Compilation of Email Communications and News Articles
4/3/20 to 6/13/20

Editorial by Pete Lyons on New Mexico and Interim Storage

From: David G. Victor
Sent: Friday, April 03, 2020 10:55 AM
To: Ted Quinn
Cc: Lorraine Quinn Sandstrom
Subject: (External): Re: editorial -- by Pete Lyons -- on New Mexico and Interim Storage and Nuclear Technology

CAUTION EXTERNAL EMAIL
Very good piece. Lorraine: can you include in next circular. Thx. David

From: Ted Quinn
Date: Friday, April 3, 2020 at 10:00 AM
To: David G. Victor, Manuel Camargo, John Dobken, Doug Bauder, Dan Stetson, Jerry Kern
Cc: Ted Quinn
Subject: FW: editorial -- by Pete Lyons -- on New Mexico and Interim Storage and Nuclear Technology

Hi – just published today from my friend Pete Lyons --- see link

From: peter lyons
Sent: Friday, April 3, 2020 8:24 AM
To: Ted Quinn
Subject: editorial

It ran today Ted.
https://www.abqjournal.com/1439715/nm-should-be-scientific-leader-on-nuclear-issues.html
just fyi
pete

Direct link provided within document text.
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SCE Responses to Representative Levin and Sewage Treatment Plant Update

From: Manuel Camargo
Sent: Friday, April 10, 2020 2:13 PM
To: Captain Mel Vernon; Daniel T. Stetson; David G. Victor; Donna Boston; Garry Brown; Jerry Kern; Jim Desmond (SD County Supervisor); Jim Leach; John Taylor (SJC City Council); Kathy Ward; Marni Magda; Martha McNicholas; Paul Wyatt; Rich Haydon; Sam Jammal; Supervisor Lisa Bartlett; Ted Quinn; Val Macedo
Cc: Chris Thompson; Doug Bauder; Doug Woodyard (OC); Gabaldon, Joseph M; Gene James (San
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Clemente); John Dobken; Julie C Holt; Kelli Gallion-Sholler; Kristal Jabara; Larry Rannals; Liese Mosher; Lindsey Stigall; Lorraine Quinn Sandstrom; Marisol Eaton (SD County); Mike Sappingfield; Scanlan, Katelin (KScanlan@semprautilities.com) <KScanlan@semprautilities.com>; Steve Carlson (UCSD); Tanya Flink; Amy F Pressler; Laura Parra; Christopher Abel; James Peterson; Ronald Pontes
Subject: FYI - Responses to Representative Levin and Sewage Treatment Plant Update

Hello CEP Members,

I write to share information on two SONGS-related topics: (1) an exchange with Representative Mike Levin regarding the San Onofre nuclear plant's response to the COVID-19 pandemic as well as a recent wastewater release, and (2) an update on the sewage treatment plant at SONGS.

Responses to Rep Levin
With respect to the exchange with Rep Levin, I have attached (1) a March 30 letter from Rep Levin, (2) an April 2 initial response from Edison International president & CEO Pedro Pizarro, and (3) a detailed follow-up letter from SONGS VP & CNO Doug Bauder that was sent to the Congressman today. SCE's responses also have been posted to our website—in the spirit of openness—and are available here.

Sewage treatment plant
With respect to the SONGS sewage treatment plant, I want you to be aware that on Wednesday, April 8, the plant was placed back into service.

As you may recall from Ron Pontes' report during our March 26 CEP meeting, the plant was taken off-line on March 25 following a partially treated wastewater release to the ocean. About 7,000 gallons of highly diluted wastewater was released more than a mile off-shore and 50 feet below the ocean surface. The event was triggered by a large influx of water into the plant. The source of that water is still under investigation.

The San Diego County Department of Environmental Health determined that because of the dilution factor (200:1) and the off-shore location of the release, it was low impact, requiring no action on the part of the public. This was a non-radiological release.

Before putting the treatment plant back in service, the SONGS team took several actions to prevent a reoccurrence of the event, including:

- Tested and verified the sewage treatment system equipment is performing properly. We identified an influent pump start switch that was not working properly and it was repaired.
- Established temporary storage reserve onsite where any future unanticipated volume of influent can be routed.
- Ensured there is 24/7 support available from our licensed sewage treatment operations contractor to respond to off-normal events.

A more detailed evaluation of the event is ongoing.

Let me know if you have questions.

Be well.

Manuel

Manuel C. Camargo Jr.
Principal Manager, Strategic Planning
SONGS Decommissioning
Southern California Edison
www.SONGScommunity.com

Direct links are available within document text.
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SCE Update on SONGS Wastewater Release

From: Manuel Camargo
Sent: Thursday, April 23, 2020 8:11 AM
To: Captain Mel Vernon; Daniel T. Stetson; David G. Victor; Donna Boston; Garry Brown; Jerry Kern; Jim Desmond (SD County Supervisor); Jim Leach; John Taylor (SJC City Council); Kathy Ward; Marni Magda; Martha McNicholas; Paul Wyatt; Rich Haydon; Sam Jammal; Supervisor Lisa Bartlett; Ted Quinn; Val Macedo
Cc: Chris Thompson; Doug Bauder; Doug Woodyard (OC); Gabaldon, Joseph M; Gene James (San Clemente); John Dobken; Julie C Holt; Kelli Gallion-Sholler; Kristal Jabara; Larry Rannals; Liese Mosher; Lindsey Stigall; Lorraine Quinn Sandstrom; Marisol Eaton (SD County); Mike Sappingfield; Scanlan, Katelin; Steve Carlson (UCSD); Tanya Flink; Ronald Pontes; BRIAN METZ; Amy F Pressler; James Peterson; Christopher Abel
Subject: Update on SONGS Wastewater Release

Good morning CEP Members,

I write to make you aware of an update on the March 25 release of wastewater from the sewage treatment plant at San Onofre. SCE has posted an update to the San Onofre website, which is available at https://www.songscommunity.com/need-to-know/overview/update-on-wastewater-release-from-san-onofre-sewage-treatment-plant.

You will recall that we provided an initial update on the wastewater release during our CEP meeting on March 26, the day after the event.

Please let me know if you have questions.

Take care and be well!

