

Hall, Randy

From: Hall, Randy
Sent: Wednesday, February 20, 2013 11:18 AM
To: Ryan.Treadway@sce.com
Cc: 'joseph.bashore@sce.com'; 'John.Brabec@sce.com'; 'Mark.Morgan@sce.com'; 'Lee.Kelly@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; Andersen, James; Lund, Louise
Subject: ~~PROPRIETARY INFORMATION~~ ^{of H} Draft Request for Additional Information on SCE's Response to NRC's Confirmatory Action Letter for San Onofre Nuclear Generating Station Unit 2 RAIs 38-52(ME9727)
Attachments: RAIs 38 to 52 prop final.pdf

February 20, 2013

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. In support of that response, SCE submitted proprietary versions of several reports by letter dated November 28, 2012 (ADAMS Accession No. ML12348A287).

The CAL specifies SCE's commitments to provide to NRC the results of your assessment of the replacement steam generator tube wear identified at SONGS, the actions taken to prevent loss of tube integrity in Unit 2, and the basis for SCE's conclusion that there is reasonable assurance that the unit can be operated safely. The CAL further stipulates that it will remain in effect until the NRC has reviewed SCE's response to the actions specified therein, including responses to staff's questions and the results of your evaluations; and the NRC staff communicates to SCE in writing that it has concluded that Unit 2 can be operated without undue risk to public health and safety, and the environment.

The NRC staff is continuing its detailed review of the information provided by SCE in support of your conclusion that SG tube integrity will be maintained, and that there is reasonable assurance, as required by NRC regulations, that Unit 2 will operate safely. To complete our review, the staff has determined that additional information is needed regarding the operational assessments discussed in your CAL response.

The staff's latest request for additional information (RAI) is attached. Please note that the NRC staff has designated several of the attached questions as proprietary, based on the requests for withholding provided in your letters dated November 28, 2012, and February 18, 2013. These questions will be withheld from public disclosure as marked, pending the NRC staff's final determination on SCE's requests for withholding under 10 CFR 2.390. Please review NRC's designation of proprietary information in the attached RAI and provide any comments or revisions if you do not agree with our designation. We intend to issue a redacted, non-proprietary version of this RAI to be made publicly available, and would like to do so in advance of our February 27, 2013, meeting with you here at NRC headquarters, so we request that you provide any

comments promptly. Following any discussions to clarify this RAI, we will formally transmit the final version to you by letter (and we will provide the missing ADAMS accession numbers for certain references in that letter).

The NRC staff may develop additional questions, which we will transmit to SCE as they become available. Please let me know if you have any questions.

Sincerely,

Randy Hall, Senior Project Manager
San Onofre Special Projects Branch
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation
USNRC
(301) 415-4032
Randy.Hall@nrc.gov

Attachment to February 20, 2013, electronic mail from Randy Hall, USNRC, to Ryan Treadway, Southern California Edison

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

(Redacted)

Redacted information is identified by blank space enclosed within double brackets

PROPRIETARY INFORMATION *JLH*

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

On March 27, 2012, the NRC issued a Confirmatory Action Letter (Agencywide Documents Access and Management System (ADAMS) Accession No. ML12087A323) to Southern California Edison (SCE) for the San Onofre Nuclear Generating Station (SONGS), Units 2 and 3. The Confirmatory Action Letter (CAL) confirmed the commitments made in SCE's March 23, 2012, letter entitled, "Steam Generator Return-to-Service Action Plan" (RTS Action Plan; ADAMS Accession No. ML12086A182). Commitment 2 of the RTS Action Plan states in part that SCE will determine the cause(s) of the tube-to-tube interactions that resulted in steam generator tube wear in Unit 3, and will implement actions to prevent loss of integrity due to these causes in the Unit 2 steam generator tubes. Commitment 3 of the RTS Action Plan states in part that, prior to entry of Unit 2 into Mode 2, SCE will provide to the NRC the results of SCE's assessment of Unit 2 steam generators, and the basis for SCE's conclusion that there is reasonable assurance, as required by NRC regulations, that Unit 2 will operate safely.

By letter dated October 3, 2012 (ADAMS Accession No. ML122850320), SCE submitted its response to the NRC Confirmatory Action Letter (CAL), for SONGS Unit 2. By letters dated November 28, 2012 (ADAMS Accession No. ML12348A287), and February 18, 2013 (ADAMS Accession No. ML13051A190), SCE submitted proprietary versions of several reports enclosed with or referenced in the October 3, 2012 CAL response, along with affidavits supporting SCE's request for withholding the proprietary information under 10 CFR 2.390.

Steam generator tubes are an integral part of the reactor coolant pressure boundary and are relied on to maintain primary system pressure and inventory. The operating licenses for SONGS Units 2 and 3 require SCE to conduct a Steam Generator Program (Technical Specification 5.5.2.11), to ensure that steam generator tube integrity is maintained. TS 5.5.2.11 specifies performance criteria for maintaining SG tube integrity. The processes used to meet the SG performance criteria are defined by NEI 97-06, "Steam Generator Program Guidelines." These processes include performing detailed technical evaluations, called operational assessments, to demonstrate that tube structural integrity will be maintained under normal and accident conditions for the proposed operating cycle.

The NRC staff is continuing its detailed review of the information provided by SCE in support of SCE's conclusion that SG tube integrity will be maintained, and that there is reasonable assurance, as required by NRC regulations, that Unit 2 will operate safely. To complete this review, the staff has determined that additional information is needed regarding the operational assessments discussed in your CAL response.

