March 19, 2004

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: RELAXATION OF THE REQUIREMENTS OF ORDER EA-03-009 REGARDING REACTOR PRESSURE VESSEL HEAD INSPECTIONS, SAN ONOFRE NUCLEAR GENERATING STATION (SONGS), UNITS 2 AND 3 (TAC NOS. MC1542 AND MC1543)

Dear Mr. Ray:

On February 11, 2003, the U.S. Nuclear Regulatory Commission (NRC) issued Order EA-03-009 requiring specific inspections of the reactor pressure vessel (RPV) head and associated penetration nozzles at pressurized water reactors. The NRC issued an errata to the Order on March 14, 2003, to correct an administrative part of the Order related to requests for relaxation of the Order requirements. On February 20, 2004, the NRC issued the First Revised Order Modifying Licenses, which supersedes and revises certain inspection aspects of the original Order.

Section IV.F of the Order states that requests for relaxation associated with specific penetration nozzles will be evaluated by the NRC staff using its procedure for evaluating proposed alternatives to the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code in accordance with Section 50.55a(a)(3) of Title 10 of the *Code of Federal Regulations* (10 CFR 50.55a(a)(3)).

Sections IV.A and IV.B of the Order provide criteria to categorize each plant's RPV head with respect to its susceptibility to primary water stress corrosion cracking (PWSCC). For plants like SONGS, Units 2 and 3, with RPV heads categorized as highly susceptible to PWSCC, Section IV.C.(1) of the Order requires that the RPV head penetration nozzles be inspected each refueling outage as prescribed in Sections IV.C.(5)(a) and IV.C.(5)(b).

By letter dated December 9, 2003, as supplemented by letters dated February 9, February 28, and March 12, 2004, Southern California Edison Company (SCE or the licensee) requested relaxation from the requirements in Section IV.C.(1) of the Order for SONGS, Units 2 and 3. The relaxation request was made pursuant to the procedure specified in Section IV.F of the Order. Specifically, SCE requested relaxation from nondestructive examination (NDE) requirements in inaccessible areas around control element drive mechanism (CEDM) and incore instrumentation penetrations.

The NRC staff has reviewed and evaluated the information provided in support of your request for relaxation as documented in the enclosed safety evaluation (SE). The staff's SE concludes that SCE has demonstrated good cause for the requested relaxation and that the proposed alternative provides an acceptable level of quality and safety. Therefore, pursuant to

Section IV, paragraph F, of the Order, the staff authorizes the proposed relaxation and alternative inspection for the 91 CEDMs at SONGS Unit 2 and the 91 CEDMs at SONGS Unit 3 for one operating cycle, subject to the condition outlined in the conclusion section of the enclosed SE. Mr. Rainsberry of your staff agreed to this condition during a telephone conversation on March 19, 2004.

You should be aware that, when vessel head inspections are performed using ASME Code requirements, acceptance criteria, or qualified personnel, those activities and all related activities fall within the jurisdiction of the ASME Code. Therefore, Order-related inspection activities may be subject to third party review, including those by the Authorized Nuclear Inservice Inspector.

Sincerely,

/RA/
Herbert N. Berkow, Director
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-361 and 50-362

Enclosure: Safety Evaluation

cc w/encl: See next page

Section IV, paragraph F, of the Order, the staff authorizes the proposed relaxation and alternative inspection for the 91 CEDMs at SONGS Unit 2 and the 91 CEDMs at SONGS Unit 3 for one operating cycle, subject to the condition outlined in the conclusion section of the enclosed SE. Mr. Rainsberry of your staff agreed to this condition during a telephone conversation on March 19, 2004.

You should be aware that, when vessel head inspections are performed using ASME Code requirements, acceptance criteria, or qualified personnel, those activities and all related activities fall within the jurisdiction of the ASME Code. Therefore, Order-related inspection activities may be subject to third party review, including those by the Authorized Nuclear Inservice Inspector.

