Citizens' Oversight Projects (COPs)
771 Jamacha Rd #148
El Cajon, CA 92019
CitizensOversight.org
619-820-5321

August 21, 2018

California Coastal Commission
Dayna Bochco, Chair
cc: Commissioners and Staff
45 Fremont Street, Suite 2000
San Francisco, CA 94105- 2219

Greetings:

We have some serious concerns regarding the San Onofre Nuclear plant Independent Spent Fuel Storage Facility (ISFSI) which the California Coastal Commission (CCC) permitted in a vote on October 6, 2015. These concerns relate to issues that have arisen after our settlement agreement (of the lawsuit Citizens Oversight vs. California Coastal Commission) took effect in 2017.

Citizens Oversight requests that the CCC invoke a formal investigation, including a full-stop to all movement of spent fuel until these issues are fully resolved. Your investigation should include a thorough safety review and report in concert with oversight by the Nuclear Regulatory Commission.

The issues we are concerned with are as follows:
1. NEAR MISS INCIDENT: Safety inspector and whistle-blower David Fritch spoke at the 9 Aug 2018 Community Engagement Panel (CEP) meeting in Oceanside. Fritch described a near-miss incident where a fully loaded (approx. 104,000 lbs) spent nuclear fuel canister (multi-purpose canister, MPC) was held by only 1/4 inch from falling 18 feet into the underground vault.

Fritch, an OSHA inspector who has been working on the San Onofre site where spent fuel is being moved to the underground spent fuel storage installation only 100 ft from the water's edge, said that the workers thought they had lowered the canister into the underground vault, only to find out that it had become lodged on a guide ring.

Fritch's full remarks and the initial SCE response to them at the meeting can be viewed in the meeting video [1]. His comments are attached to this letter. See also media coverage [2].

The facts broached by the testimony of Fritch at the CEP meeting have been corroborated by Southern California Edison (SCE). The workers had moved a canister full of spent fuel assemblies inside a Holtec "HI-TRAC" transfer cask using a transporter that can both lift the canister and transfer cask and roll them over to the underground vault where the canister is to be placed. Steel, lead, and water are the principal shielding materials in the HI-TRAC transfer cask so workers can work near the MPC without receiving a fatal dose of radiation.

Once over the underground vault, the bottom of the transfer cask has a sliding door that can move out of the way so the MPC-37 canister (approx. 104,000 lbs) can be lowered into the vault. (Figure 1).

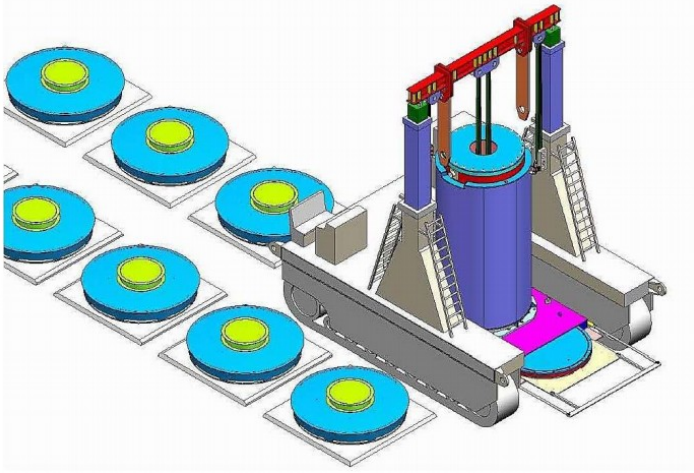


Figure 1: Transporter lowering an MPC canister into an underground vault protected by Transfer Cask

The rigging holding the canister lowered all the way, and workers thought the canister had successfully been lowered into the vault. However, the bottom of the canister had become lodged on the top of the alignment ring, which exists about four feet from the top of the vault, and the MPC canister was only barely held by about 1/4 inch from falling about 18 feet into the vault. (Figure 2).

Apparently, the workers then took radiation readings, were concerned that the readings were too high, and then discovered that the canister was teetering on the alignment ring. They pulled the canister up with the rigging and re-centered it, and then successfully lowered it into the vault. Fritch also said that this was at least the second time this issue had come up.

Some have commented that there was no risk to the public in this near miss incident. We disagree. This event could have been a major disaster, and it is one that has not been adequately modeled nor is there any plan to deal with it.

