



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

November 26, 2008

Mr. Ross T. Ridenoure
Senior 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 –
REQUEST FOR ADDITIONAL INFORMATION RELATED TO TEST
PROTOCOL USED IN THE TESTING AT VUEZ (TAC NOS. MC4714 AND
MC4715)

Dear Mr. Ridenoure:

By letter dated February 27, 2008 to the U.S. Nuclear Regulatory Commission (NRC) (Agencywide Documents Access and Management System (ADAMS) Accession Nos. ML080600406), Southern California Edison (SCE, the licensee) submitted a supplemental response to Generic Letter (GL) 2004-02, "Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis Accidents at Pressurized Water Reactors," for the San Onofre Nuclear Generating Station (SONGS), Units 2 and 3.

The NRC staff has reviewed the licensee's submittal and determined that additional information is needed in order to conclude there is reasonable assurance that GL 2004-02 has been satisfactorily addressed for SONGS, Units 2 and 3. The enclosed document is a request for additional information (RAI).

The NRC requests that the licensee respond to these RAIs within 90 days of the date of this letter. However, the NRC would like to receive only one response letter for all RAIs with exceptions stated below. If the licensee concludes that more than 90 days are required to respond to the RAI, the licensee should request additional time, including a basis for why the extension is needed. The NRC staff discussed the RAI questions with Ms. Linda Conklin and others in a conference call on November 17, 2008, at which time your staff agreed to the 90-day response schedule.

If the licensee concludes, based on its review of the RAIs, that additional corrective actions are needed for GL 2004-02, the licensee should request additional time to complete such corrective actions as needed. Criteria for such extension requests are contained in SECY-06-0078 (ADAMS Accession No. ML053620174), and examples of previous requests and approvals can be found on the NRC's sump performance website, located at:
<http://www.nrc.gov/reactors/operating/ops-experience/pwr-sump-performance.html>.

Any extension request should also include results of contingency planning that will result in near-term identification and implementation of any and all modifications needed to fully address GL 2004-02. The NRC staff strongly suggests that the licensee discuss such plans with the staff before formally transmitting an extension request.

The exception to the above response timeline is RAI 1 in the enclosure. The NRC staff considers in-vessel downstream effects to not be fully addressed at SONGS, Units 2 and 3, as well as at other pressurized water reactors. The licensee's submittal refers to draft WCAP-16793-NP, "Evaluation of Long-Term Cooling Considering Particulate, Fibrous, and Chemical Debris in the Recirculating Fluid." At this time, the NRC staff has not issued a final safety evaluation (SE) for WCAP-16793-NP. Because of this, the licensee may demonstrate that in-vessel downstream effect issues are resolved for SONGS, Units 2 and 3, by either (1) demonstrating, without reference to draft WCAP-16793-NP, that in-vessel downstream effects have been addressed or (2) showing that plant conditions are bounded by the final WCAP-16793-NP and addressing any conditions and limitations specified in the NRC final SE for the topical report. The specific issues raised in question RAI 1 should be addressed regardless of which approach the licensee chooses to take in response to RAI 1.

The NRC staff is currently developing a Regulatory Issue Summary to inform licensees of the NRC staff expectations and plans regarding resolution of this remaining aspect of Generic Safety Issue 191, "Assessment of Debris Accumulation on PWR Sump Performance."

Should you have any questions on the issues discussed in this letter, please contact me at (301) 415-1480.

Sincerely,



N. Kalyanam, Project Manager
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-361 and 50-362

Enclosure: Request for Additional Information

cc w/encl: Distribution via ListServ

OFFICE OF NUCLEAR REACTOR REGULATION

REQUEST FOR ADDITIONAL INFORMATION

SAN ONOFRE NUCLEAR GENERATING STATION, UNITS 2 AND 3

SUPPLEMENTAL RESPONSE TO GENERIC LETTER (GL) 2004-02

By letter dated February 27, 2008 to the U.S. Nuclear Regulatory Commission (NRC) (Agencywide Documents Access and Management System (ADAMS) Accession Nos. ML080600406), Southern California Edison (SCE, the licensee) submitted a supplemental response to Generic Letter (GL) 2004-02, "Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis Accidents at Pressurized Water Reactors," for the San Onofre Nuclear Generating Station (SONGS, Units 2 and 3).

