UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

June 2, 2021

Mr. Charles Langley
Executive Director
Public Watchdogs
7867 Convoy Court, Suite 302
San Diego, CA 92111

SUBJECT: RESPONSE TO THE PETITION REQUESTING ENFORCEMENT ACTION UNDER SECTION 2.206 OF TITLE 10 OF THE CODE OF FEDERAL REGULATIONS IN THE FORM OF DEMANDS FOR INFORMATION TO SOUTHERN CALIFORNIA EDISON AND ITS SUBCONTRACTORS UTILIZING HI-STORM UMAX SYSTEM

Dear Mr. Langley:

On behalf of the U.S. Nuclear Regulatory Commission (NRC), I am responding to the petition by Public Watchdogs, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR), Section 2.206, "Requests for action under this subpart," dated October 13, 2020 (Agencywide Documents Access and Management System [ADAMS] Accession No. ML20294A388). The NRC's Executive Director for Operations referred the petition to the Office of Nuclear Material Safety and Safeguards (NMSS) for action.

Our petition review board (PRB) has reviewed your petition. The PRB's final determination is that the concerns expressed in the petition do not meet the criteria for consideration under 10 CFR 2.206 because the issues described in the petition have previously been the subject of NRC staff review. In approving the installation of the Holtec HI-STORM UMAX storage system, the NRC staff considered the credibility of events [including those events described in the petition], analyzed the respective consequences, and found the HI-STORM UMAX system design to be adequate for protecting public health and safety.

Petition Request

In the October 13, 2020 petition, Public Watchdogs requested that the NRC take enforcement action in the form of demands for information to Southern California Edison (SCE), Holtec, and all other licensees, using the Holtec HI-STORM UMAX storage system, and all other Holtec systems whose licensing documents (Final Safety Analysis Reports and/or Safety Evaluation Reports) claim that, "There are no credible events that could result in release of radioactive materials from the system." In addition, Public Watchdogs requested that the NRC require SCE and its subcontractors to respond with information and objective analyses that validate the claim that certain risks including radiological releases from the HI-STORM UMAX system are not credible. Public Watchdogs also requested that the associated technical analysis include the following effects:

- Loss of Cooling
- Flooding

- Corrosion
- Fuel cladding failures
- Excessive pressure
- Criticality
- Thermal transients

Summary of NRC Staff Actions

On November 13, 2020 (ADAMS Accession No. ML20321A081), the NRC informed Public Watchdogs that the NRC staff concluded, in accordance with Section II.B.1 of the NRC Management Directive (MD) 8.11, "Review Process for 10 CFR 2.206 Petitions" (ADAMS Accession No. ML18296A043), that the petition request does not contain urgent safety issues that require immediate action.

On January 12, 2021 (ADAMS Accession No. ML21012A337), Public Watchdogs was informed by email of the PRB's initial assessment that the petition request does not meet MD 8.11 Section III.C.1(b)(i) criterion for petition evaluation. The criterion states: "The issues raised by the petitioner have not previously been the subject of a facility-specific or generic NRC staff review." Specifically, the concerns expressed in this petition have previously been evaluated or considered in NRC staff licensing reviews and in the evaluation of prior 2.206 petition requests submitted by Public Watchdogs.

On March 9, 2021, a virtual public meeting was held for Public Watchdogs to provide any additional information to the PRB for consideration in the PRB's determination regarding the petition's acceptability for review. Public Watchdogs gave two presentations during the meeting (ADAMS Accession Nos. ML21042A077 and ML21070A318). The transcript for the March 9, 2021, public meeting is available in ADAMS under Accession No. ML21084A478.

On March 30, 2021 (ADAMS Accession No. ML21117A349), Public Watchdogs sent an email with the following statement along with additional questions to the NRC:

> We have new information related to our October 13, 2021,10 CFR 2.206 petition. This information is the result of a March 18, 2021 SONGS[1] "Community Engagement Panel Meeting," which was recorded by the licensee, Southern California Edison at www.songscommunity.com, and also as a result of new NRC disclosures made during our recent PRB meeting.

