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United States Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
DOCKET NO. 50-261/LICENSE NO. DPR-23

**RESPONSE TO REQUEST FOR ADDITIONAL
INFORMATION - REQUEST FOR RELIEF REGARDING
SURFACE EXAMINATION OF REACTOR PRESSURE
VESSEL NOZZLE-TO-SAFE END WELDS (RELIEF REQUEST NO. 32)**

Ladies and Gentlemen:

By letter dated March 21, 2001, H. B. Robinson Steam Electric Plant (HBRSEP), Unit No. 2, submitted Relief Request No. 32 requesting relief from the requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, Section XI, regarding surface examination requirements for Reactor Pressure Vessel (RPV) nozzle-to-safe end welds. In a teleconference with the NRC staff on March 27, 2001, additional information was requested to complete the staff's review.

Attachments I, II, and III to this letter contain the requested information to support the staff's review of Relief Request No. 32.

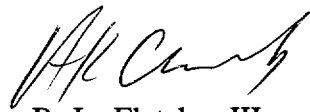
The original HBRSEP, Unit No. 2, submittal of Relief Request No. 32 on March 21, 2001, requested that relief be authorized in accordance with 10 CFR 50.55a(g)(6)(i). Review of the additional information requested by the staff has resulted in the determination that the more appropriate basis for Relief Request No. 32 is 10 CFR 50.55a(a)(3)(ii), in that unusual hardship and difficulty exists with regard to performance of the Code-required surface examinations of the RPV nozzle-to-safe end welds. Therefore, HBRSEP, Unit No. 2, requests that Relief Request No. 32, if approved, be authorized as a proposed alternative pursuant to 10 CFR 50.55a(a)(3)(ii).

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By letter dated October 19, 1992, the NRC authorized Relief Request No. 18 in support of the HBRSEP, Unit No. 2, Third Ten-Year Inservice Inspection (ISI) Program Plan. Relief was requested and granted from performing 100% of the Code-required surface examination of the RPV nozzle-to-safe end weld. Implementation of Relief Request No. 18 was contingent upon the successful qualification and associated performance demonstration of inner diameter ultrasonic examination techniques that could accurately and reliably detect and size outer diameter surface-connected defects. Since this proposed alternative examination technique has not yet been demonstrated or qualified, Relief Request No. 18 is no longer viable and cannot be implemented. It is therefore requested that Relief Request No. 18 be withdrawn or canceled.

If you have any questions regarding this matter, please contact Mr. H. K. Chernoff.

Sincerely,


for B. L. Fletcher III
Manager - Regulatory Affairs

CTB/ctb

Attachments:

- I. Response to Request for Additional Information
- II. Reactor Pressure Vessel Hot Leg Nozzle Assembly
- III. Reactor Pressure Vessel Cold Leg Nozzle Assembly

c: Mr. L. A. Reyes, NRC, Region II
Mr. R. Subbaratnam, NRC, NRR
NRC Resident Inspectors

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2

REQUEST FOR RELIEF REGARDING SURFACE
EXAMINATION OF REACTOR PRESSURE VESSEL
NOZZLE-TO-SAFE END WELDS (RELIEF REQUEST NO. 32)

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

1. The Code requires a volumetric and surface examination of the Reactor Pressure Vessel (RPV) nozzle-to-safe end dissimilar metal welds. In a letter dated October 19, 1992, the staff granted your request for relief to use a through-wall ultrasonic examination to satisfy the volumetric and surface requirements. In a letter dated February 16, 2001, the staff granted your request for relief to perform the ultrasonic (UT) examinations from the inside surface of the nozzle/safe end/pipe. Your letter dated March 21, 2001, is requesting relief from the Code-required surface examination. The staff can grant relief from the Code, but not to another request for relief. In light of the previously granted requests for relief, explain how you intend to satisfy the volumetric examination requirement, i.e., follow the 1986 Edition of the Code for the volumetric examination and request relief only for the surface examination (the current request) or add the volumetric examination (identifying the differences with respect to the 1986 Edition of the Code) to the current request.
 - A. This request addresses the surface examinations of nozzle-to-safe end welds. Does it also address safe end-to-pipe welds? If not, how will the surface of the nozzle-to-safe end welds be examined?

Response

By letter dated October 19, 1992, the NRC issued a Technical Evaluation Report on the H. B. Robinson Steam Electric Plant (HBRSEP), Unit No. 2, Third Ten-Year Inservice Inspection (ISI) Program Plan. Section 3 of this report included an evaluation of Relief Request No. 18, "Examination Category B-F, Items B5.10 and B5.130, Reactor Vessel Nozzle-to-Safe End Welds and Dissimilar Metal Welds." Relief was requested and granted from performing 100% of the Code-required surface examination of the RPV nozzle-to-safe end welds. Implementation of Relief Request No. 18 was contingent upon the successful qualification and associated performance demonstration of inner diameter UT examination techniques that could accurately and reliably detect and size outer diameter surface-connected defects. This relief did not involve or affect volumetric examination requirements specified within Table IWB-2500-1, Item No. B5.10, and the associated Figure No. IWB-2500-8.

