QUESTIONS FROM THE PUBLIC FOR THE MARCH 28, 2019 CEP MEETING

Ground Rules for Questions:

- SCE can only answer questions that are directed to SCE; questions about the Nuclear Regulatory Commission are forwarded to the NRC
- SCE can only answer specific questions
- Names of the submitter will be provided with the question and identified by full first name and last name initial
- Similar questions will be combined, along with the names of the submitters
- Multi-faceted questions may be separated into individual answers
- SCE may restate submitted questions for clarity; a full list of un-redacted questions is provided here
- The term "Answer Pending" is used when information is not yet available

RADIATION MONITORING

1. **Is Edison planning to cooperate with reputable organizations to implement monitoring of radiation around the ISFSI or the generating station? (Joe M.)**

   SCE is committed to ongoing radiation monitoring. For the current Fuel Transfer Operations, SONGS has installed and operates a radiation monitoring system to monitor direct radiation at the ISFSI facility and along the transport path. For decommissioning, we are planning to install a new gamma radiation monitoring system with data being streamed directly to independent public agencies with radiological expertise, and those agencies would then publish monthly reports for public awareness.

   Perimeter monitoring of the ISFSI area will occur 24/7 as long as fuel is on site. The monitoring equipment will meet stringent nuclear energy industry specifications and required calibrations. Implementation of the radiation monitoring system is expected at the completion of fuel transfer to the ISFSI.

   Radiation monitoring information was provided during the 4Q Community Engagement Panel (CEP) meeting on Nov. 29, 2018. The link is provided here. For more information on SONGS Decommissioning visit the SONGScommunity.com.

   From the beginning of SONGS operations through present day, SONGS has filed an Annual Radiological Environmental Operating Report with the NRC. Such reports are available via the SONGScommunity.com website here and the most recent report is available on the NRC website here.

CANISTER DOWNLOADING

2. **The Nuclear Regulatory Commission (NRC) has reported the training canister used in the initial download were smaller than the ones to be used. Do you think using a canister that was not the actual size led to the misalignment of the canister on August 3rd 2018? (Elija G.)**

   SCE performed evaluations to determine the cause of the Aug. 3 canister downloading event and the size of the training canister was not a contributing factor. The Multi-Purpose Canister (MPC) simulator is an effective training tool: if misaligned, it cannot be inserted into the storage module. The training canister dimensions were designed to be slightly smaller than an actual canister, so that once the training canister was filled with cement it would simulate the weight of a canister loaded with spent fuel. The training canisters were discussed during the Q4 CEP meeting on Nov. 29, 2018, and the Q1 CEP meeting on March 28, 2019. A link to previous CEP meeting materials including videos and transcripts is provided here. For more information on SONGS Decommissioning visit the SONGScommunity.com.

3. **Can we expect an Edison event report for the canister loading issue on July 22, 2019? (Kale W.)**

   No. The NRC does not require an event report for the issue encountered while downloading the canister on July 22, 2018. The NRC reviewed the event details during its Special Inspection, and Scott Morris, NRC Region IV Administrator, discussed the event reporting requirement during the 1Q CEP meeting on March 28, 2019. Morris explained that the circumstances and facts surrounding canister downloading issues on July 22 did not meet the criteria for an NRC event report. That's because during the July 22 event, the canister always remained supported by the slings and the vertical cask transporter. The link to the CEP meeting materials, including the meeting video and transcript is provided here. For more information on SONGS Decommissioning visit songscommunity.com.

CANISTER #30

4. **What is the path forward for canister #30? Will there be an event report filed? (Kale W., Michelle A.)**

   No. An NRC Event Report is not required for canister #30. While canister #29 was being lowered into the Independent Spent Fuel Storage Installation (ISFSI), canister #30 was in final preparations in the spent fuel pool (SFP) building. Canister handling stopped due to the downloading incident with canister #29. Canister #30 was filled with spent fuel, dried, filled with helium and welded shut. Canister #30 is in a HI-TRAC transfer cask and seismically restrained in the SFP building. The HI-TRAC cask provides adequate cooling and shielding. Canister #30 is in full compliance with license requirements. This information was presented during the 4Q Community Engagement Panel (CEP) meeting on Nov. 29, 2018. A link is provided here. For more information on SONGS Decommissioning visit songscommunity.com

5. **Please present any NRC documents approving the use of a Transfer Cask for storing a canister of spent fuel waste. (Kale W.)**

This question refers to the transfer cask that currently contains canister #30. Consistent with requirements set forth in NUREG-1536, "Standard Review Plan for Spent Fuel Dry Storage Systems at a General License Facility," analysis of the configuration of a canister in the transfer cask is required for decay heat removal, temperature distribution, and radiation protection.

