

## Table of Contents

<b>Frequently asked Questions and Answers Regarding the August 3, 2018, Canister Misalignment Event at SONGS and the NRC Special Inspection .....</b>	<b>3</b>
1. Did the fuel canister suffer any damage because of this incident? .....	3
2. What would be the potential consequences of a fuel canister dropping 17-18 feet to the bottom of a storage vault? When calculating potential damage, has anyone evaluated what happens to the fuel assemblies inside the canister? What is your reference for analyzing potential damage to fuel from such a drop? please provide. ....	4
3. Why didn't workers notice that the fuel canister was resting on the divider plate assembly? ...	5
4. Why wasn't there a public report about this event which occurred on August 3, 2018? .....	5
5. I keep hearing about a July event that hasn't appeared on the NRC event notification website, an event that SONGS has not made an announcement about. Why hasn't NRC compelled SONGS to make a notification just like for the August 3 event at SONGS? .....	5
6. This is the second complication involving SONGS fuel loading and Holtec. Does the NRC still have confidence in their ability to do this job properly? .....	7
7. Why wasn't SONGS properly overseeing this activity? .....	7
8. SONGS fuel loading activities are on hold. When will they be allowed to re-start these activities? .....	7
9. What is the purpose of the metal flange and metal gussets that the spent fuel canister was resting on? .....	8
10. Were the metal flange or metal gussets designed to support the load of a spent fuel canister? .....	8
11. If the event happened on August 3, 2018, why did it take until September 10, 2018, to start the Special Inspection? .....	9
12. We have heard that SONGS officials say they cannot remove a canister from the UMAX ISFSI and open it to inspect the fuel. Is that correct? How would SONGS unload a canister placed in the UMAX ISFSI? How does Edison plan to offload a canister in the case of an incident? Why do you not request a hot cell on site while fuel is being storage there? .....	9
13. For members of the public in the area surrounding SONGS who may be worried whether the canisters are robust enough, what is the NRC's message to them? .....	11
14. What measures are being taken at SONGS to prevent another canister hang-up event like the August 3, 2018, canister misalignment incident? SCE described the use of a string/rope attached to the canister, so they could monitor the position of the canister. Was this feature included in the final design of the downloading protocol? .....	11
15. What were the differences between the dummy and the actual canisters being used for fuel transfer? Why did the NRC allow SONGS to use a different size canister for training? .....	11
16. When will NRC hold its own public meeting at a location where the public of San Diego can voice their opinions regarding dry cask storage at SONGS? .....	12
17. Will the NRC have an inspector on-site to observe future canister movements? Would NRC consider having a Resident Inspector for the SONGS site? .....	12
18. How was the inspection of previously loaded canisters being performed at SONGS? .....	13

19. What is the plan for aging management evaluation given that metal to metal to contact took place during downloading at SONGS? .....	13
20. Could the NRC have been at fault to some degree for allowing this situation to even occur in the first place? .....	13
21. Was the final safety analysis report able to be revised regarding possibility of and acceptability of scratches, without NRC approval? .....	14
22. How are public safety concerns being addressed given that Edison has discontinued the alert system? .....	14
23. What monitoring mechanism is being provided on the SONGS storage canisters and on what schedule to guarantee that no leaks are about to occur? .....	15
24. The contents of Canister #30 were removed from the spent fuel pool almost a year before it was finally installed into the UMAX ISFSI. Was NRC concerned about dangerous heat build-up inside Can #30? What was the internal and exterior temperature of Can #30? .....	16
25. Why did the NRC let SCE load spent fuel in pin-supported shim canisters not approved by the NRC? How are the 4 canisters with faulty shims being addressed and how can they be inspected and retrieved? How has the 4 canisters with faulty shims been addressed? .....	16
26. Will the spent waste be moved further inland, across the I-5 freeway deeper into Camp Pendleton to a safer, more geologically stable place? If so, are you consulting directly with the Acjachemen Nation to ensure no cultural, sacred or burial sites are threatened? What are the significant obstacles to relocating the ISFSI across the 5 freeway away from the tideline? .....	17
27. Spent fuel storage at San Onofre is another Chernobyl waiting to happen. The spent fuel storage canisters being used as SONGS are Chernobyl in a can. ....	17
28. When assessing the licensee's corrective actions, did the NRC assess the impact on ALARA due to having additional personnel near the cask during transport and download? .....	18
29. Canister #30 was loaded but had to be paused, could not be downloaded to storage because of safety issues and work stoppage. How much radiation has been released during these abnormal events? How does this affect your yearly allowable totals? .....	18
30. It was mentioned in a previous CEP meeting that there were damaged fuel rods in the spent fuel pools at SONGS. How many, where, and how are they being contained? .....	18
31. What are the plans when a canister falls over during transit? .....	19
32. When calculating potential damage in the event of a canister drop, has anyone evaluated what happens to the fuel rods inside the canister? .....	19
33. Will there be any changes made to the internal components of the UMAX ISFSI Pad at SONGS to alleviate alignment problems? .....	19
34. What is the Holtec NRC approved license (CoC) for transportation of their multi-purpose canisters (MPCs)? .....	19
35. Edison has total current assets exceeding 3.6 billion. Do you think a fine of \$116,000 will have any effect on SCE? .....	20
36. My question is about the implications of these discoveries, findings, and responses to other sites experiencing similar activities. Are other ISFSI sites in compliance with new practices? ...	20

