

Fed regulators look at New Mexico as a site for nuclear waste. Will it take San Onofre's?



A recent photo of the new storage site that holds nuclear waste at the San Onofre Nuclear Generating Station (SONGS). A group in New Mexico has applied to the federal government to build a site to house nuclear waste from facilities across the country, including SONGS. (Photo from Southern California Edison)



By **Rob Nikolewski**

MARCH 6, 2018, 4:35 PM

The [Nuclear Regulatory Commission](#) is considering a private company's application to build a facility in New Mexico that would store nuclear waste.

- If approved, the site may provide an avenue to send the 3.55 million pounds of spent nuclear fuel that is beached at the San Onofre Nuclear Generating Station.
- Supporters say if the licensing process moves quickly, they can get the facility up and running by 2021.
- But even if approved, there is no guarantee the waste at San Onofre will end up at the site.

New Mexico, San Onofre and a proposed site for nuclear waste. Here's the full story:

A group wants to build a storage facility in a remote area of New Mexico that would be the destination for nuclear waste from plants around the country — including the 3.55 million pounds beached at the San Onofre Nuclear Generating Station (SONGS).

Now, federal regulators have confirmed they are willing to consider the details of the facility.

The Nuclear Regulatory Commission (NRC) last week contacted Holtec International, a New Jersey-based company that wants to build the site. The agency will [begin a technical review](#) of Holtec's application.

The NRC is in charge of licensing the nation's nuclear facilities, including sites that store spent nuclear fuel.

"This is the next really big step in order to get licensed," said John Heaton, the chairman of the [Eddy-Lea Energy Alliance](#), which is named for the two counties in rural southeastern New Mexico backing the project. "Our expectation is we'll move through that process and hopefully have a license some time in early 2020."

The NRC [in a news release](#) announced the Holtec application has been "formally docketed" but was quick to add that does not indicate the agency will approve the project. Staffers will begin "detailed" safety, security and environmental reviews.

The proposed storage facility would be a private enterprise. Ground has not been broken, but the site would be a big one, storing up to 8,680 metric tons of commercial nuclear waste.

For perspective, the now-shuttered [Yucca Mountain repository in Nevada was licensed to hold 70,000 metric tons](#), although nuclear officials have said Yucca Mountain could hold four to nine times that amount.

San Onofre's 3.55 million pounds of nuclear waste equals [1,609 metric tons](#).

Heaton said if the NRC licensing process goes relatively smoothly, the Holtec storage site in New Mexico could start accepting spent fuel by early to mid-2021.

The Holtec proposal is considered a "consolidated interim storage" facility — sites located in remote locations and built with local community approval.

“It’s in the desert that is seismically very stable and with no real commercial overhead traffic,” Heaton said. “From many perspectives, it’s a very good geological location as well as being isolated” from population centers.

By contrast, SONGS is in a state with a history of earthquakes, and the plant is lodged between the ocean and one of the country’s busiest freeways, Interstate 5. Some 8.4 million people live within a 50-mile radius.

Even if the New Mexico project gets the green light, that would not necessarily mean the nuclear waste at SONGS would go there.

Spent fuel is located at nuclear plants — both active and retired — across the country, and when it comes to physically moving waste [it is unclear](#) which containers and which sites get priority.

The Department of Energy (DOE) has what is called an “Acceptance Priority Ranking” that essentially gives the nod to the oldest fuel that has been discharged from a particular location. It’s called the [“oldest fuel first”](#) principle.

But no precedent has been set and some experts have argued that waste at facilities that no longer produce electricity or at sites in vulnerable areas should go first. SONGS, which has not generated power since 2012 and with its spent fuel located little more than 100 feet from the Pacific, would qualify on both points.

Heaton appeared in the San Diego area twice last year, arguing the case for the Holtec site and [telling members of the Community Engagement Panel](#) at SONGS [as well as the California Coastal Commission](#) that the New Mexico site would be happy to accept San Onofre’s waste.

“Getting (the spent fuel) consolidated in one place where the geology is right and where it’s in a remote area in a desert environment is the right thing to do,” Heaton said in a telephone interview Tuesday.

But consolidated interim storage has its critics. Some say it would be better to focus on one permanent site to house the nation’s growing stockpile of nuclear waste. Also, they say, putting spent fuel in an interim site results in moving the radioactive spent fuel twice.

And while New Mexico’s governor [wrote a letter in 2015 to the secretary of DOE](#) supporting the Holtec project, not everyone in the Land of Enchantment is in favor of it.

“There isn’t a single nuclear power plant in New Mexico at all,” said Rose Gardner, who lives about 35 miles from the proposed site and is [co-founder of the Alliance for Environmental Strategies](#), which is

opposed to nuclear power. “So why do I have to put up with everyone else’s trash coming here and possibly creating a nuclear disaster?”

Transporting the nuclear waste, whether to the Holtec site in New Mexico or any other potential consolidated interim storage site, would likely go via rail.

[David Victor, chairman of the SONGS Community Engagement Panel](#), said DOE is moving along with a program to test the rail cars that will be used.

“And it looks likely those will be ready soon,” Victor said in an email, “at which point the weak link will be the lack of a federal program to buy enough rail cars to move the fuel.”

MAR 6, 2018 @ 06:00 AM

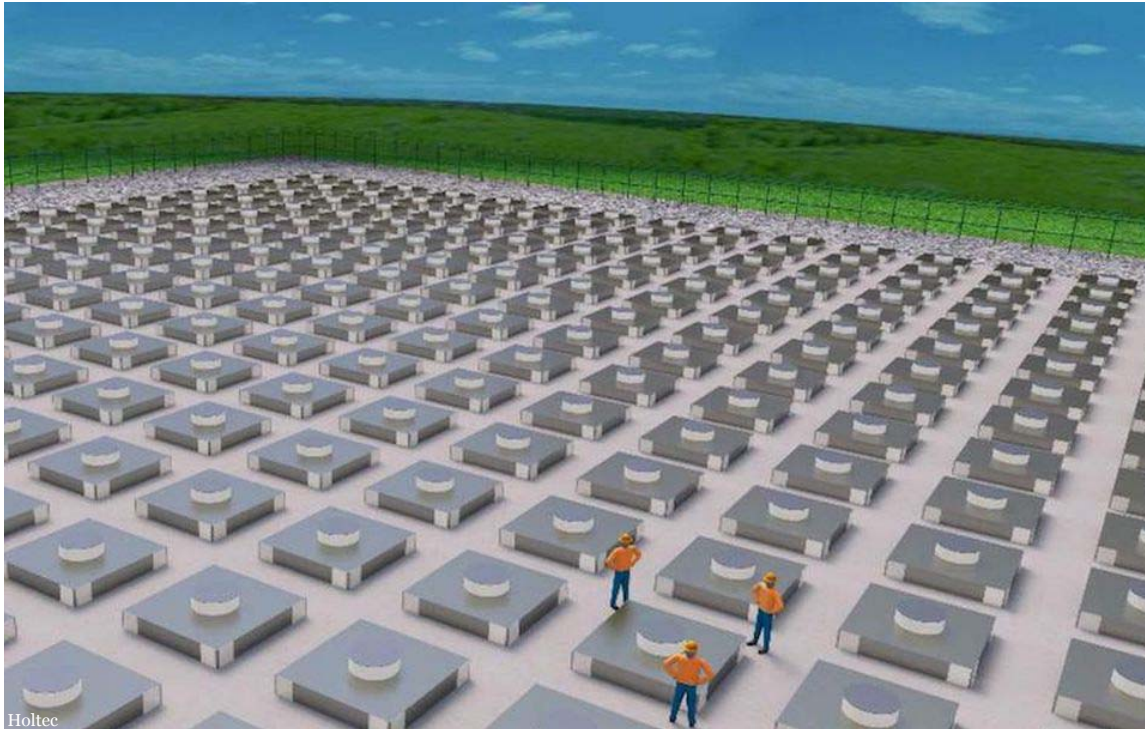
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The Little Black Book of Billionaire Secrets

Will We Actually Get A Place To Store Our Nuclear Waste?