The Holtec transfer cask, HI-TRAC VW, is certified along with MPC-37 by the NRC in Docket Number 72-1032, (HI-STORM Flood/Wind System). Analyses for an MPC placed in a HI-TRAC VW are presented in HI-STORM FW Final Safety Analysis Report (HI-2114830) Chapters 4 (Thermal Evaluation), and Chapter 5 (Shielding Evaluation), respectively. The Certificate of Compliance and associated NRC Safety Evaluation Report can be found in NRC ADAMS under search term "72-1032." The link to the NRC website is provided here.

Analyses for a NUHOMS dry shielded canister (DSC) placed in a transfer cask are contained in the FSAR for Certificate of Compliance 72-1004. For more information on SONGS Decommissioning visit SONGScommunity.com.

SEISMIC

6. **What is the earthquake rating of the waste storage enclosure where the canisters are stored? (Dave W.)**

San Onofre is designed to withstand the maximum credible earthquake for its location without releasing radioactive materials. The commonly known Richter scale is not used to determine earthquake building safety for any building. Instead, building safety relies on a more accurate value known as "peak ground acceleration," which is based on the anticipated ground movement at the site during the largest potential earthquake. San Onofre is designed for the largest peak ground acceleration that could occur at the site, as estimated by geologist who have extensively studied the site and surrounding area.

As approved by the U.S. NRC, San Onofre was built to withstand a peak ground acceleration of at least 0.67g (g refers to the force of gravity). The Independent Spent Fuel Storage Installation (ISFSI), where the canisters are stored, is designed to withstand a peak ground acceleration of 1.5g. For comparison, the current California Building Code design requires any buildings built in the vicinity of San Onofre to be designed to withstand an earthquake motion that has peak ground acceleration of 0.38g.

This topic was discussed during the 1Q CEP meeting on Feb. 16, 2017. The link for the CEP meeting presentation and materials is here. A link to our website information on Seismic Safety at San Onofre and related studies is provided here. For more information on SONGS Decommissioning visit SONGScommunity.com.

CANISTER INTERGRITY / INSPECTIONS

7. What is the corrosion standard used to determine acceptability? Is it desert, mountain environments? (Susan)

The service life limiting degradation mechanism for used fuel canisters in a marine environment is expected to be chloride-induced stress corrosion cracking (CISCC). For CISCC to penetrate a stainless steel canister, it requires a buildup of chloride salts, water, and through-wall tensile stresses. The buildup of chloride salts takes years to deposit from air circulating over the dry surfaces of the warm canister. Humidity in the circulating air can result in wet salt deposits under specific humidity conditions, but only after the surfaces of the canister have substantially cooled, which usually takes over 20 years. The few areas that have the potential for through-wall tensile stresses are the shell weld zones of spent fuel canisters.

To minimize the risk of CISCC, canisters at SONGS are fabricated from Type 316L stainless steel which is highly corrosion resistant and viewed as the best stainless steel for marine environments. CISCC has been infrequently observed in stainless steel materials used in other nuclear plant components with wetted sea salt contamination over many years of operation. While that experience is relevant, the physical protection afforded by dry storage system concrete shielding and the elevated operating temperature of the canisters present key differences in whether or not CISCC can occur. Conservative extrapolation of the industry experience with dry storage canisters leads to a lifetime projection of more than 100 years for the SONGS Type 316L stainless steel canisters. For more frequently asked questions (FAQs) related to spent nuclear fuel storage at SONGS click here or visit our website at songscommunity.com.

8. How are canisters inspected for deterioration and leaks? (Steve V.)

Loaded spent fuel canisters at SONGS can and have been inspected via remote robotic inspection. A small robotic crawler is capable of carrying a high resolution camera known as a borescope which is used to inspect the exterior surface of the canister. SCE inspected eight Holtec UMAX canisters during March and April 2019 to determine what, if any, abrasions were caused by the downloading of canisters into the vertical vaults in which they are stored. SCE was able to inspect the vertical exterior surface of the canister, or “shell walls.” The borescope has a video resolution capable of identifying deterioration or cracking on the canister surface. A link to additional information on canister inspections is provided here. For more information on SONGS Decommissioning visit songscommunity.com.

HOLTEC DESIGN

9. **The question of ASME certification on the Holtec Canisters was asked at the end of the CEP meeting, but not answered. Please clarify whether or not Holtec Canisters have an ASME N3 Certification stamp for containers storing nuclear materials. (Michelle A.)**

   The Holtec canisters are designed in accordance with the American Society of Mechanical Engineers (ASME) standards. An ASME "N" stamp is not required for dry storage canisters.

