

December 21, 2006

Mr. Richard M. Rosenblum  
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 - RE:  
REQUEST FOR RELIEF NO. ISI-3-26 FOR THE INSERVICE INSPECTION  
PROGRAM AND APPROVAL TO USE THE ALTERNATIVE REQUIREMENTS  
OF ASME CODE CASE N-513-2 (TAC NOS. MD3135 AND MD3136)

Dear Mr. Rosenblum:

By letter of September 29, 2006, Southern California Edison (SCE) requested that the U.S. Nuclear Regulatory Commission (NRC) approve a relief request to use the alternative requirements of Code Case N-513-2, "Evaluation Criteria for Temporary Acceptance of Flaws in Moderate Energy Class 2 or 3 Piping," in lieu of Subarticle IWA-4000 of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code), Section XI, for San Onofre Nuclear Generating Station, Units 2 and 3 (SONGS 2 and 3).

Based on our review of the submitted information, we conclude that the proposed alternatives in ASME, Section XI, Code Case N-513-2, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR), paragraph 50.55a(a)(3)(i), the proposed alternative is authorized to perform piping evaluations to determine whether temporary continued operation of applicable ASME Classes 2 and 3 piping system is allowed. This authorization applies to SONGS 2 and 3, for the remainder of the 10-year inservice inspection interval of the respective units as noted in the relief request.

Use of Code Case N-513-2 is authorized for use for this relief request only until such time as the Code Case is published in a future version of RG 1.147, and incorporated by reference in 10 CFR 50.55a(b). At that time, if SCE intends to continue implementing this Code Case, it must follow all provisions of Code Case N-513-2 with conditions as specified in RG 1.147, and limitations as specified in Sections 50.55a(b)(4), (b)(5), and (b)(6), if any.

If you have any questions, please contact N. Kalyanam at 301-415-1480.

Sincerely,

***/RA/***

David Terao, Chief  
Plant Licensing Branch IV  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket Nos. 50-361 and 50-362

Enclosure: Safety Evaluation

cc w/encl: See next page

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Docket Nos. 50-361 and 50-362

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cc w/encl: See next page

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

THIRD 10-YEAR INSERVICE INSPECTION INTERVAL

REQUEST FOR RELIEF NO. ISI-3-26

USE OF ASME CODE CASE N-513-2

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 September 29, 2006 (Agencywide Documents Access and Management System's (ADAMS) Accession Number ML062760306), pursuant to paragraph 50.55a(a)(3)(i) of Title 10 of the *Code of Federal Regulations* (10 CFR), Southern California Edison (SCE, the licensee) submitted a request for relief to be implemented during the third 10-year inservice inspection (ISI) interval at San Onofre Nuclear Generating Station, Units 2 and 3 (SONGS 2 and 3). Specifically, SCE requested U.S. Nuclear Regulatory Commission (NRC) approval of a relief request to use the alternative requirements of American Society of Mechanical Engineers (ASME) Code Case N-513-2, "Evaluation Criteria for Temporary Acceptance of Flaws in Moderate Energy Class 2 or 3 Piping," in lieu of Subarticle IWA-4000 of the ASME Boiler and Pressure Vessel Code (ASME Code), Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," to SONGS 2 and 3.

2.0 REGULATORY EVALUATION

The ISI of the ASME Code Class 1, Class 2, and Class 3 components is to be performed in accordance with the ASME Code, Section XI, and applicable edition and addenda as required by 10 CFR 50.55a(g). Pursuant to paragraph 10 CFR 50.55a(a)(3)(i), alternatives to the requirements of paragraph (g) may be used, when authorized by the NRC, if the applicant demonstrates that the proposed alternatives would provide an acceptable level of quality and safety.

Pursuant to paragraph 10 CFR 50.55a(g)(4), ASME Code Class 1, Class 2, and Class 3 components (including supports) must meet the requirements, except the design and access provisions and the preservice examination requirements, set forth in the ASME Code, Section XI, to the extent practical within the limitations of design, geometry, and materials of construction of the components. Paragraph 10 CFR 50.55a(g)(4) requires that inservice examination of components and system pressure tests conducted during the first 10-year inspection interval and subsequent inspection intervals comply with the requirements in the latest edition and addenda of Section XI of the ASME Code. The latest edition and addenda of

Section XI of the ASME Code are incorporated by reference in paragraph 10 CFR 50.55a(b), 12 months prior to the start of the 10-year inspection interval.

3.0 SCE'S RELIEF REQUEST

3.1 ASME Code Component(s) Affected

ASME Code, Section XI, Moderate Energy Class 2 and Class 3 Piping.

3.2 Applicable ASME, Section XI, Code Edition and Addenda

1995 Edition through the 1996 Addenda

3.3 Applicable ASME Code Requirements (as stated in submittal)

CLASS 3

IWB-3000 states, "This Article is in course of preparation. The rules of IWB-3000 may be used."