## **Frequently asked Questions and Answers Regarding the August 3, 2018, Canister Misalignment Event at SONGS and the NRC Special Inspection**

### **1. Did the fuel canister suffer any damage because of this incident?**

No. The canister did not sustain any damage due to the misalignment incident. SONGS staff visually inspected the metal flange areas that the cask is believed to have made contact with and only observed minor paint scrapes and wear marks.

The NRC understands that all canisters in the UMAX ISFSI may have experienced metal to metal contact because of the design of the vertical ventilated module (VVM) divider shell which stands between the canisters and storage vault outer wall. The clearance space between the canister and the divider shell is quite small, about a quarter of an inch. So, canisters may bump against the shell while being loaded into the vault. A future inspection item will involve an aging management evaluation of all other canisters given the high likelihood of metal to metal contact.

In March and April 2019, SCE brought in an outside contractor to evaluate the incidental contact and scratching of a subset of the 29 spent fuel storage canisters that had been downloaded prior to and including the canister of the August 3, 2018, incident. The contractor used a robotic camera that was calibrated and equipped with video processing software to assess the incidents and depths of scratches on eight previously downloaded canisters from a variety of locations in the SONGS ISFSI pad. SCE performed a statistical analysis and arrived at a 95% confidence interval that scratch depths would not approach ASME B&PV limits for a 5/8" thick walled spent fuel storage canister.

NRC evaluated the full body of sample data provided by the SCE contractor and performed its own independent statistical analyses and found that the results from SCE were well bounded by NRC's results at the 95% confidence interval.

**2. What would be the potential consequences of a fuel canister dropping 17-18 feet to the bottom of a storage vault? When calculating potential damage, has anyone evaluated what happens to the fuel assemblies inside the canister? What is your reference for analyzing potential damage to fuel from such a drop? please provide.**

The NRC independently reviewed the licensee's evaluation analyzing the potential effects of a canister drop. The evaluation conservatively assumed the canister fell an uninterrupted 25 feet to the base of the UMAX vault. The actual height the canister could have dropped was about 18 feet. It was concluded that the canister would have remained intact as a result of the fall.

However, the spent fuel would not have remained intact after such a drop. The licensee's analysis concluded that fuel damage would involve deformation and buckling of the lowest section of the spent fuel assemblies.

In addition, NRC independently reviewed safety function analyses for drop accident conditions centering around criticality control, thermal performance, shielding, and pressure. The NRC concluded that expected temperature and pressure limits would have remained bounded by the accident limits contained in the Holtec UMAX Final Safety Analysis Report. Criticality safety would have been maintained since the canister would not have breached and the spent fuel remained dry. External radiological dose rates of the canister could have increased minimally.