   The following is per NUREG-1536, "Standard Review Plan for Spent Fuel Dry Storage Systems at a General License Facility" which is the Nuclear Regulatory Commission's regulation for dry storage canisters:

   "No single structural code currently accepted by the NRC (such as the American Society of Mechanical Engineers [ASME] Boiler and Pressure Vessel [B&PV] Code, Section III, Division 1 [ASME B&PV]) or Section III, Division 2 may cover the design of all spent nuclear fuel (SNF) storage systems. Consequently, the acceptability of any given structure will be contingent upon a combination of adherence to applicable portions of multiple codes and a review of the functional performance of the structure taken as a whole."

   Further, as stated in the NRC-approved Holtec HI-STORM UMAX Technical Specification Section 3.3, The American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), 2007, is the governing Code for the HI-STORM UMAX system MPC as clarified in Table 3.1 (list of ASME code alternatives) except for Code Sections V and IX.

TRANSPORTATION / TRANSPORT CASK

10. **Do you have public access to transporting procedures? Are there Regulatory Guides for transporting? (Richard G.)**

    Spent nuclear fuel has been transported successfully in the U.S. for decades. In fact, Duke Energy has transported more than 5,500 nuclear fuel assemblies between nuclear plants it operates since 1989.

    The Department of Transportation (DOT) regulations provide radiation limits for spent-fuel transportation packages. NRC regulations for the safety of transport packages for large quantities of radioactive materials, including spent nuclear fuel, can be found in the Code of Federal Regulations, 10 CFR Part 71. Each utility and organization develops procedures based on compliance with the regulations, but are not available to the public. The background, perspective, and context for Spent Nuclear Fuel Shipments was provided during the Q3 Regular Community Engagement Panel (CEP) meeting on August 9, 2018. A link is provided here. Visit the NRC website here for information on spent fuel transportation. For more information on SONGS Decommissioning visit songscommunity.com.

11. **Please identify what cask is approved by the NRC to store or transport a canister that is potentially leaking, overheating, or containing damaged fuel. (Kale W.)**

In the highly unlikely event of a compromised canister, the following transportation overpacks are approved for the types of canisters used at SONGS:

1. HI-STAR 190 overpack licensed under Certificate of Compliance 71-9373 for Holtec MPC-37.

2. NUHOMS MP187 overpack licensed under Certificate of Compliance 71-9255 for existing NUHOMS 24PT1 canisters.

3. NUHOMS MP197HB overpack licensed under Certificate of Compliance 71-9302 for existing NUMONS 24PT4 canisters.

The above overpacks provide the containment boundary, shielding, and heat rejection capability for the stored canister. The associated safety analysis report (SAR) for each CoC contains the thermal analysis for transporting the 24PT1, 24PT4, and MPC-37 canisters. While a SAR may require an intact canister confinement boundary to transport spent fuel, the intact confinement boundary is redundant to the transportation cask confinement boundary. Thus, a transportation cask can be used to provide onsite confinement for a leaking canister. For more information on SONGS Decommissioning visit SONGScommunity.com.

12. Is such a transfer cask onsite at San Onofre? (Kale W.)

SCE does not have a transportation cask onsite at San Onofre. Storing a transportation cask onsite is one of several potential approaches to address a degraded canister, and is being evaluated further in the context of defense-in-depth and aging management.

What You Should Know:

- **Transportation casks** or overpacks are used to transport the MPC from the dry storage facility to an offsite consolidated interim storage facility or permanent spent fuel repository.
- **Transfer casks** are used to transfer the MPC from the spent fuel building to the dry storage facility.
- At San Onofre, the HI-TRAC **transfer cask** is used to house the Multi-Purpose Canister (MPC) (sealed canister consisting of a fuel basket for spent fuel) as it is being transferred from the spent fuel building to the dry storage facility.

For more information on SONGS Decommissioning visit SONGScommunity.com.

FUEL RETRIEVAL

13. What facility would a canister be taken to for inspecting and handling damaged fuel? What about a hot cell? (Kale W.)

A canister containing damaged fuel will be stored in the ISFSI with all other canisters, until a suitable off-site storage location becomes available.

With respect to repackaging spent fuel for transport off-site once the location becomes available, a dry transfer system or "hot cell" is one method contemplated in the NRC's 2014 Generic Environmental Impact Statement for Continued Storage of Spent Fuel (NUREG-2157) if spent fuel remains on site longer than the life of dry storage canisters. There is no requirement to have a hot cell on site. The CPP-603 Irradiated Spent Fuel Storage Facility at the Idaho Nuclear Technology and Engineering Center provides the potential infrastructure to support handling and examining of casks and their contents. Additional information is available at the Office of Nuclear Energy. A link is provided here.

