October 18, 2018

To: Todd Prodanovich, Editor
Surfrider Magazine

Fr: Donna Gilmore, Systems Analyst
Founder, SanOnofreSafety.org
San Clemente, CA 92672
949-204-7794
donnagilmore@gmail.com

San Onofre Spent Nuclear Fuel isn't going anywhere and is unsafely stored

I appreciate your efforts to find and share the truth in your October 17, 2018 article "*The Truth About San Onofre's Nuclear Waste*". However, until this highly radioactive spent nuclear fuel is stored in containers that don't crack, and in containers that can be inspected, maintained and monitored to prevent leaks and explosions, nothing else matters. That is not happening. Worse yet, Edison has no plan in place to stop leaks and explosions or replace failing canisters.

Southern California Edison and the Nuclear Regulatory Commission (NRC) have made finding the truth difficult. Your article contains misleading information from Southern California Edison and from others who are not fully knowledgeable about San Onofre and other U.S. spent nuclear fuel storage and transport issues. I have done the deep dive to find the truth. Some of this is shared below. More facts and sources at SanOnofreSafety.org.

I agree with Dan Stetson's comment: *I really wonder whether or not it will be moved in our lifetime," Dan Stetson, the Vice Chairman of the San Onofre Nuclear Generating Station (SONGS) Community Engagement Panel, tells me over the phone. "I think, realistically, those canisters are going to stay at San Onofre."*

There are legal, technical and political reasons why this waste will likely be here indefinitely. Therefore, it is critical this waste be stored safely. That is not happening. And the waste needs to be cooled for decades (up to 45 years from when it came out of the reactor) before the radiation levels and temperatures are low enough to meet transport regulations. There are other transport and storage issues not addressed here, but I've included some of the most important ones.

Nuclear waste is stored unsafely due to Edison and Nuclear Regulatory Commission mismanagement
Most elected officials and the public trust the Nuclear Regulatory Commission (NRC) and do not know that Southern California Edison and the NRC are allowing unsafe nuclear waste storage. They are allowing this highly lethal nuclear fuel waste to be stored in thin-wall stainless steel canisters, only 5/8" thick, that are vulnerable to short-term cracks, leaks and explosions. These thin-wall canisters cannot be inspected for cracks, inside or out. They cannot be repaired, maintained or monitored to prevent or stop leaks or explosions. *You wouldn't buy a car that couldn't meet those basic common-sense safety requirements*. This isn't nuclear science. It's bad engineering.

Edison has no system in place to stop cracks or leaks or replace failing canisters, even though their license requires the ability to return the fuel waste back to the pool. The NRC knows this, but is ignoring it. Instead, Edison plans to destroy the pools without having another method to deal with failing canisters. The false assumption is "nothing can go wrong".

Promised legislation will make the problem worse
The legislation that Edison endorses that promises to move San Onofre nuclear waste to Texas, New Mexico, Nevada or elsewhere is fatally flawed. Most legislators and the public do not even know what is in these nuclear waste bills and do not know the NRC is approving unsafe nuclear waste storage containers.

H.R. 3053, passed in the House and pending in the Senate:

- Removes critical safety requirements from the current law, the Nuclear Waste Policy Act of 1982. It relies on the NRC to protect our safety.
- Removes federal, state and public rights for oversite, input and transparency.
- Allows Edison and others to transfer ownership to the Department of Energy (DOE) right where the waste sits today.
- Current mandatory waste funding will no longer exist. Instead, we will be at the mercy of Congress to allocate funds to safely store and manage this waste. Their track record and the DOE track record shows inadequate funding and major leaks at existing DOE nuclear waste sites.
- It removes Nevada's utility rights, including water rights, preempting all other federal and state laws.
- It ignores transport infrastructure issues and safety problems.
- It eliminates environment reviews of all proposed sites, preempting states' rights.

San Onofre nuclear waste
There are 29 Holtec thin-wall canisters already loaded with highly radioactive spent nuclear fuel. Each canister holds roughly a Chernobyl nuclear disaster's worth of Cesium-137 and other lethal radionuclides. There are 44 more Holtec canisters planned for loading.

There are 51 Areva NUHOMS thin-wall canisters loaded, 50 with spent nuclear fuel and one with other types of dangerous nuclear waste (referred to as GTTC). Some of these canisters are already 15 years old. An additional 12 Areva canisters are planned for GTTC nuclear waste.