After the drop the spent fuel would no longer meet the licensing requirements for storage or transportation. The licensee would be required to perform either significant evaluations or supplemental operations to ensure the safe retrieval, unloading, and re-packaging of the fuel.

The analysis of the potential canister drop and the consequences of the spent fuel contents followed guidance from NUREG-1864 "A Pilot Probabilistic Risk Assessment of a Dry Cask Storage System at a Nuclear Power Plant," dated March 2007.

The drop analysis is available in a nonproprietary form in the NRC ADAMS system (NRC ADAMS Accession No. ML071340012).

### **3. Why didn't workers notice that the fuel canister was resting on the divider plate assembly?**

The answer to this question involves several NRC Special Inspection identified inadequacies. Dry cask personnel lacked the proper training and certifications to operate the important to safety equipment. Dry cask storage procedures did not provide adequate directions for how to determine whether the spent fuel storage canister was being supported by the downloader slings. Procedures did not include qualitative or quantitative means to determine when the slings were no longer supporting the load. Finally, no licensee oversight staff were in direct visual observation of important to safety activities during downloading operations on August 3, 2018.

### **4. Why wasn't there a public report about this event which occurred on August 3, 2018?**

The NRC has reporting requirements for ISFSI licensees in 10 CFR 72.75. The NRC determined and informed the licensee that they had failed to file a report in accordance with the regulations of 10 CFR 72.75(d)(1) during its exit meeting with the licensee on September 14, 2018. Later that day, the licensee made the required 10 CFR 72.75 report.

### **5. I keep hearing about a July event that hasn't appeared on the NRC event notification website, an event that SONGS has not made an announcement about. Why hasn't NRC compelled SONGS to make a notification just like for the August 3 event at SONGS?**

During the NRC Special Inspection, it was discovered that a similar, but very different, canister misalignment issue had occurred a couple of weeks prior to the August 3<sup>rd</sup> event. NRC learned of the event while speaking with workers at the San Onofre plant during the special inspection in September 2018. NRC learned that the dry cask storage crew experienced uncommon difficulty in aligning the spent fuel canister for downloading on July 22, 2018. The spent fuel canister had

hung up several times while they were attempting to download it into the UMAX ISFSI. What was typically a 15-minute evolution ended up requiring an hour and a half of manipulation. Ultimately, the crew achieve the download, but only after swapping out the rigger for a more experienced member of the crew and equipping themselves with a stronger flashlight.

The most important difference between the July 22<sup>nd</sup> and August 3<sup>rd</sup> event was that during the July 22<sup>nd</sup> issue, the loaded spent fuel canister was always supported by the important to safety rigging equipment. The cask loading crew was aware of and attentive in identifying that the July 22<sup>nd</sup> misalignment had occurred and quickly recognized the binding and worked to achieve proper alignment to download the canister. During the August 3<sup>rd</sup> event, the cask loading crew was inattentive and unaware of the status of the spent fuel canister, which in-turn allowed the transporter operator to fully lower the rigging features to the seated position. This left the important to safety rigging equipment coiled up on the ground, near the base of the transporter, with 20+ feet of slack. The spent fuel canister was wedged and solely supported by an estimated 2.25 square inches of the metal on the internals of the vault system. Had the canister shifted off the ledge of vault internals, with the rigging equipment completely slack, the canister would have fallen an estimated 18 feet to the floor of vault. The licensee was unaware of this condition until a radiation protection technician alerted them that radiation levels were not consistent with those of a downloaded canister. During the August 3<sup>rd</sup> event, the canister was fully unsupported by the slack rigging equipment at a position roughly 18 feet above the bottom of the ISFSI vault for about 45 minutes.

The Special Inspection Team found that although the July 22<sup>nd</sup> event had been documented in a Production Traveler, it had never been entered into the site's corrective action program. This finding was cited as a failure to enter deviations experienced in downloading conditions into its corrective action program to determine the cause of the misalignment and develop corrective actions to preclude reoccurrence (10 CFR 72.172) (NRC ADAMS Accession No.

ML18341A172, Errata: San Onofre Nuclear Generating Station - NRC Special Inspection Report 050-00206/2018-005, 050-00361/2018-005, 050-00362/2018-005, 072-00041/2018-001 and Notice of Violation, page 8).