The NRC reviewed a mathematical model of a drop test of a canister devised by Holtec [3] Also, Brookhaven National Labs published this more detailed model [4].

Although the model devised above included a drop of the canister inside the HI-STORM (above-ground) shell, this analysis was limited to a drop of **only 12 inches, not 18 feet.** The other aspects of that report were regarding drops of the HI-TRAC transfer cask holding a canister. Those models considered larger drops of up to 100 feet. But in those modeled drops, they considered that the contained canister was a "rigid cylinder" and they did not consider the damage to the MPC itself. If you've heard of drop tests of "30 feet", these tests include the transportation or transfer cask which provide structural support and/or impact limiting.

As a trained engineer, my thoughts are as follows. First, models can be wrong, as they have never been validated by any actual drops of fully loaded MPC-37 canisters to see what would happen. But intuition says that if the 104,000 lb, 5/8" thick stainless steel canister had fallen the 18 feet, it would have suffered substantial damage, particularly at the bottom which takes the full weight of the rest of the cylinder.

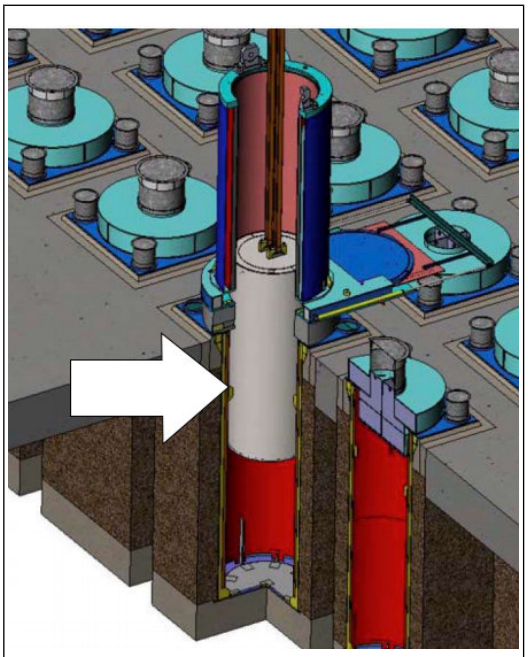


Figure 2: Arrow shows location of alignment ring which was supporting the entire 104 ton mass on about 1/4" from falling about 18 feet into the vault.

The containment may have been breached (most likely at the weld to the base plate), and it very likely would have become wedged in the bottom of the vault (because the sides of the cylinder may have bent in and out or bent to one side). This would have damaged the air vents of the underground vault, perhaps crushing them and eliminating any circulating air. Then, the fuel may quickly overheat. If the fuel assemblies inside were also compromised, there is a risk that a critical reaction would have been sustained. It could have resulted in a meltdown or explosive scenario, contaminating the coastal area for many miles. It is unclear how anyone could then get the crumpled canister back out of the underground vault even if the canister containment boundary is not compromised.

We have learned from statements of Tom Palmisano that perhaps the #1 safety consideration with spent fuel, is the avoidance of a "criticality event," that is, an extremely rapid increase in radioactivity, and consequently in heat output, and consequently in pressure, resulting in an explosive environment which would blow apart the gathered uranium as well as the cask itself, spewing radioactive particles in highly transportable, inhalable, and ingestible form (i.e., small particles which can be carried many miles by the wind). Since there is no rebar between the casks in the cement ISFSI island (only on the top and bottom of the ISFSI), this might result in deformation of the cement into adjacent vaults, causing a breach and possibly another criticality event in those adjacent casks, and possibly a cascading series of criticality events in the entire ISFSI.

These mistakes place the population of approximately 8.4 million residents around the facility at extreme risk of a major disaster, as well as likely radioactive contamination of the ocean and beach areas around the facility. Of concern also was the fact that Edison did not disclose this near-miss at their own meeting and it seems such events have happened at least one other time, also not disclosed. Edison has no plan for what to do if a real disaster should unfold.

Fritch also listed a number of concerns regarding the dismal safety culture at the plant. He said they were under-trained, under-staffed, and did not communicate lessons learned to subsequent workers.

2. CHANGED COMPONENTS:
Secondly, we learned at the March 2018 CEP meeting that Holtec had modified the MPC canister system by changing the design of the ends of the "shim" blocks, which are open to encourage circulation of the helium inside the canister. The design was changed from a more robust end with cut-outs to a flat cut design with stand-off pins. SCE reported that they discovered some loose pins in the bottom of a canister.