Manuel

Manuel C. Camargo Jr.
Principal Manager, Strategic Planning
SONGS Decommissioning
Southern California Edison
www.SONGScommunity.com
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Direct link available within document text.
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David Victor Elected to American Academy of Arts and Sciences

From: Manuel Camargo
Sent: Monday, April 27, 2020 10:23 AM
To: Captain Mel Vernon; Daniel T. Stetson; David G. Victor; Donna Boston; Garry Brown; Jerry Kern; Jim Desmond (SD County Supervisor); Jim Leach; John Taylor (SJC City Council); Kathy Ward; Marni Magda; Martha McNicholas; Paul Wyatt; Rich Haydon; Sam Jammal; Supervisor Lisa Bartlett; Ted Quinn; Val Macedo
Cc: Chris Thompson; Doug Bauder; Doug Woodyard (OC); Gabaldon, Joseph M; Gene James (San Clemente); John Dobken; Julie C Holt; Kelli Gallion-Sholler; Kristal Jabara; Larry Rannals; Liese Mosher; Lindsey Stigall; Lorraine Quinn Sandstrom; Marisol Eaton (SD County); Mike Sappingfield; Scanlan, Katelin; Steve Carlson (UCSD); Tanya Flink; Christopher Abel; James Peterson; Amy F Pressler; Laura Parra
Subject: David Victor Elected to American Academy of Arts and Sciences

Good morning CEP Members,

Congratulations to David who has been elected to the American Academy of Arts and Sciences. Those of us who have the opportunity to work with David know how much he truly deserves the honor.

https://ucsdnews.ucsd.edu/pressrelease/four-from-uc-san-diego-elected-to-american-academy-of-arts-and-sciences

Best regards,

Manuel

Manuel C. Camargo Jr.
Principal Manager, Strategic Planning
SONGS Decommissioning
Southern California Edison
www.SONGScommunity.com

Direct link is available within document text.
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After decades, the heart of a nuclear reactor will finally leave San Onofre

From: Manuel Camargo
Sent: Friday, May 01, 2020 8:01 AM
To: Captain Mel Vernon; Daniel T. Stetson; David G. Victor; Donna Boston; Garry Brown; Jerry Kern; Jim

Desmond (SD County Supervisor); Jim Leach; John Taylor (SJC City Council); Kathy Ward; Marni Magda; Martha McNicholas; Paul Wyatt; Rich Haydon; Sam Jammal; Supervisor Lisa Bartlett; Ted Quinn: Val Macedo
Cc: Chris Thompson; Doug Bauder; Doug Woodyard (OC); Gabaldon, Joseph M; Gene James (San Clemente); John Dobken; Julie C Holt; Kelli Gallion-Sholler; Kristal Jabara; Larry Rannals; Liese Mosher; Lindsey Stigall; Lorraine Quinn Sandstrom; Manuel Camargo; Marisol Eaton (SD County); Mike Sappingfield; Scanlan, Katelin; Steve Carlson (UCSD); Tanya Flink
Subject: SONGS in the News

Good morning CEP Members,

Sharing a story from the Orange County Register regarding one of the early milestones in SONGS decontamination & dismantlement: removing a large component from Unit 1 which was retired in 1992.

https://www.ocregister.com/2020/04/30/after-decades-the-heart-of-a-nuclear-reactor-will-finally-leave-san-onofre/

Best regards,

Manuel

Manuel C. Camargo Jr.
Principal Manager, Strategic Planning
SONGS Decommissioning
Southern California Edison
www.SONGScommunity.com

Direct link is available within document text
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Advance Materials and Process Leading to May 28th CEP Meeting on Outlier Events

From: David G. Victor
Date: Monday, May 18, 2020 at 4:55 PM
To: Dan Stetson, Jerry Kern, Lisa Bartlett, Donna Boston, Garry Brown, Jammal CIV Osamah A, John Taylor, Rich Haydon, Jim Desmond, Jim Leach, Val Macedo, Marni Magda, Martha McNicholas, Ted Quinn, Ward, Kathy, Mel Vernon, Paul Wyatt, Ken Schultz, Mike Sappingfield, Kristal Jabara, Debra Lewis. James Gene, Douglas Woodyard, Marisol Endrozo, Jackie Littler, Nicole Perez, Tanya Flink, Victor Cao, Veronica Ferencz, Roger Johnson, Gary Headrick, Ace Hoffman, Torgen Johnson, Katie Day, Stephen Rea, Donna Boston, Patrick Papin, Mike Corradini, Kevin Crowley, Ed Lyman, Kelli Gallion, Ross Quam, Randall Granass, Tom Isaacs
Cc: David G. Victor, Doug Bauder, Manuel Camargo, Jerry Stephenson, John Dobken, Liese Mosher, Lorraine Sandstrom, Al Bates, Julie Holt, Vince Bilovsky
Subject: advance materials and process leading to May 28th event on outlier events
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To: CEP members and alternates; members of the outlier events planning committee; guest speakers
Cc: SCE SONGs team
From: David Victor, CEP Chairman
Re: Preparations for May 28th CEP meeting
Date: 18 May 2020

Our May 28th CEP meeting will focus on "outlier" scenarios and response strategies. Preparations for this CEP meeting has been a lengthy process with multiple inputs and engagement of third-party experts.

A key element of this has been to identify outlier scenarios and set priorities. To provide transparency to the process for prioritizing, I have prepared the attached memo which will be posted to the www.SONGScommunity.com website along with the agenda, which I also attach. Due to the pandemic, the meeting will be via Skype.

Next week, on May 21, draft presentations, pre-read material and a document library will be posted to the website, as well. When we send out those advance materials we will also include instructions on how to submit and post questions in advance. We are circulating all these materials earlier than usual to make it easier to engage, probe and question.

All best regards,
David

Attachment #1 – CEP process memo, appendices and CEP meeting agenda, May 18, 2020
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Radiation Research Papers Recommended by Dr. Patrick Papin (SDSU)

From: David G. Victor
Sent: Thursday, May 28, 2020 10:01 PM
To: Lorraine Quinn Sandstrom
Cc: Daniel T. Stetson; Manuel Camargo
Subject: (External):FW: Radiation research papers

CAUTION EXTERNAL EMAIL

Lorraine

Can you pls add these two papers to the next CEP circular? With an explanation: "During the 'outlier events' meeting Prof Papin mentioned that there was some rethinking under way in the scientific community around the right dosage limits for radiation. We asked him for some additional papers on this matter, and he said these would be the right entry points."

All best
David

On 5/28/20, 6:53 PM, "Patrick Papin" wrote:

David—here are 2 interesting papers regarding radiation research.

Thanks,
Patrick

Direct link provided here. "Risk of low-dose radiation and the BEIR VII report: A critical review of what it does and doesn't say," by Michael K. O'Connor Mayo Clinic, Section of Nuclear Medicine, Charlton 1-225, Rochester, MN 55905, United States, August 18 2017.

Direct Link provided here. – **"Classification of radiation effects for dose limitation purposes: history, current situation and future prospects,"** by Nobuyuki HAMADA* and Yuki FUJIMICHI, Journal of Radiation Research, 2014, 55, 629-640, Advance Access Publication May 3, 2014.