**6. This is the second complication involving SONGS fuel loading and Holtec. Does the NRC still have confidence in their ability to do this job properly?**

Both SCE and Holtec International were subject to NRC's escalated enforcement process. Both SCE and Holtec International have completed corrective actions for their previously identified lapses in regulatory compliance. SCE, after completing four causal evaluations; identifying numerous corrective actions, procedure enhancements, and new equipment; implementing new training requirements; and several rounds of NRC inspections, returned to fuel transfer operations the week of July 15, 2019. NRC is confident that SCE and SONGS will be able to load fuel safely and in compliance with federal regulations until they have completed fuel transfer operations from its spent fuel pools into the Holtec UMAX ISFSI.

**7. Why wasn't SONGS properly overseeing this activity?**

The NRC's inspection documented that San Onofre management failed to ensure that appropriate oversight was provided to its contractor workforces during important-to-safety evolutions. SCE has completed four causal evaluations; identifying numerous corrective actions, procedure enhancements, and new equipment; and implemented new training requirements. NRC is now confident in SCE's ability to properly oversee dry fuel storage operations at SONGS.

**8. SONGS fuel loading activities are on hold. When will they be allowed to re-start these activities?**

San Onofre voluntarily suspended movement of spent fuel and committed to waiting for NRC's inspection of its corrective actions prior to resuming fuel handling activities. NRC agreed that SCE was prepared to return to fuel transfer operations at SONGS verbally on May 17, 2019 and

documented this decision by letter on May 28, 2019 (NRC ADAMS Accession No. ML19148A508).

SONGS placed canister #30 from the Unit-3 fuel building into its UMAX ISFSI on July 18, 2019. The following week, SONGS returned to fuel transfer operations from its decommissioning reactor units spent fuel pools to dry storage in the UMAX ISFSI pad. As of November 18, 2019, SONGS has loaded ten additional spent fuel storage canisters from the Units-2 and -3 spent fuel pools.

**9. What is the purpose of the metal flange and metal gussets that the spent fuel canister was resting on?**

The “metal flange” is the divider shell’s “shield ring,” located at the top of the divider shell and around the shell’s inner circumference. The shield ring provides additional shielding at the inlet vent locations from any possible radiation coming from the gap (“annulus”) between the spent fuel canister and divider shell.

The eight metal gussets are also located near the top of the divider shell and are equally spaced around the inner diameter of the shell on the shield ring. The metal gussets center and brace the spent fuel canister’s top area from any movement during a seismic event, to ensure the canister does not shift and remains centered within the divider shell so that air flow is not obstructed around the outside of the canister.

**10. Were the metal flange or metal gussets designed to support the load of a spent fuel canister?**

No, the divider shell shield ring is not designed or intended to support the weight of a spent fuel storage canister.



**11. If the event happened on August 3, 2018, why did it take until September 10, 2018, to start the Special Inspection?**

The canister was placed in a safe condition once the misalignment was discovered and all fuel handling activities at San Onofre were suspended. The on-site portion of the inspection was scheduled to allow San Onofre time to critically self-evaluate the event and their performance. The NRC likely would have initiated the on-site phase of the inspection sooner had San Onofre not voluntarily suspended fuel handling activities.

**12. We have heard that SONGS officials say they cannot remove a canister from the UMAX ISFSI and open it to inspect the fuel. Is that correct? How would SONGS unload a canister placed in the UMAX ISFSI? How does Edison plan to offload a canister in the case of an incident? Why do you not request a hot cell on site while fuel is being storage there?**

Under NRC regulations (10 CFR 72.122(l)), dry cask storage licensees must be able to safely remove, with no operational safety problems, the spent fuel from storage for further processing or disposal. The NRC recently issued Interim Staff Guidance (ISG)-2, Revision 2, Fuel Retrievability in Spent Fuel Storage Applications, which is available on NRC's website at: <https://www.nrc.gov/reading-rm/doc-collections/isg/spent-fuel.html>.

