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October 27, 2014

10 CFR 50.12

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Subject: **Docket No. 50-206, 50-361, 50-362, and 72-041**
Response to Requests for Clarification of October 6, 2014 RAI Responses Concerning Emergency Planning Exemption Request
San Onofre Nuclear Generating Station, Units 1, 2, 3 and ISFSI

Reference: (1) Letter from T. J. Palmisano (SCE) to the U.S. Nuclear Regulatory Commission (NRC) dated March 31, 2014; Subject: Docket Nos. 50-206, 50-361, 50-362, and 72-041, Emergency Planning Exemption Request, San Onofre Nuclear Generating Station, Units 1, 2, 3, and Independent Spent Fuel Storage Installation, ADAMS Accession No. ML 14092A332

(2) E-mail from T. J. Wengert (NRC) to A. L. Sterdis (SCE) dated October 8, 2014; Subject: Request for Clarification of October 6, 2014 RAI Response Concerning Proposed Exemption from Certain EP Requirements (TAC Nos. MF3835, MF3836, and MF3837), ADAMS Accession No. ML14296A469.

Dear Sir or Madam:

By letter dated March 31, 2014 (Reference 1), Southern California Edison (SCE) submitted an exemption request from certain requirements of 10 CFR 50.47, "Emergency Plans," and 10 CFR Part 50, Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities," for San Onofre Nuclear Generating Station (SONGS) Units 1, 2, and 3, and the Independent Spent Fuel Storage Installation (ISFSI). Granting the exemptions requested is necessary to support review and approval of a Permanently Defueled Emergency Plan and associated Emergency Action Levels both of which are being addressed separately.

By e-mail dated October 8, 2014 (Reference 2), the NRC requested clarifications related to previous responses to requests for additional information. The requested clarifications are contained in the Enclosure to this letter.

The conclusions of the no significant hazards consideration and environmental considerations contained in Reference 1 are not affected by, and remain applicable to, this revised request.

There is one new regulatory commitment in this submittal.

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Should you have any questions, or require additional information, please contact Ms. Andrea Sterdis at (949) 368-9985.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on 10/27/2014

Sincerely,

Enclosures:

1. Responses to NRC Request for Clarifications of Previous Responses Regarding Emergency Planning Exemption Requests
2. New Commitment

cc: M. L. Dapas, Regional Administrator, NRC Region IV
T. J. Wengert, NRC Project Manager, SONGS Units 2 and 3
R. E. Lantz, NRC Region IV, San Onofre Units 2 and 3
G. G. Warnick, NRC Senior Resident Inspector, SONGS Units 2 and 3

ENCLOSURE 1

Responses to NRC Request for Clarifications of Previous Responses Regarding Emergency Planning Exemption Requests

Request for Clarification #1

The Spent Fuel Pool (SFP) Makeup and Spray Strategies are depicted and described on page 13 of 16 of the October 6, 2014, submittal. The SFP purification system is illustrated and described in the schematic as a functioning system. The description in the schematic states that the purification system provides SFP temperature indication to the control room via the plant computer from TE7703 when the Fuel Pool Purification System is in operation.

However, it is the NRC staff's understanding that the SFP purification systems, for both units, were removed from service some time ago to facilitate removal of all IX resin and that the system is no longer in operation and is no longer maintained. It is not clear to the staff whether these systems have been abandoned, or if the licensee considers these systems available in their current state. Please clarify the current status of the SFP purification systems and confirm that the information provided in the October 6th submittal is accurate with respect to the purification system.

SCE Clarification #1

The SCE response to Revised RAI-010, provided to the NRC on October 6, 2014, was intended to show defense-in-depth for Spent Fuel Pool (SFP) cooling and makeup including normal systems, Internal Makeup Strategy, External Makeup Strategy, and External Spray Strategy. If available, normal cooling and makeup systems would be used. The SFP Purification System is one of the normal systems that could be used to provide makeup. The current status of the SFP Purification System is that the system is available but not in service. Procedures to use the SFP Purification System pumps to fill the opposite SFP remain available. The breaker for each of the pumps (1 per SFP) is open and administratively controlled. The system has not been drained. The ion-exchange (IX) resin has been removed and therefore the purification function is no longer available. The mechanical portion of the SFP Purification System (e.g., pumps, valves and piping) and required power supplies remain available (not abandoned or physically removed). The SFP Purification System can be placed back into service to provide SFP makeup from the opposite SFP within an estimated time of 30 minutes using procedure SO23-3-2.11.1.

