

September 13, 2007

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 -
REQUEST FOR ADDITIONAL INFORMATION - RELIEF REQUEST ISI-3-27,
USE OF STRUCTURAL WELD OVERLAY AND ASSOCIATED ALTERNATIVE
REPAIR TECHNIQUES (TAC NOS. MD4580 AND MD4581)

Dear Mr. Rosenblum:

By letter dated February 21, 2007, Southern California Edison (SCE, the licensee) submitted a request for the approval of ISI-3-27 to use alternatives to the requirements of the American Society of Mechanical Engineers (ASME) Code, Section XI, 1995 Edition through 1996 Addenda, IWA-4000, for repair/replacement activities related to the performance of structural weld overlays at San Onofre Nuclear Generating Station, Units 2 and Unit 3, for the third 10-year inservice inspection interval.

After reviewing your request, the U.S. Nuclear Regulatory Commission staff has determined that additional information is required to complete the review. This was discussed with Ms. Linda Conklin of your staff and it was agreed SCE would provide the additional information requested in the enclosure within 30 days from the receipt of the formal request for additional information.

If you have any questions, please contact me at (301) 415-1480.

Sincerely,

/RA/

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: See next page

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DATE	9/10/07	9/10/07	8/15/07	9/13/07

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San Onofre Nuclear Generating Station
Units 2 and 3

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May 2007

OFFICE OF NUCLEAR REACTOR REGULATION

REQUEST FOR ADDITIONAL INFORMATION

RELIEF REQUEST (RR) ISI-3-27

SAN ONOFRE NUCLEAR GENERATING STATION, UNIT 2 AND 3

SOUTHERN CALIFORNIA EDISON

DOCKET NOS. 50-360 and 50-361

1. Most recent industry experience involves the hot cracking of nickel Alloy 52M weld overlay deposits on stainless steel (SS) base materials with higher levels of sulfur in the austenitic SS base metal. The application of a low sulfur stainless steel weld build-up or barrier layer stopping just short of the dissimilar metal (DM) weld (Alloy 82/182) is a method used to avoid this hot cracking phenomenon.
 - (a) Discuss whether you have considered the potential of hot cracking and if you have plans to incorporate the use of a barrier weld layer prior to welding of the full structural overlay.
 - (b) As part of your analysis to use a barrier weld layer, please include in your discussion meeting the Chromium (Cr) content outlined in Attachment 2 of RR ISI-3-27, the transition point from barrier layer, mock-up testing performed, and whether or not barrier layer will be considered part of the structural weld overlay (SWOL).
 - (c) Discuss the basis if you should choose not to utilize the barrier layer.
2. Section 4.0 of ISI-3-27 on page 4 of 14.

Provide material specification for the SS similar metal (SM) welds designated to be incorporated as part of the full SWOL planned at San Onofre Nuclear Generating Station, Unit 2 and 3.
3. Section 4.0, page 5 of 14.
 - (a) Confirm that a flaw of 10 percent (%) thickness of the pipe base metal wall will be analyzed for crack growth in the base metal.
 - (b) Will a flaw of the same size (i.e., 10% of the weld overlay thickness) be assumed in the SWOL and analyzed for crack growth in the SWOL?
4. Section 4.0, page 6 of 14 and continued on page 7 of 14 states the requirements for qualification and performance of ultrasonic testing (UT) examination of base metal on the DM and SM welds; however, it does not state requirements for the surface examination of this base metal. Provide acceptance criteria and discuss your repair strategy if the base material inspection results identify indications exceeding the acceptance criteria.

5. Section 4.0, on page 6 of 14 and continued on page 7 of 14 you identified cast SS base material components. You state, "...Southern California Electric (SCE) will perform the qualified Appendix VIII, Supplement 10, as modified by the Performance Demonstration Inspection (PDI) Program UT exam, on the Alloy 82/182 welds from the nozzle side which is ferritic steel. Appendix VIII, Supplement 9 'Qualification Requirements for Cast Austenitic Piping Welds' is the course of preparation and is not required by Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(g)(6)(ii)(c)." In these cases, SCE will perform UT examination from the cast austenitic SS side in accordance with ASME Section XI, Appendix III.
 - (a) Discuss the technical acceptability of the proposed UT examination for detecting flaws in the cast SS with PDI-qualified representative mockups, examination procedures and personnel not demonstrated from cast materials, with or without the SWOL installed.
 - (b) Since UT examination is not qualified to detect flaws in cast SS material regardless of the SWOL, discuss how crack growth calculation will be performed in terms of the initial flaw size. A conservative approach would be to assume a 100% through-wall flaw existing in the original base metal/weld in the crack growth calculation even if UT examination is performed of the base metal prior to SWOL installation.
 - (c) Clarify the following statement, "...SCE will perform a UT examination using the best available technique for the pre-service and inservice inspections for these welds."
6. Section 4.0 of RR ISI-3-27 states that, "The most appropriate technique to detect surface cracking [hydrogen introduced during temper bead weld process] is the surface examination technique that SCE will perform on the overlay and the adjacent base material in a band at least 1.5 times the thickness of the base material on either side of the overlay. In the unlikely event that this type of cracking does occur, it would be initiated on the surface on which the welding is actually performed or in the [heat affected zone] HAZ immediately adjacent to the weld." "...it would not be possible with current technology to UT inspect 100% of the volume within 1.5 times the thickness of the base material because of geometric considerations. Inspection of an increased volume would result in increased dose to inspection personnel without a compensating increase in safety or quality because there is no plausible mechanism for formation of new flaws or propagation of existing flaws in the region." Discuss further whether hydrogen-induced cracking is a surface phenomenon exclusively and whether this condition can occur undetected in the region you will surface inspect, but not UT inspect.
7. Section 4.0 of RR ISI-3-27 on page 8 of 14 states, "Acceptance of UT indications in weld overlay repairs using Section XI acceptance criteria has been approved by the Nuclear Regulatory Commission in past weld overlay applications (e.g. References 1, 2)."
 - (a) Provide the specific subarticle of the ASME Code Section XI that the acceptance criteria will be based on to disposition indications in the SWOL.

- (b) Discuss how the indications will be dispositioned if the indications do not satisfy the acceptance criteria.
- (c) Discuss the disposition of an indication in the SWOL if that indication is attributed to primary water stress-corrosion cracking.