SONGS Procedure HPP-2464-500, MPC Unloading, Revision 8, describes the process for retrieving spent fuel assemblies from dry cask storage at SONGS. The process involves removing a spent fuel canister from the UMAX ISFSI using the transfer cask and vertical cask transporter; transferring the spent fuel canister back to the fuel building using the HI-PORT; securing the transfer cask in the cask wash-down area; cutting access holes into the canister closure rings to access the vent and drain ports; reflooding the canister with water from the spent fuel pool; cutting the lid of the welded canister; placement of the transfer cask and spent fuel canister back into the spent fuel pool; removal of the canister lid; and removal of the spent

fuel assemblies back into spent fuel pool storage racks. Additionally, SCE performed pre-operational dry runs of these unloading activities as required by the conditions of the Certificate of Compliance for the UMAX system. NRC RIV inspectors were on-site and observed these unloading dry-run activities in June through December of 2017 (NRC ADAMS Accession No. ML18200A400).

A “hot cell” is a common term used in the nuclear industry to describe a shielded room/structure where radioactive material can be handled remotely. A “portable hot cell” would be a non-permanent structure that could be shipped from site to site or it could be constructed on site-by-site basis, that would contain a shielded room/structure where radioactive material can be handled remotely.

Holtec’s Transfer Cask that carries/handles a canister loaded with spent fuel would not meet the industry’s definition of a portable hot cell. As it is not a shielded room/structure that allows for the remote handling of the radioactive material. Also, there is no NRC regulation that governs the licensing of “portable hot cells”.

An example of a portable hot cell is thoroughly described in NUREG-2157 “Generic Environmental Impact Statement for Continued Storage of Spent Nuclear Fuel,” as a “Dry Transfer System.” A Dry Transfer System would meet the industry definition of a hot cell, since it would be a shielded room/structure that allows for the remote handling of radioactive material. If you would like to read more about this example of a portable hot cell the NUREG is available on the NRC website.

**13. For members of the public in the area surrounding SONGS who may be worried whether the canisters are robust enough, what is the NRC's message to them?**

Dry spent fuel storage casks are designed and built to safely withstand severe events, including drops, external explosions, fires, floods, earthquakes, and tornado damage. The available information suggests the canister in this incident avoided any significant damage.

NRC staff will continue evaluating SCE's performance during spent fuel transfer and storage operations to ensure the public remains safe while spent fuel is stored at San Onofre.

**14. What measures are being taken at SONGS to prevent another canister hang-up event like the August 3, 2018, canister misalignment incident? SCE described the use of a string/rope attached to the canister, so they could monitor the position of the canister. Was this feature included in the final design of the downloading protocol?**

A load sensing shackle is being employed during downloading operations so that workers are always aware of the weight of the canister during downloading operations. If a sudden reduction in weight is noted before the canister has reached the bottom of the storage vault, an alarm will indicate a loss of load. Video cameras are also being used to assist in monitoring the canister as it is lowered into the vault. There is also a "tell-tale rope" (or string, as mentioned in the question) that a worker will hold as the canister is lowered into the vault. If the rope stops traveling through the rigger's hands, that will be an additional indication that the canister's downward progress has been interrupted. These measures and additional oversight will ensure that a canister hang-up does not happen again.

**15. What were the differences between the dummy and the actual canisters being used for fuel transfer? Why did the NRC allow SONGS to use a different size canister for training?**

A dummy canister is a canister with no spent fuel that is used for training workers involved with canister downloading operations. The dummy canister used at SONGS is about three quarters

of an inch smaller in diameter than a real canister. It is designed to be slightly smaller in diameter because it will be filled with concrete. The extra room is allowed for possible outward bulging due to concrete weight and outward pressure. The canister is required to simulate the actual weight of a canister filled with spent fuel. The simulator canister used at SONGS is made of carbon steel, which is painted versus the uncoated stainless steel of real canisters. Both the simulator and a loaded spent fuel storage cask at SONGS weigh 50 tons.

There is no requirement that the dummy canister be the exact same size as a real spent fuel storage canister, although they need to weigh the same so that operators can practice canister movement as realistically as possible.