The NRC staff reviewed the March 30, 2021 information provided by Public Watchdogs and discussed during a PRB meeting and concluded that the information did not contain: 1) support for the assertions made in the petition, 2) references to the purported sources of information, 3) efforts to demonstrate the relevance of the information to the petition, and 4) a request for any enforcement-related action. However, the questions provided in Public Watchdog's email dated March 30, 2021 will be addressed in the form of NRC staff general correspondence. The NRC plans to respond to your March 30, 2021 questions, and the questions from Mr. Paul Blanch via his email dated February 9, 2021 (ADAMS Accession Nos. ML21040A262 and ML21040A316), on or before July 30, 2021.

The PRB's final determination, based on the review of the October 13, 2020 petition and the review of information related to the March 9, 2021 public meeting, is discussed as follows.

[1] San Onofre Nuclear Generating Station (SONGS)

C. Langley

NRC Staff Response to Specific Petition Concerns

The information requested in the October 13, 2020 petition regarding the credibility of events was previously addressed in the NRC's response to Public Watchdogs' 2.206 petition dated February 5, 2020 (ADAMS Accession No ML20036E999) which was related to the HI-STORM UMAX system at SONGS. The concerns, as raised in your February 5, 2020 petition, are identified in the bulleted list below, and they were addressed in the NRC's September 1, 2020 closure letter (ADAMS Accession No. ML20216A610). The PRB considers that the NRC's September 1, 2020 closure letter effectively addressed the concerns contained in the October 13, 2020 petition. Specifically, the NRC's September 1, 2020 closure letter addressed the following issues which are noted with their respective applicability to those contained in the October 13, 2020 petition (in brackets) regarding loss of cooling, flooding, corrosion, fuel cladding failures, excessive pressure, criticality, and thermal transients.

- Canister integrity and possible rupture due to thermal shock [i.e., effects related to loss of cooling, flooding, corrosion, and excessive pressure and thermal transients]
- Criticality due to the introduction of sea water into the fuel [i.e., effects related to criticality]
- Potential overpressure due to steam formation [i.e., effects related to flooding and excessive pressure]
- Canister deformation and radiation levels may prevent removal of the multipurpose canisters (MPCs) [i.e., effects related to flooding and excessive pressures]
- Potential landslides [i.e., effects related to loss of cooling]
- Long-term and irreversible corrosion [i.e., effects related to flooding and corrosion]
- Major radiation releases to the environment [i.e., effects related to loss of cooling, flooding, corrosion, fuel cladding failures, excessive pressure, criticality, thermal transients]

A summary of the NRC's responses, as relevant to each of the effects listed in Public Watchdogs' October 13, 2020 petition, along with additional information from the Holtec HI-STORM UMAX Final Safety Analysis Report (FSAR), Revision 5 (ADAMS Accession No. ML18192B094), and the safety evaluation report (SER) for the HI-STORM UMAX Storage System, Amendment 0 (ADAMS Accession No. ML15093A510), is provided below:

Loss of Cooling

- With respect to Public Watchdogs' concerns on loss of cooling, the NRC's closure letter dated September 1, 2020 provided a summary of the redacted version of HI-STORM UMAX FSAR Section 4.6.2.5. The summary included a discussion that the MPC pressure remains below the normal pressure limits, and the temperatures of the MPC component and its spent fuel contents will remain well below accident temperature limits, under both fully and partially flooded conditions.

- Regarding the concerns of loss of cooling resulting from blockage(s), HI-STORM UMAX FSAR Section 12.1.4 provides corrective actions for partial blockage of air vents including removal, cleaning, and replacement of the affected mesh screens. As noted in this FSAR section, the system technical specifications require periodic inspection of the air vent screens or temperature monitoring to verify passive cooling of the MPCs. In addition, FSAR Section 12.2.10.3 discusses the corrective actions for a 100% blockage

of air inlet accident. The correction actions include removal of the blockage(s) with mechanical and manual means and system inspection for damage.