HBRSEP, Unit No. 2, working in conjunction with EPRI and a vendor, has determined that the actual coverage obtainable on the outer diameter surface from an inner diameter UT examination is inadequate and that the techniques used in this limited scan are incapable of detecting all of the flaws. This examination technique also had some degree of tendency to produce false calls. Due to the limited scan area inherent in the HBRSEP, Unit No. 2, safe end design, the use of additional angles to increase coverage and obtain reliable examination results was precluded. Based on this evaluation, it was determined that the outer diameter surface examination conducted by UT examination from the inner diameter surface is neither practical nor reliable.

Relief Request No. 18 was granted based upon the ability to qualify the proposed alternative examination technique, i.e., the capability of inner diameter UT examinations to detect outer diameter surface-connected defects. Since this proposed alternative examination technique has not yet been demonstrated or qualified, Relief Request No. 18 is no longer viable and cannot be implemented. It is therefore requested that Relief Request No. 18 be withdrawn or canceled.

HBRSEP, Unit No. 2, will perform volumetric examinations of RPV nozzle-to-safe end welds in accordance with the 1986 Edition of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, Section XI, Examination Category B-F, Item No. B5.10, and Figure No. IWB-2500-8. Relief is requested from the Code-required surface examination of the RPV nozzle-to-safe end welds, as described within HBRSEP, Unit No. 2, Relief Request No. 32, dated March 21, 2001.

Volumetric examination of RPV safe end-to-pipe and safe end-to-elbow welds will be performed in accordance with the 1986 Edition of the ASME B&PV Code, Section XI, Examination Category B-J, Item No. B9.11, and Figure No. IWB-2500-8. Since Examination Category B-J is subject to the requirements of the 1974/Summer 1975 Addenda for sample selection, a surface examination of the RPV safe end-to-pipe and safe end-to-elbow welds is not required during Refueling Outage 20 (RO-20) and is not currently scheduled. Due to the proximity of these welds to the RPV nozzle-to-safe end welds, a limited portion of the outer diameter of the safe-end-to-pipe and safe end-to-elbow welds will be visible during the VT-2 visual examination which is identified as the proposed alternative examination for Relief Request No. 32.

2. Your request for relief is based on 10 CFR 50.55a(g)(6)(i). To use 10 CFR 50.55a(g)(6)(i), you must show that a change in the Code has made the examination requirements or portions of the requirements impractical.
 - A. In the table listing weld identification, 1984 examinations, 1990 examinations, also list the percent coverage for surface examinations. When was the last time these welds received 100% surface examinations?
 - B. Insufficient time to develop and qualify an alternative UT procedure for through-wall examinations.

Response

HBRSEP, Unit No. 2, has completed a review of 10 CFR 50.55a and NRR Office Letter No. 808, "Relief Request Reviews," dated July 31, 2000. Relief Request No. 32 is associated with the 1986 Edition of the ASME B&PV Code, Section XI, and is based upon the impracticality of performing the Code-required surface examinations due to the limited accessibility to the outer diameter of the RPV nozzle-to-safe end welds. The significant dose rates in the areas of these examinations also contribute to the impracticality and hardship associated with these examinations. Relief Request No. 32 is not associated with or related to a change in Code examination requirements.

NRR Office Letter No. 808 would appear to permit the granting of relief pursuant to 10 CFR 50.55a(g)(6)(i) for the circumstances described within the HBRSEP, Unit No. 2, request for relief dated March 21, 2001. However, it has been determined that the more appropriate basis for Relief Request No. 32 is 10 CFR 50.55a(a)(3)(ii), in that unusual hardship and difficulty exists with regard to performance of the Code-required surface examinations of the RPV nozzle-to-safe end welds. Therefore, HBRSEP, Unit No. 2, requests that Relief Request No. 32, if approved, be authorized as a proposed alternative pursuant to 10 CFR 50.55a(a)(3)(ii).

- A. Surface examination data from 1984 indicates that the configuration of RPV nozzle-to-safe end welds and surrounding structure limited the outer diameter surface examination to approximately the top 20 inches of the weld outer diameter.

Review of historical examination data for the HBRSEP, Unit No. 2, RPV found no documentation that a 100% surface examination of the RPV nozzle-to-safe end welds has been performed since the RPV was delivered from the fabrication facility.

- B. Relief Request No. 32 is associated with the 1986 Edition of the ASME B&PV Code, Section XI, and is based upon the impracticality of performing the Code-required surface examinations due to the limited accessibility to the outer diameter of the RPV nozzle-to-safe end welds. The significant dose rates in the areas of these examinations also contribute to the impracticality and hardship associated with these examinations. The ability to qualify and demonstrate inner diameter UT examinations to detect outer diameter surface-connected defects was identified as a proposed alternative examination relative to Relief Request No. 18 and is not currently a Code-required examination for HBRSEP, Unit No. 2. Since this proposed alternative examination technique has not yet been demonstrated or qualified, Relief Request No. 18 is no longer viable and cannot be implemented.
3. Identify the material being used for the pipe, safe end, nozzles, and weld materials (stainless steel, carbon steel, inconel, etc.). Also, identify the process (cast, wrought, forged, etc.) used for manufacturing the pipe, safe end, and nozzles.

