These attributes result in the ability of the reactor to cool itself for more than seven days without operator intervention or AC power on or off site. Based on core damage frequency, the ESBWR is the world's safest approved nuclear reactor design."

Caroline Reda, president and CEO of GEH, said NRC "design certification will not only benefit our US customers, it marks a crucial step forward for the ESBWR's commercial advancement globally."

Jay Wileman, senior vice president of nuclear plant projects for GE Hitachi Nuclear Energy, said in an interview Monday that the design certification would be "a great pivot point" for the company in talks with international reactor buyers.

Some countries, like Mexico and Taiwan, require "country of origin" design approval before a reactor can be considered in a tender, Wileman said.

Other countries, such as Finland, have regulators who are experienced at interacting with NRC, and would cooperate with the US regulator in licensing the ESBWR in their country, he said.

India has already identified a potential site for several ESBWRs, making it a top opportunity for GEH, Wileman said.

"One of the things [Nuclear Power Corporation of India] wanted from us was to have the design certification in place" before a formal deal to acquire the units could advance, Wileman said.

One obstacle to any deal to provide reactors to India remains that country's nuclear liability law, which unlike almost all other countries does not channel all liability for a nuclear accident to plant operators, raising concerns among some vendors that they could share in any liability claims.

US and other vendors have said they are unlikely to sell reactors to India under the current liability regime there.

Wileman said he hopes new Indian Prime Minister Narendra Modi will be asked to address the issue during a planned visit later this month to the US.

In addition to India, GEH sees opportunities to sell the ESBWR in Poland, Saudi Arabia, Sweden and Vietnam, Wileman said.

US PROJECTS

The final design certification rule is expected to be published in the Federal Register by the end of the month, GEH said. The rule will become final 30 days after publication, NRC said in a statement Tuesday.

Specific projects to build and operate ESBWRs must also be licensed by NRC. DTE Electric is considering building an ESBWR at its Fermi plant in Michigan, and Dominion is considering building one at North Anna in Virginia.

Both companies have submitted and NRC is reviewing combined construction permit-operating license applications for those projects. NRC approvals of those licenses are expected in 2015 and 2016, respectively, GEH said.

GEH submitted the design certification application to NRC for the ESBWR in August 2005. NRC staff in January 2012 delayed submitting to the commission a rulemaking package to certify the design after discovering errors in the modeling of the reactor's steam dryer and the safety review was reopened.

Subsequently, the US Department of Justice alleged in January 2014 that "GE Hitachi concealed known flaws in its [ESBWR] steam dryer analysis and falsely represented [to NRC] that it had properly analyzed the steam dryer." GEH denied the allegations but settled the lawsuit in January, agreeing to pay a \$2.7-million fine.

NRC's Advisory Committee on Reactor Safeguards in April told NRC Chairwoman Allison Macfarlane that it had reviewed agency staff's "evaluation of the revised analysis procedure for the structural and functional integrity of the ESBWR steam dryer." ACRS said "the ESBWR steam dryer design is adequate, and the associated structural analysis and planned startup test program are acceptable. There is reasonable assurance that the ESBWR design can be

constructed and operated without undue risk to the health and safety of the public."

New nuclear science grants propel Idaho State University into top tier in nuclear materials in the United States

ISU Headlines
September 12, 2014
[LINK](#)

Using new grant funding, Idaho State University researchers are working to create accurate reactor physics benchmarks that will help ensure the safe operation of nuclear reactors, a critical component in our energy future.

These grants also enable ISU nuclear researchers to study nuclear fuel materials and how they perform over time. This research is aimed at improving the life span and stability of these fuels.

ISU has received three new grants this fiscal year worth more than \$600,000 in total, from the U.S. Department of Energy Nuclear Energy University Programs.

"These new funds build on a tradition of excellence in nuclear materials at ISU," said Howard Grimes, ISU vice president for research and economic development. "We are leveraging our research expertise with the Idaho National Laboratory to assist our state in becoming a preeminent center for excellence in nuclear materials, science, and engineering. This is in alignment with the vision being created by Gov. Otter's Leadership in Nuclear Engineering commission."

Grimes is a member of the LINE commission.

One of them is a \$400,000 grant to ISU nuclear science Assistant Professor Chad Pope.