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Jerry Kern is Moving On with Thanks and Best Wishes from CEP

From: Manuel Camargo
Sent: Tuesday, June 09, 2020 11:30 AM
To: Captain Mel Vernon; Daniel T. Stetson; David G. Victor; Donna Boston; Garry Brown; Jerry Kern; Jim Desmond (SD County Supervisor); Jim Leach; John Taylor (SJC City Council); Kathy Ward; Marni Magda; Martha McNicholas; Paul Wyatt; Rich Haydon; Sam Jammal; Supervisor Lisa Bartlett; Ted Quinn; Val Macedo
Cc: Chris Thompson; Doug Bauder; Doug Woodyard (OC); Gabaldon, Joseph M; Gene James (San Clemente); John Dobken; Julie Holt; Kelli Gallion-Sholler; Kristal Jabara; Larry Rannals; Liese Mosher; Lindsey Stigall; Lorraine Quinn Sandstrom; Marisol Eaton (SD County); Mike Sappingfield; Scanlan, Katelin; Steve Carlson (UCSD); Tanya Flink; Christopher Abel; James Peterson; Vincent J Bilovsky; LOU BOSCH; Kelli Gallion-Sholler
Subject: Jerry Kern moving on

Transmitted on behalf of David Victor and Doug Bauder

Dear CEP Members,

It is with mixed emotions that we announce Jerry Kern's resignation from the SONGS Community Engagement Panel. Jerry has represented the City of Oceanside on the CEP since its formation in early 2014, including as Secretary during the past few years. Please join us in thanking Jerry for his many contributions—his balance, integrity, and insights into public engagement. Jerry has made the CEP are more effective and even-keeled body, and we all owe him our gratitude.

Jerry was one of the founders of the first charter schools in Oceanside and a career-long teacher. He is a paragon of public service and grace.
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We wish Jerry and his family all the best as he moves on with the next chapter of his life and as he enjoys retirement.

Oceanside Mayor Peter Weiss will appoint a successor to Jerry to represent the city on the CEP. For now, please join us in thanking Jerry for his contributions to SONGS decommissioning and public engagement.

All best regards,

David and Doug
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CCC to Consider Inspection & Maintenance Program for SONGS ISFSI at July Virtual Meeting

From: Manuel Camargo
Sent: Saturday, June 13, 2020 11:11 AM
To: Captain Mel Vernon; Daniel T. Stetson; David G. Victor; Donna Boston; Garry Brown; Jim Desmond (SD County Supervisor); Jim Leach; John Taylor (SJC City Council); Kathy Ward; Marni Magda; Martha McNicholas; Paul Wyatt; Rich Haydon; Sam Jammal; Supervisor Lisa Bartlett; Ted Quinn; Val Macedo
Cc: Chris Thompson; Doug Bauder; Doug Woodyard (OC); Gabaldon, Joseph M; Gene James (San Clemente); John Dobken; Julie Holt; Kelli Gallion-Sholler; Kristal Jabara; Larry Rannals; Liese Mosher; Lindsey Stigall; Lorraine Quinn Sandstrom; Manuel Camargo; Marisol Eaton (SD County); Mike Sappingfield; Scanlan, Katelin; Steve Carlson (UCSD);Tanya Flink; Jerry L Stephenson; Ronald Pontes; Ian Michael Forrest; Jessica Rankin; Vincent J Bilovsky
Subject: For Awareness - CCC to Consider Inspection & Maintenance Program for SONGS ISFSI at July Virtual Meeting

Hello all,

I write to make you aware that an Inspection and Maintenance Program (IMP) for the Holtec multi-purpose canisters (MPCs) at SONGS will be considered for approval by the CCC during part of its July virtual meeting. SCE developed the IMP in response to a special condition in the 2015 ISFSI Coastal Development Permit issued by the California Coastal Commission (CCC). The SONGS IMP is one the industry's most advanced and comprehensive fuel management programs because it includes robotic inspections, a test canister program, a demonstrated canister repair method, and more.

The CCC staff retained a specialty consultant, Lucius Pitkin Inc. (LPI), to review the IMP and LPI produced a report. The CCC staff report, the IMP, and the LPI report all are available on the CCC's home page, which is available here. The Commission staff report includes a recommendation for the Commissioners to approve the IMP. More information on the IMP has been posted to the SONGS website and that information is available here.

Please feel free to share this information with people in your networks.
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Let me know if you have questions.

Best regards,

Manuel

Manuel C. Camargo Jr.
Principal Manager, Strategic Planning
SONGS Decommissioning
Southern California Edison
www.SONGScommunity.com
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News Articles Following May 28 CEP Outlier Events Meeting

Terrorism? Sabotage? Canister failure? Experts explore San Onofre doomsday scenarios

Edison official warns meeting participants of 'unhelpful dread and anxiety' that can lead to bad decision-making

By **TERI SFORZA** | tsforza@scng.com | Orange County Register
PUBLISHED: May 29, 2020 at 5:09 p.m. | UPDATED: May 29, 2020 at 5:13 p.m.

What calamity would befall Southern California if terrorists launched rocket-propelled grenades at San Onofre's spent fuel storage systems?

Would there be an explosion — releasing dangerous radioactive clouds — if aging canisters filled with nuclear waste cracked, then water seeped inside?

What of sabotage? Security? Fire?

After years of prodding by local activists, Southern California Edison's Community Engagement Panel held a virtual four-hour meeting Thursday, May 28, to consider a handful of doomsday scenarios that nuclear plant owners generally avoid.

"A meeting like this has never happened before," said David Victor, chair of the volunteer panel and co-director of UC San Diego's Laboratory on International Law and Regulation.

That seemed to unnerve Tom Isaacs — an expert whose resume spans the National Academy of Sciences, Stanford University, the Nuclear Threat Initiative and the Blue Ribbon Commission on America's Nuclear Future — just a bit.
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"This was an unusual assignment," said Isaacs, now chair of Edison's "experts team," strategizing over the future of nuclear waste at the retired San Onofre Nuclear Generating Station. "It's always good to push the envelope and ask the 'what if' questions. But there's no end to that — you can always imagine something more serious."

It's possible to go too far, he said, creating "unhelpful dread and anxiety" that can lead to bad decision-making.

So the experts sketching "outlier events" at San Onofre didn't dissect possible attacks by rogue nuclear powers like North Korea, or even a series of missiles launched from offshore cargo ships by well-armed terrorists. Rather, they considered more "plausible" scenarios — none of which would result in radioactive plumes choking any part of Southern California.

That, in turn, led to some frustration.

"We didn't ask for a discussion of what would happen in a war where ICBMs would be used," said activist Roger Johnson of San Clemente by email. "Short-range missiles would be easy for terrorists to acquire. They are for sale on the international arms market. They refused to discuss such threats."

Terrorism

How vulnerable are San Onofre's dry storage systems to attack?

Public versions of classified studies — done after 9/11, after the Fukushima disaster in Japan, and in Germany — suggest answers, said Kevin Crowley, who directed dozens of National Academies' studies on nuclear safety and security, radioactive waste management and more.

Scenario one: Attack by a shaped-charge anti-tank weapon (an explosive device designed to focus blast energy) on a cast-iron cask containing nuclear waste. In this test, the bare cask was breached — but the cask within a concrete jacket, or overpack, was not breached. Material could be released from a bare cask, but precisely how much would depend on the number of damaged fuel elements and other factors.

Scenario two: High-speed impacts meant to simulate 747 aircraft engine impacts on dry storage systems. Steel slugs weighing 110 pounds were fired from a 155-mm cannon at simulated waste overpacks. The slugs penetrated the overpacks several feet, but didn't completely penetrate the canisters to result in a big release of radioactive material.

