

Community Engagement Panel
IFMP and May 22, 2014 Meeting
Responses to Comments and Questions

1. **HBF Storage:** What is the viewpoint on this matter from the nuclear workers association (comment by D. Victor)
 - **Response:** The Union has stated it currently does not have a position on canning undamaged HBF. However, if the canning process increases worker dose when it is not technically required, then the Union would reconsider its position.

2. **ISFSI Pad:** What is Edison's views on why the site is secure (comment by D. Victor)
 - **Response:** The San Onofre site, including the ISFSI, is under the same security requirements as when it was an operating plant. Security regulations are governed by the NRC and remains a part of the plant's licensing basis.

3. **Seismic risk:** What is the design of the SFP, regarding a seismic-introduced failure or disruption of the fuel prior to being moved to casks (comment by D. Victor)
 - **Response:** San Onofre's spent fuel pools are structurally robust, with hardened, steel-reinforced 3-foot thick concrete enclosures. The spent fuel pools are seismically designed to withstand a peak ground acceleration of .67g and are situated at a low elevation. Since 30 feet of the spent fuel pool is below grade (or sea level), this low elevation would further protect the fuel assemblies and the pool water inventory during a seismic event. This low elevation would also make it easier to add water if necessary.

4. **Casks that can store 32-37 fuel elements:** Is that Edison's view or do you think there is a case for smaller loadings of fuel assemblies as a matter of safety—if so, what is the safety/cost tradeoff? (comment by D. Victor)
 - **Response:** Spent fuel storage casks are designed and physically sized for safe storage, shielding and decay heat of the fuel. The capacity of the casks, whether for 24, 32 or 37 fuel assemblies, are regulated and licensed by the NRC.

5. **ISFSI Location:** The proposed location is between the oceanfront and the only coastal transportation corridor in a highly populated area (comment by G. Brown)
 - **Response:** SCE's current plan is to expand the ISFSI in its current location. A study was conducted, evaluating numerous locations - within the San Onofre Easement, the surrounding area of Camp Pendleton including the San Onofre Mesa location, and offsite areas. SCE concludes that the existing location best meets criteria of the most predictable licensing and permitting outcome, providing the quickest offload from wet to dry storage and most prudent cost to the ratepayer. See ISFSI Location Recommendation Position Paper for additional details.

6. **Decommissioning schedule :** The 20-year timeline for SONGS appears arbitrary and is NOT as important as ensuring the decommissioning process and dry storage facility is as safe (comment by G. Brown)

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- **Response:** Safety remains the top priority and San Onofre will ensure that the plant is safely decommissioned regardless of the timeline. The 20-year timeline is based on benchmarked studies from other recently decommissioned commercial nuclear plants and then scaled accordingly to San Onofre's size, with additional time added for uncertainties since planning is not complete. Using the information available, the 20-year timeline was developed to meet a safe, achievable and cost effective decommissioning of San Onofre.
7. **High Burnup Fuel:** I am concerned that the HBF fuel now located in the SONGS fuel pools will not be allowed to cool in the pools (comment by G. Stone)
- **Response:** The required cooling time is part of the design basis and licensing requirements for the dry storage system. No fuel will be transferred to dry storage without meeting the cooling time requirement contained in the cask license.
8. **Dry Cask Accident:** I see no mitigation plan in place if there is an accident with the dry casks (comment by G. Stone)
- **Response:** Dry cask accident analyses and mitigation strategies are described in the fuel storage system Safety Analysis Report and station procedures. Accident scenarios of the dry cask system would not be described in the IFMP.
9. **Dry Cask Accident:** I see no margin in the budget if there is an accident with the dry casks (comment by G. Stone)
- **Response:** NRC regulations require that SONGS maintain insurance to cover damages for any on-site property damage and environmental clean-up costs resulting from an accident, including an accident associated with dry cask storage. The current minimum insurance requirement is \$1.06 billion. Given these required resources to deal with accidents, the NRC does not expect that budgeting for accident scenarios would be described in the IFMP.
10. **IFMP General Comments** (comments by T. Quinn and R. Macpherson)
- Plan appears to meet the requirements in 10 CFR 50.54 (bb) - will need to be updated also as any changes are made
 - The plan appears to be very similar to the Dominion-Kewaunee and Duke-Crystal River.
 - Select a qualified bidder for the spent fuel casks, and negotiate a commitment for schedule to meet the SNF Pad 2 schedule completion by 6/1/2019. This appears to me to be the critical path
 - Agreement of the IFMP and assumptions the report made
 - **Response:** Comments noted, incorporation into IFMP not needed at this time.