The Areva canisters may already have many cracks, but since Edison has no way to inspect for cracks, we have no idea how many cracks there are or how deep the cracks are.

Edison's real plan appears to be to hide high radiation levels and hope the canisters don't explode
Shockingly, the NRC is complicit. They are amending licenses so these nuclear waste generators no long need to report peak radiation levels from the outlet air vents of the concrete modules storing the canisters. This is where levels will be highest with leaking canisters. There are high readings from some of the older canisters, but the NRC refuses to tell us why. Edison is hiding the current amount of radiation and other toxic material that is being released at San Onofre into the air, ground and ocean. The NRC is complicit. We won't know which way to run… or surf.

Edison has a history of hiding radiation leaks.
Decades ago Edison's Santa Susana nuclear reactor in Southern California had a meltdown due to Edison mismanagement. Edison hid for over 20 years that they released major amounts of radionuclides into the Simi valley communities. It's still not cleaned up. A student found this evidence at the UCLA library. That is the only reason the public found out. The government was complicit in hiding this.

Edison hid for 17 days that the radioactive releases from a defective San Onofre Reactor Unit 3 steam generator went into the environment. The NRC finally reported it, so Edison had to come clean.

Requests to have public access on-line radiation monitoring near the canisters are being ignored. What are they hiding?

The only solution left to protect California is stop loading thin-wall canisters and use thick-wall casks
Proven thick-wall casks must be used to store **all** San Onofre nuclear waste. Thick-wall casks (10" to 19.75" thick) provide monitored retrievable fuel and containment. They are designed to be inspected, maintained, repaired and monitored to prevent radioactive leaks and explosions. Casks should be stored in hardened buildings for additional environmental and security protection. Continuous on-line radiation monitoring with public access must be required.

Thick-wall casks are designed for both storage and transport. Thick-wall casks have bolted lids (instead of welded lids), so contents can be inspected to ensure they are maintained safely for storage and transport. Expensive thin-wall canisters have welded lids, so cannot be opened without destroying the canisters. Partially cracked canisters are not safe for transport.

Thick-wall casks are the international standard. Casks survived the 2011 Fukushima tsunami and 9.0 earthquake in Japan. Thin-wall canisters with partial cracks have no earthquake seismic rating. Thick-wall casks are used in Germany and most countries. France sells the U.S. the thin-wall canisters, but only uses thick-wall casks in their country. Thick-wall casks are sold in the U.S., but Edison refused to even allow bids of thick wall casks. Instead, they make numerous misleading claims as to why they didn't choose them. The reality is they want the fuel out of the pools fast because of the high overhead cost of maintaining the pools. They bragged about this in a trade article. Holtec promised them the quickest timeframe for unloading fuel into dry storage.

Holtec canister problems may cost us Southern California
Edison was warned about problems with Holtec, but chose to use them anyway. Holtec loaded over half the canisters at Diablo Canyon nuclear plant incorrectly. Holtec has a history of quality control problems. History repeated itself at San Onofre. The first Holtec canisters loaded had defective basket shims. These shims are need to prevent criticalities and keep the fuel cool so it doesn't overheat. Holtec loaded four of these defective canisters at San Onofre before noticing a loose bolt in one of the empty canisters. Holtec changes the design of the shims, but didn't tell the NRC or Edison or the other facilities that received these defective canisters.

Tom Palmisano, Edison Chief Nuclear Officer, admitted the loaded defective canisters could not be unloaded back into the pool, even though this is a requirement of their NRC license (Condition 8). Palmisano said the canisters are too hot (200 to 300 degrees Celsius) to be returned to the pool. Water boils at 100 degrees Celsius. In spite of this admission, the NRC still allowed this loading to continue. The NRC knew when they approved the loading of hotter canisters that this would be the result, but approved the higher heat loads anyway. The NRC has yet to provide the results of their "investigation" of this defective basket shim issue. However, numerous other facilities have been using these Holtec canisters since 2016. Those of us in the know refer to the NRC as Nuclear Rubberstamp Commission.

One of the days we almost lost Southern California
A whistleblower, David Fritch, spoke out about the almost drop of a bare 49-ton Holtec canister 18 feet. This happened more than once, he said. However, Edison did not share this information with the public, or formally report it as an "Event" with the NRC. Instead, Tom Palmisano (Edison) told the public they were giving their workers a must needed break.