"No dry storage system provides complete protection, but any radioactive material releases from attacks would be relatively small," Crowley said. "Jet fuel fires from aircraft attacks would likely be dispersed and of short duration."

San Onofre has two dry storage systems: The new Holtec Hi-Storm UMAX system, a partially buried "concrete monolith" that will house 73 waste canisters; and the older, above-ground Areva NUHOMS system, which houses 51 waste canisters.

The Holtec system features reinforced concrete at least 4 feet thick, officials said, and its position on the bluff helps shield the Areva system.

Sabotage

If terrorists are going to be able to commit radiological sabotage, they need access to the facility, said Ed Lyman, director of nuclear power safety for the Union of Concerned Scientists in Washington, D.C.

San Onofre's security plan is, of course, confidential. And while Edison has vowed to have more robust security than the Nuclear Regulatory Commission requires for decommissioned nuclear plants, Lyman has concerns.

In the NRC's eyes, decommissioning plants don't pose the same risk as operating reactors that are actually splitting atoms. So security requirements change. Once all waste is out of the cooling pools and into dry storage, the NRC doesn't require annual force-on-force security exercises. Cyber-security programs are also eliminated.

While sabotage on dry storage has been shown to have limited consequences, there are types of attacks that could cause greater releases of radioactivity than has been assumed, Lyman said.

The NRC started the process to require more robust security measures to address that — increasing distances between storage systems and boundaries, and adding engineered barriers — but has backed off.

The ability of San Onofre's dry storage systems to withstand "enhanced adversary attack modes" without causing off-site doses in excess of 5 rem — the limit — is not clear, Lyman said. "It's probably difficult to mobilize that much from the cask, but not impossible," he said.

As waste is expected to remain on the bluff for years — perhaps decades, as the federal government figures out where to put it — there's concern that canisters might crack as they age, introducing water and oxygen. Could that create pressure, causing the canister to explode?

Michael Corradini, a nuclear engineering professor emeritus at the University of Wisconsin, said cracks would likely be plugged by oxidation in stainless steel canisters, or be so small as to prevent water entry.

Major through-wall cracks — "postulated, but highly unlikely" — would take a great deal of time, perhaps decades, to reach "combustible mixture."

Assuming an ignition source in the canister — which there is not, he said — and combustion, “analyses result in combustion pressures less than half of the design pressures for the canisters,” he said. “No gross canister failure can occur.”

More to come

Many members of the public weren’t much mollified.

“We know the 9/11 terrorists considered attacking a nuclear power plant,” Johnson said. “What might happen here with huge explosions coming from an Oklahoma City-type truck bomb? What about bunker-busting RPGs fired from half a mile away or missiles launched from cargo ships over the horizon? Is someone going to argue that dozens of direct hits by missiles would cause no serious damage?”

Residents need to know more, he said.

Victor, the committee chair, said the discussion is not over. There will be follow-up, and an online library with scientific material on earthquake, tsunami, sea level rise and other threats is under construction.

At the meeting’s end — after a woman rhetorically asked who was going to be responsible for her death — Victor appeared to lose some patience. “Somehow, things are not being communicated,” he said. “Ask, ‘What is the evidence? Where are the real risks?’ Focus on how we get the fuel out of here.”

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SONGS Staff, Consultants Discuss Emergency Scenarios During Community Engagement Panel

By Dana Point Times On May 29, 2020

By Collin Breaux

Staff and consultants with the San Onofre Nuclear Generating Station (SONGS) discussed how the station would handle canisters cracking or corroding, terrorist attacks and other emergency situations during a community engagement panel on Thursday, May 28.

Members of the public listened in and commented during the panel discussion.

SONGS is being decommissioned—a process that began in 2013—and plans are underway to dismantle the power plant. Local residents have questioned aspects of SONGS’ safety and transparency, including the effects of nuclear leakage on the community and in the ocean. SONGS staff and consultants have responded by saying they are taking every step to ensure safety for the community and employees, insisting people are not at risk.

Michael Corradini, a nuclear engineering professor at University of Wisconsin, said the dry used fuel storage systems at SONGS are stainless steel and specifically designed for coastal environments.
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Inspections are done regularly on canisters for corrosion, and remediation techniques are taken if any corrosion is detected.

As for the possibility of terrorist attacks, details discussed were scant due to security reasons, but a presentation slide did say the robust designs of dry storage systems help protect spent fuel from terrorist attacks due to massive physical shielding. There also are multiple barriers to radioactive material releases, though no dry storage system provides complete protection against all types of attacks.

Speaking generally on outlier events, Tom Isaacs—Southern California Edison Experts Team Chairman and an independent strategic advisor for nuclear waste—said a consistent way to deal with these scenarios is continuous improvement.

"Experience shows one of the biggest risks in any of these endeavors is complacency," Isaacs said.

Petitioners who called for the community engagement panel wrote in a letter before the meeting that they had hoped to see public concerns addressed, saying they were previously disappointed that many of the worst-case scenarios were not addressed at past public meetings over the past six years.

"For us, the issue has shifted from the dangers presented by fuel pools and operating reactors to possible dangers in dry cask storage. Although this is safer, it now appears that this waste will remain on site for the indefinite future. Since it has nowhere to go, what could possibly go wrong in the next 30-50 years?" petitioners wrote in the letter. "While there have been discussions of various internal threats, the public is especially concerned about the seldom-discussed external threats or what the industry calls beyond design basis threats. We are not alone in this concern since 100 million Americans lived within 50 miles of a NPP and more and more waste is piling up on site all over the country."

During the discussion on terrorist scenarios, petitioners also said they would like to hear explanations on how SONGS would handle "Oklahoma City-type truck bombs, aircraft crashes, bunker-busting RPGs fired from distances, and missiles possibly fired from cargo ships which pass the area every day."

There had been no positive cases of COVID-19 at SONGS, as of the panel discussion.

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Edison Wants 'Right Place' for SONGS Spent Fuel, Exec Says

BY CHRIS SCHNEIDMILLER, MAY 29, 2020

Another canister of spent fuel was being transferred to dry storage Thursday evening at the San Onofre Nuclear Generating Station (SONGS), even as an executive affirmed majority owner Southern California Edison's (SCE) hopes to find an off-site home for the radioactive waste.

"We have engaged a strategic team to put together a plan that we will review, and that's on track to be completed by the end of the year," Doug Bauder, SCE's vice president for decommissioning and chief nuclear officer, said during an online meeting of the SONGS
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Community Engagement Panel. The plan, he said, "will include optionality and actions for relocation of the fuel off-site."

An SCE spokesman said Thursday he could not elaborate on the contents of the document: "The plan is still being worked on and is not in final form."

Bauder was calling from his office at the retired nuclear power plant in San Diego County, where contractor Holtec International was offloading the 64th of 73 canisters of spent nuclear fuel from reactor Units 2 and 3. That job was expected to wrap up Thursday, with all canisters placed in the dry-storage pad by midsummer, Bauder said.

At that point, about 3.5 million pounds of fuel assemblies from SONGS' three reactors will be in below-ground storage along the Pacific Ocean.

