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

April 27, 2016

Mr. Thomas J. Palmisano
Vice President and Chief Nuclear Officer
Southern California Edison Company
San Onofre Nuclear Generating Station
P.O. Box 128
San Clemente, CA 92674-0128

SUBJECT: SAN ONOFRE NUCLEAR GENERATING STATION, UNITS 2 AND 3 – CORRECTION LETTER FOR LICENSE AMENDMENT NOS. 233 AND 226 REGARDING MODIFICATION TO THE OPERATING LICENSES TO ALLOW CHANGES TO SPECIFIC REGULATORY GUIDE COMMITMENTS (CAC NOS. L53073 AND L53074)

Dear Mr. Palmisano:

By letter dated March 11, 2016 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML16055A522), the U.S. Nuclear Regulatory Commission (NRC) issued Amendment No. 233 to Facility Operating License No. NPF-10 and Amendment No. 226 to Facility Operating License No. NPF-15 for the San Onofre Nuclear Generating Station (SONGS), Units 2 and 3, respectively. The amendments were issued in response to a letter from Southern California Edison (SCE) dated August 20, 2015 (ADAMS Accession No. ML15236A018), as supplemented by letters dated November 19, 2015, and January 12, 2016 (ADAMS Accession Nos. ML15327A410 and ML16014A376, respectively).

Amendment Nos. 233 and 226 allow for revision of the Updated Final Safety Analysis Report (UFSAR) to reflect the significant reduction of decay heat loads in the SONGS Units 2 and 3 spent fuel pools resulting from the time that has elapsed since the permanent shutdown of the units in 2012. The revisions support design basis changes associated with implementing the "cold and dark" plant status described in the Post-Shutdown Decommissioning Activities Report.

Subsequent to the issuance of the March 11, 2016, license amendment, SCE submitted a letter dated April 12, 2016 (ADAMS Accession No. ML16104A402), notifying the NRC that during the review and implementation of the associated safety evaluation (SE) SCE identified three items in need of correction or clarification within both the SCE submittals and the NRC's subsequent SE. A description, discussion, and disposition for each of these items is provided as follows:

Correction and Clarification 1 – Spent Fuel Pool Liner Leakage

In the supplemental letter dated November 19, 2015, SCE responded to NRC questions regarding management of leakage through the spent fuel pool (SFP) liner resulting from a design basis cask drop or light load handling accident. One of the statements included in SCE's response indicated that leak chase drain valves were available to mitigate potential leakage from the spent fuel pool liner without challenging the SFP makeup capability. As a result of this

information, a statement was incorporated into the NRC's SE that reads: "Furthermore, liner leaks can be mitigated by shutting the leak chase drain valves if and when appropriate. Therefore, liner leakage would not require immediate availability of make-up water to maintain safe storage of the fuel." Subsequently, SCE has determined that the statement regarding leak chase drain valves being present at SONGS is inaccurate. While the configuration of the leak pipes is such that they can be mechanically plugged, no valves presently exist in the piping.

The NRC staff has evaluated the significance of this error on the conclusions reached in the SE regarding SFP liner leakage and makeup capacity, and determined that there is no safety impact associated with the absence of leak chase drain valves in the SFP piping at SONGS. The licensee's evaluation, stating that at the maximum SFP liner leakage rate of 50 gallons per minute it would take approximately 70 hours to drain the SFP and connected cask pool and transfer pool water levels to an elevation 10 feet above the stored fuel, was what the NRC staff's decisions in this area were based upon. Therefore, the conclusion that ample shielding and cooling of the stored fuel will remain available such that liner leakage would not require immediate availability of make-up water to maintain safe storage of the fuel, remains valid.

The NRC staff also notes that this error in providing information to the NRC has been entered into the SCE Corrective Action Program. Given the above considerations, the NRC agrees that a revised SE page should be issued to exclude the statement regarding leak chase drain valves in order to prevent future confusion. Enclosed please find a corrected Page 10 of the NRC's SE, which removes the sentence that discusses leak chase drain valves.

Correction and Clarification 2 – Spent Fuel Pool Suction Piping

In the supplemental letter dated January 12, 2016, SCE responded to NRC questions regarding how the design feature preventing draining or siphoning the spent fuel pool below 23 feet above the top of the fuel was maintained. One of the statements included in SCE's response stated that "while the current [Spent Fuel Pool Cooling] system is in operation, the suction line has to remain available." As a result of this information, a statement was incorporated into the NRC's SE that reads: "The licensee stated that this [Spent Fuel Pool Cooling suction] piping will no longer be used once the ISFPCS [Independent Spent Fuel Pool Cooling System] is fully in service." Subsequently, SCE clarified that the purpose of the original statement was to show that this suction line was needed at least until the Spent Fuel Pool Cooling system was retired. SCE did not intend to imply that the piping would be removed, and therefore unavailable; or that it would not be re-purposed following retirement of the Spent Fuel Pool Cooling System and implementation of the ISFPCS. Under the ISFPCS, this line is intended to be used as the injection path for the spent fuel pool makeup system.

