

Jack,

I am attaching an RAI from John Tsao, (DCI/EFEB).

I may be sending from one more reviewer (Don Naujock of DCI/CPNB) who reviews the NDE portion of the relief request.

Since there is a very short lead time even for a verbal authorization, please let me know how soon you can provide the response.

Thanks

Kaly

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Subject: RAI from DCI/CFEB on ISI-3-18
Creation Date: 3/7/06 8:13AM
From: N. Kaly Kalyanam

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Recipients

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Files	Size	Date & Time
MESSAGE	971	03/07/06 08:13AM
Staff RAI 3-3-06.wpd	11414	03/06/06 01:05PM

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REQUEST FOR ADDITIONAL INFORMATION
THIRD TEN YEAR INSERVICE INSPECTION INTERVAL
RELIEF REQUEST ISI-3-18
USE OF STRUCTURAL WELD OVERLAY
SAN ONOFRE NUCLEAR GENERATING STATION, UNIT 2

By letter dated February 22, 2006, Southern California Edison (SCE) requested approval 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 structural weld overlay repairs at San Onofre Nuclear Generating Station (SONGS) Unit 2 for the third 10-year inservice inspection interval. The alternatives are presented in Relief Request ISI-3-18.

To complete its review, the staff requests for the following additional information.

1. On page 2 of the February 22, 2006 letter, SCE stated that the ASME Code, Section XI, Nonmandatory Appendix Q is published in the 2005 Addenda of ASME Section XI. The staff has not approved nor adopted the 2005 Addenda of ASME Section XI in Title 10, the Code of Federal Regulations, Part 50.55a (10 CFR 50.55a). Therefore, the 2005 Addenda of ASME Section XI cannot be used to support the relief request.
2. On page 2 of the February 22, 2006 letter, SCE stated that the flaw indications in welds 02-005-027 and 02-005-028 are not caused by primary stress corrosion cracking (PWSCC), but by fabrication. The staff thinks that the indications may grow to through wall, become a leakage path, and propagate into the overlay. Discuss whether the weld overlay is designed to address the likelihood of this scenario (i.e., the weld overlay will provide structural support and prevent leakage).
3. On page 5 of the February 22, 2006 letter, SCE stated that as a result of the weld overlay, the resulting stresses in the piping material will be decreased. However, some stresses such as tensile stresses or residual stresses may be increased. Also, changes to stresses may be different depending on the location of the pipe wall thickness (e.g., the inside diameter region vs. the outside diameter region). Discuss the stress distribution along the thickness and length of the pipe/weld wall.
4. On page 5 of the February 22, 2006 letter, SCE stated that it is performing a stress analysis to support the structural weld overlay repair. However, the stress analysis will not be completed until some time after the Unit 2 return to service. The staff needs to review the stress analysis to verify the adequacy of the structural integrity of the repaired piping/weld. Provide details of the stress analysis such as the approach, the acceptance criteria, the methodology, and the ASME Code requirements even though the final results are not available at present.
5. (1) Confirm that the outside diameter of the 4 original welds is 7.957 inches and the thickness is 1.40 inches. (2) Identify the width (in the axial direction) of the welds that will be repaired. (3) SCE stated that the weld overlay will be applied to the original weld surface with a temper bead weld technique per Code Case N-638-1. However, based on the design drawings of the repair as shown in Attachment 3 to Relief Request ISI-3-18, the overlay seems to extend beyond the original weld width. Provide the thickness and width of the weld overlay. Identify

Attachment

whether this information is proprietary. (4) Section 1(a) of Code Case N-638-1 requires that the weld overlay area be within 100 square inches and the overlay thickness be within one half of the ferritic base metal. Confirm whether these two limitations are satisfied. If not, SCE needs to request additional relief.

6. On page 5 of Relief Request ISI-3-18, first paragraph, SCE discussed the length of the structural weld overlay repair, but not the thickness. Discuss whether the thickness of the weld overlay satisfies the required thickness per ASME Code Case N-504-2, but not exceeds the thickness requirement of Code Case N-638-1 (see Question 5).

7. On page 6 of Relief Request ISI-3-18, SCE discussed inservice examination of the weld overlay repairs per Article Q-4000 and Subarticle Q-4300. (1) Discuss the inspection schedule for each of the four weld overlay repairs during the third 10-year ISI inspection interval and beyond. (2) The four subject welds are part of the ASME Examination Category B-F, "Risk-Informed Piping Examination." Discuss any conflict between the inspections required by Examination Category B-F, and Article Q-4000 and Subarticle Q-4300. (3) Article Q-4000 and Subarticle Q-4300 are parts of Appendix Q to the 2005 Addenda of the ASME Code, Section XI. The staff has not approved the 2005 Addenda of the ASME Code. Therefore, SCE needs to use requirements from sources other than the 2005 Addenda (See Question 1).

8. The weld overlay will extend to a portion of the safe end and pressurizer nozzle. The weld filler metal will be Alloy 52M. (1) Discuss any adverse impact of the Alloy 52M weld overlay on cast austenitic stainless steel (the safe end) and low alloy carbon steel (the pressurizer nozzle) in terms of the micro-structure interactions between the base metal and Alloy 52M weld metal. (2) Provide any crack growth rate data of Alloy 52M. If not available, discuss whether the crack growth rate of Alloy 52M is similar to Alloy 52.

9. Table 3 of Relief Request ISI-3-18. Code Case N-638-2, Section 4(b), requires the inspection of the final weld surface and the band area (beyond the weld surface) of at least 1.5 times the component thickness or 5 inches, which ever is less. SCE stated that it will perform the ultrasonic examination of the weld overlay, but will not perform the ultrasonic examination of the base metal as required by section 4.0(b) of Code Case N-638-2. SCE stated that any major base material cracking would take place in the heat affect zone directly below the weld overlay or in the underlying Inconel 82/182 weld deposit and not in the required band of material out beyond the overlay.

(1) Provide data to support the statement that cracking will not occur in the band area mentioned above.

(2) SCE stated that pressurizer nozzle will not be inspected because of nozzle configuration. Provide details as to why pressurizer nozzle configuration impedes inspections.

(3) SCE stated that any cracking in the base material would be detected by the examination of the weld overlay. However, SCE also stated that the ultrasonic examination of cast austenitic stainless steel is not qualified as discussed in Enclosure 1 to the February 22, 2006 letter. Therefore, cracking in the safe end may not be detected because the safe

end is made of cast austenitic stainless steel. Clarify the discrepancy.

(4) SCE needs to explain why ultrasonic examination of the safe end base metal per Section 4(b) of Code Case N-638-1 is not necessary.

10. Enclosure 1. In Chapter 8 of the EPRI report, EPRI discussed extensively the ultrasonic examination of the safe end. EPRI did not discuss the ultrasonic examination of the pressurizer nozzle. Clarify whether the pressurizer nozzle will be examined ultrasonically as part of the weld overlay repair and whether the ultrasonic technique is qualified to examine the pressurizer nozzle (See Question 9).