**James Conca**, CONTRIBUTOR*I write about nuclear, energy and the environment* [FULL BIO](#) ✓

Opinions expressed by Forbes Contributors are their own.



Artist's Rendering of Holtec's HI-STORE CIS Storage Facility for spent nuclear fuel. It will be the first centralized [+]

It certainly looks like it. At the end of February, the United States Nuclear Regulatory Commission accepted Holtec International's license application for its [proposed consolidated interim storage facility for spent nuclear fuel](#), called HI-STORE CIS.

To be located in southeastern New Mexico near Carlsbad, the facility would store spent nuclear fuel, which is better referred to as slightly used nuclear fuel, until a [final disposal facility is built](#) or until we build our [new fast reactors that will burn it](#), or we recycle it into new fuel.

Reactor fuel usually spends [five years in the reactor](#), after which about 5% of the energy in the fuel is used, but fission products of the reactions have built-up to the point where the fuel must be replaced. After leaving the reactor, the spent fuel usually spends about 5 years in spent fuel pools of water, until heat and radiation

have decreased sufficiently to allow the fuel to be passively cooled in a dry cask (see 1,2,3).



Commercial nuclear reactor fuel usually spends five years in the reactor. After leaving the reactor, the spent fuel usually

At this point the dry casks can stay where they are for over a century, or be moved to a centralized storage facility like Holtec is proposing. This would make the logistics and costs of storage easier and lower than having dozens of sites around the country, especially at those sites where the reactors themselves are gone.

A [study by Oak Ridge National Laboratory](#) showed an interim storage site would save the U.S. Treasury \$15 billion by 2040, \$30 billion by 2050, and \$54 billion by 2060.

The [NRC has concluded](#) that spent fuel storage in pools and casks is safe and secure. This and other nuclear developments follow directly from the recommendations of [President Obama's Blue Ribbon Commission on America's Nuclear Future](#), and were followed up in the [President's Memorandum on disposal of Defense High-Level Waste](#) and the [2013 Administration's Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Radioactive Waste](#).

[Conca and Wright \(2012\)](#) provide background on nuclear waste and interpretation of the three BRC recommendations pertaining to nuclear waste disposal that has led to some of these changes.

Interim storage of spent nuclear fuel [is nothing new](#). It's been going on in the United States for decades at existing nuclear plant sites. Much of our used fuel, over 70,000 tons, is in interim storage in pools and casks at operating nuclear power plants, and several that have been shut down and decommissioned, throughout the country.

Dry casks are typically constructed of one or more shells of steel, cast iron, and reinforced concrete to provide leak containment and radiation shielding. Casks typically hold 10 tons of spent fuel. At present, dry cask storage is licensed at 35 nuclear plant sites in 24 states. There are 65 sites with operating reactors in the United States.

Now that Holtec's application has been accepted for review, it will take several years to license and construct such a consolidated interim storage facility.

HI-STORE CIS is a subterranean used nuclear fuel storage system (see figure) with a maximum storage capacity of 10,000 canisters that can each hold about 12 tons of spent fuel. The first phase of the project is an initial 40-year license application for 500 storage cavities which can hold over 8,500 metric tons of uranium. Uranium makes up over 95% of the fuel.

HI-STORE CIS is being funded by Holtec with the enthusiastic support of local communities in southeastern New Mexico, including the [Eddy-Lea Energy Alliance](#) and the state's [Governor Susana Martinez](#).

John Heaton, Chair of the Eddy-Lea Energy Alliance, estimates that the entire facility would take ten years to construct, and employ about 300 local workers.

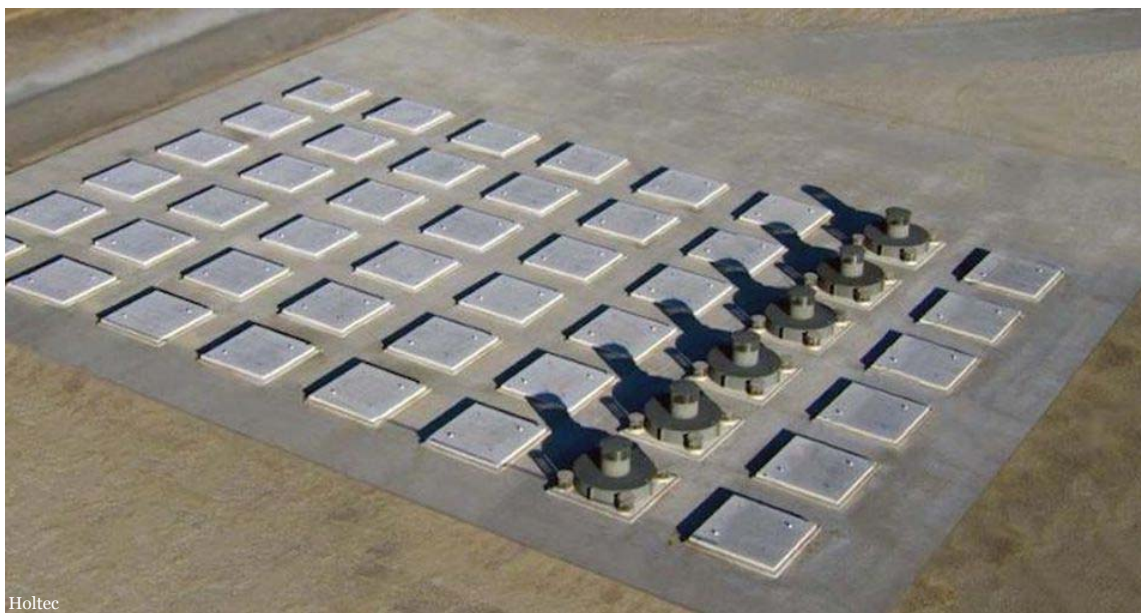
The NRC has projected the cost of the regulatory review of Holtec's application at approximately \$7.5 million. At this writing, HI-STORE CIS is the only ongoing licensing effort in the country that seeks to fulfill DOE's desire for a consolidated interim storage facility.

Critics of the project cite the danger of transporting what could be volatile nuclear waste, and are worried about the environmental impact of burying spent nuclear fuel in New Mexico. Both are not serious risks since none of the waste is volatile, there are no free liquids to leak, we've been disposing of nuclear waste in New Mexico since 1999 (some of it very high activity) and we have transported many thousands of tons of nuclear waste, nuclear weapons and spent nuclear fuel over millions of miles of roadways - with no problems.

Critics always say any ideas about handling nuclear waste are bad but leaving them where they are is not acceptable, then never suggest any scientifically-credible solutions.

Our nuclear waste containers have been tested over the last 30 years by running into concrete bunkers at 80 mph, being dropped onto huge steel spikes, burned in jet fuel fires at thousands of degrees, and sunk deep in water for weeks. These things are as strong as humans can make them.

And Holtec has already done this kind of thing before very successfully. Holtec's HI-STORM UMAX was certified and licensed by the NRC in 2015 and is already deployed at many nuclear power plants around the United States (see figure). It was engineered to store all of our used nuclear fuel that has been produced.



Holtec
It will take several years to license and construct such a consolidated interim storage facility. But Holtec has already [+]

The HI-STORM UMAX stores the canister entirely below-ground allowing unobstructed views of the entire facility from any direction. HI-STORE CIS is designed to unify the storage of all different storage canisters (both vertically and horizontally stored) in one standardized HI-STORM UMAX system simplifying operations and moving beyond our older management activities.

These systems are indeed a temporary interim measure. The stainless-steel canisters are easily retrievable and ready for transport to whatever permanent solution is chosen, such as deep geologic disposal or burning in fast reactors. The canisters are designed, qualified, and tested to survive for centuries and prevent the release of radioactive material under the most adverse accident scenarios postulated by NRC regulations for both storage and transportation.