The NRC staff has evaluated the significance of this clarification on the conclusions reached in the SE regarding drain down and potential siphoning of the SONGS SFP, and determined that there is no safety impact associated with maintaining the current spent fuel pool cooling suction line and repurposing it as the injection path for the spent fuel pool makeup system. Specifically, the conclusion that the SFP would be protected against siphoning, draining events, and other spent fuel pool inventory loss during design basis events remains valid. Although this suction piping will not be removed from service following transition to the ISFPCS, the risk of siphon from this source remains low by design due to (1) the entire un-isolated piping run is designed to Seismic Category I requirements; (2) the piping is stainless steel, rated at 150 psig, and is Quality Class lll AQ (augmented quality); (3) all isolation valves are manual and not subject to

spurious opening; and (4) the bottom elevation of the suction line as it enters the SFP is at an elevation more than 21 feet above the top of fuel.

Given the above considerations, the NRC agrees that a revised SE page should be issued to remove the statement regarding the future use of the Spent Fuel Pool Cooling system suction piping in order to prevent future confusion. Enclosed please find an additional correction to Page 10 of the NRC's SE, which removes the sentence that discusses taking the Spent Fuel Pool Cooling system suction line out of service after the ISFPCS is operational.

Correction and Clarification 3 – Spent Fuel Pool Spillage Return

In Section 3.1 of the August 20, 2015, license amendment request, SCE discussed that any leakage resulting from failure of the primary piping would not be lost but would be spilled back on to the SFP operating deck(s) and return to the pools. In the April 12, 2016, letter, SCE clarified that while it is true that leakage onto the operating deck(s) could potentially return to the pool, it is more likely that such leakage would collect and drain through floor drains to the Fuel Handling Building sump. This information was provided for clarification only, was not described in the NRC's SE, and no conforming changes to the SE are necessary.

If there are additional questions regarding any of the above corrections or clarifications, please contact me at 301-415-3178, or via email at Marlayna.Vaaler@nrc.gov.

Sincerely,

/RA/

Marlayna Vaaler, Project Manager
Reactor Decommissioning Branch
Division of Decommissioning, Uranium Recovery,
and Waste Programs
Office of Nuclear Material Safety and Safeguards

Docket Nos. 50-361 and 50-362

Enclosure:
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spurious opening; and (4) the bottom elevation of the suction line as it enters the SFP is at an elevation more than 21 feet above the top of fuel.

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Sincerely,

/RA/

Marlayna Vaaler, Project Manager
Reactor Decommissioning Branch
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Docket Nos. 50-361 and 50-362

Enclosure:
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ADAMS Accession No. ML16117A291 ***concurred via e-mail**

OFFICE	NMSS/RDB/PM	NMSS/DUWP/LA	NRR/DSS/SBPB	NMSS/RDB/BC
NAME	MVaaler	CHolston	SJones*	BWatson
DATE	4/26/16	4/26/16	4/26/16	4/27/16

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3.2 SFP Make-up System

The NRC staff reviewed the proposed design of the SFP make-up water system to identify changes that may affect the reliability of the system. The staff identified the following significant design changes:

- the proposed design of the primary make-up water system and the supporting electrical distribution system would be Quality Group D (i.e., ASME B31.1, "Power Piping," is the design code for piping), Quality Class III-AQ (Augmented Quality, which means that most criteria of the quality assurance program apply), and Seismic Category I for mechanical portions of the system only rather than ASME Code Class 3, safety-related, and Seismic Category I

The safety importance of the SFP make-up water system is related to the potential for a substantial loss of SFP coolant inventory during or following a design basis event. The primary concerns are loss of coolant inventory due to leakage and evaporation. The licensee described that the protection against leakage would not be altered by the ISFPCS installation. As described in Section 3.1 above, the decay heat rate of the stored fuel has decreased significantly; consequently, the maximum rate of evaporation has decreased as well. Therefore, potential for a substantial loss of coolant inventory by evaporation has decreased following the permanent shutdown of SONGS Units 2 and 3.

The SFPs also remain protected against leakage due to design-basis accidents and events. The design-basis fuel handling accident does not result in damage to the SFP liner or result in any leakage because the liner plate is in direct contact with the pool floor. The SONGS UFSAR states that leakage from the SFP would be controlled by a system of leak chases located behind the SFP liner plates. The leak chases are connected to drain pipes, which terminate in the leak collection sump. The licensee determined that leakage into the leak chases would be limited to about 50 gallons per minute based on the cross-sectional area of the chases and drain piping. The licensee determined that a non-mechanistic 50 gallon per minute leak would require about 70 hours to drain the SFP and connected cask pool and transfer pool water levels to an elevation 10 feet above the stored fuel, which still provides ample shielding and cooling of the stored fuel. Therefore, liner leakage would not require immediate availability of make-up water to maintain safe storage of the fuel.

The potential for a substantial loss of coolant inventory from the SFP through connected systems is also limited. The SONGS Units 2 and 3 SFPs contain no drains and the bottom of the gate opening to adjacent pools is about two and a half feet above the top of stored fuel. The lowest piping penetration through the SFP liner is the SFPCS suction line, which is over 21 feet above the top of the stored fuel. The ISFPCS will use a vertical suction line that terminates at approximately the same elevation in the SFP, so its operation would not change the potential inventory loss associated with failure of connected piping. The SFPCS discharge piping will remain in service as the ISFPCS discharge, and, although the piping extends lower in the SFP than the suction line, it contains a siphon break approximately 26 feet above the top of the stored fuel. Therefore, the SFP is well protected against coolant inventory loss through