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11. How does SONGS determine fuel has cooled sufficiently to allow placing in dry storage? Why not actually take temperature measurements of assemblies?

Response: SONGS uses a computer code approved by the NRC to calculate the decay heat of spent fuel assemblies and determine they are acceptable to be placed in dry fuel storage canisters. Although it is physically possible to measure the surface temperature of fuel assembly cladding, this practice is neither utilized at San Onofre, nor in the industry. Due to the compactness of the fuel rods in each assembly, only temperatures of the exterior rods or end caps of interior rods, are accessible. Contact temperature readings would not provide an accurate measure of decay heat.

The specific computer code used is *ORIGEN-S*, which is the industry standard used to determine decay heat of fuel to be loaded into dry fuel storage canisters. Technical support of *ORIGEN-S* is detailed in NUREG/CR-5625 (ORNL-6698). *ORIGEN-S* has been benchmarked and validated through "actual" decay heat measurements taken from fuel assemblies of U.S. commercial nuclear plants (e.g., Point Beach and Turkey Point) at national laboratories. The established process used to determine the decay heat of fuel to be loaded into dry storage has been validated by the NRC as accurate and safe.

12. What is a spent fuel pool island, how many decommissioning plants have used the spent fuel pool island and what is the reliability of the technology?

Response: A spent fuel pool "island" is term used to describe a method where the spent fuel pool is isolated from its normal plant installed support systems and is replaced by stand-alone cooling and filtration units. Spent fuel pool (SFP) islands are simpler, smaller, localized to the spent fuel area and are tailored to shutdown conditions and eliminates the potential for decommissioning activities inadvertently damaging SFP-related components, which may result in a loss of SFP cooling or pool water inventory.

Whether an island or normal plant installed equipment is used to cool the SFP, the responsibility and requirement for removing residual heat under NRC regulations remains.

General Design Criterion (GDC) 61, "Fuel Storage and Handling and Radioactivity Control," set forth in Appendix A, "General Design Criteria for Nuclear Power Plants," to Title 10, Part 50, of the Code of Federal Regulations (10 CFR Part 50), "Domestic Licensing of Production and Utilization Facilities", requires that fuel storage and handling systems be designed to ensure adequate safety under anticipated operating and accident conditions. Specifically, GDC 61 requires (1) periodic inspections; (2) suitable radiation shielding; (3) appropriate containment, confinement, and filtering systems; (4) residual heat removal capability consistent with its importance to safety; and (5) prevention of significant reduction in fuel storage inventory under accident conditions."

The SFP island cooling system will be designed to ensure sufficient residual heat removal capability is available until all spent fuel is moved to dry storage.

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Approximately 1/2 of the decommissioned commercial nuclear plants in the U.S. have utilized a spent fuel pool island or a form of cooling that is separate from plant installed systems - specifically, the Big Rock Point, Trojan, Connecticut Yankee, Millstone-1, Maine Yankee, Yankee Rowe and Zion plants.

The spent fuel pool "island" or alternate fuel pool cooling systems are reliable and have been used in the nuclear industry since the early 1990s. In some cases, the alternate cooling systems were used for operating plants with fuel assemblies producing much higher heat loads than the spent fuel assemblies at San Onofre.