As an add-on, Holtec is also seeking approval from NRC to use the heat generated by the waste, from just sitting on the pad, to make clean drinking water from dirty water from industrial processes like drilling. New Mexico generates a lot of water contaminated with organics and salts, especially in the region where the interim storage facility will be located, and using their patented process-heat design would be quite a boon to this arid region.

Using [waste heat](#) for industrial processes, even just heating homes and buildings, is just what Sweden and other Scandinavian countries do with much of their waste heat, from all generation sources, not just nuclear. It's about time we employed this type of energy efficiency in all process or waste heat, from industry and energy.. Venting so much heat to the atmosphere is wasteful and counter-productive if one cares about [global warming](#).

Holtec International is a diverse energy company headquartered in Jupiter, Florida that hopes to use this system for its own future nuclear waste. Holtec is developing and testing a small modular reactor, the SMR-160 in its new *Singh Technology Campus* on the Delaware River in Camden, New Jersey. Like almost all SMRs, it will be walk-away safe, unable to melt-down.

Dealing with the waste is really the last hurdle in a bright and clean nuclear future.

Dr. James Conca is an expert on energy, nuclear and dirty bombs, a planetary geologist, and a professional speaker. Follow him on Twitter [@jimconca](#) and see his book at [Amazon.com](#)



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

February 28, 2018

Ms. Kimberly Manzione, Licensing Manager
Holtec International
Holtec Technology Campus
One Holtec Boulevard
Camden, NJ 08104

SUBJECT: HOLTEC INTERNATIONAL'S APPLICATION FOR SPECIFIC INDEPENDENT
SPENT FUEL STORAGE INSTALLATION LICENSE FOR THE HI-STORE
CONSOLIDATED INTERIM STORAGE FACILITY FOR SPENT NUCLEAR
FUEL – ACCEPTED FOR REVIEW

Dear Ms. Manzione:

By letter dated March 30, 2017 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17115A431), as supplemented on April 13, October 6, December 21 and 22, 2017; and February 23, 2018 (ADAMS Accession Nos. ML17109A386, ML17310A218, ML17362A097, ML18011A158, and ML18058A617, respectively), Holtec International (Holtec) submitted to the U.S. Nuclear Regulatory Commission (NRC) an application for a specific independent spent fuel storage installation license to construct and operate the HI-STORE Consolidated Interim Storage (CIS) Facility, in Lea County, New Mexico, in accordance with the requirements of Part 72 of Title 10 of the *Code of Federal Regulations* (10 CFR 72), "*Licensing Requirements for the Independent Storage of Spent Nuclear Fuel, High-Level Radioactive Waste and Reactor-Related Greater than Class C Waste.*" The license application seeks NRC approval to store up to 8,680 metric tons uranium of commercial spent nuclear fuel in the HI-STORM UMAX Canister Storage System for a 40-year license term.

The NRC staff reviewed your application, as supplemented, and concluded it provides sufficient information for docketing; and for the staff to begin a detailed safety, security, and environmental review. Accordingly, the NRC staff has established a schedule for the safety, security, and environmental review that provides for the NRC staff to issue the first round of requests for additional information (RAIs) in several parts, beginning in March 2018 and ending in August 2018. The schedule also provides that, if necessary, a second round of RAIs could be issued by NRC staff beginning in February 2019. The NRC staff expects to complete its safety, security, and environmental reviews by July 2020.

This proposed schedule assumes that Holtec will provide timely and high-quality RAI responses within 60 days of the receipt of each individual RAI letter. In accordance with the guidance in LIC-SFM-26, "Operational Strategies and Management Expectations" (ML16222A251), RAI responses which are not received within the agreed-upon time may result in the review being delayed or suspended. In addition, low-quality RAI responses may be deemed non-responsive and may be grounds for suspending the review. In general, additional changes to the application that are submitted, except for changes made to address the NRC staff's RAIs, may cause a delay in the schedule outlined above. In addition, the NRC staff estimates that

completing the review and making an independent assessment of the proposed application will cost approximately 7.5 million dollars.

The NRC staff will be in contact with you to schedule a public meeting in the near future to discuss additional details regarding the review process and communicate staff expectations on quality and timeliness of responses to RAIs. If you have any questions regarding these matters, please contact the Project Manager, Mr. Jose Cuadrado, at (301) 415-0606. Also, please reference Docket No. 72-1051 and CAC/EPID No. L-2017-NEW-0011 in future correspondence related to this action.

Sincerely,

/RA/

Michael C. Layton, Director
Division of Spent Fuel Management
Office of Nuclear Material Safety
and Safeguards

Docket No. 72-1051
CAC/EPID No.: L-2017-NEW-0011

HOLTEC INTERNATIONAL'S APPLICATION FOR SPECIFIC INDEPENDENT SPENT FUEL STORAGE INSTALLATION LICENSE FOR THE HI-STORE CONSOLIDATED INTERIM STORAGE FACILITY FOR SPENT NUCLEAR FUEL – ACCEPTED FOR REVIEW,
DOCUMENT DATE: FEBRUARY 28, 2018

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The quiet fight to finally send nuclear waste to Yucca Mountain

by Susan Ferrechio | March 13, 2018 01:01 AM



People walk into the south portal of Yucca Mountain during a congressional tour of the proposed radioactive waste dump near Mercury, Nev. Nevada's Board of Examiners has approved a \$5.1 million contract with an outside legal team to help fight President Trump's proposal to restart the Yucca Mountain nuclear waste dump. (AP Photo/John Locher, File)
John Locher

The negotiations to pass a fiscal 2018 spending bill this month include a quiet effort by a Republican lawmaker from Illinois to restart plans to store the nation's nuclear waste in Nevada's Yucca Mountain.

There are no nuclear power plants in Rep. John Shimkus's district in the southeastern region of the state. But the long-decommissioned Zion nuclear plant in northern Illinois is home to stored waste that Shimkus said would be better off moved to Yucca Mountain, which the federal government chose three decades ago to serve as the repository for all of the nation's spent nuclear fuel.

"It's fenced and guarded, it's on Lake Michigan, and the city can't develop that site," Shimkus said of the closed Zion plant.



Many other
closed or
soon-to-be-

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decommissioned sites need a permanent place to store nuclear waste, as do active nuclear plants that could be forced to close due to a lack of safe disposal space.

"Science says long-term, geological storage is the safest way," Shimkus, a longtime proponent of opening the Yucca storage site, said.

Yucca Mountain is the nation's only approved geologic repository for high-level nuclear waste.

The site, located about 100 miles northwest of Las Vegas, was chosen by the Department of Energy to eventually store spent fuel from nuclear power plants, U.S. Navy reactors, and waste generated from building nuclear weapons.

But opposition from the Silver State has stalled the three-decade effort to develop the Yucca site.

Former Senate Majority Leader Harry Reid, D-Nev., deserves much of the credit for stopping the project by using his position in the Senate and his alliance with the Obama administration to block funding and stack the Nuclear Regulatory Commission with Yucca opponents.

With Congress and the White House under GOP control, Shimkus is now urging Senate GOP leaders to include in the fiscal 2018 omnibus spending package an additional \$150 million that would be used to revive the licensing process for the Yucca Mountain site.

The omnibus is likely to hit the House and Senate floors for a vote in the days before March 23, when a temporary spending bill expires.

Shimkus' request aligns with President Trump, who in both his 2018 and 2019 budget request included \$120 million for the Department of Energy to begin reviving the stalled Yucca licensing process.

The House added \$30 million for the Nuclear Regulatory Commission, which had largely closed down Yucca licensing activities under the Obama administration.

Shimkus said reviving Yucca would involve an NRC adjudication of Nevada's arguments that using Yucca to store nuclear waste is unsafe and would put the state's residents at risk.

The state's argument counters a five-volume, 2015 NRC safety evaluation report that determined Yucca Mountain could safely store spent nuclear fuel.

"Part of the main contention of Nevadans is the science is not sound," Shimkus said. "This money complies with the law. It says, let's have the debate. If opponents are right on the science, then Yucca can't happen."