14. Is Edison's defense-in-depth relying on a non-existent hot cell? (Kale W.)

No. As discussed in several presentations provided during Community Engagement Panel (CEP) meetings, dry cask storage defense-in-depth is predicated on the following:

- Canister design
- Canister fabrication methods
- Operations, maintenance and security of the canisters
- Inspection of the canisters, as required
- Remediation of the canisters, if necessary, based on inspection findings

The use of a hot cell is one potential option for remediation. Other methods are also in development, such as canister repair and/or containment. A link to previous CEP meetings on defense-in-depth, including the September 14, 2017 CEP meeting, is provided here.

What You Should Know:
Canister inspections are an integral part of the Aging Management Program (AMP) for dry cask storage at San Onofre. AMPs by regulation are required after 20 years of service. The newer Holtec dry cask storage system at San Onofre will have an Inspection & Maintenance program in place by October 2020, as required by a coastal development permit that was issued by the California Coastal Commission. The original AREVA dry cask storage system in place at San Onofre will have an AMP to support service in 2023 and beyond. A link to the March 28, 2019 CEP meeting, which includes information on inspections is provided here. For more information on SONGS Decommissioning visit SONGScommunity.com.

15. Does a hot cell exist in the U.S. capable of transferring fuel assemblies from one large canister to another? If so, where? (Kale W.)

No. Currently, a hot cell does not exist in the United States that is capable of transferring fuel assemblies from one canister to another. The CPP-603 Irradiated Spent Fuel Storage Facility at the Idaho Nuclear Technology and Engineering Center provides the potential infrastructure to support handling and examining of casks and their contents. Please refer to question #13 above for additional information on hot cells. For more information on SONGS Decommissioning visit the SONGScommunity.com.

16. **How much will the Fuel Handling Hot Cell Facility cost?**

The potential cost for the use of a hot cell is a range of $8 million to $16 million. This estimate is based on reports prepared for the U.S. Department of Energy Office of Used Nuclear Fuel Disposition Research and Development, Under DOE Idaho Operations Office Contract DE-AC07-05ID14517 and a presentation by Stylianos Chatzidakis and John Scaglione Reactor and Nuclear Systems Division Oakridge National Laboratory, Nov. 7, 2018. For more information on SONGS Decommissioning visit songscommunity.com.

17. **If Edison intends to use the pool as a method of retrieving fuel from a canister, please present NRC approved re-flooding analysis. (Kale W.)**

SCE does not intend to use the spent fuel pool as a method of retrieving fuel from a canister. Spent fuel pools are not the only way to provide adequate shielding during used fuel handling and repackaging. A degraded used fuel canister could be installed in a "repair" cask with a larger diameter on site using existing dry used fuel handling equipment without use of a spent fuel pool. This "repair" cask could then be stored in a shielded location above ground or in an oversized storage location such as the one already planned at SONGS as part of the Holtec UMAX system. A link to our Frequently Asked Questions on Spent Nuclear Fuel Storage at SONGS is provided here. For more information on SONGS Decommissioning visit songscommunity.com.

RISK ASSESSMENTS

18. **Both the NRC and Edison were quoted as stating that the beachside nuclear waste storage at San Onofre presents "zero risk" of a radiological impact outside the boundaries of SONGS. What risk analysis was used to proclaim this 'zero risk'? (Kale W.)**

To be clear, SCE stated the Aug. 3, 2018, canister downloading incident presented no risk to the health and safety of employees or the public from a breach of the canister, had a drop occurred (of course, the canister did not drop).

This was concluded from a deterministic analysis of a canister drop from 25 feet, which is conservative as compared to the 18-foot scenario of Aug. 3. The results were no breach of the canister from a 25-foot drop and no release of radioactive material. This analysis also has additional margin built in. The link to the drop analysis is provided here.

What You Should Know: Regarding a catastrophic release of radiation, SCE has echoed what the NRC said very clearly, that there is no credible scenario that would result in an off-site release of radiation impacting the health and safety of the public.

Read more in SCE's Op-Ed in the Coast News Group here. Information on emergency planning requirements of a decommissioning nuclear energy facility is available here. For more information on SONGS Decommissioning visit songscommunity.com.

WASTE CATEGORIZATION

19. Please identify what category of waste the NRC and Edison consider the spent fuel waste to be. (Kale W.)

The categories referred to in this question apply to radioactive sources, not spent fuel. The Nuclear Waste Policy Act of 1982 defines Spent Nuclear Fuel (SNF) as fuel that has been withdrawn from a nuclear reactor following irradiation, the constituent elements of which have not been separated by reprocessing. SNF may include: (1) intact, non-defective fuel assemblies or fuel rods; (2) failed fuel assemblies or fuel rods; (3) segments of fuel rods or pieces of fuel derived from spent fuel rods; and (4) various nonfuel components and structural parts of irradiated fuel assemblies. New and spent fuel are regulated per 10 CFR 70, 72, 73, and 74. A link to the information above is provided here. For more information on SONGS Decommissioning visit songscommunity.com.