"We use computer models to predict how reactors behave, but the primary way we can trust those models is to compare them to real reactor performance," Pope said. "We will define the exact dimensions and parameters for this reactor and configuration, and then we'll build models to show that we can get correct results that match reality."

Pope is using experimental data obtained from the EBR-II nuclear reactor, located at the Idaho National Laboratory.

"Our results will be included in the International Handbook of Evaluated Reactor Physics Benchmark Experiments, so designers will use this information as they advance their new simulation techniques," Pope said. "The work I do today will be important to designers over the next several decades. Developers around the world interested in fast -reactor design will be able to use our benchmarks to build their codes."

Two doctoral and one master's student will be working with Pope on the benchmarking project.

The three NEUP grants received by ISU this fiscal year are a portion of the \$10.4 million in grants that the ISU Department of Nuclear Engineering and Health

Physics has pulled in since the beginning of fiscal year 2012.

"Receiving these NEUP grants is more evidence that ISU has one of the best nuclear science and health physics departments in the country," said Richard Brey, dean of the ISU College of Science and Engineering. "These particular grants are very much in line with our college's strategic plan. We're focusing on nuclear science and engineering as one of our major areas we do well and is a strength, and we want to continue to enhance."

The two other NEUP grants received in 2014 will both use ISU's Nuclear Engineering Laboratory, which includes the AGN-201, a self-contained, graphite-moderated research and training reactor that is licensed to operate at a maximum thermal power of 5 watts. It consists of two basic units, the reactor unit and the control console. The ISU facility is one of only 25 experimental nuclear reactors on college campuses in the United States.

Pope has received a \$91,000 grant for infrastructure improvement to the reactor laboratory.

"The laboratory allows us to attract high-quality students and perform important research," Pope said. "It will provide us with instruments and supporting components to upgrade the facility. The neutron detectors that come with this grant will help us do higher quality research."

George Imel, ISU professor of nuclear engineering and health physics, will be using the reactor laboratory as part of a \$3 million grant to the University of Wisconsin and collaborators to test innovative ways to image nuclear fuel behavior to improve the safety of nuclear reactors and help prevent accidents in the future. Imel and an ISU doctoral student will begin their study on campus and then move their efforts to Kansas State University to use their transient reactor.

"We will be evaluating methods to determine what is happening inside of nuclear fuel as it is disrupted, when there is transient overpowering, too much power in a fuel, and what happens when there is under cooling," Imel said. "It will be ground-breaking research."

The Nuclear Tourist: An unforeseen legacy of the Chernobyl meltdown

National Geographic

October 2014 Issue

[LINK](#)

They say that five sieverts of radiation is enough to kill you, so I was curious to see the reading on my Russian-made dosimeter as our tour van passed into the exclusion zone--the vast, quarantined wilderness that surrounds Chernobyl. Thick stands of pines and birches crowded the roadside as our guide reminded us of the ground rules: Don't pick the mushrooms, which concentrate radionuclides, or risk letting the contaminants into your body by eating or smoking outdoors. A few minutes later we passed the first of the abandoned villages and pulled over to admire a small band of wild Przewalski's horses.

Twenty-eight years after the explosion of a nuclear reactor at Chernobyl, the zone, all but devoid of people, has been seized and occupied by wildlife. There

are bison, boars, moose, wolves, beavers, falcons. In the ghost city of Pripjat, eagles roost atop deserted Soviet-era apartment blocks. The horses--a rare, endangered breed--were let loose here a decade after the accident, when the radiation was considered tolerable, giving them more than a thousand square miles to roam.

I glanced at my meter: 0.19 microsieverts per hour--a fraction of a millionth of a single sievert, a measure of radiation exposure. Nothing to worry about yet. The highest levels I had seen so far on my trip to Ukraine were on the transatlantic flight from Chicago--spikes of 3.5 microsieverts per hour as we flew 40,000 feet over Greenland, cosmic rays penetrating the plane and passengers. Scientists studying Chernobyl remain divided over the long-term effects of the radiation on the flora and fauna. So far they have been surprisingly subtle. More threatening to the animals are the poachers, who sneak into the zone with guns.