Sincerely,

/RA/

Herbert N. Berkow, Director
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-361 and 50-362

Enclosure: Safety Evaluation

cc w/encl: See next page

DISTRIBUTION:

PUBLIC	RidsNrrPDIVHBerkow	RidsNrrPMBPham
PDIV-2 r/f	RidsAcrsAcnwMailCenter	RidsRgn4MailCenter (KKennedy)
GHill (4)	RidsNrrLAEPeyton	RidsOgcRp
TChan	EReichelt	WKoo
RGuzman	RTadesse	

*For previous concurrences see attached ORC
**SE Input Date

ADAMS Accession Number: ML040840128 * Previously concurred

OFFICE	PDI-2/PM*	PDI-2/LA*	EMCB/SC**	OGC*	PDIV-2/SC*	PDIV/D*
NAME	BPham	EPeyton	TChan	AHodgdon	SDembek	SDembek for HBerkow
DATE	3/19/04	3/19/04	3/19/04	3/19/04	3/19/04	3/19/04

OFFICIAL RECORD COPY

cc:
Mr. Raymond Waldo, 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, Radiation Program Director
Radiologic Health Branch
State Department of Health Services
Post Office Box 942732 (MS 178)
Sacramento, CA 94327-7320

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. Dwight E. Nunn, Vice President
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. Joseph J. Wambold, Vice President
Southern California Edison Company
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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

ORDER (EA-03-009) RELAXATION REQUEST, ALTERNATE EXAMINATION COVERAGE

FOR REACTOR PRESSURE VESSEL HEAD PENETRATION NOZZLES

SAN ONOFRE NUCLEAR GENERATING STATION UNITS 2, AND 3

SOUTHERN CALIFORNIA EDISON

DOCKET NOS. 50-361, 50-362

1.0 INTRODUCTION

The First Revised Order EA-03-009 (hereinafter referred to as Order), issued on February 20, 2004, requires specific examinations of the reactor pressure vessel (RPV) head and vessel head penetration (VHP) nozzles of all pressurized water reactor (PWR) plants. Section IV, paragraph F, of the Order states that requests for relaxation of the Order associated with specific penetration nozzles will be evaluated by the NRC staff using the procedure for evaluating proposed alternatives to the American Society of Mechanical Engineers (ASME) Code in accordance with 10 CFR 50.55a(a)(3). Section IV, paragraph F, of the Order states that a request for relaxation regarding inspection of specific nozzles shall address the following criteria: (1) the proposed alternative(s) for inspection of specific nozzles will provide an acceptable level of quality and safety, or (2) compliance with this Order for specific nozzles would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

For San Onofre Nuclear Generating Station (SONGS) Units 2 and 3, and similar plants determined to have a high susceptibility to primary water stress corrosion cracking (PWSCC) in accordance with Section IV, paragraphs A and B, of the Order, the following inspections are required to be performed every refueling outage in accordance with Section IV, paragraphs C.(5)(a) and (b) of the Order:

(a) Bare metal visual (BMV) examination of 100% of the RPV head surface (including 360° around each RPV head penetration nozzle). For RPV heads with the surface obscured by support structure interferences which are located at RPV head elevations downslope from the outermost RPV head penetration, a bare metal visual inspection of no less than 95 percent of the RPV head surface may be performed provided that the examination shall include those areas of the RPV head upslope and downslope from the support structure interference to identify any evidence of boron or corrosive product. Should any evidence of boron or corrosive product be identified, the licensee shall examine the RPV head surface under the support structure to ensure that the RPV head is not degraded.

(b) For each penetration, perform a nonvisual NDE [nondestructive examination] in accordance with either (i), (ii), or (iii):

(i) Ultrasonic testing of the RPV head penetration nozzle volume (i.e., nozzle base material) from 2 inches above the highest point of the root of the J-groove weld (on a horizontal plane perpendicular to the nozzle axis) to 2 inches below the lowest point at the toe of the J-groove weld on a horizontal plane perpendicular to the nozzle axis (or the bottom of the nozzle if less than 2 inches [see Figure IV-1 [of the February 20, 2004, Order]); OR from 2 inches above the highest point of the root of the J-groove weld (on a horizontal plane perpendicular to the nozzle axis) to 1.0-inch below the lowest point at the toe of the J-groove weld (on a horizontal plane perpendicular to the nozzle axis) and including all RPV head penetration nozzle surfaces below the J-groove weld that have an operating stress level (including all residual and normal operation stresses) of 20 ksi tension and greater (see Figure IV-2 [of the February 20, 2004]). In addition, an assessment shall be made to determine if leakage has occurred into the annulus between the RPV head penetration nozzle and the RPV head low-alloy steel.