SONGS's first reactor began operations in 1968, with Unit 1 closing in 1992 and Units 2 and 3 following in 2013 after they were equipped with faulty steam generators.

Unit 1 has been largely decommissioned, while contractor SONGS Decommissioning Solutions began major cleanup operations on the other two reactors in February. That work has been limited in recent months during the COVID-19 pandemic, to prevent workers from potentially spreading the respiratory virus.

Generally, there are about 400 personnel on-site at SONGS, but some are currently telecommuting. There have been no positive cases of COVID-19 to date among the workforce at SONGS, Bauder said. "If we get any challenges at all to our worker safety and health we will stand down that appropriate work."

Asbestos removal of the containment building has been completed, ahead of demolition operations. The 770-ton reactor pressure vessel from Unit 1 has also been shipped off-site for disposal. As of Thursday night, it was on a train rolling through Nevada on its way to EnergySolutions' low-level radioactive waste disposal facility in Clive, Utah.

EnergySolutions is one of the partners in SONGS Decommissioning Solutions. Its partner, infrastructure multinational AECOM, said in early April it is in negotiations to sell its stake. The company has not identified the potential buyer.

Decommissioning of the final two reactors is scheduled to be completed by December 2028, at a projected cost of $4.4 billion, according to a revised post-shutdown decommissioning activities report (PSDAR) Southern California Edison submitted on May 7 to the Nuclear Regulatory Commission. That will involve decontamination, dismantlement, and demolition of facilities and infrastructure, along with removal and disposal of all waste. Southern California Edison is on the hook for three-fourths of the decommissioning obligations for both reactors, with 20% held by fellow utility San Diego Gas & Electric and the rest divided between the cities of Anaheim and Riverside.

The PSDAR forecasts on-site storage of SONGS' used fuel through December 2045, based on the utility's estimate from 2017 that the Department of Energy would begin taking the material from Units 2 and 3 in 2034.

The Energy Department is responsible under legislation enacted to 1982 for disposal of spent fuel from commercial nuclear power plants and high-level radioactive waste from defense nuclear operations. Congress set a Jan. 31, 1998, deadline for disposal to begin, but DOE still does not have any place to put the waste.

Keeping SONGS' used fuel in a densely populated, seismically active region about 100 feet from the ocean has been a major worry for local advocacy organizations and residents. While Southern California Edison has emphasized the safety of the storage system, those fears were exacerbated by an August 2018 incident in which one canister was left at risk of an 18-foot drop into its slot for nearly an hour. That led to a nearly yearlong pause in the fuel offload and a $116,000 fine from the Nuclear Regulatory Commission.

Several groups have sought assistance from the federal courts and NRC to force Southern California Edison to relocate the material, so far without any success.

But, to settle a lawsuit from the organization Citizens' Oversight over the storage plan, Southern California Edison committed in August 2017 to pursue "commercially reasonable" efforts to fine a new home for the canisters. The strategic plan is part of that pledge.

Idaho-based environmental services specialist North Wind was hired last June to prepare the document, with assistance from a panel of experts formed by SCE.

"We are very focused on safely storing it here at SONGS, but we're also focused on finding the right place for it to go," Bauder said during the meeting. He did not elaborate on what optionality and actions might be included in the strategic plan.

In a November 2019 briefing to the Community Engagement Panel, North Wind executives said the plan would address issues such as the means for transporting the spent fuel – by train or truck – along with options such as consolidated spent fuel storage facilities being planned for Texas and New Mexico. Those facilities, pending licensing by the Nuclear Regulatory Commission, could open by the mid-2020s.

Bauder said SCE expects to meet the deadline for responding to a notice of violation from the San Diego Regional Water Quality Control Board following a March 25 release of 7,000 gallons of wastewater from SONGS' sewage treatment facility. The spill did not involve radioactive material, he said: "The radioactive systems at SONGS are completely isolated from the sewage system and the storm drains."

Bauder's presentation lasted about 10 minutes at the top of a meeting focused on discussion of potential "outlier event," such as acts of terrorism, at the facility.

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Debunking Fears Of Nuclear Waste At California's San Onofre Reactor

James Conca Contributor
Energy
I write about nuclear, energy and the environment



The Holtec UMAX spent fuel storage system that will house 73 waste canisters at SONGS. Doomsday ... [+] scenarios were front and center during Southern California Edison's Community Engagement Panel last week.

SCE Decades before clickbait was a thing, antinuclear rhetoric was on its way to become the ultimate clickbait. Just throw the words nuclear, cancer, waste or radiation into a title and you're bound to get thousands of hits.

San Onofre Nuclear Generating Station, or SONGS, has been inundated with this stuff for a long time. But the intensity seems to be growing, even eight years after the nuclear power plant shut down. The recent focus has been on the spent nuclear fuel, better referred to as slightly used nuclear fuel.

This fuel has been out of the reactor for between 8 and 27 years. The really hot stuff decays away before 5 years while the spent fuel is still in pools of water. The half-life of the remaining hot stuff, Cs-137 and Sr-90, is only 30 years, so these are a lot cooler than when they were in the reactor. After 200 years, the fuel isn't very radioactive at all since all the hot gamma-emitters are gone.

Yet contrary to anywhere else in the world, the fear seems to have grown in southern California regarding this shuttered reactor and its old fuel.

This fear is unfounded. No one has ever been harmed by commercial nuclear waste. No deaths, no cancers, nothing. Ever. We're in the middle of a global pandemic, social unrest and the beginnings of a depression, and these folks are concerned about old nuclear fuel?

One of the problems with this issue is that the public wants some reassurance that things are fine, that they don't have to worry about something like this nuclear waste. Ever.

But the hurdle is that scientists and regulators must be technically correct and non-judgmental when they discuss scientific issues like this. We usually aren't allowed to say zero. Instead, we use terms like virtually nothing, not statistically different from zero, or vanishingly small. We understand that in the scheme of things, values that can be described like this do not warrant any further worry.

So as a scientist who has worked on nuclear waste for 35 years, has handled and experimented on this waste, measured these systems to get exact numbers, designed disposal systems, was an author of the Yucca Mountain License Application, monitored the waste, have lived beside nuclear waste for these last 35 years, have had my children and grandchildren live next to nuclear waste – I can tell you without reservation that you have nothing to worry about from the nuclear waste at San Onofre.

Compared to all other risks that you face in Southern California, the risk from nuclear waste at SONGS is vanishingly small.

Nevertheless, last week, Southern California Edison's Community Engagement Panel (CEP) held a virtual four-hour meeting to consider doomsday scenarios, or outlier events, concerning this waste. Teri Sforza at the Orange County Register gave a good accounting of the meeting.



The Orano (previously Areva) NUHOMS system that holds 50 waste canisters at SONGS, used before the ... [+] UMAX system was built.

SONGS has two dry storage systems. The new Holtec Hi-Storm UMAX system, a partially buried concrete monolith that will house 73 waste canisters, and the older, above-ground concrete-bunkered Orano (previously Areva) NUHOMS system, which houses 50 waste canisters. The Holtec system features reinforced concrete at least 4 feet thick.