A few minutes later we reached Zalesye, an old farming village, and wandered among empty houses. Broken windows, peeling paint, crumbling plaster. On the floor of one home a discarded picture of Lenin--pointy beard, jutting chin--stared sternly at nothing, and hanging by a cord on a bedroom wall was a child's doll. It had been suspended by the neck as if with an executioner's noose. Outside, another doll sat next to the remains of a broken stroller. These were the first of the macabre tributes we saw during our two days in the zone. Dolls sprawling half dressed in cribs, gas masks hanging from trees--tableaux placed by visitors, here legally or otherwise, signifying a lost, quiet horror.

Farther down the road we were surprised by an inhabitant. Dressed in a scarf, a red sweater, and a winter vest, Rosalia is one of what officials call the "returnees"--stubborn old people, women mostly, who insist on living out their lives in the place they call home. She seemed happy for the company. Prompted by our guide, she told us of worse hardships. The lands around Chernobyl (or Chornobyl, as it is known in Ukraine) are part of the Pripjat Marshes on the eastern front, where the bloodiest battles of World War II were fought. She remembers the German soldiers and the hardships under Stalin.

"You can't see radiation," she said in Ukrainian. Anyway, she added, she is not planning to have children. She lives with five cats. Before we departed, she showed us her vegetable garden and said her biggest problem now is Colorado potato bugs.

There is something deeply rooted in the human soul that draws us to sites of unimaginable disaster. Pompeii, Antietam, Auschwitz, and Treblinka--all eerily quiet now. But in the 21st century we hold a special awe for the aftermath of nuclear destruction. The splitting of the atom almost a hundred years ago promised to be the most important human advance since the discovery of fire. Unleashing the forces bound inside atomic nuclei would bring the world nearly limitless energy. Inevitably it was first used in warfare, but after Hiroshima and Nagasaki a grand effort began to provide electricity "too cheap to meter," freeing the world from its dependence on fossil fuels.

More than half a century later the swirling symbol of the atom, once the emblem of progress and the triumph of technology, has become a bewitching death's-head, associated in people's minds with destruction and Cold War fear. Every spring visitors head for Stallion Gate in southern New Mexico for an open house at Trinity Site, where the first atomic bomb was detonated--a preview of what was to come when the bombers reached Japan. Monthly tours to the Nevada Test

Site in the Mojave Desert, where more than a thousand nuclear weapons were exploded during the Cold War, are booked solid through 2014.

Then there is the specter of nuclear meltdown. In 2011, Chernobyl, site of the world's worst catastrophe at a nuclear power plant, was officially declared a tourist attraction.

Nuclear tourism. Coming around the time of the Fukushima disaster, the idea seems absurd. And that is what drew me, along with the wonder of seeing towns and a whole city--almost 50,000 people lived in Pripyat--that had been abandoned in a rush, left to the devices of nature.

Sixty miles away in Kiev, Ukraine's capital city, weeks of bloody demonstrations had led in February to the expulsion of the president and the installation of a new government. In response to the upheaval Russia had occupied Crimea, the peninsula that juts from southern Ukraine into the Black Sea. Russian troops were massing on Ukraine's eastern border. In a crazy way, Chernobyl felt like the safest place to be.

The other diehards in the van had come for their own reasons. John, a young man from London, was into "extreme tourism." For his next adventure he had booked a tour of North Korea and was looking into options for bungee jumping from a helicopter. Gavin from Australia and Georg from Vienna were working together on a performance piece about the phenomenon of quarantine. We are used to thinking of sick people quarantined from the general population. Here it was the land itself that was contagious.

Of all my fellow travelers, the most striking was Anna, a quiet young woman from Moscow. She was dressed all in black with fur-lined boots, her long dark hair streaked with a flash of magenta. It reminded me of radioactivity. This was her third time at Chernobyl, and she had just signed up for another five-day tour later in the year.

"I'm drawn to abandoned places that have fallen apart and decayed," she said. Mostly she loved the silence and the wildlife--this accidental wilderness. On her T-shirt was a picture of a wolf.

"Radioactive Wolves?" I asked. It was the name of a documentary I'd seen on PBS's Nature about Chernobyl. "It's my favorite film," she said.

In the early hours of April 26, 1986, during a scheduled shutdown for routine maintenance, the night shift at Chernobyl's reactor number four was left to carry out an important test of the safety systems--one delayed from the day before, when a full, more experienced staff had been on hand.

