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Hi Joe,

I have reviewed the SONGS Coastal Development Permit (CDP) application for environmental impacts that fall under the purview of the California Coastal Commission. To put the CDP in perspective, I also reviewed the SONGS Irradiated Fuel Management Plan (IFMP) for cost estimates that fall under the purview of the California Public Utilities Commission. Finally, I reviewed the Holtec UMAX licensing basis documents to determine if they supported loading the UMAX system in the proposed configuration.

Environmental Impact (California Coastal Commission):

Southern California Edison intends to expand their SONGS ISFSI using the Holtec UMAX Dry Cask Storage System (DCSS) system. This is a vertical cask underground system licensed by the NRC. Attachment 1, Sections 1.2.1 and 1.4.2 of the Coastal Development Permit (CDP) application describe the SONGS installation.

SONGS intends to use the Holtec UMAX system in a one-half underground and one-half above ground configuration. The excavation for the underground half is limited to 12.5 feet due to high groundwater level. The upper 12.5 feet is above ground and will be enclosed laterally by a free-standing earthen berm. The above ground portion will resemble a pyramid with the top cut off. The slope on all four sides is 45 degrees.

Any excavation underneath a decommissioned nuclear plant presents a potential for environmental damage, far in excess of that presented by an above ground facility. During decommissioning of Unit 1, three substantial concrete structures were identified approximately 8 - 10 feet below grade in the area of the new ISFSI footprint. Two of the structures supported the Unit 1 circulating water inlet pipes. The third structure supported the Unit 1 Containment Sphere. Also, SONGS installed a “LEGO” block retaining wall next to the old turbine building structure to restrain the heavy haul path during the Unit 1 ISFSI campaign. In 2008 when I was last there, SONGS had no plans to remove any of these structures. At that time, the plan was to expand the existing ISFSI over the top of these structures. Perhaps they have been removed since then, however no mention is made of them in the CDP application.

This is significant because Tritium was found in the ground water during Unit 1 decommissioning. Several sampling wells were dug and each high tide brought increasing Tritium concentrations. Although Tritium has a radioactive decay life of only 12.5 years, there may still be some left. I do not know if this was ever remediated. If not, excavation of the site to 12.5 feet and removal of any remaining underground concrete structures will disturb any residual Tritium and possibly return it to the groundwater.

Attachment 1, Section 1.4.2 of the CDP states that the excavated soil will be repurposed for the earthen berm. Any contaminated soil will then be exposed to the environment and gaseous tritium will become airborne.

Decommissioning of the ISFSI in 2049 will challenge the environment for a second time when the contaminated Cavity Enclosure Containers (CECs) must be removed and shipped off site for burial.

Costs (California Public Utilities Commission)

The SONGS Irradiated Fuel Management Plan (IFMP) was submitted to the NRC in a letter dated September 23, 2014 from P.T. Dietrick (SCE) to the U.S. Nuclear Regulatory Commission (ADAMS ML14269AO32). The SONGS IFMP estimates the total cost to construct the ISFSI to be approximately 396 million dollars. ISFSI construction costs around the country have recently run between 80 and 100 million dollars for a 50 unit storage facility. Although the SONGS ISFSI is 25% larger than most, the Holtec bid is 4 times the going rate for an ISFSI and is twice the NAC and Transnuclear bids. Also the SONGS IFMP estimate for decommissioning the ISFSI in 2049 is approximately 33 million dollars.

Attachment 1, Sections 1.3 and 1.5.3 of the CDP application state that in 2014, SCE was presented with several proposals for cask storage systems, including the Holtec UMAX system. Section 1.5.4 of the application states that two alternatives to the Holtec UMAX system were considered. These were:

- Expanding the existing Transnuclear horizontal storage system
- Installing a Holtec vertical storage system similar to the one in use at the Diablo Canyon Nuclear Station

The NAC Magnastor vertical cask storage system was also considered but not discussed in Section 1.5.4 of the application.

The two above ground technologies; the NAC Magnastor vertical storage system and the Transnuclear horizontal storage system were rejected early in the process because SONGS did not believe the seismic qualification of either system would meet the California Most Severe Earthquake (MSE) criteria of 1.5g horizontal (in two directions) and 1.0g vertical.

NAC had proposed a restraint system using bollards and Transnuclear had proposed banding 4 horizontal modules together to meet the MSE criteria. The CDP application is silent on these two alternative solutions to the MSE criteria, so I cannot determine if the SONGS position was technically sound.

Since the SONGS selection of the HOLTEC UMAX system is the primary driver behind the extraordinary costs, I strongly recommend that the California Public Utilities Commission request a copy of the SONGS analysis of the NAC and Transnuclear system seismic restraint systems to determine if the SONGS position was technically sound.

I also recommend that the California PUC investigate why the Holtec UMAX system is estimated to cost 4 to 4.5 times the going rate for an ISFSI.

Holtec UMAX Licensing Basis Documents (U.S. Nuclear Regulatory Commission)

The SONGS proposed configuration is not discussed directly or by inference in either the HOLTEC UMAX Final Safety Analysis Report (FSAR) or the NRC Safety Evaluation Report (SER). Therefore it is unlikely that the NRC considered this configuration during the licensing process. I have expressed my specific comments to the NRC. Details are provided at the end of this report.

At a minimum, Holtec will be required to submit an FSAR Change Notice to the NRC for review. If the FSAR change is not approved, a Certificate of Compliance (CoC) amendment will be required. This process could delay the project for up to 2 years.

Comments That I Have Expressed to the NRC:

1. Settlement:

One method to prevent settlement where bedrock is not available or reachable is the float system. Soil, equivalent to the weight of a fully loaded ISFSI, can be excavated. With this approach, pressure exerted on the soil by the installation is equal to the pressure exerted by the original soil, and the installation would not be expected to settle.

Comment:

The SONGS excavation is only 12.5 feet, which I suspect is far less than the weight of a 25 foot fully loaded ISFSI structure, with a 3 foot thick concrete Support Foundation Pad (SFP) and a 2 foot thick ISFSI pad. I am questioning whether the ISFSI structure will settle under its own weight. Attachment 1, Figure 6 of the CDP application shows that the base of the Support Foundation Pad (SFP) is 7.5 feet above Mean Low Water Level (MLWL). Figure 6 (revised) shows that the base of the Support Foundation Pad (SFP) is 5.4 feet above Mean Sea Level (MSL). Neither figure indicates the groundwater level at high tide, but if the two elevations are linear there will only be 3.5 feet of soil under the SFP at high tide. Has the soil strength at this depth been analyzed? Has the soil at this depth been analyzed for liquefaction during an earthquake?

2. Seismic Response:

Although I am not a seismologist, I would expect a totally underground system to move together as one unit during an earthquake. However the SONGS installation is not totally underground. Only one half is underground and the other half is above ground.

Comment:

I am concerned that the free standing earthen berm around the upper half of the installation will move independently of the lower half during an earthquake, creating a shear force between the two halves. If the shear force is substantial, the integrity of the Cavity Enclosure Containers (CECs) may be compromised. If the earthen berm slides or collapses, the radiation shielding around the CECs will be lost. Further, the support under the ISFSI pad may be compromised. Has this been analyzed?