

May 5, 2004

Mr. A. Edward Scherer
Manager of Nuclear Regulatory Affairs
Southern California Edison Company
P.O. Box 128
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Dear Mr. Scherer:

SUBJECT: SAN ONOFRE NUCLEAR GENERATING STATION, UNITS 2 AND 3,
INSERVICE INSPECTION PROGRAM RELIEF REQUEST ISI-3-8, EMBEDDED
FLAW REPAIR PROCESS (TAC NOS. MC1470 AND MC1471)

By letter dated December 3, 2003, as supplemented by letter dated March 15, 2004, Southern California Edison Company requested relief from specific requirements in the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code) for the San Onofre Nuclear Generating Station Units 2 and 3 (SONGS). The licensee proposed an alternative to the ASME Code Section XI requirements that preclude welding over or embedding an existing flaw. The request is based on the use of the Westinghouse repair methodology as documented in Westinghouse Topical Report WCAP-15987-P, Revision 2, "Technical Basis for the Embedded Flaw Process for Repair of Reactor Vessel Head Penetrations," which was reviewed and approved by the Nuclear Regulatory Commission (NRC) staff.

Based on the enclosed safety evaluation, the NRC staff concludes that the proposed alternative provides an acceptable level of quality and safety. Therefore, pursuant to 50.55a(a)(3)(i) of Title 10 of the *Code of Federal Regulations*, the NRC staff authorizes the proposed alternative in Relief Request ISI-3-8 to the repair requirements of IWA-4410(a), NB-4131, NB-2538, and NB-2539.1 of ASME Code Sections III and XI at SONGS, for the third 10-year inservice inspection interval.

Sincerely,

/RA/

Stephen Dembek, Chief, Section 2
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

San Onofre Nuclear Generating Station, Units 2 and 3

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Docket Nos. 50-361 and 50-362

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cc w/encl: See next page

ADAMS Accession No.: ML 041260459

***SEE PREVIOUS CONCURRENCE
NRR-028**

OFFICE	PDIV-2/PM	PDIV-1/LA	EMCB/SC*	OGC (NLO) *	PDIV-2/SC
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Dated: May 5, 2004

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

INSERVICE INSPECTION PROGRAM RELIEF REQUEST ISI-3-8

SOUTHERN CALIFORNIA EDISON COMPANY

SAN ONOFRE NUCLEAR GENERATING STATION UNITS 2 AND 3

DOCKET NOS. 50-361 AND 50-362

1.0 INTRODUCTION

By letter dated December 3, 2003 (Accession No. ML033420178), as supplemented by letter dated March 15, 2004 (Accession No. ML040790120), Southern California Edison Company (the licensee), submitted relief request ISI-3-8 for the San Onofre Nuclear Generating Station, Units 2 and 3 (SONGS) to use an embedded repair technique if cracks were found on the inside and/or outside diameter of the SONGS control element drive mechanism (CEDM) nozzles or on the J-groove attachment welds. These techniques would be used in lieu of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code) Section III requirements that preclude welding over or embedding an existing flaw.

2.0 REGULATORY BASIS

The Inservice Inspection (ISI) of the ASME Code Class 1, 2, and 3 components is to be performed in accordance with Section XI of the ASME Code and applicable edition and addenda as required by 10 CFR 50.55a(g) of Title 10 of the *Code of Federal Regulations* (10 CFR), except where specific relief has been granted by the Nuclear Regulatory Commission (NRC) pursuant to 10 CFR 50.55a(g)(6)(i). The regulation at 10 CFR 50.55a(a)(3), states in part that alternatives to the requirements of paragraph (g) may be used, when authorized by the NRC, if the licensee demonstrates that: (i) the proposed alternatives would provide an acceptable level of quality and safety, or (ii) compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Pursuant to 10 CFR 50.55a(g)(4), ASME Code Class 1, 2, and 3 components (including supports) will meet the requirements, except the design and access provisions and the preservice examination requirements, set forth in the ASME Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," to the extent practical within the limitations of design, geometry, and materials of construction of the components. The regulations require that inservice examination of components and system pressure tests conducted during the first 10-year interval and subsequent intervals comply with the requirements in the latest edition and addenda of Section XI of the ASME Code incorporated by reference in 10 CFR 50.55a(b) 12 months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein. The ISI code of record for SONGS, third 10-year ISI interval which started August 17, 2003, is the 1995 Edition, 1996 Addenda of Section XI of the ASME Code.

3.0 INSERVICE INSPECTION PROGRAM RELIEF REQUEST ISI-3-8

3.1 ASME Code Components Affected

Relief Request ISI-3-8 would allow repairs on the inside and outside diameter of CEDM penetrations as well as the J-groove attachment welds of CEDM penetrations, In-Core Instrumentation penetrations and reactor pressure vessel head vent penetrations.

3.2 Code Requirements for which Relief is Requested

ASME Section XI, IWA-4410(a) states in part:

(b) "Welding, brazing, metal removal, and installation activities shall be performed in accordance with the Owner's Requirements and the Construction Code of the component or system....."