But Shimkus is up against bipartisan opposition from the Senate's Nevada delegation, which could hobble efforts to pass the omnibus and keep the government fully operational.

Election year politics make the issue even more complicated. Sen. Dean Heller, Nevada's sole Republican senator, is the most vulnerable GOP lawmaker up for re-election in November.

He is staunchly opposed to reviving the Yucca Mountain storage project and called the funding proposal "reckless."

This year, the Senate stripped out the \$150 million for the DOE and NRC from its own energy appropriations measure.

The final decision on whether to add it back in to the omnibus will be largely up to Majority Leader Mitch McConnell, R-Ky., who is known to fiercely protect his vulnerable incumbents.

Shimkus is not discouraged and said he's been told that the spending bill remains open for possible additions, including the money for reviving the Yucca Mountain storage site.

"I'm not going to predict in the end it will be in there, but I'd rather the omnibus not be closed, with an opportunity," Shimkus said. "People have listened to my argument. And they've said there is a lot of merit to it. It's taken a lot of education. That's good. It's all positive."



Lessons Learned from the West Valley Spent Nuclear Fuel Shipment within the United States

Michael J. Tyacke, Traci Anderson

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Abstract

This paper describes the lessons learned from the U.S. Department of Energy (DOE) transportation of 125 DOE-owned commercial spent nuclear fuel (SNF) assemblies by railroad from the West Valley Demonstration Project to the Idaho National Engineering and Environmental Laboratory (INEEL). On July 17, 2003, DOE made the largest single shipment of commercial SNF in the history of the United States. This was a highly visible and political shipment that used two specially designed Type B transportation and storage casks. This paper describes the background and history of the shipment. It discusses the technical challenges for licensing Type B packages for hauling large quantities of SNF, including the unique design features, testing and analysis. This paper also discusses the preshipment planning, preparations, coordination, route evaluation and selection, carrier selection and negotiations, security, inspections, tracking, and interim storage at the INEEL.

Background and History

In 1966, Nuclear Fuels Services (NFS), Inc. began operation of Western New York Nuclear Services Center, the first and only commercial fuel processing facility in the United States (U.S.). The facility is located south of Buffalo, New York on 200 acres of land owned by New York State. NFS operated the facility under a lease with the State of New York from 1966 to 1972. In 1972, NFS halted processing with the intent of upgrading the facility for greater production. After the facility was shut down, the U.S. government enacted stricter environmental laws, which significantly increased the cost for upgrading the facility. For financial reasons, NFS decided not to upgrade the facility and did not renew its lease with New York State when the lease expired in 1980. At that time, there were 750 SNF assemblies stored at the facility.

In 1980, the U.S. Congress passed the West Valley Demonstration Project Act, which directed the U.S. Department of Energy (DOE) to conduct a high-level waste management project at the former processing facility. Between 1983 and 1986, 625 of the SNF assemblies, involving 257 individual cask shipments, were returned to the originating utilities. The remaining 125 of the 750 SNF assemblies belonged to NFS. In 1984, DOE agreed to take title of these assemblies in exchange for NFS providing two large dual-purpose casks for transporting and storing the SNF assemblies.

The Idaho National Engineering and Environmental (INEEL), one of DOE's national laboratories, had a program for developing and testing prototype casks for the dry storage of SNF. Development of a multi-purpose cask system for transport and storage of SNF was added to the program. The INEEL became responsible for managing the procurement, licensing, and ultimately storing of the loaded casks in Idaho.

Several attempts were made in the 1990s to prepare for shipment. However, for technical and political reasons, the shipment was repeatedly delayed. In August 2001, DOE had everything in place to make the shipment. But, in late October 2001, DOE chose to postpone the shipment and focus on efforts at the INEEL to meet legal commitments with the State of Idaho on waste management. Even though the September 11 terrorist attack did not cause the delay in the shipment, sensitivity to the attack would have been a factor in making the shipment.

On July 17, 2003, DOE completed the shipment. The movement of more than 2,300 miles was completed safely, securely, and without incident more than 17 hours ahead of schedule; see Figure 1.

Type B Packages Licensing

The West Valley cask systems are high capacity, first-of-a-kind, specially designed Type B packages for transport and storage casks; see Figure 2. The TN-REG cask (USA/9206/B(U)F) is a cylindrical steel cask designed for shipment of up to 40 pressurized water reactor SNF assemblies. It has an empty weight of 82,100 kg (181,000 lb) and a fully loaded and assembled weight of 105,687 kg (233,000 lb). The TN-BRP cask (USA/9202/B(U)F) is a right circular cylindrical cask designed for shipment of up to 85 boiling water reactor SNF assemblies. It has an empty weight of 81,465 kg (179,600 lb) and a fully loaded and assembled weight of 101,033 kg (222,739 lb).



Figure 1. Photograph of the loaded West Valley casks parked inside the INEEL secured area.

Initially, DOE intended to self-license the casks as authorized in the 49 Code of Federal Regulations (CFR) for the U.S. Department of Transportation [1]. However, for political and public acceptance reasons DOE decided to have the U.S. Nuclear Regulatory Commission (NRC) license the casks. This decision had a significant impact on the licensing and approval of the casks.

To accommodate the large payload, the cask design incorporated features that had never been licensed. Borated stainless steel (BSS) baskets were used for criticality control; see Figure 2. The NRC had never licensed a Type B cask with BSS basket. Because the BSS was not a codified material, the NRC would not allow DOE to take credit for the materials for use in criticality control or providing structural integrity. That decision resulted in the casks being licensed for only half-load shipments. Special inserters were designed and built to be placed inside half of the basket ports to provide criticality control and structural integrity.

Delays in the shipment allowed time for BSS material to become codified. Several technical meetings and destructive examination of representative samples of actual materials from inside the original basket provided the technical basis for the NRC to allow DOE to use the BSS basket for criticality and structure control. The BSS materials were shown to have uniformly distributed boron throughout the material and the structural integrity to meet or exceed the physical properties required for codified BSS materials. By demonstrating the integrity of the material, the NRC agreed to license the casks for a single, full load, one-time-only shipment.

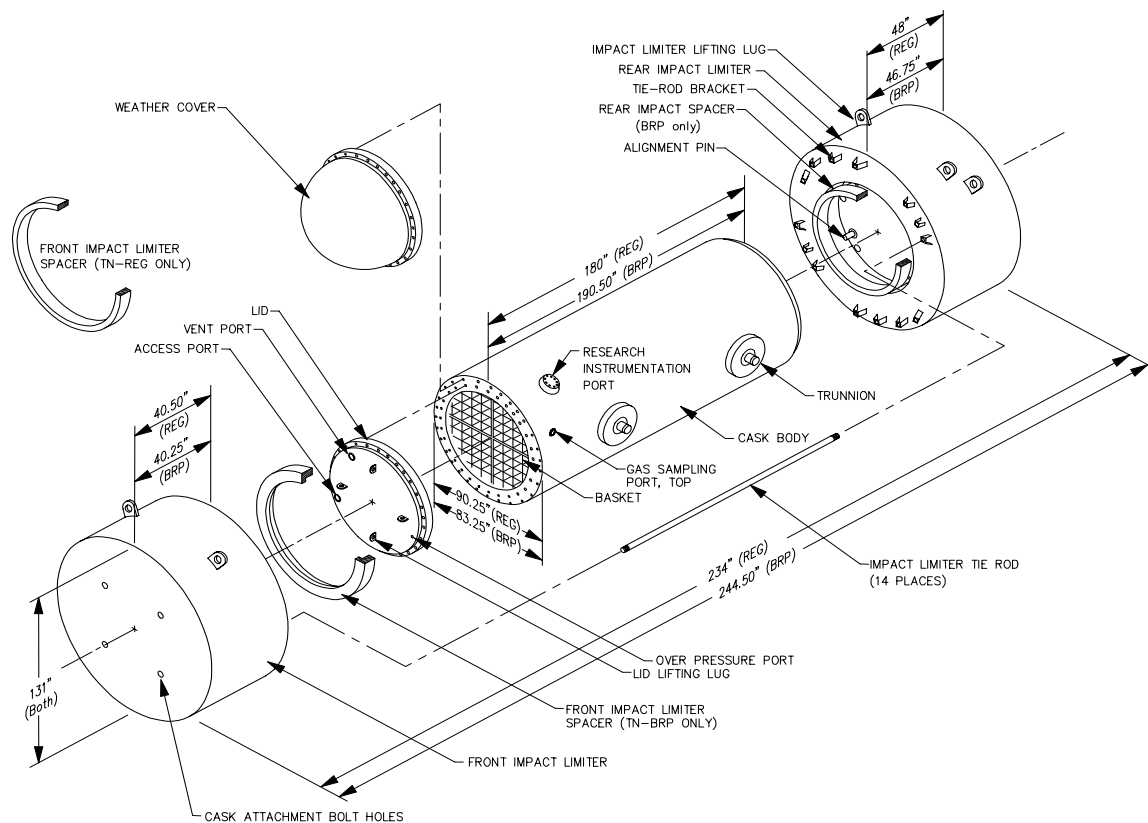
Other design and hardware changes resulted from the NRC licensing. The bolts attaching the impact limiters to the casks had to be enlarged. Special tie rods were installed between the two impact limiters to ensure that the impact limiters did not break loose from the casks during a hypothetical accident; see Figure 3.