An NRC Event Notice Report (#53605) was not made by Edison until September 14th for this August 3rd event. The NRC states in this notice that the Holtec "*VCT [Vertical Cask Transporter] was no longer capable of mitigating the consequence of an accident, and there was no redundant equipment available and operable to perform the required safety function*."
https://www.nrc.gov/reading-rm/doc-collections/event-status/event/2018/20180917en.html

Edison then admitted this almost drop, but claimed the canister could have survived the **18-foot drop**, or even a larger drop. However, the Holtec NRC approved specifications state a canister drop of over **11 inches** inside a transfer cask requires the contents of the canister to be inspected. This canister wasn't even in a protective transfer cask. The NRC said a dropped canister in a hole was never evaluated because they didn't think it could happen. Now they know better, but history has shown Edison and the NRC prioritize profits over safety.

The NRC is investigating this almost drop, but is ignoring the many questions the public has asked. Fritch said the canister was caught on a lip of a canister guide ring inside the hole. That lip should have not been there. This is a bad engineering design. Fritch also said every one of the 29 canisters loaded is unavoidably scraped and banged against that steel guide ring as it's being lowered into each hole.

This means all 29 canisters have pit corrosion cracking. Rather than a safe loading system, this is a "crack initiation" system. Once a crack starts in stainless steel canisters, the NRC states cracks can grow through the wall in 16 years. This assumed a canister temperature below boiling point. However, in hotter canisters cracks grow much faster. No one has addressed this issue.

Explosion risks in each canister – even without cracks
Spent nuclear fuel canisters are vulnerable to hydrogen gas explosions, according to the Nuclear Waste Technical Review Board (NWTRB) December 2017 report to Congress. The thin-wall canisters are pressure vessels, yet have no pressure monitoring or pressure relieve valves. This will cause canisters to over pressurize and explode. This is one a number of conditions that can cause canisters to explode.

Thin-wall canisters do not meet ASME standards
The NRC allows exemptions to critical ASME standards (American Society of Mechanical Engineers). Thin-wall canisters don't or cannot not meet them, so NRC gives numerous ASME exemptions that benefit industry profits, but reduces our safety. Thick-wall casks can meet ASME standards and other safety standards.

Increased explosion risks from high burnup fuel
The NRC allows high burnup fuel in spite of the known storage and transport risks. High burnup fuel is low enriched uranium fuel that burns longer in the reactor. This damages the fuel rods, uranium fuel pellets and fuel assembly baskets. The rods (most are zirconium), the uranium fuel pellets and fuel assembly baskets metal structure become damaged and creates metal hydrides. Zirconium hydride, when combined with air, will result in hydrogen gas explosions. Zirconium hydride powder and gas explode at 270 degrees C. Uranium hydrides will also ignite. Once uranium ignites, it will continue to

reignite as the temperature increases. Most “experts” are not aware of the high burnup hydride issues, so assume cracking, leaking canisters will not explode. High burnup fuel causes the fuel rods (cladding) to become brittle. The NRC is still studying whether normal train vibrations will cause the rods to fail.

Chernobyl nuclear disaster in each canister

Each canister contains roughly the amount of Cesium-137 and other radionuclides as release from the 1986 Chernobyl nuclear disaster. Explosions will trigger major releases of radionuclides and Edison has no plan to prevent or stop this. Instead, they downplay the risk, but provide no credible evidence of their claims. With explosions, Cesium-137 and other radionuclides will disperse in air, ground and water. It will go wherever the wind takes it. Chernobyl is still a wasteland. Chernobyl radiation traveled around the world. They still cannot eat reindeer in Finland due to the Chernobyl radiation in the mushrooms.

Hydrogen gas explosions occurred at Fukushima in March 2011 after the meltdown of three reactors when the fuel overheated. The “experts” said that could never happen. There are still three American-made Fukushima Daiichi nuclear reactors out of control in Japan. No one knows how to stop this. It’s a continuing disaster, spreading radioactive materials throughout the environment, including the Pacific Ocean, the air, food, water, sea life and elsewhere. It’s an economic and health disaster with no good solutions. Prevailing winds send the radiation in our direction.

When and if these “Chernobyl cans” start exploding, there is no emergency plan other than permanent evacuation. We are running out of time. We need all hands on deck to help change the way nuclear waste is stored at San Onofre and elsewhere in California and the rest of the United States.