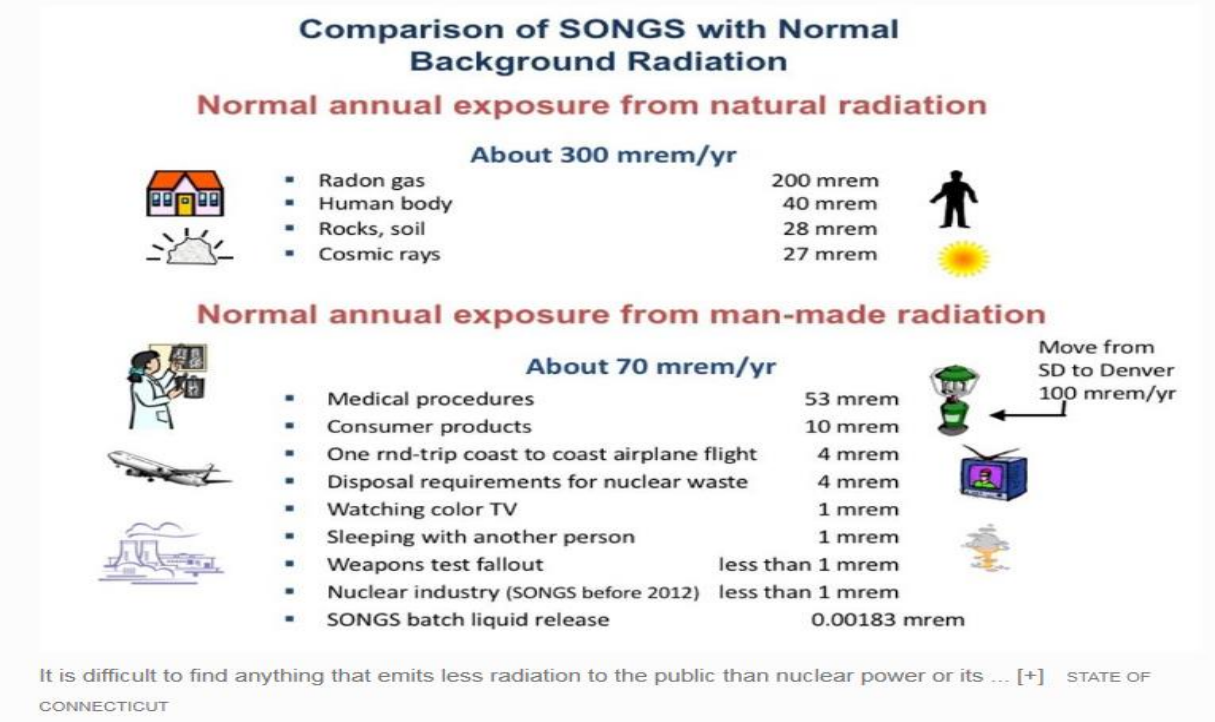
The NUHOMS system has 5-foot-thick reinforced concrete walls and interconnected roofing slabs to enhance performance as a single, sturdy structure. They are designed and certified to independently withstand severe hazards, including tsunamis, hurricanes, sustained flooding, extreme impacts, tornados, and earthquakes.

IN addition, the above-ground NUHOMS construction allows 100% canister surface inspection and remediation—plus inside-and-out storage module inspection—for post-event inspection or just as a regular part of managing aging.

The serious events that we consider all the time for nuclear waste include corrosion and cracking, dropping a canister from a height, sea level rise and submergence in water, tsunamis, earthquakes, sabotage, direct hit by an aircraft, even hydrogen explosions. These have been studied extensively for 30 years and none of them, if they occurred at SONGS, would cause an increase of radiation exposure to the public greater than background levels.

As an example, one accident scenario assumed the lid of a dry cask was completely removed, or blown off, and that all of the fuel rods were damaged. All of the volatile, or gaseous, radionulcides in the gaps and spaces around the rods, like Xe, Kr and I, are released. As bad as this is, and as unlikely as it would be to occur, the dose at 100 meters from the fuel would be only a one-time 3 mrem (0.03 mSv) dose.

Eating a bag of potato chips a day gives you more than 4 mrem/yr (Yes, potato chips are the most radioactive food with about 13,000 pCi of beta radiation per 12-oz bag, nothing to worry about, just to give some perspective)



It is difficult to find anything that emits less radiation to the public than nuclear power or its ... [+] waste. State of Connecticut

This is why no one outside of SoCal gives nuclear fuel in dry cask storage much thought. That the regulatory authority over nuclear issues, the Nuclear Regulatory Commission (NRC), says these systems are safe for decades, even centuries, doesn't seem to mean anything to this segment of the public.

But then there's the wild stuff you can imagine, that's in lots of movies and science fiction books from the 1950s on.

What if terrorists launched short-range missiles at SONGS' spent fuel storage systems? Or anti-tank guns? Or rocket-propelled grenades (RPGs)? Or North Korea sent over a nuke? The first three would do almost nothing, and the latter would be a lot bigger problem than some radioactivity from old fuel!

As a scientist in this field, it's frustrating to hear these scenarios discussed as if they were serious. Just because you can imagine something doesn't make it true, or possible, or important. And any terrorist that had these weapons wouldn't waste them on such a lousy target.

Terrorists have long realized that nuclear facilities of any sort are too militarily hardened to make sense attacking. It's the reason why 9/11 didn't involve a nuclear plant. Flying a 747 into one wouldn't do much except kill everyone on the plane. We've studied this a lot. Just look at the figure above. This much steel and concrete just doesn't react like things do in the movies, even to a short-range missile.

Just lob an RPG at a chlorine tanker car as it passes through San Diego on Interstate 5 and you'll kill more people than Chernobyl did. Or hit a natural gas plant – that would do real damage.

And nuclear waste is orders of magnitude less risky than an operating nuclear reactor.

There's lots of myths that add to this nuclear fear and they always pop up during any nuclear discussion:

You can't make a nuclear weapon out of commercial spent nuclear fuel – we tried to.

You can't even make a dirty bomb out of commercial spent nuclear fuel – we tried to.

You can't get cancer by living next to a nuclear power plant – we've studied that extensively. The only time that's happened was at Chernobyl 34 years ago, and that was a meltdown at a weapons reactor that didn't even have a containment building. All reactors in America have containment structures and are completely different types of reactors.

Contrary to popular opinion, nuclear energy is the safest form of energy there is, even renewables kill more people per TWh than nuclear, although renewables are really safe compared to fossil fuel.

"This was an unusual assignment," said Dr. Tom Isaacs, an actual expert in this field, having been a member of the National Academy of Sciences, part of the Nuclear Threat Initiative, and part of President Obama's Blue Ribbon Commission on America's Nuclear Future, among other things.

Isaacs is Chair of Edison's experts team, strategizing over the future of nuclear waste at the retired San Onofre Nuclear Generating Station. "It's always good to push the envelope and ask the *what if* questions. But there's no end to that — you can always imagine something more serious."