Some of the SNF was damaged. There was not enough room in the casks or baskets to accommodate damaged fuel canisters. Specially designed caps were placed at the top and bottom of each fuel assembly basket port to contain any loose material that may result from the transportation or a hypothetical accident.

Lessons learned from the design, fabrication, and licensing of the West Valley casks are to first include the regulator early in the design process. This ensures buy in, at least conceptually, to all design features before beginning fabrication. Using new and exotic materials that have not been codified is risky and can be very costly to qualify. Another lesson learned is to be willing to challenge traditional ways of doing business. The NRC is a rigorous regulator. However, the NRC is willing to listen to and consider different approaches if there is a strong technical basis. It can be costly and time consuming to prove the technical basis.

West Valley SNF Shipment

Preparations for the shipment of the West Valley SNF required comprehensive planning and coordination between the West Valley Demonstration Project (WVDP), INEEL, states, tribes, other federal agencies, and the railroad



TN-REG and TN-BRP PACKAGING ISOMETRIC VIEW

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Figure 2. Isometric view of the TN-REG and TN-BRP SNF transport and storage casks.



Figure 3. Photograph of a loaded West Valley cask with the impact limiters and tie rods installed.

carriers. West Valley Nuclear Services Company managed the WVDP under the direction of the DOE West Valley Office. They had the overall management responsibility for the project and were responsible for inspecting and loading the SNF; and sealing, drying and testing the casks. The loaded casks were moved to a safe and secure location within the WVDP complex for temporary storage; see Figure 4. During storage, West Valley Nuclear Services Company performed radiation-monitoring inspections of the casks on a regular basis.

The responsibility for cross-country transport was shared between the INEEL and WVDP. West Valley Nuclear Services Company was responsible for public inquiries and shipment inspections. The INEEL was responsible for the railroad carriers, route evaluation and selection, security, emergency response, and shipper of record.

DOE worked closely with the states, tribes, railroad carriers, and other federal agencies in planning and preparing for the shipment. Shipping planning, information briefings, training courses and communication were coordinated with Council of State Governments–Midwest, Council of State Governments–Eastern Regional Conference, Western Governor’s Association and the Shoshone-Bannock Tribes. Additional planning activities were coordinated with security points-of-contact for the states, tribes, carriers, and various federal agencies.



Figure 4. Photograph of the loaded West Valley casks stored within the West Valley Demonstration Project Site.

Route Selection

Selection of the route was undertaken by DOE early in the planning and preparation process. The Oak Ridge National Laboratory (ORNL) was tasked with identifying, evaluating, and prioritizing possible railroad routes from the WVDP to the INEEL. ORNL used the INTERLINE [2] rail routing computer model to identify 28 possible routes; see Figure 5. The routes were then evaluated and ranked based on transit time, distance, population, interchange, number of carriers, and track usage. DOE had additional restrictions that were factored into the route selection, such as limited route options within New York State, which did not compromise the ranking of the routes. Once a preliminary preferred route was identified, DOE made contact with the affected railroad carriers, states, and tribes.

Four carriers, eleven states, and two tribes were identified as being affected by the route. The railroad carriers were: Buffalo and Pittsburgh Railroad (BPRR), Norfolk Southern (NS) Railway, CSX Transportation (CSXT), and Union Pacific Railroad (UPRR). The states were: New York, Pennsylvania, Ohio, Indiana, Illinois, Missouri, Kansas, Nebraska, Colorado, Wyoming, and Idaho. The Shoshone-Bannock Tribes of Fort Hall, Idaho, were affected. Before finalizing the route, the carriers, states, and tribes confirmed that the proposed route was acceptable.

There were several lessons learned from the route selection process. First, there must be clearly defined route selection criteria, e.g., distance, population, interchanges, carriers, and class of track. Second, the use of an analytical tool, like INTERLINE, ensures that the route selected, ranking and selection use the appropriate criteria and are not biased. Third, every effort should be made not to change the route unless there is a strong technical justification. Fourth, the carriers, states, and tribes should be included early in the planning process to ensure that all pertinent factors are considered. Finally, the lack of flexibility in the railroad system makes it difficult to identify

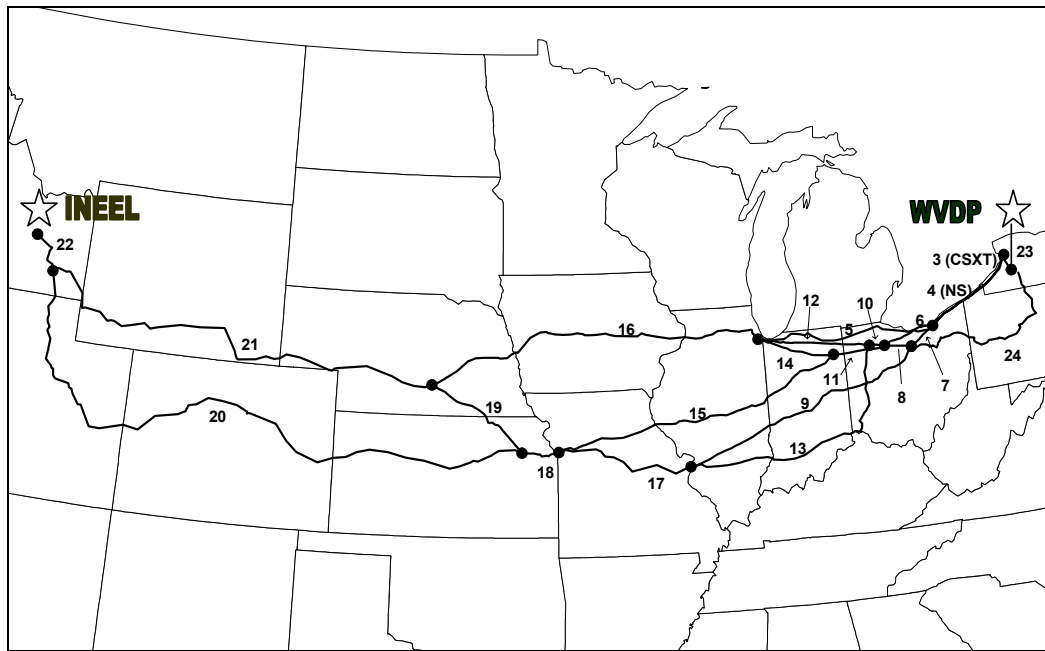


Figure 5. Map showing the sections of railroad route that were used for evaluation and identifying a preferred route.

specific alternate routes for cross-country rail shipments. The railroad carriers need flexibility to choose and use alternate routes. Close coordination between the carriers, states, and tribes is needed to ensure alternate routes can be used safely and securely.