]]

44. In Reference 4, p. 15, Section 6.3, "Assumption," Item (1) "Fluid force," it is assumed there is no in-plane motion if the stability ratio (SR) is less than 1.0. How has MHI accounted for the potential that in-plane tube motion may occur at a SR less than 1.0 and how is the analysis result affected if a smaller value is used for this threshold?
45. In Reference 5, p. 4-12 (38 of 66), Section 4.7, "Effect of Power Reduction," the probability of initiation (POI) is based on a calculation of dynamic pressure. Please provide the location in the U-bend selected to compute the parameter and provide justification for selection for this application. It is not clear that dynamic pressure is a key parameter for correlation of the TTW damage patterns experienced at SONGS.
46. In Reference 6, p. 15 of 131, please provide justification for selection of $\beta=5.0$ for the threshold value of the fluid elastic instability constant, and explain why it is a conservative selection for this application, considering the T/H conditions and size of the SONGS replacement SGs.
47. In Reference 7, p. 87, Section 4.2.3, please explain how [[

]]

48. In Reference 7, p. 88, Section 4.2.4, please provide information to demonstrate that the [[

]]

49. In Reference 7, p. 95, Figure 4-3 is provided for [[

]]

50. In Reference 7, p. 102 through 137, Figures 4-5 through 4-40 show local SR results. Please provide a tabulated summary of the results for [[

]]

51. In Reference 7, p. 101, in order for NRC staff to better understand the Westinghouse methodology and overall results, please provide a summary of analytic results that includes a breakdown of [[

]]

52. In Reference 7, p. 254, Section 7.2.2.1, [[

]]

REFERENCES

1. Letter from Richard J. St. Onge, SCE, to Document Control Desk, USNRC, "Docket No. 50-361, Confirmatory Action Letter Response – Proprietary Documents, San Onofre Nuclear Generating Station, Unit 2," November 28, 2012. (ADAMS Accession No. ML12348A287); Enclosure 3, MHI Document L5-04GA564 Rev. 9, "Tube Wear of Unit-3 RSG – Technical Evaluation Report." **[Proprietary]** [Note: a non-proprietary version of this report was provided as Enclosure 2, Attachment 4, to SCE's letter dated October 3, 2012. See ADAMS Accession Nos. ML12285A265-ML12285A267]
2. Letter from Richard J. St. Onge, SCE, to Document Control Desk, USNRC, "Docket No. 50-361, Supplemental Document Submittal Regarding Confirmatory Action Letter Response (TAC No. ME9727), San Onofre Nuclear Generating Station, Unit 2," February 18, 2013; (ADAMS Accession No. ML13051A190); Enclosure 1, MHI document L5-04GA567, "Evaluation of Stability Ratio for Return to Service," Rev. 6. **[Proprietary]** [A non-proprietary version of this report was provided as Enclosure 4 to SCE's letter dated February 18, 2013. See ADAMS Accession No. ML13051A192].
3. Letter from Richard J. St. Onge, SCE, to Document Control Desk, USNRC, "Docket No. 50-361, Confirmatory Action Letter Response – Proprietary Documents, San Onofre Nuclear Generating Station, Unit 2," November 28, 2012. (ADAMS Accession No. ML12348A287); Enclosure 4, MHI Document L5-04GA571 Rev. 6, "Screening Criteria for Susceptibility to In-Plane Tube Motion." **[Proprietary]** [Note: a non-proprietary

version of this report was provided as Enclosure 2, Attachment 5, to SCE's letter dated October 3, 2012. See ADAMS Accession No. ML12285A267]

4. Letter from Richard J. St. Onge, SCE, to Document Control Desk, USNRC, "Docket No. 50-361, Supplemental Document Submittal Regarding Confirmatory Action Letter Response (TAC No. ME9727), San Onofre Nuclear Generating Station, Unit 2," February 18, 2013; (ADAMS Accession No. ML13051A190); Enclosure 2, MHI document L5-04GA585, "Analytical Evaluations for Operational Assessment," Rev. 2. **[Proprietary]** [A non-proprietary version of this report was provided as Enclosure 5 to SCE's letter dated February 18, 2013. See ADAMS Accession No. ML13051A193].

5. 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; **Enclosure 2**, "San Onofre Nuclear Generating Station Unit 2 Return to Service Report, Revision 0." **Attachment 6**, "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. 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; **Enclosure 2**, "San Onofre Nuclear Generating Station Unit 2 Return to Service Report, Revision 0." **Attachment 6**, "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)

7. Letter from Richard J. St. Onge, SCE, to Document Control Desk, USNRC, "Docket No. 50-361, Supplemental Document Submittal Regarding Confirmatory Action Letter Response (TAC No. ME9727), San Onofre Nuclear Generating Station, Unit 2," February 18, 2013; (ADAMS Accession No. ML13051A190); Enclosure 3, Westinghouse document, LTR-SGDA-12-36, "Flow-Induced Vibration and Tube Wear Analysis of the San Onofre Nuclear Generating Station Unit 2 Replacement Steam Generators Supporting Restart," Rev. 3. **[Proprietary]** [A non-proprietary version of this report was provided as Enclosure 6 to SCE's letter dated February 18, 2013. See ADAMS Accession No. ML13051A197].