(ii) Eddy current testing or dye penetrant testing of the entire wetted surface of the J-groove weld and the wetted surface of the RPV head penetration nozzle base material from at least 2 inches above the highest point of the root of the J-groove weld (on a horizontal plane perpendicular to the nozzle axis) to 2 inches below the lowest point at the toe of the J-groove weld on a horizontal plane perpendicular to the nozzle axis (or the bottom of the nozzle if less than 2 inches (see Figure IV-3 [of the February 20, 2004, Order]); OR from 2 inches above the highest point of the root of the J-groove weld (on a horizontal plane perpendicular to the nozzle axis) to 1.0-inch below the lowest point at the toe of the J-groove weld (on a horizontal plane perpendicular to the nozzle axis) and including all RPV head penetration nozzle surfaces below the J-groove weld that have an operating stress level (including all residual and normal operation stresses) of 20 ksi tension and greater (see Figure IV-4 [of the February 20, 2004 Order]).

(iii) A combination of (i) and (ii) to cover equivalent volumes, surfaces, and leak paths of the RPV head penetration nozzle base material and J-groove weld as described in (i) and (ii). Substitution of a portion of a volumetric exam on a nozzle with a surface examination may be performed with the following requirements:

1. On nozzle material below the J-groove weld, both the outside diameter and inside diameter surfaces of the nozzle must be examined.

2. On nozzle material above the J-groove weld, surface examination of the inside diameter surface of the nozzle is permitted provided a surface examination of the J-groove weld is also performed.

Footnote 3 of the Order provides specific criteria for examination of repaired VHP nozzles.

By letter dated December 9, 2003, as supplemented by letters dated February 9, February 28, and March 12, 2004 Southern California Edison (SCE, the licensee) requested relaxation to implement an alternative to the requirements of Section IV, paragraphs C.(5)(b)(i) and (ii), of the Order for RPV head penetration nozzles at SONGS, Units 2 and 3.

2.0 ORDER EA-03-009 RELAXATION REQUEST FOR EXAMINATION COVERAGE FOR REACTOR PRESSURE VESSEL HEAD PENETRATION NOZZLES

2.1 Order Requirements for Which Relaxation is Requested

Section IV.C.(5)(b) of Order EA-03-009 requires, in part, that the following inspections be performed every refueling outage for high susceptibility plants similar to SONGS Units 2, and 3:

(i) Ultrasonic testing of the RPV head penetration nozzle volume (i.e., nozzle base material) from 2 inches above the highest point of the root of the J-groove weld (on a horizontal plane perpendicular to the nozzle axis) to 2 inches below the lowest point at the toe of the J-groove weld on a horizontal plane perpendicular to the nozzle axis (or the bottom of the nozzle if less than 2 inches (see Figure IV-1 [of the February 20, 2004, Order]); OR from 2 inches above the highest point of the root of the J-groove weld (on a horizontal plane perpendicular to the nozzle axis) to 1.0-inch below the lowest point at the toe of the J-groove weld (on a horizontal plane perpendicular to the nozzle axis) and including all RPV head penetration nozzle surfaces below the J-groove weld that have an operating stress level (including all residual and normal operation stresses) of 20 ksi tension and greater (see Figure IV-2 [of the February 20, 2004, Order]). In addition, an assessment shall be made to determine if leakage has occurred into the annulus between the RPV head penetration nozzle and the RPV head low-alloy steel.

(ii) Eddy current testing or dye penetrant testing of the entire wetted surface of the J-groove weld and the wetted surface of the RPV head penetration nozzle base material from at least 2 inches above the highest point of the root of the J-groove weld (on a horizontal plane perpendicular to the nozzle axis) to 2 inches below the lowest point at the toe of the J-groove weld on a horizontal plane perpendicular to the nozzle axis (or the bottom of the nozzle if less than 2 inches (see Figure IV-3 [of the February 20, 2004, Order]); OR from 2 inches above the highest point of the root of the J-groove weld (on a horizontal plane perpendicular to the nozzle axis) to 1.0-inch below the lowest point at the toe of the J-groove weld (on a horizontal plane perpendicular to the nozzle axis) and including all RPV head penetration nozzle surfaces below the J-groove weld that have an operating stress level (including all residual and normal operation stresses) of 20 ksi tension and greater (see Figure IV-4 [of the February 20, 2004, Order]).

(iii) A combination of (i) and (ii) to cover equivalent volumes, surfaces, and leak paths of the RPV head penetration nozzle base material and J-groove weld as described in (i) and (ii). Substitution of a portion of a volumetric exam on a nozzle with a surface examination may be performed with the following requirements:

1. On nozzle material below the J-groove weld, both the outside diameter and inside diameter surfaces of the nozzle must be examined.

2. On nozzle material above the J-groove weld, surface examination of the inside diameter surface of the nozzle is permitted provided a surface examination of the J-groove weld is also performed.

The licensee has requested relief from Section IV, paragraphs C.(5)(b)(i) and (ii) of the Order. The specific relaxation requested is identified below.