For the backup temperature instrumentation (i.e., TE 7703) provided in the SFP Purification System, as discussed in the response to RAI-010, the system must be in-service with the pump running to provide an accurate indication of temperature. If the Purification System pump is not running, SFP temperature can be read in the Control Room via the plant computer data point for TE7702, which is located in the SFP Cooling System piping. One of the two SFP cooling pumps must be running to get an accurate pool temperature reading from TE7702. While the SFP Purification System is operated on an occasional basis, the SFP Cooling System is continuously in service. TISH7739, located in the pool itself, provides an alarm in the Control Room when SFP temperature reaches 132^{O}F. This instrument also provides local indication of the SFP temperature on the east side of the pool.

Preventive Maintenance activities for the SFP Purification System pumps remain the same as those which were performed prior to SONGS permanent shutdown with the following exceptions:

- Line Starter and Control Circuit PMs have been deactivated using the DEC Process Evaluations.

Since the system is no longer routinely operated, SONGS will implement a routine activity to periodically verify pump operation.

In summary, the response included the current installed SFP cooling and makeup capability to demonstrate that there are multiple methods to provide water to the SFPs. (Normal SFP cooling and makeup systems as well as the Internal and External Mitigation Strategies). The diversity and number of viable methods of SFP makeup demonstrate a robust functional capability.

Request for Clarification #2

In the response to RAI-014, the justification for operation of the ventilation system following a seismic event does not address power availability. Since power transmission is among the most fragile systems and no information was provided regarding the status of the Class IE distribution, the statement that the system is Class II/I as a basis for functionality following a seismic event alone is inadequate. Please clarify the basis for functionality of the ventilation system or provide alternative justification demonstrating that the stored fuel would be adequately cooled by natural circulation air flow in a completely drained spent fuel pool.

SCE Clarification #2

SCE conducted RAI clarification discussions with NRC. As a result of the discussions, SCE determined that, the adiabatic fuel heat-up calculation can be used to determine adequate time exists from the time of spent fuel pool drainage to initiation of a zirconium fire. The basis for NRC Emergency Planning exemption approval is that a conservative analysis demonstrates > 10 hours for the zirconium fuel cladding to reach 900°C from the time a beyond design basis event causes drainage of the Spent Fuel Pool. SONGS calculations demonstrate that as of August 2014 it will take > 17 hours from event initiation to reach 900°C using standard adiabatic assumptions for the limiting fuel assembly. However, the NRC staff has identified that for the first 2-3 years after final plant shutdown, calculations which include air cooling may be the limiting or most conservative method to analyze the fuel heat-up, since this calculation method includes the fuel clad heat-up caused by an exothermic oxidation reaction.

NUREG-1738 indicates that oxidation becomes a significant contributor to the overall heat source total power at temperatures above approximately 600°C. The calculated heat-up time to 565°C demonstrated by the SONGS adiabatic fuel heat-up calculation (previously submitted to the NRC in Table RAI-015-1 in SCE response to RAI-015) demonstrates margin to the 600°C and therefore the use of the adiabatic calculation remains valid. That heat-up time from pool drainage until cladding temperature reaches 565°C was 10 hours as of August 31, 2014.

Additionally, fuel clad oxidation's contribution to overall fuel heat-up rates with clad temperature below 900°C was discussed in NRC document, "Evaluation of Adiabatic Calculation Performed by the Office of Nuclear Regulatory Research to Support Emergency Preparedness Exemptions for Decommissioning Reactors," ML14132A169, dated July 16, 2014, page 2.

> "NUREG-1738 contains the results of a calculation comparing adiabatic heat-up to air-cooled heat-up and found that in some cases, the air-cooled case resulted in faster heat-up (Figure 2.2 in NUREG-1738) since the adiabatic case didn't consider oxidation. RES staff estimates that this will be a small effect because for blocked airflow the amount of oxidant to feed the more energetic air (as opposed to steam) oxidation reaction will be limited. For situations where the fuel is

subject to increased airflow, staff estimates the increase in heat generated from oxidation will be partially or completely offset by a corresponding heat loss from air cooling such that, overall, this remains a small effect below 900°C."

Since SONGS adiabatic fuel heat-up calculations demonstrate >10 hours from pool drainage until the clad temperature reaches 565°C, significant additional time margin exists before the fuel clad temperature reaches 900°C, even assuming some heat-up caused by oxidation. Based upon the excerpt from the NRC document above, the SONGS calculation demonstrates that the heat-up from 565°C to 900°C will take an additional 7 hours, for a total of 17 hours from SFP drainage to reaching 900°C.

ENCLOSURE 2

NEW COMMITMENT

Number	Commitment	Due Date/Event
1	SCE will implement a routine activity to periodically operate the spent fuel purification pumps.	Initial operation will be performed prior to end of year.