

**Lent, Susan**

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**From:** Hall, Randy  
**Sent:** Thursday, December 20, 2012 2:57 PM  
**To:** Ryan.Treadway@sce.com  
**Cc:** joseph.bashore@sce.com; John.Brabec@sce.com; Broaddus, Doug; Jackson, Christopher; Kulesa, Gloria; Elliott, Robert; Pelton, David; Paige, Jason; Murphy, Emmett; Karwoski, Kenneth; Thurston, Carl; Hoxie, Chris; Grover, Ravinder; Beaulieu, David; Parks, Benjamin; Clifford, Paul; Schulten, Carl; Lantz, Ryan; Werner, Greg; Taylor, Nick; Rahn, David; Thorp, John; Benney, Brian  
**Subject:** Draft Request for Additional Information on SCE's Response to NRC's Confirmatory Action Letter for San Onofre Nuclear Generating Station Unit 2 (ME9727)  
**Attachments:** SONGS Draft RAI Dec 20.docx

December 20, 2012

Mr. Ryan Treadway  
Manager, Nuclear Regulatory Affairs  
San Onofre Nuclear Generating Station  
Southern California Edison Company

Ryan:

By letter dated October 3, 2012, (Agencywide Documents Access and Management System (ADAMS) Accession No. ML122850320) Southern California Edison (SCE) submitted its response to the NRC Confirmatory Action Letter (CAL) dated March 27, 2012, for San Onofre Nuclear Generating Station (SONGS), Unit 2. The NRC staff is continuing its detailed review of SCE's CAL response and Return to Service report for SONGS Unit 2 and has determined that further additional information is needed in order to complete our evaluation. The NRC staff previously provided draft requests for additional information (RAIs) regarding the CAL response to you on November 30 and December 10, 2012 (ADAMS Accession Nos. ML12338A110 and ML12345A427, respectively). The staff's latest RAI is attached. The staff may develop additional questions, which we will transmit to SCE as they become available.

Please contact me if you have any questions.

Sincerely,

Randy Hall, Senior Project Manager  
San Onofre Special Projects Branch  
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OFFICE OF NUCLEAR REACTOR REGULATION  
REQUEST FOR ADDITIONAL INFORMATION  
SOUTHERN CALIFORNIA EDISON  
SAN ONOFRE NUCLEAR GENERATING STATION, UNIT 2  
RESPONSE TO MARCH 27, 2012, NRC CONFIRMATORY ACTION LETTER  
DOCKET NO. 50-361  
TAC NO. ME9727

By letter dated October 3, 2012, (Reference 1), Southern California Edison (SCE) submitted its response to the NRC Confirmatory Action Letter (CAL) dated March 27, 2012, for San Onofre Nuclear Generating Station (SONGS), Unit 2. The NRC staff is continuing its detailed review of SCE's CAL response for SONGS Unit 2 and has determined that additional information is needed in order to complete our evaluation. The staff's additional question is stated in this draft request for additional information (RAI) below. The staff previously issued two sets of RAI questions on this subject, on November 30, 2012 (ADAMS Accession No. ML12338A110), and on December 10, 2012 (ADAMS Accession No. ML12345A427). For continuity, the numbering scheme for this additional question begins where the prior RAI questions ended.

32. SONGS Unit 2 Technical Specification (TS) 3.4.17 requires that steam generator structural integrity be maintained in Modes 1, 2, 3, and 4 (Power Operation, Startup, Hot Standby, and Hot Shutdown, respectively). Limiting Condition for Operation (LCO) 3.4.17, "Steam Generator (SG) Tube Integrity," requires that steam generator tube integrity shall be maintained and all steam generator tubes satisfying the tube repair criteria shall be plugged in accordance with the Steam Generator Program in MODES 1, 2, 3, and 4. The steam generator tube rupture (SGTR) accident is the limiting design basis event for SG tubes and avoiding an SGTR is the basis for LCO 3.4.17. Surveillance Requirement (SR) 3.4.17.1 requires "Verify SG tube integrity in accordance with the Steam Generator Program."

