September 26, 2005

Mr. Harold B. Ray
Executive Vice President
Southern California Edison Company
San Onofre Nuclear Generating Station
P.O. Box 128
San Clemente, CA 92674-0128

SUBJECT: SAN ONOFRE NUCLEAR GENERATING STATION (SONGS), UNITS 2 AND 3 RE: CORRECTION TO RELAXATION OF THE REQUIREMENTS OF ORDER EA-03-009 REGARDING REACTOR PRESSURE VESSEL HEAD INSPECTIONS (TAC NOS. MC5522 AND MC5523)

Dear Mr. Ray:

In its letter dated June 27, 2005, the Nuclear Regulatory Commission (NRC) staff authorized, pursuant to Section IV.F of the First Revised NRC Order EA-03-009 dated February 20, 2004, for SONGS, Units 2 and 3, the proposed alternative inspection submitted in your letter dated January 3, 2005 (Agencywide Documents Access and Management System Accession No. ML050050216). The proposed alternative inspection is authorized for the 91 control element drive mechanisms (CEDMs) at SONGS, Unit 2, and the 91 CEDMs at SONGS, Unit 3, for each operating cycle, for which the First Revised NRC Order EA-03-009 dated February 20, 2004, remains in effect, and is subject to the condition stated in the letter dated June 27, 2005.

In its letter, the NRC staff stated that each operating cycle for which the alternative inspection was authorized would be not greater than 21 months. This statement is incorrect in that 21 effective full power months (EFPMs) should have been stated because the time period was based on the 1.75 effective full power years (EFPYs) in the table on page 6 of the safety evaluation (SE) attached to the June 27, 2005 letter. To correct this error, I have enclosed pages 7 and 8 of that SE which have the correct reference to 21 EFPMs, and a vertical bar on the right-hand side of the page showing where the change was made.

Sincerely,

/RA/
Jack Donohew, Senior Project Manager, Section 2
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-361 and 50-362

Enclosure: Pages 7 and 8 of Safety Evaluation dated June 27, 2005

cc w/encl: See next page

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Note 1: Stress intensity is less than the threshold of 9 Mpa / m [K_{th} from page 4-5 of the licensee's letter dated February 28, 2004] and therefore will not propagate towards the bottom of the weld.

The results above illustrate the conservatism in the licensee's requested relaxation, as the calculated inspection frequency is longer than a SONGS operating cycle. The operating cycle for each SONGS Unit is 19.5 months. The licensee's calculations for the relaxation request based on as-designed weld sizes will support a period of 1.75 EFPYs, or 21 effective full power months (EFPMs).

The licensee's analysis in WCAP-15819, Rev. 1 used the crack growth formula in Electric Power Research Institute (EPRI) Report Material Reliability Program (MRP) report MRP-55, "Material Reliability Program (MRP) Crack Growth Rates for Evaluating Primary Water Stress Corrosion Cracking (PWSCC) of Thick Wall Alloy 600 Material (MRP-55), Revision 1." However, the NRC staff has not yet made a final determination on the acceptability of the subject industry report. Should the NRC staff determine the crack growth formula used by the licensee to be unacceptable, the licensee will be required to revise its analysis to incorporate an acceptable crack growth formula as described below. In agreement with this, the licensee included in their submittal dated January 3, 2005, the following condition:

> If the NRC staff finds that the crack-growth formula in industry report MRP-55 is unacceptable, then SCE will revise its analysis that justifies relaxation of the Order within 30 days after the NRC informs the licensee of an NRC-approved crack growth formula. If SCE's revised analysis shows that the crack growth acceptance criteria are exceeded prior to the end of the current operating cycle, SCE will consider Relaxation Request 3 [licensee's January 3, 2005, submittal] to be rescinded and, within 72 hours, SCE will submit to the NRC written justification for continued operation. If the revised analysis shows that the crack growth acceptance criteria are exceeded during the subsequent operating cycle, SCE will, within 30 days, submit the revised analysis for NRC review. If the revised analysis shows that the crack growth acceptance criteria are not exceeded during either the current operating cycle or the subsequent operating cycle, SCE will, within 30 days, submit a letter to the NRC confirming that its analysis has been revised. Any future crack-growth analyses performed for this and future cycles for RPV head penetrations will be based on a crack growth rate formula that is acceptable to the NRC.

As an added conservatism, the licensee stated that the crack growth curves do not include the time that would be required for an axial crack to propagate through the attachment weld and result in a leakage path. Additional operating time would be required for a safety concern (ejection of a nozzle or substantial corrosion of the low-alloy steel RPV head) to develop as a result of that leak. Therefore, it would take more than one operating cycle for a postulated flaw in the uninspected region to develop into a safety concern.

The licensee stated that the threaded portion of the extension shaft guide cone would serve to retain potential loose parts resulting from a circumferential crack in the uninspected area. A postulated 360-degree through-wall crack in the narrow un-inspected annulus above the guide

cone threads could result in separation of the guide cone from the penetration. However, the licensee stated the guide cone would be retained by the control element assembly (CEA) shroud and associated CEA extension shaft. This condition would not interfere with CEA function or any other reactor coolant system function, and would be readily observed in the subsequent refueling outage.