Holtec apparently changed the design without informing their customers or the NRC.

We note that the two issues combined would have caused even worse problems. That is, if the pin design was used, coupled with the near miss drop, then these pins would surely bend or break off and the canister would more quickly overheat due to lack of internal cooling circulation of the helium.

3. NO ACCIDENT SCENARIO PLANS: Coupled with these two issues is the lack of any plans for what to do if such an event were to occur. The response by SCE representative Tom Palmisano to the question regarding what they would do had the canister actually fallen the 18 feet (see [1]) was that they would take readings, make reports, and then figure out what to do. We find this lack of pre-laid plans appalling. We have also learned that moving a compromised canister back to the spent fuel pool is problematic, as reflooding a very hot canister is a tricky and dangerous proposition that may result in cracking the cladding due to the sudden temperature changes. However, it has been a standard assumption in the nuclear industry that a pool would be available at the dry storage site and used to stabilize a failed or compromised canister. [5]

It is important to note that the Holec spent fuel dry storage systems use components that are used at various stages. The innermost MPC itself provides only containment and does not provide shielding nor sufficient structural robustness for transportation or storage. The system provides shielding during transfer to the ISFSI through the use of the Transfer Cask (HI-TRAC) which surrounds the MPC when the spent fuel assemblies are first loaded. Then, this is transported to the U-MAX underground ISFSI. It is at this stage of handling the MPC canister, lowering it into the underground vault, that we find the canister has no additional protection from the fall. Also, when the canister is removed from the ISFSI and loaded back into the Transfer Cask, we again have the risk that it might fall into the vault. Then finally, when the MPC is removed from the Transfer Cask and moved into the Transportation Cask (Holtec HI-STAR 190), we have a similar highly risky period when the MPC is not yet protected by the transportation Cask. These transitions include manipulations of the MPC alone, and mean that risk factors will be higher. All these transitions should be included in the review process which should occur at this juncture. We notice that these critical transitions are not adequately covered by NRC human factors documents. [6]

Therefore, Citizens Oversight calls on the Coastal Commission to open a formal investigation into the situation. including the following:

1. **STOP:** A full-stop on any further movement of spent fuel to the underground facility until a full analysis, report, and corrective actions are defined and taken.

2. **REPORT:** SCE must report this incident to the Nuclear Regulatory Commission (NRC) and conduct an analysis to determine how these mistakes occurred. The NRC should also let us know why they were unaware of this incident, and why such incidents are not reported. This review should extend to any possible similar accidents that may occur during the sensitive transitions of the MPC from one enclosure to another.

3. **DISCLOSE:** SCE should disclose all prior similar events, including the one referenced by Mr. Fritch, and any other "mistakes" made by their staff during the spent fuel loading operation. The Coastal Commission should provide oversight to insure all issues are being addressed appropriately by the NRC.

4. **RESPOND:** SCE should provide a response to the claims that they are under-staffed, under-trained, and have a poor safety culture, including steps to be taken to become safety oriented.

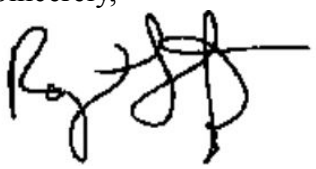
5. **PLAN:** Since this is a known failure mode, SCE should explain the steps they would take to deal with the problem, assuming the worst, that the canister would have fallen, been stuck in the vault, breached the containment boundary, and proceeded into a meltdown or explosive scenario. It is

unacceptable to hear yet again from Tom Palmisano of SCE that they would "evaluate the situation and decide what to do at the time." And if the spent fuel pools are demolished, as they propose, then how can the intensely radioactive spent fuel be repackaged?

6. **REDESIGN:** Holtec should change their design of the spent fuel system so it is impossible for a canister get stuck in the lowering process, and improve observability during that process so there can be no confusion as to the state of the canister at all times. Also, all other transitions, when the canister is moved from one containment to another, are critical and must be addressed with specific plans.

California Coastal Commission, please take your responsibility as the permitting agency for the coastal region. Since you approved the permit for the ISFSI, please immediately open your investigation as described above.