Yes, you can always imagine stuff – it's called science fiction – and has no place in serious discussions about nuclear energy or nuclear waste.

Of course, the best and only thing to do with this waste is bury it in a deep geologic repository, like we have in New Mexico. And we should store it at a single interim site until that happens, like is being proposed in New Mexico or West Texas. NRC has already said that would be safe.

That's the effort that these folks and their elected officials should be hashing out with their counterparts in New Mexico and West Texas so that it happens as fast as possible.

Not wasting time worrying about short-range missiles coming off the ocean.

Follow me on Twitter or LinkedIn. .



James Conca

I have been a scientist in the field of the earth and environmental sciences for 33 years, specializing in geologic disposal of nuclear waste, energy-related research,

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SONGS Panel Mulls Safety Threats; SCE Renews Emergency Preparedness MOU

(California Energy Markets (subscription only) article, May 6, 2020)

Despite pleas from local stakeholders and community activists over the years, Southern California Edison, the utility operator of the San Onofre Nuclear Generating Station, and independent experts maintain that until long-term or permanent off-site storage for spent nuclear fuel becomes available, it is safest kept on-site at the decommissioning plant. Experts and stakeholders at a May 28 meeting of the SONGS Community Engagement Panel, held via videoconference, discussed safety issues stemming from the independent spent-fuel storage installation at the plant, which was shuttered early in 2012 following a radiation leak.

Only 10 of SONGS' 73 spent nuclear fuel canisters remain to be transferred from cooling pools to the on-site ISFSI, and SCE is on track to have the transfer completed by midsummer. "After all the spent nuclear fuel is in dry storage this summer, San Onofre will be primarily an industrial deconstruction site for the next eight years," Doug Bauder, SCE vice president and chief nuclear officer, said in a June 3 news release.

Limited dismantlement continues under altered work requirements necessitated by the pandemic, Bauder said at the meeting. He also updated attendees on the investigation into a March 25 release of partially treated wastewater from the SONGS sewage plant (see CEM No. 1586 [12]). The reasons behind the release remain unclear, and SCE said it is currently taking corrective actions to prevent a recurrence.

ISFSIs are highly robust and designed with significant events in mind, Bauder said during a presentation at the meeting, pointing out that ISFSIs carry a much lower risk than operating reactors. The panel and visiting experts at the meeting addressed a wide array of concerns, both human and environmental, that the panel labeled "outlier scenarios." These included sea-level rise, tsunami, canister corrosion, earthquake, sabotage, terrorism and explosion. Several of these were discussed at the meeting, while documents containing information about less likely events were compiled into "human outliers" and "natural outliers" libraries on the SONGS decommissioning website.
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Physicist Patrick Papin of the graduate program in homeland security at San Diego State University reassured the community during his presentation that risk levels to the general public and even to SONGS workers from the ISFSI are low, based on acceptable dosage data. Randall Granaas, SCE nuclear fuel and ISFSI engineer, said that cesium-137 is not volatile at dry-storage temperatures and explained that off-site releases from the Chernobyl and Fukushima nuclear accidents were due to a force associated with an operating reactor. Without such a force, radioactive contamination on the surface of the fuel and fuel particulate is not very mobile, Granaas said.

Kevin Crowley, former senior director of the Nuclear and Radiation Studies Board of the National Academies of Sciences, Engineering and Medicine, gave an overview of dry-storage vulnerability assessments carried out by governments, the nuclear industry and independent analysts regarding cask sabotage and numerous terror-attack scenarios. Massive physical shielding and multiple barriers to radioactive release help protect spent fuel, though no dry storage system can provide complete protection against all attack types, Crowley said, adding that it would be difficult for terrorists to attack such systems. Robust security, continual assessment and readily deployable countermeasures are important for keeping such threats low.

Ray Lutz of the group Shut San Onofre, in cooperation with Citizens' Oversight Projects, suggested on the COP website three California alternatives he believes would be better than the SCE ISFSI, "which is only 100 ft from the ocean and inches over the high-water mark at San Onofre." The alternative sites include the Fishel Option, Eagle Mountain and Chocolate Mountain, and the groups' preferred Pendleton Option, which would relocate the waste inland within the U.S. Marine Corps base at nearby Camp Pendleton.

"The dry storage of spent nuclear fuel at SONGS is designed to maintain the safety and confinement of spent nuclear fuel," SCE spokesman John Dobken told California Energy Markets in an email. "What we heard from the outside experts at the CEP meeting is that even under so-called outlier events, the storage systems will continue to protect the health and welfare of the public."

SCE and five local-government agencies reaffirmed their long-standing collaboration on emergency preparedness regarding SONGS, the utility said in a June 3 news release. Orange and San Diego counties and the cities of San Clemente, Dana Point and San Juan Capistrano approved a new memorandum of understanding outlining the specific responsibilities of each participant at their respective board meetings on June 2, the release says. The agreement will provide the five local jurisdictions more than $12.6 million for SONGS' eight-year deconstruction period through 2029, and more than $9.9 million for the 20-year period through 2049, by which time spent nuclear fuel could potentially be removed from the site. However, support will continue until the spent fuel is actually relocated to an off-site, federally licensed facility, the release says.
–Abigail Sawyer

Links are not accessible via this "subscription only" website, so the blue text was changed to black, e.g.; (see CEM No. 1586 [12])
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News Articles Following Approval of Memorandum of Understanding with SCE for Emergency Preparedness
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New emergency agreement for San Onofre provides millions to local governments

Agencies pledge to actively work to persuade federal officials to find a repository, and to take San Onofre's waste first

By **TERI SFORZA** | tsforza@scng.com | Orange County Register
PUBLISHED: June 4, 2020 at 3:08 p.m. | UPDATED: June 4, 2020 at 3:34 p.m.

Southern California Edison will pay local governments $22.5 million over coming decades to plan for and respond to any emergency at the shuttered San Onofre Nuclear Generating Station, according to a new agreement.

Orange and San Diego counties, as well as the cities closest to the plant — San Clemente, Dana Point and San Juan Capistrano — will get funding for emergency planning, training, exercises and communications efforts through 2049. That's the year everyone hopes the federal government will have finally found a permanent home for the nation's commercial nuclear waste.

In the agreement, agencies pledged to "actively work" together to persuade federal officials to find a repository, and to take San Onofre's waste first when relocation time finally arrives.

While some officials worried the money might not be enough — "If we have a terrorist attack or something else occur, we could be in a world of hurt until we get those canisters off site," said Orange County Supervisor Lisa Bartlett — critics objected to a confidentiality clause they say will block the release of important information to the public.

The agreement was approved by all five agencies this week.

Risk and money



The Holtec Hi-Storm Umax dry storage system for spent fuel at San Onofre Nuclear Generating Station. (Courtesy Southern California Edison)

The emergency risks posed by San Onofre have grown smaller. The plant ceased splitting atoms in 2012, eliminating the chance of a catastrophic core meltdown, and all spent fuel is slated to be out of cooling pools soon.