Carrier Selection and Negotiations

The railroad carriers played an integral role in the successful completion of the West Valley SNF shipment. Contracts were established with the four carriers. Negotiating those contracts was complicated and time-consuming. Negotiations began as soon as the railroad carriers were identified and took nearly 2 years to negotiate for the 2001 shipment attempt and an additional 6 months to renegotiate the contracts for the 2003 actual shipment.

Lessons learned from selecting and negotiating with the railroad carriers included beginning discussions with the carriers as early as possible and understanding the uniqueness of the railroad system, operations, and limitations. Other lessons learned included 1) minimizing the number of requirements imposed on the railroad carriers and their personnel, 2) minimizing the number of en route inspections and only use railroad trained Federal Railroad Administration (FRA) certified inspectors, and 3) setting a firm shipping date that allows adequate time for the carriers to coordinate the shipment and maintain that shipping date. This will make negotiations for transporting the materials much easier.

Liability will be the most complicated issue to resolve in negotiating an agreement with the railroad carriers. An equitable adjustment clause was provided in the contract to supplement the nuclear accident coverage provided by Price-Anderson. The equitable adjustment clause covered nonnuclear impacts on the carriers in the event of an accident.

Finally, for large shipping campaigns, DOE should consider owning or long-term leasing the railroad equipment. Owning or long-term leasing of equipment allows DOE better control over delivery, use, maintenance, and inspection of the equipment.

Security

Security has always been an integral part of SNF shipments in the U.S. However, since the September 11, 2001, terrorist attack, it has become even more important. Protecting key information is an important security measure. Key information should be provided to only those with a "need to know." Information that could be used by adversaries to disrupt the shipment and response to an event includes the schedule, route, detailed packaging and content information, communications, security measures, emergency response procedures, and other information.

Security should perform threat assessments and establish an integral system that draws security information from key federal, state, tribal, local, and carrier sources. It is necessary to clearly understand the roles, responsibilities and limitations of the armed escorts. Coordinating multi-security forces, e.g., state, tribes, carriers, and federal, was complicated. DOE considered having federal officers escort the shipment. The federal officers are trained for railroad operations and have jurisdiction over the railroad lines and throughout the various state and tribal jurisdictions.

Finally, DOE worked with the carriers to block information about the shipment from their internet tracking system. This was necessary because there are people that track all activities on the railroad as a hobby and have an excellent communication network through the internet. They are especially interested in unusual operations and equipment that is not normally seen in their area.

Inspections

Inspections were important for demonstrating to DOE, the carriers, FRA, states, and tribes that the shipment could and was done safely and in compliance with the regulations. The inspections were done in three phases, e.g., preshipment, en route, and postshipment.

The preshipment inspections involved the FRA inspecting over 2,300 miles of primary route tracks and the associated equipment before the shipment. FRA also performed mechanical inspections of the rolling stock prior to delivery to the WVDP and prior to the shipment from the site. West Valley Nuclear Services Company and the State of New York (state of origin) performed radiological (radiation and surface contamination) inspections of the shipping casks at the WVDP Site. Information from these inspections was provided to other states, tribes, carriers, and federal agencies as appropriate.

It is important to standardize the preshipment radiological inspection, conduct it sufficiently in advance of the shipment to allow distribution to all involved parties, and to use it as the cornerstone of the confirmatory inspections. Acceptance by all involved parties of the survey results performed during inspections is a first step in developing a process whereby redundant en route radiological inspections during routine shipping operations can be streamlined or eliminated.

Multiple preshipment mechanical inspections (including at the point of origin) of the rolling stock are recommended for single or first-of-a-series shipments by railroad. Identifying a mechanical problem at the time of the shipment or during the shipment could have significant impact on the shipment, public/stakeholder confidence in the shipment, schedule, and cost. Sharing the results of those inspections with interested parties who have a “need-to-know” can provide confidence in the planning and safety of the shipment and reduce the need for en route inspections.

At various locations along the route, the FRA and the carriers performed the en route mechanical inspections of the rolling stock. The carriers, states, and DOE also performed radiological inspections of the shipping casks at predetermined locations along the route; see Figure 6.

En route inspections were made near New Castle, Pennsylvania; Peru, Indiana; and Cheyenne, Wyoming. There is a false sense of security in assuming en route inspections ensure the safety of the shipment. The railroads operate very efficiently, using well-coordinated schedules. Delaying or imposing restrictions on a shipment can negatively affect all the other shipments on the route. Stopping the shipment for an extended period increases security risks. And, the more people around accessing the railroad yards, the greater the chance someone will get hurt, especially if nonrail or non-FRA personnel are involved in the inspections. Eliminating the need for prearranged en route stops of railroad shipments for radiological inspections would benefit in expediting shipments and reducing the costs of the shipper and the impacted states and tribes. Reducing transit time and movement complexity will also enhance security.



Figure 6. Photograph of en route radiological inspection of a railcar and cask.

The FRA has developed a plan for ensuring the safety of high-level waste and SNF [3]. FRA needs enough time to perform track inspections so that the carriers can correct deficiencies and the FRA can reinspect. For multiple SNF shipment rail campaigns, the involved parties and agencies should work together to establish an approach to review and adjust the inspection plan as the number of shipments increases to ensure safety while still identifying redundancy and ways to streamline the process.

Idaho State Police inspectors and INEEL radiological technicians performed a postshipment inspection once the shipment was safely secured within the INEEL. The tribes were invited to participate in this inspection, but were not available. Results from that inspection showed that the shipment had not changed en route. INEEL inspectors also performed physical inspection of the casks, tiedowns, and railcars once the loaded railcars were parked within the Idaho Nuclear Technology and Engineering Center (INTEC) fenced area. Again there were no abnormalities found from that inspection. Results from these inspections were shared with the states, tribes, and other federal agencies.

Tracking

The West Valley shipment was tracked by three methods, e.g., Transportation, Tracking, and Communications System (TRANSCOM) satellite tracking system; rail carrier's dispatch tracking system; and the West Valley Project Status Center using cell phones between the Center and DOE representatives on the train.

TRANSCOM was the formal tracking system used by the states, tribes; and others with a "need-to-know" to monitor the shipment. The TRANSCOM Communications Center and Program developed a TRANSCOM Plan. The plan contained shipment-specific, emergency preparedness communications and a contingency plan for addressing loss of communications with TRANSCOM end users.

The dispatch centers for each rail carrier tracked the shipment and coordinated it with other freight shipments in the same manner as all other shipments. The centers play a critical role in ensuring that the entire rail system runs smoothly and safely. It would be inappropriate and potentially unsafe to ask the dispatch centers to perform functions above and beyond their routine operations.

The DOE representatives on the train provided up to the minute status of the train and surrounds situation. The representatives not only provided real time communications for the status of the shipment, but they also provided other critical functions. They operated the on-board TRANSCOM system. They performed confirmatory radiological surveys during the en route inspections. The DOE representatives were also available to provide first responder and technical assistance, if needed. The use of a 24-hour status center and representatives on the train is critical to ensuring that the shipment is functioning as planned and that deviations from the plans can be dealt with appropriately and in a timely manner.

Interim Storage at the INEEL

The loaded West Valley casks were placed in interim storage within the fenced area of INTEC; see Figure 7. Radiological and physical inspections were conducted to verify that the condition of shipment had not changed in transit. Gas samples were taken from the casks to verify that there was no gas pressure buildup in the casks. These gas samples also provided a baseline for future sampling. The casks will be stored horizontally on the railcars until an alternate disposition is identified.

Conclusions

The West Valley SNF shipment from the WVDP to the INEEL was a successfully coordinated team effort. It is recommended that future cross-country SNF shipments by railroad establish a *systemwide approach* to coordinating activities with railroads, states, and tribes, and the FRA. Areas with the greatest potential for increasing efficiency, ensuring quality performance, and reducing costs are:

- The regulator needs to be included early in the planning and design process, especially if unproven exotic materials and untested designs are proposed.
- Route selection needs to be clearly defined and nonbiased. Selection of the final routes need to be closely coordinated with the carriers, states, and tribes.