2.2 Licensee's Proposed Alternative

The licensee seeks relaxation from the Order where inspection coverage is limited by inaccessible areas of 91 control element drive mechanism (CEDM) penetration nozzles from SONGS Unit 2 and 91 CEDM penetration nozzles from SONGS Unit 3 with respect to NDE, including ultrasonic testing (UT), eddy current testing (ET), and dye penetrant testing (PT).

SCE proposes to meet the Order requirements, or to examine each CEDM nozzle from 2 inches above the top of the attachment weld to as far down the nozzle as physically possible. The licensee stated the distance shall be at least the minimum inspection distance below the bottom of the attachment weld as follows:

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
CEDM #'s 87 through 91	0.35 inches below the bottom of the weld

2.3 Licensee's Basis for Proposed Alternative

The licensee stated the material near the bottom of each CEDM nozzle cannot be inspected due to the presence of a CEDM extension shaft guide cone threaded to the ID surface. The licensee stated the length of the inside diameter (ID) surface of each CEDM nozzle that cannot be inspected is approximately 1.5 inches.

In a letter dated February 9, 2004, the licensee provided a response to an NRC request for additional information (RAI) regarding the CEDM extension shaft guide cone threads . The licensee stated that the guide cones are threaded into the ID of all 91 CEDM penetrations. The guide cone threads are staked with a set screw which is plug-welded to preclude unthreading of the cone during operation. In addition, the licensee stated that there are two 1" long fillet welds between the top of the tapered portion of the guide cone and the bottom of the CEDM nozzles. The licensee stated that the removal of each guide cone would require destructive removal of three welds and the stake, then unthreading the guide cone. The licensee estimated the time to perform this labor would be at least one hour per guide cone in a radiation field of approximately 4R/hr. The licensee estimated the dose to be 4 person-rem per nozzle to remove the guide cones. The licensee also stated additional time would be required to replace the guide cones. The licensee stated that grinding and drilling operations required to remove the guide cones would degrade the CEDM penetrations with respect to PWSCC resistance.

In conclusion, the licensee stated neither the UT nor the surface examination methods specified in the Order would effectively examine the threaded surface that would be exposed as a result of guide cone removal.

2.4 Evaluation

The NRC staff's review of this request was based on criterion (2) of paragraph F of Section IV of the Order, which states:

> Compliance with this Order for specific nozzles would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Within the context of the licensee's proposed alternative examination of the RPV head penetration nozzles, the licensee has demonstrated the hardship that would result from implementing examinations to the bottom end of these nozzles.

The phenomenon of concern is PWSCC, which typically initiates in the areas of highest stress. The area of CEDM penetrations that has the highest residual stress is the area adjacent to the J-groove attachment weld. Therefore, it is most probable that PWSCC will initiate adjacent to the J-groove attachment weld.

The licensee requested to limit the examination of the nozzle base material surface to the following:

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

The licensee's request to limit the examination of the nozzle base material is supported by the licensee's analysis which demonstrated that no flaw below that portion of the nozzle identified above would propagate to a level adjacent to the J-groove weld within the next operating period. The licensee's flaw evaluation was performed by postulating an axial flaw in the area of missed coverage below the weld using the method described in WCAP-15819, Rev. 1, "Structural Integrity Evaluation of Reactor Vessel Upper Head Penetrations to Support Continued Operation: San Onofre Units 2 and 3". The calculations performed using WCAP-15819, Rev. 1 were used to generate the crack growth curves illustrated in WCAP-15819, Rev. 1. The licensee identified the conservatisms embedded in the flaw evaluation and they are listed below:

1. The flaw has been assumed to be a through wall flaw.

2. Appendix C of WCAP-15819, Rev. 1 determined the initial through wall flaw size by conservatively postulating that the lower extremity of the flaw is located where either the inside or outside surface hoop stress drops below 0 ksi.

3. The flaw has been assumed to initiate in and propagate from a region below the proposed inspection coverage area. Flaws have never been observed in this low stress region away from the weld without the presence of other flaws in the high stressed region near the weld.

4. The stress intensity factor calculation was based on the highest stress anywhere along the postulated flaw and was applied uniformly along the entire length of the through-wall axial flaw.

5. The crack growth curves shown in Appendix C of WCAP-15819, Rev. 1 were generated based on the hoop stress distribution for the as-designed weld configuration instead of the as-built weld configuration.