“After all the spent nuclear fuel is in dry storage this summer, San Onofre will be primarily an industrial deconstruction site for the next eight years,” said Doug Bauder, Edison vice president and chief nuclear officer, in a prepared statement. “We value our longstanding relationships with the local jurisdictions, and maintaining our association with our local first responders for the long term is important to us and to the community.”

The new agreement was three years in the making. It replaces a similar one and reflects diminished risk.

Funding to agencies will decrease over the years. In 2020-21, Orange County will get $960,171, San Diego County will get $366,509, and the three cities will each get $217,924.

The second year, they’ll get 75 percent of that; the third, 66 percent; and then 25 percent from 2029 through 2049.

All told, that’s $12.6 million for the eight-year tear-down period through 2029, and some $9.9 million for the 20-year period through 2049.

“One reason for that is the drastically reduced risk posture of the site,” spokesman John Dobken said by email. “During operations, there were 82 emergency action levels (or adverse plant conditions) for San Onofre. Once all the spent fuel is in passive dry storage, there will be three. None involve an off-site radiological release, even as a result of outlier events such as earthquakes or aircraft impacts.”

Orange County’s total will be $10.2 million over the life of the agreement, and supervisors worry that might not be enough.

“These funds cover just the basics,” Bartlett said. “If there’s an incident, those bills are going to be really big. Evacuation of cities. Nuclear fuel leaking into atmosphere. I need to have confidence SCE will step up to the plate.”

Donna Boston, director of emergency management for the Orange County Sheriff’s Department, said that if an emergency costs agencies more money, the agreement allows them to bill Edison for the excess.

Edison is proud of the agreement. To its knowledge, no other decommissioning plant in the nation is continuing to support local emergency response at this level, it said.

Confidentiality clause

Some activists objected, particularly to one clause.

"No party will use, copy, adapt, alter, part with possession of or otherwise disclose any information or record of another party … which is of a confidential nature or has been identified as confidential … in accordance with applicable Federal and California State laws," the agreement says.

"The confidentiality clause allows Edison to hide radiation levels and other information the public should have a right to know," said Donna Gilmore in a letter opposing the agreement. "This clause is a huge red flag. Edison should not have free reign to decide what should be kept from the public. Don't allow Edison to have the unlimited authority to censor our government from information the public needs and deserves to know."

In fact, Edison said, the confidentiality clause was added at the request of Orange County, not the company. The state's public records laws would still apply to government records.

Edison recently unveiled its first batch of monthly radiation-monitoring data through the California Department of Public Health — an attempt to allay community concerns about the "nuclear waste dump on the beach," as critics have called the dry storage systems. Monitors are placed at strategic points on the pads, with a control monitor on a hill above.

Real-time reports?

Critics say it's not enough. They want real-time radiation reporting, and monitors placed directly at outlet air vents for the more than 130 canisters that will soon be in storage.

"Unless monitors are located near the outlet air vents, we won't know which canisters are failing," Gilmore said

Edison said this may reflect a misunderstanding between radiation and contamination.

"Radiation is like heat from a fire. Put something in front of it and you don't feel the heat, or as much heat," spokesman Dobken said. That's what the systems do with their canisters and concrete shielding. Readings at the vents versus the sides or front would not be different from a radiation perspective, he said.

Contamination, though, would require a breach of the canisters allowing material from inside the canister to work its way out via the air vent.

"Underlying this theory is the false belief the canisters are cracked," Dobken said. "They aren't. We conduct surveys of the areas around the (dry storage systems) so would see any of this material if it existed. But it doesn't."

Edison measures radiation on site and reports that to the Nuclear Regulatory Commission and the state. "If there were contamination coming out, we would find that," Dobken said.

Used Nuclear Fuel Storage at San Onofre Raises Concerns Over Plant's Vulnerability

By HOSAM ELATTAR ***(Voice of OC Article)***

The Orange County Board of Supervisors Tuesday approved a memorandum of understanding with Southern California Edison to provide the county over $10 million in financial support for emergency preparedness at the San Onofre Nuclear Generating station.

Supervisor Lisa Bartlett, who made the motion in support of approving the memorandum, said if there is an incident at the plant it could cost the county a lot of money to address the emergency and the sum agreed to would only cover notifying communities of an incident.

Donna Boston, Orange County director of emergency management, said there is a provision in the agreement that would allow the county to bill Southern California Edison for any excess spending if an emergency response is needed.

"We're not getting but a pittance when you consider what it's going to take on an emergency preparedness basis, whether it's evacuation of cities, or if we've got nuclear fuel that's leaking out into the atmosphere or the communities," Bartlett said.

The supervisors' action comes on the heels of a virtual meeting held last week by the San Onofre Community Engagement Panel about the plant's vulnerability. The panel made up of local officials and community members advises the plant's operators on the dismantling of the plant and meets at least four times a year.

The plant at San Onofre was retired in June 2013 after uproar from the public and local officials over a radiation leak in 2012.

Since then the used nuclear fuel that's been cooling in wet pools is being converted to dried storage and is kept at the plant. About nine of the 73 canisters of used fuel have yet to be transferred to dry storage but the process is expected to be completed by mid-summer.

"We're moving the spent fuel rods out of the cooling pools and into the dry cast storage, which is safer, but you're still going to have all of those spent fuel rods in the dry cast storage that are above ground, which concerns me," said Bartlett.

Supervisor Andrew Do also shared concerns about the possibility of exposing people in the county to radiation if there is an emergency.

"If you think about the direction that we are moving in as a county, with more development in South County as well, the impact of any kind of incident at San Onofre can be very significant," Do said.

At the virtual community meeting last week, Kevin Crowley, the former senior board director of Nuclear and Radiation Studies at the National Academies of Sciences, Engineering, and Medicine, said numerous assessments have been done on the vulnerability of the dry storage system.

Crowley was one of several experts the community engagement panel brought in to quell the public's concerns. He said it would be difficult for terrorists to successfully attack the canisters to the point where significant amounts of radioactive material would be released.

"These systems are massively shielded, and they contain multiple barriers to the release of radioactive materials, and attack must penetrate all barriers to result in any significant releases," Crowley said.

"No dry storage system provides complete protection against all types of terrorist attacks that one could postulate. However, any radioactive material released from attacks would likely be small," he said.

Boston, the director of county emergency management, said at the virtual meeting that if officials get reports of a situation at the plant they will deploy the necessary people to assess the situation and determine the proper response.

"We do not manage hazards, we manage consequences. So we're looking at what the impact is and then we're going to work to lessen that impact for our community and protect our community," Boston said.

Some members of the public felt the virtual meeting had an inadequate discussion of the worst case scenario at San Onofre.

"There is no plan for when one of these canisters does fail," said Kalene Walker during the public comment portion of the presentation at last week's virtual meeting. "There's so many issues regarding this system. I'm into prevention. Emergency response is super important and appreciated. But I don't want to be anywhere near when one of these canisters goes off."

Bartlett said Tuesday that canisters have cracked before.

"If we have a terrorist attack or something else occurs, we could be in a world of hurt until we get those canisters completely moved off site somewhere else," Bartlett said.