- An accepted contracting system with the railroads should be established.



Figure 7. Aerial photograph of INTC, the final storage location of the West Valley casks.

- Standard guidelines for protecting critical information and dissemination of information to those with a “need-to-know” is critical for security.
- A process for establishing and maintaining schedules is vital.
- National protocols are needed to standardize radiological inspections, limit en route inspections, and eliminate en route inspections by non-FRA-certified personnel.
- Larger shipping campaigns need the ability to periodically review all procedures and processes, look for efficiencies and improvements, and eliminate those no longer needed.
- A plan to identify roles, responsibilities, and contingencies is needed for TRANSCOM use.
- The use of a DOE 24-hour status center and representatives on the train is critical to ensuring that the shipment is functioning as planned and that deviations from the plans are dealt with appropriately and timely.

References

- [1] 49 CFR Part 107, Subpart E, “Designation of Approval and Certification Agencies.”
- [2] Oak Ridge National Laboratory, *Interline Routing Model*, Revision 0, March 1993.
- [3] Federal Railroad Administration, *Safety Compliance Oversight Plan for Rail Transportation of High-Level Radioactive Waste and Spent Nuclear Fuel, Ensuring the Safe, Routine Rail Transportation of Foreign Research Reactor Spent Nuclear Fuel*, June 1998.



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

January 30, 2018

The Honorable Cory A. Booker
United States Senate
Washington, DC 20510

Dear Senator Booker:

On behalf of the U.S. Nuclear Regulatory Commission (NRC), I am responding to your letter of December 14, 2017, forwarding questions from the Office of the Governing Body of the Township of Lacey, New Jersey, regarding closure of the Oyster Creek Nuclear Generating Station. The NRC staff's responses to those questions are enclosed.

If you need any additional information, please contact me or have your staff contact Eugene Dacus, Director of the Office of Congressional Affairs, at (301) 415-1776.

Sincerely,

Kristine L. Svinicki

Enclosure:
As stated

**Response to Request for Information
Senator Cory A. Booker
Letter dated December 14, 2017**

- 1. It is our understanding that the dry casks and the containers housing the spent fuel will need replacement at some point in the future. Who will be responsible for the replacement and maintenance of the casks and containers after Exelon is no longer actively on site?**

Exelon, as the current holder of the license, will be responsible for safely maintaining the on-site spent fuel storage systems. NRC regulations require licensees to manage and provide funding for the management of spent fuel as long as the spent fuel remains on site.

The NRC does not consider whether the dry storage systems will require replacement before the spent fuel is shipped off site. However, after the initial 20-year license period for these systems, aging management programs would be implemented to detect the effects of aging and apply corrective actions such that the safety functions of the system are maintained. Any identified areas that indicate degradation would require the licensee to demonstrate that the dry storage system remains safe or pursue repair or other remedies to ensure that the spent fuel is safely confined. Because the NRC does not prescribe how licensees should take corrective action with respect to specific designs, any potential corrective actions for a dry cask storage system would be case-specific. The NRC does, however, evaluate whether the corrective actions taken are effective and sufficient to keep the spent fuel stored safely and that the licensees remain compliant with our regulatory requirements.

- 2. It is our understanding that the licensing of the casks is sufficient for 20 years with further renewals up to 40 years. In addition, site specific licenses are good for 40 years. At the Federal level, has there been any discussion of the licensing process after that time period?**

The NRC's regulations were revised in 2011 to allow for initial and renewal terms of up to 40 years rather than 20-year terms. The regulations do not limit the number of times an applicant can request renewal of a cask or storage system certificate, provided that the applicant demonstrates that the effects of aging on the components are adequately addressed in accordance with the regulations (10 CFR 72.240).

- 3. It is our understanding that once the plant is completely disassembled there will be no infrastructure in place to handle the repackaging of spent fuel material should the casks or containers need replacement. Is there a plan for this contingency, and what are the safety implications of reopening the cask storage?**

If safety issues are identified with a spent fuel storage system, the licensee must pursue corrective actions to ensure that the spent fuel is safely stored. As part of its regulatory oversight, the NRC evaluates whether the corrective actions are effective and sufficient to maintain the safety functions of the storage system.

If a storage canister needs to be opened, the licensee must keep the fuel confined, maintain the fuel in an arrangement that does not cause a nuclear chain reaction, and shield the workers and the public from radiation.

Enclosure

4. Have there been any updates or discussions regarding siting, licensing, constructing or operating interim storage for spent fuel anywhere in the U.S.?

In 2006, the NRC licensed Private Fuel Storage (PFS) to build and operate an interim spent fuel storage facility in Utah to store 44,000 tons of spent nuclear fuel. However, construction of the PFS facility has not occurred. The NRC has received two applications to construct and operate consolidated interim spent fuel storage facilities. The NRC's review of one application for a proposed facility in Texas was suspended by request of the applicant. The NRC staff is currently evaluating the other application for a proposed site in New Mexico to determine if it has sufficient information to begin the required safety and environmental reviews.

5. In the event there are permanent or interim storage facilities sited, are there site-specific plans for Oyster Creek regarding the transportation of casks, and are the casks at Oyster Creek certified for transportation?

The NRC is not aware of any plans to transport spent fuel from Oyster Creek to an offsite storage facility. Any transportation of spent fuel by the U.S. Department of Energy (DOE) would be governed by requirements specified in the Nuclear Waste Policy Act of 1982, as amended. In particular, Section 180(a) of the Act specifies that DOE is to transport spent fuel in NRC-certified transportation casks.

If, in the future, plans are developed to transport spent fuel offsite, NRC has approved a transportation cask for use with the NUHOMS 61-BT canisters used to store fuel at Oyster Creek. The transportation cask would be brought to the Oyster Creek site at the time of shipment. The certificate of compliance and safety analysis report for the transportation cask detail the NRC-approved procedures for loading the canisters into the transportation cask.¹

6. In the event that Lacey Township becomes a long term storage site, by design or necessity, who will be handling the long term handling, maintenance and security of the site?

Exelon, as the current holder of the license, will be responsible for all operations necessary for securing and safely maintaining the spent fuel at the site. Exelon must comply with the security requirements in its NRC-approved Physical Security Plan. The NRC regularly inspects implementation of security plans to ensure compliance with the associated requirements.

7. Will a private contractor be in charge of securing and maintaining the site in the future, and what are the mechanisms in place for contractor turnover, bankruptcy, liability, etc.?

Exelon may use contractors or subcontractors for work at the site, but Exelon is ultimately responsible for the secure and safe storage of the spent fuel. Licensees are required to manage and provide funding for the management of spent fuel as long as the spent fuel remains on site.

¹ NRC, Certificate of Compliance No. 9302 for the Model No. NUHOMS-MP197 Package; Revision 8, May 23, 2017 (ADAMS Accession No. ML17143A256). TN Americas, NUHOMS-MP197 Transportation Package Safety Analysis Report (Chapter 7, Operating Procedures), Revision No. 18, April 28, 2017 (ADAMS Accession No. ML17152A163).

8. What is the compensation plan of the Federal government to the communities hosting nuclear storage?

The NRC is the regulatory agency with responsibility for ensuring that licensees comply with regulations pertaining to the safe and secure storage of spent fuel. Compensation to the communities hosting nuclear storage is not addressed by our regulations.

9. Can you assist in determining what the State of New Jersey's obligation or plan is for onsite storage and compensation?

The NRC can only speak to obligations associated with the NRC and NRC licensees. In that regard, Exelon, as the current holder of the license to store spent fuel at Oyster Creek Generating Station, is responsible for complying with all NRC regulations as long as the spent fuel is stored onsite.