The licensee provided a table that illustrates the required time in effective full power years (EFPY) for the upper crack tip to reach the bottom of the weld from the inspection coverages extracted from Appendix C as compared to the as-built calculation results. The results are identified below:

Nozzle Angle (°)	Nozzle Number	Minimum Required Inspection Coverage Below the Weld per Appendix C Curves (inches)	EFPY (Appendix C)	EFPY (As-Built Weld Sizes)
0	1	0.43	1.75	1.81
7.8	2-35	0.43	1.75	2.17
29.1	36-87	0.42	1.75	∞ (Note 1)
49.7	88-91	0.35	1.75	∞ (Note 1)

Note 1: Stress intensity is less than the threshold of 9 Mpa$\sqrt{m}$ [K_{th} from page 4-5 of the February 28, 2004, submittal] and therefore will not propagate towards the bottom of the weld.

The licensee concluded that the results above illustrate the conservatism and the requested relaxation results in a minimum inspection frequency that is longer than the SONGS operating cycle.

The licensee's analysis in WCAP-15819, Rev. 1, used the crack growth formula in the Electric Power Research Institute's (EPRI) report Material Reliability Program (MRP), 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." The staff has not yet made a determination on the acceptability of the subject industry report. Should the crack growth formula used by the licensee be found unacceptable, the licensee will be required to revise its analysis to incorporate an acceptable crack growth formula as described below.

> If the NRC staff finds that the crack-growth formula in industry report MRP-55 is unacceptable, the licensee shall 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 the licensee's revised analysis shows that the crack growth acceptance criteria are exceeded prior to the end of the current operating cycle, this relaxation is rescinded and the licensee shall, within 72 hours, 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, the licensee shall, 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, the licensee shall, 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 must be based on an acceptable crack growth rate formula.

The licensee stated that the postulated initial crack for the WCAP-15819, Rev. 1, Appendix C curves extends from the expected lower extent of the inspection coverage area to the point where hoop stresses on either the ID or the outside diameter (OD) become compressive. Appendix C crack growth curves use design weld sizes, which are conservative compared to the as-built weld sizes.

The licensee stated the minimum inspection coverage values that are requested are taken from the most conservative crack growth rate curves. The licensee stated that the Appendix C curves support that a through-wall axial crack growing from the minimum distance inspected for each CEDM below the weld would take at least one operating cycle to reach the bottom of the weld.

As an added conservatism, the licensee stated 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 RPVH) to develop as a result of that leak. The licensee stated that multiple inspection intervals would be available to detect a flaw that initiates in the un-inspected region prior to potential development of a safety concern.

The licensee stated the threaded portion of the extension shaft guide cone would serve to retain potential loose parts resulting from a circumferential crack in the un-inspected 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.

The licensee concluded, based on a review of data acquired during the Unit 2, Cycles 12 and 13 refueling outages, examination data can be collected from 2 inches above the top of the attachment weld to at least the requested minimum distances below the bottom of the attachment weld in all 91 CEDM penetrations. The licensee stated the proposed inspection scope to at least the minimum distance below the attachment weld provides at least one additional inspection interval to detect cracks propagating from the un-inspected area to the bottom of the weld and multiple inspection intervals would be available to detect cracks propagating from the un-inspected area before they could develop into a safety concern.

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

3.0 CONCLUSION

The staff concludes that the licensee's proposed alternative examination of the 91 CEDM's each for Unit 2 and Unit 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 #2 through 35	0.43 inches below the bottom of the weld
CEDM #36 through 87	0.42 inches below the bottom of the weld
CEDM #87 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. Further inspections of these VHP nozzles in accordance with Section IV, paragraph C.(5)(b), of the Order 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, the staff authorizes the proposed relaxation and alternative inspection for the 91 CEDMs at SONGS Unit 2 and the 91 CEDMs at SONGS Unit 3 for one operating cycle, subject to the following condition:

> If the NRC staff finds that the crack-growth formula in industry report MRP-55 is unacceptable, the licensee shall revise its analysis that justifies relaxation of the First Revised Order dated February 20, 2004, within 30 days after the NRC informs the

licensee of an NRC-approved crack growth formula. If the licensee's revised analysis shows that the crack growth acceptance criteria are exceeded prior to the end of the current operating cycle, this relaxation is rescinded and the licensee shall, within 72 hours, 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, the licensee shall, 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, the licensee shall, within 30 days, submit a letter to the NRC confirming that its analyses has been revised. Any future crack-growth analyses performed for this and future cycles for RPV head penetrations must be based on an acceptable crack growth rate formula.

Principal Contributor: E. Reichelt

Date: March 19, 2004