- Additional information related to loss of cooling from blockage(s) is contained in FSAR Section 12.2.10.3 which states that for an accident event that completely blocks the inlet or outlet air openings for greater than the analyzed duration, a site-specific evaluation or analysis may be performed by the general licensee to determine whether adequate heat removal would occur for the duration of the event. Although loss of cooling from the HI-STORM UMAX system being buried under debris is not a credible event because there are no structures that loom over the casks whose collapse could completely bury the casks in debris, FSAR Section 4.6.2.4 provides a burial under debris analysis to determine the length of time that is available to the plant's emergency response organization to remedy the condition, as an extra precautionary measure.

- Additional information related to the potential for burial of the HI-STORM UMAX storage system under debris was analyzed in the SCE 10 CFR 72.212 evaluation report (not publicly available) and it was determined that such a scenario is not a credible event for the SONGS independent spent fuel storage installation (ISFSI). NRC inspection of the general licensee's 10 CFR 72.212 report is included in NRC inspection report 07200041/2017-001 (ADAMS Accession No. ML18200A400).

Flooding

- The consequences of flooding at the SONGS ISFSI were addressed in the NRC's letter to Public Watchdogs [responding to a previous 2.206 petition] dated February 26, 2020 (ADAMS Accession No. ML20038A336) on Page 3 under the heading "Flood Analysis."

- The Flood accident analysis in FSAR Section 12.2.4 states that if cavity enclosure container is partially filled with soil or debris and the divider shell cutout is blocked, such an event would be bounded by the 100% blockage of air inlet vents accident discussed in FSAR Section 12.2.10 and addressed in Loss of Cooling section.

- The HI-STORM UMAX MPCs are designed to withstand an accident with an external pressure of 55 psi (379 kPa) which is consistent with the design bases flood height of 125 feet shown on HI-STORM UMAX FSAR Table 2.3.1. as noted in the SER (ADAMS Accession No. ML15093A510) Section 3.6 Evaluation Findings.

Corrosion

- The HI-STORM UMAX FSAR Section 12.2.4.3 includes corrective action for floods that considers the risk of corrosion from long-term exposure to floodwaters.

- The FSAR states that while the short-term effect of flood on the loaded HI-STORM UMAX vertical ventilated module (VVM) is essentially benign, corrective actions after such an event are necessary. The corrective actions to restore the system to a normal configuration include the removal of floodwater and any debris deposited by the receding water. The NRC's inspection program includes provisions for reactive inspections of a licensee's site (ADAMS Accession No. ML013480367). Reactive inspections may be employed to observe and verify that corrective actions are implemented by the licensee following off-normal or accident events.

- HI-STORM UMAX canisters at SONGS have a 5/8-inch thick wall to provide additional potential corrosion protection and are constructed with laser peened welds as noted in the NRC Supplemental Inspection Report 072-00041/2018-002 (ADAMS Accession No. ML19190A217), Page 34.

- Maximum depth of scratches from canister downloading operations do not penetrate through the depth of the laser peened canister surfaces as stated in NRC Supplemental Inspection Report 072-00041/2018-002 (ADAMS Accession No. ML19190A217), Page 35. As such, the presence of scratches from downloading operations will not lead to premature degradation of the canisters.

Fuel Cladding Failures

- The temperature results reported in HI-STORM UMAX FSAR Table 4.6.9 show that the peak cladding temperature remains below the normal condition temperature limit of 400°C and far below the accident condition limit of 570°C.

Excessive Pressure

- Steam over pressurization in the VVM caused by the boiling of water, if it were to occur, would be relieved through the closure lid vents. As stated in HI-STORM UMAX FSAR Sections 2.3.2 and 3.4.4.1.5, the VVM is not capable of retaining internal pressure due to its open design. The NRC staff's review of the design and structural evaluation of the HI-STORM UMAX system is included in Chapter 3 of the SER (ADAMS Accession No. ML15093A510).

- The MPC is designed to withstand an accident with an external pressure of 55 psi (379 kPa) equivalent to a design bases flood height of 125 feet (HI-STORM UMAX FSAR Table 2.3.1).

- Burial by debris is analyzed in HI-STORM UMAX FSAR Section 4.6.2.4. HI-STORM UMAX FSAR Table 4.6.10 shows that burial under debris would not lead to an over pressurization of the MPC.

Criticality

- The HI-STORM UMAX system MPC would not be breached or exhibit leakage under the accident scenarios as discussed in the HI-STORM UMAX FSAR, therefore, criticality caused by inundation of the canister by saltwater is not a credible event.