ASME Section III, NB-4131 states in part:

"Defects in base metals may be eliminated or repaired by welding, provided the defects are removed, repaired and examined in accordance with the requirements of NB-2500."

ASME Section III, NB-2538 addresses elimination of base material surface defects and specifies defects are to be removed by grinding or machining. Defect removal must be verified by a magnetic particle or liquid penetrant examination using acceptance criteria of NB-2545 or NB-2546. If the removal process reduces the section thickness below the NB-3000 design thickness, then repair welding per NB-2539 is to be performed.

ASME Section III, NB-2539.1 addresses removal of defects and requires defects be removed or reduced to an acceptable size by suitable mechanical or thermal methods.

ASME Section III, NB-4451, NB-4452, and NB-4453.1 require the elimination of weld metal defects prior to repair welding.

3.3 Licensee's Proposed Alternative to Code

As an alternative to the rules discussed above, which do not allow welding over or embedding an existing flaw, the licensee indicated that it would use the proposed alternative method outlined in the NRC approved Westinghouse Topical Report WCAP-15987-P, Revision 2, "Technical Basis for the Embedded Flaw Process for Repair of Reactor Vessel Head Penetrations" dated May 16, 2003 (Accession No. ML031840237).

3.4 Licensee's Basis for Relief

The bases for the alternative requirements of allowing weld repairs of axial and circumferential cracks in the vessel head penetration (VHP) nozzle inside diameter (ID), at or above the J-groove weld, in the VHP nozzle ID and outside diameter (OD) below the J-groove weld, and in the J-groove weld are discussed in detail in WCAP-15987-P, Revision 2.

The NRC staff's July 3, 2003, safety evaluation (Accession No. ML031840237) found WCAP-15987-P, Revision 2 to be acceptable for referencing in licensing applications as an alternative to the 1989 Edition of Section III of the ASME Code, with limitations noted in Section 4.0 below.

4.0 STAFF EVALUATION

The staff has reviewed Westinghouse Topical Report WCAP-15987-P, Revision 2, and in a letter dated July 3, 2003, the staff accepted the referencing of the topical report for use with the following limitations:

1. Licensees must follow the NRC flaw evaluation guidelines provided in the R. J. Barrett (NRC) letter to A. Marion (Nuclear Energy Institute), "Flaw Evaluation Guidelines," April 11, 2003. (Accession No. ML030980322)
2. The crack growth rate referenced in WCAP-15987-P, Revision 2 is not applicable to Alloy 600 or Alloy 690 weld material, i.e., Alloy 52, 82, 152, and 182 filler material.
3. The nondestructive examination (NDE) requirements listed in the table below must be implemented for examinations of repairs made using the embedded flaw process.

Repair Location	Flaw Orientation	Repair Weld	Repair NDE	ISI NDE of the repair, Note 2
VHP Nozzle ID	Axial	Seal	UT and Surface	UT or Surface
VHP Nozzle ID	Circumferential	Note 1	Note 1	Note 1
VHP Nozzle OD above J-groove weld	Axial or Circumferential	Note 1	Note 1	Note 1
VHP Nozzle OD below J-groove weld	Axial or Circumferential	Seal	UT or Surface	UT or Surface
J-groove weld	Axial	Seal	UT and Surface, Note 3	UT and Surface, Note 3
J-groove weld	Circumferential	Seal	UT and Surface, Note 3	UT and Surface, Note 3

- Notes:
1. Repairs must be reviewed and approved separately by the NRC.
 2. Inspect consistent with the NRC Order EA-03-009 dated February 11, 2003, and any subsequent changes.
 3. Inspect with personnel and procedures qualified with ultrasonic test (UT) performance-based criteria. Examine the accessible portion of the repaired region. The UT coverage plus surface coverage must equal 100 percent.

The licensee stated that it would use this Westinghouse topical report and would follow the conditions and limitations identified above.

In its supplemental letter dated March 15, 2004, the licensee indicated that it had performed a code reconciliation between the applicable repair requirements of ASME Section III, 1989 Edition and ASME Section III, 1971 Edition, Summer 1971 Addenda, and that the differences were suitably reconciled. The licensee indicated that the reconciliation was performed in accordance with the SONGS ASME XI Program and that the reconciliation document is on file and available for review. The code reconciliation compared the original construction code technical requirements with the new code technical requirements to assure that the original code requirements will be fully met in their intent even with the use of new construction code requirements which may differ from the original code.

Therefore, the staff finds the use of the reactor VHP repair methodology as described in WCAP-15987-P, Revision 2, to be acceptable for the SONGS third 10-year ISI interval.

5.0 CONCLUSION

The NRC staff concludes that the proposed alternatives as stated in Relief Request ISI-3-8 provide an acceptable level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), the NRC staff authorizes the proposed alternative in Relief Request ISI-3-8 to the flaw repair requirements of IWA-4410(a) and the related requirements listed in Section 3.2 of this safety evaluation of ASME Code, Section III and XI, at SONGS for the third 10-year ISI interval.

All other requirements of the ASME Code, Section III and XI for which relief has not been specifically requested and approved remain applicable, including third party review by the Authorized Nuclear Inservice Inspector.

Principal Contributor: T. Steingass

Date: May 5, 2004