Sincerely,



Ray Lutz, Engineer
Citizens' Oversight Projects (COPs)
619-820-5321

More Information:
[1] Video of the CEP meeting with Fritch's comments and response by SCE, as well as other references on this issue: http://www.copswiki.org/Common/M1870

[2] San Diego Union Tribune Article: http://www.sandiegouniontribune.com/business/energy-green/sd-fi-songs-whistleblower-20180810-story.html

[3] Preliminary Safety Evaluation Report, Docket No. 72-1040, HI-STORM UMAX Canister Storage System, Holtec International, Inc., Certificate of Compliance No. 1040" which can be accessed from the NRC ADAMS document repository: https://www.nrc.gov/docs/ML1412/ML14122A441.pdf

[4] Impact Analysis Of Spent Fuel Dry Casks Under Accident Scenarios, Brookhaven National Labs (2003) https://www.bnl.gov/isd/documents/25144.pdf

[5] Macfarlane, Allison "Interim Storage of Spent Fuel in the United States", Annu. Rev. Energy Environ. 2001. 26:201–35, "The waste handling building will need at least one pool in the event of failed casks, failed spent-fuel assemblies, or earthquake damage." http://web.mit.edu/stgs/pdfs/annurev.energy.pdf

[6] Sandia National Labs & NRC, "Preliminary, Qualitative Human Reliability Analysis for Spent Fuel Handling", NUREG/CR-7017, https://www.nrc.gov/docs/ML1105/ML110590883.pdf Sec. 7.2 "Dropping a Cask"

TRANSCRIPT OF DAVID FRITCH STATEMENT AT 9 AUG 2018 CEP MEETING

Thank you, my name is David Fritch. I'm a worker on the ISFSI project. I work in the spent fuel project – F-R-I-T-C-H. I do industrial safety, so OSHA stuff, not nuclear stuff, but I'm out there.
And uh, I may not have a job tomorrow for what I'm about to say, but that's fine. Because I made a promise to my daughter that if no one else talked about what happened on Friday, that I would.

About 12:30, August 3rd we were downloading, and the canister didn't download, but the rigging came all the way down. There were gross errors on the part of two individuals. There were gross errors on the part of two, two individuals, the operator, and the rigger, that are inexplicable.

So what we have is is a canister that could have fallen 18 feet. That's a bad day. That happened. And you haven't heard about it. And that's not right.

My friend here is right, public safety should be first. And I've been around nuclear for many years. It's not. Behind that gate, it's not.

Here's a few things that I've observed in the three months I've been here. SCWE, um, the Safety Conscious Work Environment, where people are constantly given encouragement to raise concerns. It's not repeatedly or even, I've never even received SCWE training since I've been on site. That's not standard for a nuclear site.

Operational experience is not shared. That problem had occurred before, but it wasn't shared with the crew that was working.

We're undermanned. We don't have the the proper personnel to get things done safely.

And certainly undertrained. Many of the experienced supervisors, what we call CLS's, Cask Load Supervisors, once they understand the project and how everything works, are often sent away, and we get new ones that don't understand as well as even the craft, basic construction craft. And a lot of them who haven't been around nuclear before are performing these tasks - not technicians, not highly trained, not thorough briefs.

This is an engineering problem. What happened is, inside of that cask there's a guide ring about four feet down. And it's to guide that canister down correctly to be centered in the system. Well, it actually caught that. And from what I understand, it was hanging by about a quarter inch.

So, obviously, the point is clear. As people said, Edison is not forthright about what's going on. I'm sure they'll tell you that they were going to bring this out once it was analyzed, et cetera, et cetera. I'm sure they're preparing what they would answer if it comes out.

I came here tonight to see if this event would be shared with the community. And I was, I was disappointed to see that it was not.

And I want to thank the community of San Clemente. It's a beautiful, wonderful community with amazing people. You've been great to me. My family's here with me for the month.

Unless Edison and Holtec commit to defining success on this project as safety, and I'm not, I'm not talking about any of the concerns voiced today, I'm just talking about downloading – getting the fuel out of the building safely.

Are we going to address what would have happened to that canister if it would have fallen? Even if the shell wasn't penetrated, now will, will they take it in a repository site?

The question is, will, will Edison and Holtec commit to defining success primarily in terms of nuclear safety. And there will there be transparency, commitment to safety, and the financial commitment to make sure that it's done successfully. Thank you.