**16. When will NRC hold its own public meeting at a location where the public of San Diego can voice their opinions regarding dry cask storage at SONGS?**

NRC held a public meeting at the San Juan Capistrano Community Center on August 20th, 2019. It was recorded by an outside organization and is available for viewing on YouTube.

**17. Will the NRC have an inspector on-site to observe future canister movements?  
Would NRC consider having a Resident Inspector for the SONGS site?**

We have enhanced our inspection oversight for Southern California Edison and have conducted numerous unannounced inspections since the licensee resumed fuel transfer operations in July 2019 to ensure that the newly implemented corrective actions are effective.

In a letter dated July 16, 2019, from Kristine Svinicki, Chairman, Nuclear Regulatory Commission to the Honorable Mike Levin, United States House of Representatives, regarding NRC's inspection plan for the SONGS decommissioning process, the Chairman addressed the question of the need for a Resident Inspector at SONGS with the following statement, "We have extensive experience and a proven record with performing inspections at decommissioning sites, and the NRC's inspectors who perform this function are experts with extensive experience

in this area. In addition, I want to assure you that we will not hesitate to devote the inspection resources necessary to ensure the safe decommissioning of SONGS.” (NRC ADAMS Accession No. ML19164A327)

**18. How was the inspection of previously loaded canisters being performed at SONGS?**

The inspections were performed using a remotely-operated robotic crawler that was lowered into the space between the canister and storage vault. The crawler was equipped with navigational cameras and a borescope to identify surface irregularities. A high-powered camera was also used to characterize any surface irregularities, including width and depth measurements, as applicable.

This equipment had been used at multiple U.S. nuclear sites for Part 72 license renewal applications. An NRC inspector was on-site during seven of the eight canister inspections to observe the visual assessment activities.

**19. What is the plan for aging management evaluation given that metal to metal to contact took place during downloading at SONGS?**

NRC regulations require that dry cask storage systems must be inspectable. Aging management programs are required upon renewal of site specific and generally licensed ISFSIs. As part of the approval process for the California Coastal Commission (CCC) decommissioning permit, Southern California Edison agreed to create an Inspection and Maintenance Program for their new ISFSI system by March 31, 2020.

**20. Could the NRC have been at fault to some degree for allowing this situation to even occur in the first place?**

No. The licensee is responsible for ensuring operations are performed safely and in accordance with NRC requirements.

**21. Was the final safety analysis report able to be revised regarding possibility of and acceptability of scratches, without NRC approval?**

The final safety analysis report (FSAR) can be changed or modified by a licensee through the NRC's 10 CFR 72.48 process. However, there are stipulations on what types of things can be changed without NRC approval. Holtec changed the wording of its FSAR using that process after Edison took exception to the wording of the original FSAR that indicated that scratching or gouging would not occur on the canisters.

NRC reviewed Edison's scratch analysis and found it acceptable because any scratching would not have any safety significance.

**22. How are public safety concerns being addressed given that Edison has discontinued the alert system?**

The NRC issued amendments to the SONGS reactor operating licenses to allow transition to an ISFSI only Emergency Plan (IOEP) and Emergency Action Level (EAL) scheme on November 30, 2017 (NRC ADAMS Accession No. ML17310B482). The NRC inspectors determined that the SONGS IOEP and associated changes would provide reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency at the SONGS facility and ISFSI.

An Emergency Classification Level (ECL) is one of a set of names or titles established by the US Nuclear Regulatory Commission (NRC) for grouping off-normal events or conditions according to (1) potential or actual effects or consequences, and (2) resulting onsite and offsite response actions. The emergency classification levels, in ascending order of severity, are Notification of Unusual Event (NOUE), Alert, Site Area Emergency (SAE), and General Emergency (GE).

Currently, the most severe ECL that can be reached at the SONGS site is an Alert. An Alert would be an emergency event in progress which involves an actual or potential substantial degradation of the level of safety of the ISFSI or a security event that involves life threatening risk to site personnel or damage to site equipment because of an aircraft threat or other hostile action taking place at the facility.

The purpose of an Alert classification is to assure that offsite emergency personnel are readily available to respond if the situation becomes more serious or to perform confirmatory radiation monitoring if required and provide offsite authorities current information on plant status and parameters.