Response

Attachments II and III provide diagrams of the RPV hot and cold leg nozzle assemblies, respectively. These diagrams identify the materials used for nozzles, safe ends, piping, pipe elbows, and welds. Additionally, these diagrams identify the processes used for manufacturing the nozzles, safe ends, piping, and pipe elbows. More detailed information in this regard was provided within the HBRSEP, Unit No. 2, letter dated November 30, 2000, which provided the response to a request for additional information regarding Relief Request No. 29.

4. Get information about the EPRI evaluation of the demonstration.
- A. Why can't the UT procedure being used for the safe end-to-pipe weld be used to examine one-half of the nozzle-to-safe end weld, i.e., from the center line-to-safe end side of the weld?

Response

As noted above, HBRSEP, Unit No. 2, working in conjunction with EPRI and a vendor, has determined that the actual coverage obtainable on the outer diameter surface from an inner diameter UT examination is inadequate and that the techniques used in this limited scan are incapable of detecting all of the flaws. This examination technique also had some degree of tendency to produce false calls. Due to the limited scan area inherent in the HBRSEP, Unit No. 2, safe end design, the use of additional angles to increase coverage and obtain reliable examination results was precluded. Based on this evaluation, it was determined that the outer diameter surface examination conducted by UT examination from the inner diameter surface is neither practical nor reliable.

HBRSEP, Unit No. 2, will perform volumetric examinations of RPV nozzle-to-safe end welds in accordance with the 1986 Edition of the ASME B&PV Code, Section XI, Examination Category B-F, Item No. B5.10, and Figure No. IWB-2500-8. Volumetric examination of RPV safe end-to-pipe and safe end-to-elbow welds will be performed in accordance with the 1986 Edition of the ASME B&PV Code, Section XI, Examination Category B-J, Item No. B9.11, and Figure No. IWB-2500-8.

5. The alternative states that the VT-2 examination would be of the accessible portions of the nozzle-to-safe end welds with the insulation removed to the extent allowed by the access provided. The Code provides requirements for VT-2 examinations of insulated piping and non-insulated piping. How will you examine the weld for leakage? If the insulation is partially removed, what percent of the surface will be examined (based on previous surface examinations)?

Response

The VT-2 visual examination that has been identified as the proposed alternative examination will be conducted in accordance with the ASME Code, Section XI, IWA-5242, "Insulated Components." To improve the quality and effectiveness of the VT-2 visual examination, insulation will be removed to the extent practical to facilitate a more direct visual examination of the accessible weld outer diameter. This VT-2 visual examination will give particular attention to discoloration or residue to detect evidence of leakage and boric acid accumulation.

Surface examination data from 1984 indicates that the configuration of RPV nozzle-to-safe end welds and surrounding structure limited the outer diameter surface examination to approximately the top 20 inches of the weld outer diameter. The removal of insulation to support the proposed VT-2 visual examination would be expected to allow visual examination of a comparable area of the outer weld diameter.

6. Because of the limited information available to develop and qualify different UT procedures and the unavailability of sufficient mock-ups until November 22, 2002, the staff is considering imposing that a UT examination of the outer diameter be conducted from the inner diameter at the next refueling outage.

Response

Based upon the current state of examination technology and the progress made during the HBRSEP, Unit No. 2, Third Ten-Year ISI Interval to develop acceptable, qualified techniques for such UT examinations, there is no assurance that these examination techniques will be approved for implementation by November 22, 2002. The quality of

these examinations and the health and safety of the public are not enhanced by implementing such examination techniques before an industry consensus has been reached regarding their technical accuracy and repeatability.

HBRSEP, Unit No. 2, requests the opportunity for further discussions with the staff should a determination be made to pursue the imposition of UT examination techniques. Significant concerns could result from the imposition of requirements that are beyond the scope of the HBRSEP, Unit No. 2, Ten-Year ISI Plan. Additionally, planning for future refueling outages could be significantly impacted by the imposition of such requirements, including increased radiation doses and lost plant generation capability.

STAINLESS STEEL WROUGHT PIPE (SA-376, TP-316SS)

STAINLESS STEEL SAFE END (SA-182, TP-316SS)

INCONEL 182 BUTTERING

FORGED CARBON STEEL NOZZLE (SA-336 CS)

STAINLESS STEEL WELDMENT (FIELD WELD)

INCONEL 182 (SMAW) WELDMENT (SHOP WELD)

4 1/2"

29 +.000 - .003

28 15/16 + 1/16 - 0

DIA.

4 1/2" RADIUS

2 1/4"

16" RADIUS

45 1/16"

106 7/16" TO C. OF VESSEL

110 13/16" TO C. OF VESSEL

Reactor Pressure Vessel Cold Leg Nozzle Assembly