Within 40 seconds a power surge severely overheated the reactor, rupturing some of the fuel assemblies and quickly setting off two explosions. The asphalt roof of the plant began burning, and, much more threatening, so did the graphite blocks that made up the reactor's core. A plume of smoke and radioactive debris rose high into the atmosphere and began bearing north toward Belarus and Scandinavia. Within days the fallout had spread across most of Europe.

Throughout the night firefighters and rescue crews confronted the immediate dangers--flames, smoke, burning chunks of graphite. What they couldn't see or

feel--until hours or days later when the sickness set in--were the invisible poisons. Isotopes of cesium, iodine, strontium, plutonium. The exposures they received totaled as much as 16 sieverts--not micro or milli but whole sieverts, vastly more radiation than a body can bear. From the high-rises of Pripjat, less than two miles away, Chernobyl workers and their families stood on balconies and watched the glow.

In the morning--it was the weekend before May Day--they went about their routines of shopping, Saturday morning classes, picnics in the park. It was not until 36 hours after the accident that the evacuation began. The residents were told to bring enough supplies for three to five days and to leave their pets behind. The implication was that after a quick cleanup they would return home. That didn't happen. Crews of liquidators quickly moved in and began bulldozing buildings and burying topsoil. Packs of dogs were shot on sight. Nearly 200 villages were evacuated.

The immediate death toll was surprisingly small. Three workers died during the explosion, and 28 within a year from radiation poisoning. But most of the effects were slow in unfolding. So far, some 6,000 people who were exposed as children to irradiated milk and other food have had thyroid cancer. Based on data from Hiroshima and Nagasaki, the overall mortality rate from cancer may rise by a few percent among the 600,000 workers and residents who received the highest doses, possibly resulting in thousands of premature deaths.

After the accident a concrete and steel structure--the sarcophagus--was hastily erected to contain the damaged reactor. As the sarcophagus crumbled and leaked, work began on what has been optimistically named the New Safe Confinement, a 32,000-ton arch, built on tracks so it can be slid into place when fully assembled. Latest estimate: 2017. Meanwhile the cleanup continues. According to plans by the Ukrainian government, the reactors will be dismantled and the site cleared by 2065. Everything about this place seems like science fiction. Will there even be a Ukraine?

What I remember most about the hours we spent in Pripjat is the sound and feel of walking on broken glass. Through the dilapidated hospital wards with the empty beds and cribs and the junk-strewn operating rooms. Through the school hallways, treading across mounds of broken-back books. Mounted over the door of an old science class was an educational poster illustrating the spectrum of electromagnetic radiation. Heat to visible light to x-rays and gamma rays--the kind that break molecular bonds and mutate DNA. How abstract that must have seemed to the schoolkids before the evacuation began.

In another room gas masks hung from the ceiling and were piled in heaps on the floor. They were probably left there, our guides told us, by "stalkers"--surreptitious visitors who sneak into the zone. At first they came to scavenge, later for the thrill. They drink from the Pripjat River and swim in Pripjat bay, daring the radiation and the guards to get them. A stalker I met later in Kiev said he'd been to Chernobyl a hundred times. "I imagined the zone to be a vast, burnt-out place--empty, horrible," he told me. Instead he found forests and rivers, all this contaminated beauty.

Our tour group walked along the edge of a bone-dry public swimming pool, its high dive and racing clock still intact, and across the rotting floor of a gymnasium. Building after building, all decomposing. We visited the ruins of the Palace of Culture, imagining it alive with music and laughter, and the small

amusement park with its big yellow Ferris wheel. Walking up 16 flights of steps--more glass crunching underfoot--we reached the top of one of the highest apartment buildings. The metal handrails had been stripped away for salvage. Jimmied doors opened onto gaping elevator shafts. I kept thinking how unlikely a tour like this would be in the United States. It was refreshing really. We were not even wearing hard hats.

From the rooftop we looked out at what had once been grand, landscaped avenues and parks--all overgrown now. Pripjat, once hailed as a model Soviet city, a worker's paradise, is slowly being reabsorbed by the earth.

