

February 13, 2017

Questions from the public for Scripps, Aecom and Energy Solutions

The following is an attempt to summarize the concerns and related questions the public has regarding the storage of highly radioactive nuclear waste being buried at San Onofre. I've prioritized them here based on the primary topic of earthquakes and tsunamis, followed by questions for the new contractors.

There seems to be agreement on the major threats to public safety from a radiological disaster at the San Onofre Nuclear Generating Station (SONGS). The greatest immediate danger is from an accident in the over-crowded spent fuel pools resulting in an unstoppable plume of radiation. Second is from a radiological incident involving dry cask storage where damaged fuel assemblies could cause a critical nuclear reaction. Third is from transporting nuclear waste that can't be inspected for damage prior to attempting to move it. All of these threats could emanate from a natural disaster, human error or terrorism.

EARTHQUAKES / TSUNAMIS

If an earthquake or tsunami damages the pools or pumps it may only be a matter of hours before unprotected fuel assemblies overheat to the point where their zirconium cladding bursts into a fire that can't be extinguished with water.

How long would it take to put out such a fire? How much radiation could be released in a worst case scenario? How would you put it out? Do you have the capability on site now to deal with such an event?

The Newport/Inglewood fault appears to be connected to the Rose Canyon fault coming up from San Diego. It seems that the likely breaking point is right at San Onofre, following the contours of an underwater ledge that is over 700 feet tall and twenty five miles long, (see documents provided in advance for this discussion).

How large could the wave be from that much displacement if there was an underwater landslide? How long would it take to reach San Onofre? How long can dry casks survive being submerged? Once breached, would the sea wall actually keep the site submerged longer? Would backup systems for spent fuel pools be able to survive such an event? How long overdue is this area for having the next big earthquake or tsunami?

When we discovered that the USGS was now predicting the next big quake could easily exceed the 7.0 magnitude design limitations at SONGS, Edison suddenly stopped referring to the Richter Scale. Now they tell us what the plant can withstand in peak ground acceleration, but it is not clear how that compares to the Richter Scale.

If new evidence points to even a remote possibility that there could be a catastrophic nuclear event coming from the long overdue earthquake, shouldn't Edison's plan have to take that into account right

now? If the SONGS facility was designed to withstand a 7.0 but could get hit with at least an 8.0 (ten times larger but over thirty times stronger), is the public expected to believe that we are within safe limits just because the threat is now being expressed in terms of peak ground force? Can a slip fault cause an underwater landslide just as easily as a thrust fault? Could a major earthquake cause the partially buried dry casks to shift at their mid-point, resulting in them being lodged in a way that makes them irretrievable? What would be the eventual impact on Southern California if these casks can't be moved before they begin to fail? How severe would the impact be on our property values if there was any kind of serious problem at San Onofre and how would we be compensated? Could Dr. Driscoll explain what he thinks went wrong when other seismologists grossly underestimated the potential for the tsunami that resulted in the ongoing meltdown in Fukushima?

HUMAN ERROR/TERRORISM

SONGS has the worst safety record in the nation, and had many close calls including the leak that finally ended operations at the plant. Whistle blowers have accurately predicted such things and even with the plant shutdown, still express concerns over improper handling of spent fuel. One high ranking employee recently claimed that spent fuel assemblies that were thought to be intact, may actually have experienced damage before being loaded into dry casks.

What would be the impact of an improperly loaded cask having a nuclear reaction in dry storage? How would such a crisis be dealt with? Why should fuel pools be destroyed as soon as they are empty, instead of when the last of the nuclear waste is actually relocated, making it possible to reload a damaged container if needed?

In 2012, there was an unsolved case of sabotage to back up generators. In the near future, thousands of new employees will have access to this prime terrorist target.

What came of the sabotage investigation? What is being done to screen all employees that may wish to do us harm? Why is there no longer a no-fly-zone at SONGS? Do we have the ability to shoot down an airplane that suddenly veers towards SONGS? Could we take down any weaponized drones that approached as well? Are the critical security systems, communication devices, pumps and control valves adequately protected from cyber attacks?

It is common knowledge that dry casks were only designed as temporary nuclear waste storage containers. Now that there is nowhere to take the waste after 50 years of trying, we are told that these containers are good for hundreds of years or longer if that is what is needed. There is evidence that there are problems with half inch stainless steel canisters cracking in as few as 17 years, due to their exposure to our salty marine environment. Even Dr. Kris Singh, CEO of HOLTEC, who makes the nuclear waste containers, says they are known to crack and there is no practical way to repair them. They can only be placed in a larger cask as a temporary solution. It is not even clear if they can get close to work on them, when according to Dr. Singh, even a microscopic crack can emit millions of

curies of deadly radiation. They also lack any way to warn us of dangers since they can't be inspected for damage after being welded shut.

If we are lucky enough to escape harm while these canisters are still at San Onofre, how can we expect other communities to accept these "hot potatoes" when we are not even sure they are safe to move? Do we currently have the resources on site to transfer a leaking cask into a larger cask as recommended by Dr. Singh? Isn't it more logical to assume these canisters will need to be reloaded in better canisters before they can be safely relocated for what will still be rather long periods of interim storage? Shouldn't we be building a facility to reload canisters in a sturdy structure that can prevent leaks from getting into the environment while also preventing terrorist attacks and intrusion of our salty air? Can't we design better canisters that can be inspected, repaired and more easily transported in smaller, cooler, less conspicuous loads? Why are we moving forward with a plan that has not been peer reviewed by anyone other than Edison's experts or their "captured" regulators that arbitrarily approved long term storage at San Onofre?

Toxic chemicals to be used in decommissioning:

In a May 9, 2000 report (see attached) from the California Regional Water Quality Control Board, San Diego Region, the acceptable amounts of pollution that can be released into the ocean from SONGS can be seen in the following table.

Parameter	Units	6-Month Median	Daily Maximum
Arsenic	lb/Day	620	3,500
Cadmium	lb/Day	120	480
Chromium (Hexavalent) ^{7/}	lb/Day	240	950
Copper	lb/Day	130	1,200
Lead	lb/Day	240	950
Mercury	lb/Day	5	19
Nickel	lb/Day	590	2,400
Selenium	lb/Day	1,800	7,100
Silver	lb/Day	70	320
Zinc	lb/Day	1,500	8,600
Cyanide	lb/Day	120	480
Ammonia (as N)	lb/Day	55,000	270,000

Do tables like these actually mean that it is okay to release up to 3,500 pounds of Arsenic in a single day? Will the public be notified before these kinds of chemicals are discharged into our waters? Will radioactive waste also be discharged? What does Aecom and Energy Solutions anticipate being released into our environment during decommissioning and what is being done to minimize it? How does this future contamination get figured into the decision on whether or not to remove the huge pipes that will carry these contaminants out to sea? Do nuclear power plants built on the banks of rivers have to meet higher standards and restrictions due to higher concentrations in a smaller body of water?

These questions represent just some of the concerns I was able to glean from the public at this time. I'm sure there are many others I have missed, but I hope these will stimulate some constructive dialog leading to more protection for the general public and the environment at large.

Sincerely,

A handwritten signature in black ink, appearing to read "Gary Headrick".

Gary Headrick