Office of Mayor and City Councilmembers

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Kathy Ward, *Councilmember*
Lori Donchak, *Councilmember*
Steve Swartz, *Councilmember*

James Makshanoff, *City Manager*

February 7, 2018

The Honorable Kamala Harris
Unites States Senate
112 Hart Senate Office Building
Washington, D.C. 20510

Dear Senator Harris:

On behalf of the City of San Clemente, I want to bring to your attention to the ongoing concerns of the residents of the City of San Clemente and Southern California due to the nuclear waste stored at the San Onofre Nuclear Generating Station (SONGS). On behalf of the city of San Clemente, this letter requests your priority attention to the nuclear waste issues that affects ours and other communities close to SONGS.

Specifically, we respectfully request that you visit SONGS in the coming weeks. Senator Dianne Feinstein's visit in 2012 with the Nuclear Regulatory Commission (NRC) Chair was both productive and reassuring to the community. As San Clemente Mayor, I am happy to organize this visit.

The City of San Clemente continues to support the efforts of the U.S. Department of Energy (DOE) to proceed with the creation of a permanent spent nuclear fuel repository as tasked by the Nuclear Waste Policy Act of 1982. The City further supports the current congressional effort in H.R. 3643 (Interim Consolidated Storage Act) that would be a critical step towards removing the waste from the California coastline. We request your continued action on behalf of San Clemente to press the Federal agencies (DOE, NRC, etc) to further renew their efforts to find a real and lasting solution to our nation's nuclear waste problem.

We also believe your visit could result in sharpened policy push to recognize communities near nuclear stations that bear an elevated level of risk and this requires remedy. Six years ago, the Blue Ribbon Panel determined that the best way forward was to find communities that consent to becoming either a temporary or permanent repository. Since DOE has failed to address their lawful obligations to create a permanent spent nuclear fuel repository or develop any other solution, Southern California and San Clemente, by default, have become a permanent waste repository. This outcome is unacceptable to our residents and it demands remedy.

Finally, we appreciate that your staff has visited SONGS and made themselves available. At this time, we ask for your personal attention to the issue of nuclear waste storage. Please feel free to contact me for additional information, a discussion of dates, or other input.

Thank you in advance for your assistance.

Sincerely,



Tim Brown
Mayor
City of San Clemente

cc: Senator Dianne Feinstein
Congressman Darrell Issa
Kristine Svinicki, Chair of the Nuclear Regulatory Commission
✓ Community Engagement Panel, c/o Manuel Camargo, Southern California Edison
Sara Kaminske, Orange County Sheriff's Department
Aaron Rosen and Mike Rose, City of Dana Point
Kelli Gallion, San Onofre Nuclear Generating Station
Mike Beekman, Capistrano Unified School District
Tom Amabile and Ron Yonemitsu, County of San Diego
Lynn Mata and Jacob Green, City of San Juan Capistrano
Rich Haydon, California State Parks
Jeff Hoey and Rob Capobianco, Orange County Fire Authority
Peter Lawrence, Oceanside Fire Department
Johnny Wirsig and Thomas Kircher, Marine Corps Base Camp Pendleton
Cal OES Headquarters
Monic Ruzich, American Red Cross
California Highway Patrol
Members, San Clemente City Council
James Makshanoff, City Manager, City of San Clemente

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Emergency Managers Are Well Prepared If A Fukushima-Like Nuclear Incident Happens In The U.S.

**Ken Silverstein**, CONTRIBUTOR*I write about the global energy business.* [FULL BIO](#) ▾

Opinions expressed by Forbes Contributors are their own.



A reactor building and storage tanks for contaminated water at the Tokyo Electric Power Company Fukushima Dai- [+]

In late January and in the wee hours, Californians received a tsunami watch, triggered by a 7.9 earthquake in the Gulf of Alaska. That type of warning is underscored all along the Pacific coastline and especially in Southern California, given that it is the location of a now decommissioned nuclear plant — but one that still houses spent radioactive fuel.

To remind, Tokyo Electric Power Co.'s [Fukushima Daiichi nuclear plant crumbled on March 11, 2011](#). The earthquake didn't do it. But the resulting tsunami sure did. In that case, the powerful waves knocked out the backup power that cools the radioactive fuel rods. And without such power, the reactor's core suffers a meltdown and deadly radiation can escape.

As for Southern California generally, the structure is in place to deal not just with an incident at Edison International's San Onofre Nuclear Generating Station, or SONGS, but also with respect to all types of emergencies: wildfires, flash floods and earthquakes, to name a few. In all instances, the goal is to keep the calm, restore service and not place the lives of workers at risk while doing so.

The organizational structure collapses to facilitate decision making. Power is then shifted to a centralized disaster-response team whom is given the authority to carry out the mission. As such, "war rooms" form and meetings begin with key personnel. Together, the group decides whether resources will be deployed and if so, where and to what extent. Then it becomes a process of continually communicating the logistical strategy.

"We organize in much the same way: Someone is focused on planning, logistics, finance and mapping — and those units are all activated," Holly Crawford, director of the Office of Emergency Services for San Diego County told this writer. "There is an incident command system that creates an organization to promote efficiencies and chains of command."

To be clear, it is the job of the office of emergency services to be prepared in the event of a worst-case scenario — to do "consequence management." That office does not have oversight of the nuclear plant. Rather, it is part of a broader team that comes together during crisis training and that has regular meetings, and even simulates disasters to ensure everyone knows their role.

In the Heat of Battle

The real lessons are learned in the heat of battle. Those charged with securing the safety of the broader public set aside their daily routines and instead, go into emergency mode.

With regard to SONGS, the emergency contingencies have changed because the plant is no longer running. Now, of course, the spent fuel is getting transferred from "wet storage" where the rods that house it are getting cooled in pools to "dry storage" where they will be put in concrete-encased steel cask and buried

underground. What it means is that the Federal Emergency Management Agency no longer evaluates the emergency drills at the plant.

To prepare, San Diego County works with offsite partners that include [Southern California Edison](#) that owns SONGS, Orange County and the marine corps base at Camp Pendleton, says Tom Amabile, senior emergency services coordinator for San Diego County, in an interview. The SONGS facility itself has an annual test of its policies and procedures. San Diego County takes part.

“We have in place all the response mechanisms for when the plant was operational,” Amabile says. “We always verify — independently — what the plant is telling us. We need to do that before we can make a decision. If there was an incident because of movement of the spent fuel, we would respond accordingly by sending out teams, monitoring the area for radiation and offering assistance. We take whatever actions are necessary.”

The last real-life drill occurred in May 2014 during the Lilac wildfires. While several fires burned simultaneously, extensive planning and training served to mitigate an already bad situation — one that forced more than 121,000 people to evacuate their homes. And after that emergency, the county adjusted its processes and made improvements to such things as regional collaboration, which includes personnel from 45 different local, state and federal agencies.

Nuclear Plants Move Forward

As for the nuclear energy industry, it is primarily regulated by the Nuclear Regulatory Commission, or NRC. After the 2011 Fukushima disaster, it evaluated the seismic hazard for all such plants including SONGS. One of its main findings had been to require auxiliary water that would not just keep the fuel rods cooled down but that would also be used to keep the generators running to prevent a massive power outage. Generally, all plants also undergo continual preventive and corrective maintenance, including equipment replacement.

Because SONGS has been decommissioned, the aim is to now ensure the [safe storage of spent fuel](#) inside of the dry cask storage. To that end, activists have expressed concern that the walls of the containers are too thin and that the canisters themselves only have a 40-year lifespan. They would like to see thicker canisters that have 1,000-year lives.

“Dry storage has had no release of radiation that has endangered the public or the environment,” says Crawford, with emergency services in San Diego County. “It is

the responsibility of the NRC to license which dry cask storage will be approved. According to it, the cask must be able to resist earthquakes, projectiles, tornadoes and temperature extremes.”

Japan’s nuclear accident struck a nerve with anyone who lives near a nuclear power plant. And both the industry and its regulators have sharpened their safety protocols. While SONGS has been decommissioned, those responsible for emergency management are operating on all cylinders and are prepared to step up to any potential challenges.