IWB-3132 provides three ways in which an inservice volumetric or surface examination may be accepted.

1. IWB-3132.1, "Acceptance by Volumetric or Surface Examination",
2. IWB-3132.2, "Acceptance by Repair/Replacement Activity", or
3. IWB-3132.3, "Acceptance by Analytical Evaluation".

IWB-3132.2 states, "A component whose volumetric or surface examination detects flaws that exceed the acceptance standards of Table IWB-3410-1 is unacceptable for continued service until the additional examination requirements of IWB-2430 are satisfied and the component is corrected by a repair/replacement activity to the extent necessary to meet the acceptance standards of IWB-3000."

IWB-3142 provides four ways in which an inservice visual examination may be accepted.

1. IWB-3142.1, "Acceptance by Visual Examination"
2. IWB-3142.2, "Acceptance by Supplemental Examination"
3. IWB-3142.3, "Acceptance by Corrective Measures or Repair/Replacement Activity"
4. IWB-3142.4, "Acceptance by Analytical Evaluation"

IWB-3142.3 states, "A component containing relevant conditions is acceptable for continued service if the relevant conditions are corrected by a repair/replacement activity or by corrective measure[s] to the extent necessary to meet the acceptance standards of Table IWB-3410-1 ."

## CLASS 2

IWC-3122 provides three ways in which an Inservice Volumetric and Surface Examinations may be accepted.

1. IWC-3122.1, "Acceptance by Examination"
2. IWC-3122.2, "Acceptance by Repair/Replacement Activity"
3. IWC-3122.3, "Acceptance by Analytical Evaluation"

IWC-3122.2 states, "A component whose examination detects flaws that exceed the acceptance standards of Table IWC-3410-1 is unacceptable for continued service until the additional examination requirements of IWC-2430 are satisfied and the component is corrected by a repair/replacement activity to the extent necessary to meet the acceptance standards of IWC-3000." IWC-3132 provides four ways in which an inservice visual examination may be accepted.

1. IWC-3132, "Acceptance"
2. IWC-3132.1, "Acceptance by Supplemental Examination"
3. IWC-3132.2, "Acceptance by Corrective Measures or Repair/Replacement Activity"
4. IWC-3132.3, "Acceptance by Analytical Evaluation"

IWC-3132.2 states, "A component containing relevant conditions is acceptable for continued service if the relevant conditions are corrected by a repair/replacement activity or by corrective measures to the extent necessary to meet the acceptance standards of Table IWC-3410-1 ."

### 3.4 Basis for the Relief Request (as stated in submittal)

Proposed Alternative and Basis for Use:

The Nuclear Regulatory Commission in Regulatory Guide 1.147, "Inservice Inspection Code Case Acceptability," Revision 14, has accepted Code Case N-513-1 with the following limitations:

1. Specific safety factors in paragraph 4.0 must be satisfied.
2. Code Case N-513 may not be applied to:
  - i. Components other than pipe and tube
  - ii. Leakage through a gasket
  - iii. Threaded connections employing nonstructural seal welds for leakage prevention (through seal weld leakage is not a structural flaw; thread integrity must be maintained)
  - iv. Degraded socket welds

Code Case N-513-1 permits flaws in Class 2 and 3 moderate energy piping on a temporary basis until the next outage if it can be demonstrated that adequate pipe integrity and leakage containment are maintained. The Code Case is currently applicable to part-through and through wall planar flaws and part-through wall nonplanar

flaws. Service experience has shown that some piping can suffer degradation from nonplanar flaws, such as pitting and microbiological attack, where local inconsequential leakage can occur.

The Code Case can be used for nonplanar through-wall flaws but in a restrictive situation where nonplanar geometry is dominant in one plane. Some plants have used the intent of N-513 for nonplanar leaking flaws. However, relief requests from code requirements are still required because of the stated limited scope of N-513 in section 3.0 of the Code Case. The Code Case was revised (N-513-2) to extend the application to cover all types of nonplanar flaws. The analysis procedures were expanded to address the general case of through-wall degradation. Code Case N-513-2 has broader applications and therefore has a direct benefit for operating plants.

Code Case N-513-2 includes the incorporation of the improved flaw evaluation procedures for piping that are provided in the new Appendix C of Section XI in the 2002 Addenda.

Code Case N-513-2 addresses the limitations posed in Regulatory Guide 1.147 as follows:

1. Paragraph 4.0 was revised to incorporate references to Appendix C.
2. 1.0(a) was revised to limit the application of the code case as specified in the limitation applied in Regulatory Guide 1.147.

SCE considers the proposed alternative of using Code Case N-513-2 to provide an acceptable level of quality and safety in accordance with 10 CFR 50.55a(a)(3)(i).