- The criticality safety analyses performed for the Holtec HI-STORM Flood and Wind storage system, to demonstrate compliance with the regulatory requirements in 10 CFR 72.124 (ADAMS Accession No. ML17179A444), were applied to the HI-STORM UMAX storage system.

Thermal Transients

- The HI-STORM UMAX FSAR Section 12.2.4 addresses a flood accident and the analysis includes an evaluation of effects on structural, thermal, criticality, confinement, and radiation protection performance on the HI-STORM UMAX system. Staff findings

from the NRC safety evaluation report for the UMAX System address this concern (Amendment 0, ADAMS Accession No. ML15093A510), specifically findings F3.2 (Structural) and F4.4 (Thermal).

- The HI-STORM UMAX storage system at the SONGS ISFSI is manufactured from austenitic stainless steels that are known to remain tough and ductile to very low temperatures as stated in NUREG-1536, Revision 1, Section 8.4.16.

- The neutron fluence for dry storage system canisters is insufficient to alter the properties of the austenitic stainless-steel materials as stated in NUREG-2214, Section 3.2.2.9.

- Regarding the events that the petitioner identified in the petition request, the NRC notes that the staff has already considered these events, analyzed the respective consequences, and found the HI-STORM UMAX system design to be adequate for protecting public health and safety.

Regarding the petition's references to reactor incidents (Davis-Besse, Chernobyl, and Fukushima) as well as military and terrorist attacks, the NRC staff considers that the operating reactor incidents such as Chernobyl and Davis-Besse are not applicable to dry storage systems. The NRC staff addressed potential tsunami events similar to those observed at Fukushima in the aforementioned September 1, 2020 letter. The protection of stored spent nuclear fuel and ISFSI security are addressed under the requirements in 10 CFR Part 73.

In addition, the NRC staff has addressed the issues identified in the October 13, 2020 petition via several prior NRC correspondences and publicly available records similar to those discussed in the petition. These documents include:

- NRC 2.206 Closure Letter dated February 26, 2020 (ADAMS Accession No. ML20038A336), to Barnes and Thornburg LLP, representing Public Watchdogs' September 24, 2019 10 CFR 2.206 petition request (ADAMS Accession No. ML19309D323), as supplemented on January 21, 2020 (ADAMS Accession No. ML20023A182).

- NRC 2.206 Closure Letter dated March 4, 2020 (ADAMS Accession No ML20057G184) to the Oceansiders Against San Onofre Corruption's August 3, 2019 10 CFR 2.206 petition request (ADAMS Accession No. ML19322B094), as supplemented on January 20, 2020 (ADAMS Accession No. ML20034E843).

- NRC staff's Safety Evaluation Reports on HI-STORM UMAX Canister Storage System, Amendment 0 (ADAMS Accession No. ML15093A510), Amendment 1 (ADAMS Accession No. ML15252A423), and Amendment 2 (ADAMS Accession No. ML16341B129).

In summary, the NRC staff has already considered the effects identified in the October 13, 2020 petition, analyzed the respective consequences, and found the HI-STORM UMAX system design to be adequate for protecting public health and safety.

C. Langley

Conclusion

The PRB's final assessment is that the concerns raised in the petition do not meet the acceptance criteria in MD 8.11, Section III.C.1(b)(ii), because the issues raised in the petition have been "the subject of a facility-specific or generic NRC staff review," and none of the three circumstances in Section III.C.1(b)(ii) of MD 8.11 apply. The PRB briefed the NMSS Office Director on the final assessment, and he supported this determination.

Thank you for your continued interest in the safety and security of spent nuclear fuel, and for bringing these issues to the NRC's attention.

Sincerely,


Signed by Williams, Kevin
on 06/02/21

Kevin Williams, Director
Division of Materials Safety, Security,
State, and Tribal Programs
Office of Nuclear Material Safety
and Safeguards

Docket Nos.: 50-361, 50-362,
72-41, and 72-1040

Mr. Charles Langley 8

Closure Letter Responding to 10/13/2020, 2.206 Petition Submitted by Public Watchdogs DATE June 2, 2021

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