**23. What monitoring mechanism is being provided on the SONGS storage canisters and on what schedule to guarantee that no leaks are about to occur?**

NRC regulations require that routine monitoring of an ISFSI takes place. This is typically achieved through periodic radiological surveys of the ISFSI area and dose tracking around the ISFSI perimeter using thermo-luminescent dosimeters (TLDs) or optically stimulated luminescent dosimeters (OSLDs) that are collected quarterly or semiannually. TLDs and OSLDs are used to track radiation dose or exposure rates over long time frames.

In response to community concerns, Edison has implemented a radiation monitoring system that makes information available to the public. The ISFSI radiation monitoring systems at SONGS is not an NRC required system.

**24. The contents of Canister #30 were removed from the spent fuel pool almost a year before it was finally installed into the UMAX ISFSI. Was NRC concerned about dangerous heat build-up inside Can #30? What was the internal and exterior temperature of Can #30?**

Canister #30 was placed into the Holtec HI-TRAC transfer canister and seismically restrained in the Unit-3 fuel handling building for just over eleven months following the August 3, 2018, canister misalignment event at SONGS. Canister #30 had a heat load of 25.3 kW. Holtec spent fuel storage canisters can be stored indefinitely while in the HI-TRAC transfer cask provided that normal airflow to the transfer cask is not impeded. Radiation levels outside of the canister were being monitored using video surveillance. In addition, the temperature of the canister was periodically monitored. While in temporary storage, canister temperatures were around the 200-degree F mark. Canister #30 was transferred from the Unit-3 fuel building and installed in the UMAX ISFSI on July 18, 2019.

**25. Why did the NRC let SCE load spent fuel in pin-supported shim canisters not approved by the NRC? How are the 4 canisters with faulty shims being addressed and how can they be inspected and retrieved? How has the 4 canisters with faulty shims been addressed?**

Four of the 29 spent fuel canisters being stored in the SONGS UMAX ISFSI have shims using stainless-steel pins to facilitate helium flow for cooling. These pins have been shown to be prone to failure. Holtec analyzed the potential impact should these pins fail and concluded that a failed pin would not impact the canisters' ability to maintain cooling.

A Predecisional Enforcement Conference was held with Holtec on January 9, 2019, to discuss apparent violations involving the shim change. In April 2019, the staff issued a Severity Level (SL) III violation involving Holtec's design control process and an SLIV violation involving its screening evaluation on the need for NRC approval before making a design change. The SLIII



violation was of moderate safety significance because Holtec did not evaluate the potential consequence of shim failure.

The staff performed a follow-up inspection in June 2019 to verify effective implementation of Holtec's corrective actions and confirmed their adequacy.

**26. Will the spent waste be moved further inland, across the I-5 freeway deeper into Camp Pendleton to a safer, more geologically stable place? If so, are you consulting directly with the Acjachemen Nation to ensure no cultural, sacred or burial sites are threatened? What are the significant obstacles to relocating the ISFSI across the 5 freeway away from the tideline?**

No one has approached NRC with a plan to license any other area of Camp Pendleton for an Independent Spent Fuel Storage Installation. As a general licensee, SCE is limited to only using the portion of the Camp Pendleton site that is currently licensed under 10 CFR Part 50 co-located with their reactor site.

**27. Spent fuel storage at San Onofre is another Chernobyl waiting to happen. The spent fuel storage canisters being used at SONGS are Chernobyl in a can.**

That is not an accurate statement. The amount of Cs-137 contained in a dry storage cask system is a very small fraction in comparison. The spent fuel at SONGS has been removed from the reactor, has decayed in wet storage for more than 8 years, and is placed in dry storage with a configuration where an event similar to Chernobyl is not possible.

Accidents with dry storage systems do not involve sufficient energy required to destroy the fuel and release the contained radionuclides. The consequences of credible accidents involving dry storage systems are low and are not comparable to consequences of the Chernobyl disaster.