13. Has Zion canned all of its high burnup fuel (HBF)?

Response: Zion has decided to "can" its undamaged high burnup (>45GWd/MTU) fuel assemblies for its dry cask storage and transportation system. The 37 HBF assemblies are not damaged and did not require "canning", however, according to Zion's management, the decision to can its HBF was made at a time when the industry was uncertain how to interpret or meet the NRC's 2003 Interim Staff Guidance - 11 (ISG-11), "Cladding Considerations for the Transportation and Storage of Spent Fuel" which specifically discussed transportation of HBF.

San Onofre does not face this regulatory uncertainty, as the NRC has clarified its position that undamaged HBF does not need to be placed in fuel "cans". The NUHOMS 24PT casks used at San Onofre, which include HBF are licensed for both storage and transportation.

As recently as May 2, 2014, the NRC restated its position:

"As stated earlier, based on testing in the laboratory and modeling, the NRC staff has determined that high burnup fuel can be safely stored. The NRC staff has not seen any data from either domestic or international sources that contradict this position. While NRC regulations allow canning (i.e., placing the fuel in a container) as a means of addressing grossly damaged fuel in storage to contain the fuel in a known volume in the cask, available information indicates high burnup fuel integrity will be maintained during storage without canning. Therefore, there is no safety basis to require canning of all high burnup fuel.*

**NRC Letter (ML14084A433)*

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14. **Provide a summary and status of lawsuits with the DOE regarding permanent fuel repository, how much money SCE received and how it was used (i.e., Disposition of DOE Spent Fuel Damages Award)**

Response:

- On January 29, 2004, SCE filed a complaint (DOE Spent Fuel Litigation—Round 1) against the Department of Energy (DOE) seeking damages resulting from the DOE’s failure to begin taking spent nuclear fuel and high-level waste from SONGS for permanent storage in a federal depository, as required by the Standard Contract that SCE entered into with the DOE pursuant to the Nuclear Waste Policy Act of 1982. The complaint was filed by SCE on behalf of itself and as agent for the other SONGS participants, SDG&E, Riverside, and Anaheim.
- In June 2010, the Court of Federal Claims issued a decision awarding damages of approximately \$142 million (which includes the participants’ share), covering costs incurred from January 1, 1998 through December 31, 2005.
- Following an appeals process, which affirmed the Court of Federal Claim’s decision, SCE received the damages award payment from the federal government in November 2011, and provided the participants their respective shares of this award. SCE’s share of the award was approximately \$112 million.
- In Decision (D.) 10-07-049, the California Public Utilities Commission (CPUC) determined that the disposition of SCE’s share of damages award received in connection with the DOE Spent Fuel Litigation may be addressed in SCE’s Energy Resource Recovery Account (ERRA) Review proceeding.
- As directed by the CPUC in D.10-07-049, SCE filed Application (A.) 12-04-001 (2012 ERRA) seeking approval of SCE’s refund (customer credit) proposal for a substantial portion of the award to customers. Specifically, to ensure the amount credited to customers was the same as the amount actually collected from customers, SCE proposed retaining approximately \$1.6 million in SCE’s litigation costs and approximately \$17.6 million in Independent Spent Fuel Storage Installation (ISFSI) costs that were not collected from customers under the ratemaking that existed at the time the costs were incurred. The Office of Ratepayer Advocates (ORA) and SCE entered into an uncontested Settlement Agreement that fully resolved all of the issues in A.12-04-001, including the disposition of the award as proposed by SCE. In D.13-12-045, the CPUC approved the Settlement Agreement. SCE is in the process of implementing the refund (customer credit).
- In December 2011, SCE filed a second lawsuit (DOE Spent Fuel Litigation – Round 2) against the DOE in the Court of Federal Claims. In the Round 2 litigation, SCE is seeking damages of approximately \$98 million for the period from January 1, 2006 to December 31, 2010. This matter remains pending. Additional legal action would be necessary to recover damages incurred after December 31, 2010. The disposition of any damages recovered by SCE for the Round 2 litigation are subject to CPUC review in ERRA or other proceeding designated by the CPUC.