### 3.5 Duration of Proposed Alternative

SCE requests approval of Code Case N-513-2 to be used for the remainder of the current SONGS Units 2 and 3 third 10-year ISI interval that started on August 18, 2003, and will end on August 17, 2013, or until the NRC publishes Code Case N-513-2 in a future revision of Regulatory Guide 1.147. Upon incorporation into the Regulatory Guide, SCE will review and follow the conditions specified. All other ASME Code, Section XI, requirements for which relief was not specifically requested and authorized by the NRC staff will remain applicable including third-party review by the Authorized Nuclear Inservice Inspector.

### 4.0 TECHNICAL EVALUATION

As indicated in the above ASME Code, Section XI requirements, flaws detected in Class 2 and Class 3 piping need to be either removed by repair/replacement, or accepted by analysis or acceptance criteria of the ASME Code. In the mid-1990s, the industry proposed temporary measures to accept and manage flaws in service for Class 3 piping. On August 14, 1997, the

ASME issued the original Code Case N-513 to permit temporary acceptance of flaws in moderate-energy Class 3 piping for operation without repair/replacement of degraded pipe.

On March 28, 2001, the ASME issued Code Case N-513-1, which permits flaws in Class 2 and Class 3 piping in service temporarily without repair/replacement. Code Case N-513-1 also includes a revised flaw evaluation methodology. As stated in SCE's basis above, the staff has accepted Code Case N-513-1 in RG 1.147, Revision 14, with conditions. The staff's conditions are related to safety factors and the scope of applicability of the Code Case.

On February 20, 2004, the ASME issued Code Case N-513-2. However, the staff did not approve Code Case N-513-2 in RG 1.147, Revision 14, or 10 CFR 50.55a.

The staff has reviewed the differences between Code Case N-513-1 and Code Case N-513-2. The staff confirms that Code Case N-513-2 incorporates the conditions imposed in RG 1.147, Revision 14. As discussed above, Code Case N-513-2 incorporates the flaw evaluation procedures for piping that are specified in Appendix C to the 2002 Addenda of the ASME Code, Section XI. The staff has approved the 2002 Addenda of the ASME Code in 10 CFR 50.55a. Therefore, the use of the flaw evaluation methodology in Appendix C to the 2002 Addenda is acceptable.

The staff notes that although degraded pipe is permitted to operate per Code Case N-513-2, the degraded piping is required to be repaired or replaced during the subsequent refueling outage in accordance with the appropriate Section III and/or Section XI of the ASME Code.

Although flaws are allowed to remain in service, Code Case N-513-2 provides requirements to assure piping integrity. Code Case N-513-2 requires frequent inspections of no longer than 30-day intervals to determine if the flaw is growing and to establish the time at which the flaw will reach an unacceptable size. For through-wall leaking flaws, the Code Case requires daily walkdowns to confirm that the analysis conditions used in the evaluation remain valid. In addition, the Code Case requires an augmented volumetric examination or physical measurement to assess degradation of affected system. The Code Case requires expansion of the inspection scope by increasing the sample size. If the inspections show that the flaw growth rate is unacceptable, the Code Case requires immediate repair or replacement. Code Case N-513-2 also provides a rigorous methodology and acceptance criteria to evaluate the flaw.

On the basis of the above evaluation, the staff finds that in lieu of ASME Code, Section XI, IWA-4000, the proposed alternative requirements of Code Case N-513-2 provide an acceptable level of quality and safety.

## 5.0 CONCLUSION

On the basis of the NRC staff's review of the submitted information, the staff concludes that the proposed alternatives in ASME Code, Section XI, Code Case N-513-2, as discussed in the request for relief will provide an acceptable level of quality and safety. Code Case N-513-2 contains requirements to maintain piping structural integrity, and incorporates the conditions listed in RG 1.147, Revision 14. Use of the Code Case is authorized until such time as the Code Case is published in a future version of RG 1.147, and incorporated by reference in 10 CFR 50.55a(b). At that time, if SCE intends to continue implementing this Code Case, it



must follow all provisions of Code Case N-513-2 with conditions as specified in RG 1.147, and limitations as specified in Sections 50.55a(b)(4), (b)(5), and (b)(6), if any.

Pursuant to 10 CFR 50.55a(a)(3)(i), the proposed alternative is authorized for the performance of piping evaluations to determine whether temporary continued operation of applicable ASME Code Class 2 and Class 3 piping system is allowed. This authorization applies to SONGS 2 and 3 for the remainder of the 10-year ISI interval of the respective units as noted in the relief request. All other requirements of the ASME Code, Sections 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: N. Kalyanam

Date: December 21, 2006

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Units 2 and 3

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San Onofre Nuclear Generating Station  
Units 2 and 3

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March 2006