**28. When assessing the licensee's corrective actions, did the NRC assess the impact on ALARA due to having additional personnel near the cask during transport and download?**

Yes. The NRC evaluated the ALARA assessments at SONGS indicate that worker dose has decreased during transport and downloading operations. Canister #40, the tenth canister loaded after the August 3, 2018, canister misalignment event, had the lowest worker radiation exposures of all casks loaded at SONGS to date.

**29. Canister #30 was loaded but had to be paused, the canister could not be downloaded to storage because of safety issues and work stoppage. How much radiation has been released during these abnormal events? How does this affect your yearly allowable totals?**

Canister #30 was situated in the transfer cask and seismically restrained in the Unit-3 cask washdown area for eleven months. The area around the transfer cask was posted as a high radiation area and roped off as an exclusion zone. Radiation levels and canister temperature were monitored for abnormalities and none were noted. Canister #30 was transported from the Unit-3 fuel building to the ISFSI pad on July 17, 2019. Downloading was completed on the morning of July 18, 2019.

**30. It was mentioned in a previous CEP meeting that there were damaged fuel rods in the spent fuel pools at SONGS. How many, where, and how are they being contained?**

Damaged fuel can be stored into Holtec MPC-37 spent fuel storage canisters using a damaged fuel container (DFC). The DFC allows for the damaged fuel assembly to be secured in such a fashion that loose fuel pellets and other fuel assembly components will not be allowed to freely move about in the spent fuel storage canister. During fuel transfer operations, 60 fuel assemblies were identified as damaged. Each of these were loaded alongside intact spent fuel inside of the special canisters.

**31. What are the plans when a canister falls over during transit?**

The transportation of the spent fuel storage canisters inside of the transfer cask on the ISFSI haul path is done using a low-profile transporter and moved onto the ISFSI pad using the vertical cask transporter that is fully analyzed for potential seismic events at the site. A canister tip-over event will not occur even during an ISFSI seismic event or design basis earthquake.

**32. When calculating potential damage in the event of a canister drop, has anyone evaluated what happens to the fuel rods inside the canister?**

Yes. The NRC discusses this question in depth in NRC Supplemental Inspection Report IR 050-00206/2018-006, 050-00361/2018-006, 050-00362/2018-006, 072-00041/2018-002 (NRC ADAMS Accession No. ML19190A217).

**33. Will there be any changes made to the internal components of the UMAX ISFSI Pad at SONGS to alleviate alignment problems?**

All 75 storage vaults of the UMAX ISFSI at SONGS already have the internal divider shell components manufactured and installed inside. The only things remaining are for the spent fuel canisters to be installed inside and have the closure lid put into place. The reasons for the interference during downloading operations is well understood. The clearances between the MPC and divider shell components are on the order of a quarter of an inch on either side of an MPC during downloading operations. It is expected that some incidental contact may occur between the storage canisters and internal vault components, but these will not have any impact on the safe storage of the spent fuel.

**34. What is the Holtec NRC approved license (CoC) for transportation of their multi-purpose canisters (MPCs)?**

The Holtec approved CoC for transportation of MPCs in the HI-STORM UMAX design is 10 CFR Part 71 CoC 71-9373, or the Holtec HI-STAR 190 transportation system.

**35. Edison has total current assets exceeding 3.6 billion. Do you think a fine of \$116,000 will have any effect on SCE?**

It is not the NRC's intention that the economic impact of a civil penalty be so severe that it adversely affects a licensee's ability to safely conduct activities or puts a licensee out of business. Orders, rather than civil penalties, are used when the NRC's intent is to suspend or terminate licensed activities.

**36. My question is about the implications of these discoveries, findings, and responses to other sites experiencing similar activities. Are other ISFSI sites in compliance with new practices?**

Holtec International has provided other licensees with suggested enhancements to their canister downloading operations. In some of those cases, Holtec is providing its crews with equipment enhancements such as video cameras for use during downloading operations. Since the August 3, 2018, canister misalignment incident, NRC regional inspectors have noted greater licensee oversight in place during dry fuel storage operations at other ISFSI sites. We believe that the greater presence of licensee oversight is a direct result of licensees paying close attention to the NRC findings at SONGS.