Based upon the information above, the staff finds that the licensee has demonstrated good cause for the relaxation and that the proposed alternative examination is acceptable as it provides reasonable assurance of the structural integrity of the RPV head, VHP nozzles and welds. Furthermore, inspections to comply with the Order requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

3.0 CONCLUSION

The staff concludes that the licensee's proposed alternative examination for each of the 91 CEDMs for SONGS, Units 2 and 3 from 2 inches above the J-groove weld to the level identified below:

CEDM # 1	0.44 inches below the bottom of the weld,
CEDM #s 2 through 35	0.43 inches below the bottom of the weld,
CEDM #s 36 through 87	0.42 inches below the bottom of the weld, and
CEDM #s 88 through 91	0.35 inches below the bottom of the weld,

provides reasonable assurance of the structural integrity of the RPV head, VHP nozzles and welds. Furthermore, inspections of these VHP nozzles in accordance with Section IV, paragraph C.(5)(b), of the Order dated February 20, 2004, would result in hardship without a compensating increase in the level of quality and safety. Therefore, pursuant to Section IV, paragraph F, of the Order dated February 20, 2004, the staff authorizes the proposed alternative inspection for the 91 CEDMs at SONGS, Unit 2, and the 91 CEDMs at SONGS, Unit 3, for each operating cycle, not greater than 21 EFPMs, for a time period for which the Order dated February 20, 2004, remains in effect, subject to the following condition:

> If the NRC staff finds that the crack-growth formula in industry report MRP-55 is unacceptable, then SCE will revise its analysis that justifies relaxation of the Order within 30 days after the NRC informs the licensee of an NRC-approved crack growth formula. If SCE's revised analysis shows that the crack growth acceptance criteria are exceeded prior to the end of the current operating cycle, SCE will consider Relaxation Request 3 to be rescinded and, within 72 hours, SCE will submit to the NRC written justification for continued operation. If the revised analysis shows that the crack growth acceptance criteria are exceeded during the subsequent operating cycle, SCE will, within 30 days, submit the revised analysis for NRC review. If the revised analysis shows that the crack growth acceptance criteria are not exceeded during either the current operating cycle or the subsequent operating cycle, SCE will, within 30 days, submit a letter to the NRC confirming that its analysis has been revised. Any future crack-growth analyses performed for this and future cycles for RPV head penetrations will be based on a crack growth rate formula that is acceptable to the NRC.

Principal Contributor: J. Collins

Date: June 27, 2005

cc:
Mr. Daniel P. Breig, Plant Manager
Nuclear Generation
Southern California Edison Company
San Onofre Nuclear Generating Station
P. O. Box 128
San Clemente, CA 92674-0128

Mr. Douglas K. Porter
Southern California Edison Company
2244 Walnut Grove Avenue
Rosemead, CA 91770

Mr. David Spath, Chief
Division of Drinking Water and
Environmental Management
P. O. Box 942732
Sacramento, CA 94234-7320

Chairman, Board of Supervisors
County of San Diego
1600 Pacific Highway, Room 335
San Diego, CA 92101

Eileen M. Teichert, Esq.
Supervising Deputy City Attorney
City of Riverside
3900 Main Street
Riverside, CA 92522

Mr. Gary L. Nolff
Power Projects/Contracts Manager
Riverside Public Utilities
2911 Adams Street
Riverside, CA 92504

Regional Administrator, Region IV
U.S. Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 400
Arlington, TX 76011-8064

Mr. Michael Olson
San Diego Gas & Electric Company
P.O. Box 1831
San Diego, CA 92112-4150

Mr. Ed Bailey, Chief
Radiologic Health Branch
State Department of Health Services
Post Office Box 997414 (MS7610)
Sacramento, CA 95899-7414

Resident Inspector/San Onofre NPS
c/o U.S. Nuclear Regulatory Commission
Post Office Box 4329
San Clemente, CA 92674

Mayor
City of San Clemente
100 Avenida Presidio
San Clemente, CA 92672

Mr. James T. Reilly
Southern California Edison Company
San Onofre Nuclear Generating Station
P.O. Box 128
San Clemente, CA 92674-0128

Mr. James D. Boyd, Commissioner
California Energy Commission
1516 Ninth Street (MS 31)
Sacramento, CA 95814

Mr. Ray Waldo, Vice President
Southern California Edison Company
San Onofre Nuclear Generating Station
P.O. Box 128
San Clemente, CA 92764-0128

Mr. Brian Katz
Vice President, Nuclear Oversight and
Regulatory Affairs.
San Onofre Nuclear Generating Station
P.O. Box 128
San Clemente, CA 92764-0128

Mr. Steve Hsu
Department of Health Services
Radiologic Health Branch
MS 7610, P.O. Box 997414
Sacramento, CA 95899