We spent the night in the town of Chernobyl. Eight centuries older than Pripjat, it now has the look of a Cold War military base, the center for the endless containment operation. My hotel room with its stark accommodations was like a set piece in a museum of life in Soviet times. One of the guides later told me that the vintage furnishings were salvaged from Pripjat. I wasn't able to confirm that officially. The radiation levels in my room were no greater than what I've measured back home.

In a postapocalyptic video game called "S.T.A.L.K.E.R.: Shadow of Chernobyl," virtual visitors to the radioactive wonderland can identify the hot spots by their blue-white glow. As you travel around the exclusion zone, the radiation counter for your avatar steadily increases. You can reduce your accumulation and avoid getting radiation sickness by drinking virtual Russian vodka.

If only it were so easy. By the next morning we were becoming almost cavalier about the exposure risk. Standing beneath the remains of a cooling tower, our guide, hurrying us along, exclaimed, "Oh, over here is a high-radiation spot! Let's go see!" as casually as if she were pointing us toward a new exhibit in a wax museum. She pulled up a board covering the hot spot, and we stooped down holding our meters--they were frantically beeping--in a friendly competition to see who could detect the highest amount. My device read 112 microsieverts per hour--30 times as high as I had measured on the flight. We stayed for only a minute.

The hottest spot we measured that day was on the blade of a rusting earthmover that had been used to plow under the radioactive topsoil: 186 microsieverts per hour--too high to linger but nothing compared with what those poor firemen and liquidators got.

On the drive back to Kiev our guide tallied up our accumulated count--ten microsieverts during the entire weekend visit.

I'd probably receive more than that on the flight back home.

Environmental Management Site-Specific Advisory Board, Oak Ridge Reservation

Federal Register
September 17, 2014

[LINK](#)

SUMMARY: This notice announces a meeting of the Environmental

Management Site-Specific Advisory Board (EM SSAB), Oak Ridge Reservation. The Federal Advisory Committee Act (92, 86 Stat. 770) requires that public notice of this meeting be announced in the Federal Register.

DATES: Wednesday, October 8, 2014; 6:00 p.m.

ADDRESS: Department of Energy Information Center, Office of Science and Technical Information, 1 Science.gov Way, Oak Ridge, Tennessee 37830.

TENTATIVE AGENDA:

The purpose of the Board is to make recommendations to DOE-EM and site management in the areas of environmental restoration, waste management, and related activities.

Welcome and Announcements

Comments from the Deputy Designated Federal Officer
Comments from the DOE, Tennessee Department of Environment and Conservation, and Environmental Protection Agency Liaisons
Public Comment Period
Presentation
Additions/Approval of Agenda
Motions/Approval of September 10, 2014 meeting minutes
Status of Recommendations with DOE
Committee Reports
Federal Coordinator Report
Adjourn

Commission to Review the Effectiveness of the National Energy Laboratories

Federal Register
September 17, 2014
[LINK](#)

SUMMARY: This notice announces an open meeting of the Commission to Review the Effectiveness of the National Energy Laboratories (Commission). The Commission was created pursuant section 319 of the Consolidated Appropriations Act, 2014, Public Law 113-76, and in accordance with the provisions of the Federal Advisory Committee Act (FACA), as amended, 5 U.S.C. App. 2. This notice is provided in accordance with the Act.

DATES: Monday, October 6, 2014; 10:30 a.m.-4:00 p.m.

ADDRESS: Institute for Defense Analyses, Room 1301, 4850 Mark Center Drive, Alexandria, VA 22311.

BACKGROUND: The Commission was established to provide advice to the Secretary on the Department's National Laboratories. The Commission will review the National Energy Laboratories for alignment with the Department's strategic priorities, clear and balanced missions, unique capabilities to meet current energy and national security challenges, appropriate size to meet the Department's energy and national security missions, and support of other Federal agencies. The Commission will also look for opportunities to more effectively

and efficiently use the capabilities of the National Laboratories and review the use of laboratory-directed research and development (LDRD) to meet the Department's science, energy, and national security.

TENTATIVE AGENDA: The meeting will start at 10:30 a.m. on October 6. The tentative meeting agenda includes a review of work by the DOE National Laboratories supporting other agencies, as well as a discussion of technology transfer and technology partnering at the laboratories. Key presenters will address and discuss these topics with comments from the public. The meeting will conclude at 4:00 p.m.