The structural integrity performance criterion is described in SONGS Unit 2 TS 5.5.2.11.b.1 as follows:

All in-service steam generator tubes shall retain structural integrity over the full range of normal operating conditions (including startup, operation in the power range, hot standby, cool down and all anticipated transients included in the design specification) and design basis accidents. This includes retaining a safety factor of 3.0 against burst under normal steady state full power operation primary-to-secondary pressure differential and a safety factor of 1.4 against burst applied to the design basis accident primary-to-secondary pressure differentials. Apart from the above requirements, additional loading conditions associated with the design basis accidents, or combination of accidents in accordance with the design and licensing basis, shall also be evaluated to determine if the associated loads contribute significantly to burst or collapse. In the assessment of tube integrity, those loads that do significantly affect burst or collapse shall be determined and assessed in combination with the loads due to pressure with a safety factor of 1.2 on the combined primary loads and 1.0 on axial secondary loads. [emphasis added]

As described in the SONGS Unit 2 license, SCE "is authorized to operate the facility at reactor core power levels not in excess of full power (3438 megawatts thermal)," which is also defined as Rated Thermal Power (RTP).

In SCE's operational assessment (OA) that evaluated tube degradation caused by mechanisms other than tube-to-tube wear (Reference 3), on Page 30 of 32, SCE concluded that "there is reasonable assurance that the performance criteria for the non-[tube-to-tube wear] TTW degradation will be met if Unit 2 were to operate for a full fuel cycle of 1.577 EFPY [effective full power years] at 100% reactor power." Thus it appears that in Reference 3, SCE considered the requirements of TS 5.5.2.11.b.1 by addressing the licensed full power condition.

In contrast, SCE performed three other operational assessments that evaluated tube degradation due to tube-to-tube wear (References 4-6), but it appears that in these OAs, SCE addressed structural integrity requirements for TTW only at 70% reactor power, instead of at 100% reactor power. For example, in Reference 4, Section 10.0, "Conclusions," page 117 of 129, SCE states: "A 70% operating power level returns the Unit 2 steam generators to within the operational envelope of demonstrated successful operation...Operation at 70% power assures in-plane stability (SR<1) without dependence on any effective in-plane supports for U-bends."

Therefore, it appears that SCE has not provided an operational assessment that addresses compliance with TS 5.5.2.11.b. for tube-to-tube wear, without reliance on compensatory measures (e.g., limiting reactor power to 70% RTP).

Please clarify how the information submitted by SCE demonstrates that the structural integrity performance criterion in TS 5.5.2.11.b.1 is met for operation within current licensed limits up to the licensed RTP, or provide an operational assessment that includes an evaluation of steam generator TTW for operation up to the RTP.

## REFERENCES

1. Letter from Peter T. Dietrich, SCE, to Elmo E. Collins, USNRC, "Docket No. 50-361, Confirmatory Action Letter – Actions to Address Steam Generator Tube Degradation, San Onofre Nuclear Generating Station, Unit 2," October 3, 2012 (ADAMS Package No. ML122850320).
2. Enclosure 2 to Reference 1, "San Onofre Nuclear Generating Station Unit 2 Return to Service Report, Revision 0," October 3, 2012 (ADAMS Accession No. ML12285A263).
3. Attachment 6 to Reference 2, "SONGS U2C17 Steam Generator Operational Assessment," Appendix A, "SONGS U2C17 Outage - Steam Generator Operational Assessment," prepared by Areva NP Inc. Document No. 51-9182833-002 (NP), Revision 2), October 2012. (ADAMS Accession No. ML12285A267)
4. Attachment 6 to Reference 2, "SONGS U2C17 Steam Generator Operational Assessment," Appendix B, Revision 0, "SONGS U2C17 Steam Generator Operational

Assessment for Tube-to-Tube Wear,” prepared by Areva NP Inc. Document No. 51-9187230-000 (NP), Revision 0), October 2012. (ADAMS Accession Nos. ML12285A267, ML12285A268, and ML12285A269)

5. Attachment 6 to Reference 2, “SONGS U2C17 Steam Generator Operational Assessment,” Appendix C, “Operational Assessment for SONGS Unit 2 SG for Upper Bundle Tube-to-Tube Wear Degradation at End of Cycle 16,” prepared by Intertek APTECH for Areva, Report No. AES 12068150-2Q-1, Revision 0, September 2012. (ADAMS Accession No. ML12285A269)
6. Attachment 6 to Reference 2, “SONGS U2C17 Steam Generator Operational Assessment,” Appendix D, “Operational Assessment of Wear Indications In the U-Bend Region of San Onofre Unit 2 Replacement Steam Generators,” prepared by Westinghouse Electric Company LLC, Report No. SG-SGMP-12-10, Revision 3, October 2012. (ADAMS Accession No. ML12285A269)