The NRC staff has reviewed the licensee's submittal. The process involved detailed review by a team of approximately 10 subject matter experts, with a focus on the review areas described in the NRC's "Content Guide for Generic Letter 2004-02 Supplemental Responses" (ADAMS Accession No. ML073110389). Based on these reviews, the NRC staff determined that additional information is needed in order to conclude there is reasonable assurance that GL 2004-02 has been satisfactorily addressed for SONGS, Units 2 and 3. The following information is needed for the NRC staff to complete its review:

1. Please provide your plant-specific approach to resolution of in-vessel downstream effects, which the NRC staff considers to not be fully addressed at SONGS, Units 2 and 3. The submittal refers to draft Westinghouse Topical Report (TR) WCAP-16793-NP, "Evaluation of Long-Term Cooling Considering Particulate, Fibrous, and Chemical Debris in the Recirculating Fluid." At this time, the NRC staff has not issued a final safety evaluation (SE) for WCAP-16793-NP. Because of this, the licensee may demonstrate that in-vessel downstream effects issues are resolved for SONGS, Units 2 and 3, by either (1) demonstrating, without reference to WCAP-16723-NP, that in-vessel downstream effect issues have been addressed or (2) showing that plant conditions are bounded by the final WCAP-16793-NP and addressing any conditions and limitations specified in the NRC final SE for the topical report. The specific issues raised in this question (RAI 1) should be addressed regardless of which approach the licensee chooses to take in response to RAI 1. The NRC staff is developing a Regulatory Issue Summary to inform the industry of the NRC staff expectations and plans regarding resolution of this remaining aspect of Generic Safety Issue 191 "Assessment of Debris Accumulation on PWR Sump Performance."
2. The licensee stated that additional justification for the 20 percent fines/80 percent small-piece size distribution has been included in Section 4.5.9.1 of the revised Alion Science and Technology Debris Generation Calculation. The NRC staff considers that the approach taken is inconsistent with the SE. The terms "fines" and "small pieces" in the Alion calculation are sub-sets of the term "small fines" as defined by the SE; all of the insulation debris generated is considered to be "small fines" as defined by the SE.

Testing conducted for NUREG/CR-6369, "Drywell debris Transport Study" (ADAMS Accession nos. ML003726871, ML00328226, and ML03728322), with a zone of influence (ZOI) of 8D indicated a 20 percent fine fiber debris generation fraction. A 4D ZOI would be expected to generate a significantly higher proportion of fine fiber. The amount of fine fiber is significant from a head loss testing perspective. Please provide detailed information which justifies the assumed size distribution of 20 percent fines and 80 percent small pieces for the 4D mineral wool ZOI.

3. There is the NRC audit report dated May 16, 2007 (ADAMS Accession No. ML071230749). Attachment 2 to the licensee's letter dated February 27, 2008, is a item-by-item response to the list of open items produced during the 2006 audit of corrective actions at SONGS, Units 2 and 3. The audit open item number 5 stated that the licensee had not justified neglecting the transport of mineral wool by flotation. The response to this item is that the licensee had a vendor prepare a buoyancy evaluation for mineral wool. The evaluation showed that the mineral wool would arrive later in the event when adequate NPSH [net positive suction head] margin existed to allow for any head loss that might be caused by the floating insulation. The response for this open item has no technical basis for the time delay in the transport of the floatable insulation and no technical basis for the head loss that could result. Please provide a technical basis for the delayed transport and for the strainer head loss that would occur when the mineral wool transported by flotation does reach the strainer.
4. Audit open item number 6 stated that no justification had been provided for the assumption that containment spray drainage enters the pool as a dispersed flow rather than in concentrated streams. The open item noted that this could affect transport and the assumption of 10 percent erosion of small and large pieces of fibrous debris. The response to this item may have been partially acceptable in that the transport evaluation was revised to include a larger fraction of debris transported to the sump and a revision to the transport calculation. However, certain technical information, such as the magnitude of the change and the basis for the magnitude were not provided. In addition, the response noted that testing had been done to justify the assumption of 10 percent erosion of fibrous debris. Please provide the information that justifies the 10 percent erosion assumption. Also, please provide the information regarding the change in transport fractions due to the change in spray flow, including the basis for the change in transport.
5. It is not apparent that the strainers were tested with the quantity and type of fine fibrous debris expected to arrive at the strainers, appropriately introduced under prototypical flow conditions to ensure that a thin bed would not occur in the plant. Please provide documentation that demonstrates that the fibrous debris sizes used for testing matched the debris transport calculation.
6. Please provide justification for the application of the bump-up factor developed with a different debris bed composition than that used in the small-scale chemical tests.
7. Please evaluate how the increase in the amount of Microtherm by a factor of two confirms that the head loss determined by testing is prototypical or conservative.

8. During small-scale testing, voiding occurred that reportedly resulted in high head losses. The submittal dated February 27, 2008, also described that head loss attributable to chemical effects likely occurred at the same time. The licensee determined that most of the head loss that occurred during this period was due to voiding and some smaller fraction was due to chemical effects. This was reportedly based on evaluation of the SONGS, Units 2 and 3, data and other small scale testing. The technical basis for the determination of apportioning the head loss to these two phenomena is not clear. Please justify the method used to determine how much head loss was attributable to voiding and how much was attributable to chemical effects during the small-scale chemical effects testing.
9. Please provide a justification for the selection of 4.8 kPa as a chemical effects portion of the high-pressure drop observed during the initial part of the test.

November 26, 2008

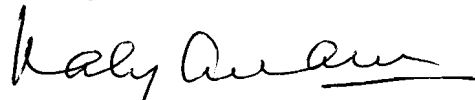
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N. Kalyanam, Project Manager
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