

October 5, 2004

Mr. R. T. Ridenoure  
Division Manager - Nuclear Operations  
Omaha Public Power District  
Fort Calhoun Station FC-2-4 Adm.  
Post Office Box 550  
Fort Calhoun, NE 68023-0550

SUBJECT: FORT CALHOUN STATION, UNIT NO. 1 – REQUEST FOR ADDITIONAL INFORMATION ON RELIEF REQUESTS RELATED TO EXAMINATIONS WITH LESS THAN 100% ASME CODE COVERAGE FOR THE THIRD 10-YEAR INTERVAL (TAC NO. MC3220)

Dear Mr. Ridenoure:

By letter dated May 20, 2004, Omaha Public Power District (OPPD/ the licensee) submitted requests for relief from the requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, for the Fort Calhoun Station, Unit 1 (FCS). The requests for relief are for the third 10-year inservice inspection interval, in which FCS adopted the 1989 Edition of ASME Section XI as the Code of record. In accordance with 10 CFR 50.55a(g)(5)(iii), the licensee has submitted 13 relief requests labeled RR-10 through RR-22 for various Class 1 pressure retaining welds in the reactor pressure vessel, welds in other vessels, and Class 2 nozzle and piping welds. The staff has completed its preliminary review of this submittal and has determined it needs additional information to complete the review. Our request for additional information is enclosed. This request was discussed with Richard Jaworski of your staff and it was agreed that a response would be provided within 30 days of receipt of this letter.

Sincerely,

*/RA/*

Alan B. Wang, Project Manager, Section 2  
Project Directorate IV  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Docket No. 50-285

Enclosure: Request for Additional Information

cc w/encl: See next page

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REQUEST FOR ADDITIONAL INFORMATION

OMAHA PUBLIC POWER DISTRICT

FORT CALHOUN STATION, UNIT 1

DOCKET NO. 50-285

Background

By letter dated May 20, 2004, Omaha Public Power District (OPPD/the licensee) submitted requests for relief from the requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, for Fort Calhoun Station, Unit 1 (FCS). The requests for relief are for the third 10-year inservice inspection (ISI) interval, in which FCS adopted the 1989 Edition of ASME Section XI as the Code of record.

In accordance with 10 CFR 50.55a(g)(5)(iii), the licensee has submitted 13 relief requests labeled RR-10 through RR-22 for various Class 1 pressure retaining welds in the reactor pressure vessel (RPV), welds in other vessels, and Class 2 nozzle and piping welds. The Code requires that essentially 100% of the examination volumes and/or surface areas described in Tables IWB-2500-1 and IWC-2500-1 be completed. "Essentially 100%" as clarified by ASME Code Case N-460, is greater than 90% coverage of the examination volume, or surface area, as applicable. Code Case N-460 has been adopted by the licensee. Section 50.55a(g)(5)(iii) states that when licensees determine that conformance with Code requirements is impractical at their facility, they shall submit information to support this determination. The NRC will evaluate such requests based on impracticality, and may impose alternatives, giving due consideration to public safety and the burden imposed on the licensee.

The NRC contractor, Pacific Northwest National Laboratory (PNNL), reviewed the information submitted by the licensee, and based on this review, determined the following information is required to complete the evaluation.

1. Request for Relief RR-10, Examination Category B-A, Items B1.11 and B1.12, Pressure Retaining Welds in Reactor Vessel

The licensee is seeking relief from the Code-required 100% volumetric coverage, as only 28.0% of circumferential girth weld RPV-SC-C-11 could be obtained. The licensee stated that limitations are caused by the six core stabilizing support lugs and the flow skirt which are not removable. A more complete description of how the support lugs and the flow skirt reduced the volume coverage by 72.0% has been omitted from the licensee's description. The licensee states that many areas of inaccessibility were so designated not because they could not be examined at all, but because the ultrasonic test (UT) sound beam only traveled in one or two directions, and not the four directions described in ASME Section XI. This type of generic statement with incomplete information is insufficient to make a recommendation on the relief request. Additionally, the licensee believes that additional inspection coverage at the expense of hardware redesign and/or modification would only allow incremental increases of

examination coverage. No basis for such inference is mentioned in the relief request. It is also not clear whether the hardware referred to implies components of the reactor vessel or inspection devices.

The licensee is therefore requested to provide information on (1) how close to the support lugs and the flow skirt the remotely controlled UT heads could be placed (diagrams would be helpful, if necessary), and (2) a description of hardware design and/or modification that would be required to allow increased coverage volumes.

2. Request for Relief RR-11, Examination Category B-A, Item B1.40, Pressure Retaining Welds in Reactor Vessel

The licensee is seeking relief from the Code-required 100% volumetric coverage, as only 77.9% of head-to-flange Weld RPVCH-HF-1 could be obtained. The licensee stated that limitations are caused by the twelve evenly spaced seismic skirt lugs and the seismic skirt and the actual head to flange geometry. Details of the calculations of the excluded coverage volume of 22.1% have been omitted from the licensee's description. The licensee states that many areas of inaccessibility were so designated not because they could not be examined at all, but because the UT sound beam only traveled in one or two directions, and not the four directions described in the ASME Section XI Code. However, only information about those regions where sound beam traveled in one direction is included in the relief request. The licensee believes that additional inspection coverage at the expense of hardware redesign and/or modification would only allow incremental increases of examination coverage. No basis for such inference is mentioned in the relief request. It is also not clear whether hardware referred to implies components of the reactor vessel or inspection devices.

The licensee states that the reported volumetric coverage of 77.9% represents adequate coverage because inaccessible examination volumes consist of a small percentage of the overall required examination volume. Also, the surface examination of the weld required by the Code, was also limited by the presence of the seismic support lugs. It is not clear how much of the surface area of the weld was subjected to surface examination.

The licensee is therefore requested to provide: (1) the calculations used to arrive at the 77.9% examination volume coverage for head-to-flange Weld RPVCH-HF-1, (2) portions of the excluded regions, if applicable, for head-to-flange Weld RPVCH-HF-1 where sound beam traveled in fewer than four directions, and (3) if applicable, insights into hardware design and/or modification to allow increased coverage volumes.

3. Request for Relief RR-12, Examination Category B-B, Items B2.11 and B2.12, Pressure Retaining Welds in Vessels Other than the Reactor Vessel

The licensee is seeking relief from the Code-required 100% volumetric coverage, as only 77.0% of circumferential girth Weld PRZ-SC-5-403 and 66% of upper shell longseam Weld PRZ-SL-2-403A could be obtained. The licensee stated that while limitations for the inspection of the circumferential girth Weld PRZ-SC-5-403 and PRZ-SL-2-403A are caused by the insulation support ring and its support lugs. In the case of the circumferential girth Weld PRZ-SC-5-403, unambiguous designation of the excluded coverage volume of 23.0% has been omitted from the licensee's description. The licensee states that many areas of inaccessibility

were so designated not because they could not be examined at all, but because the UT sound beam only traveled in one or two directions, and not the four directions described in the ASME Section XI Code. Information about those regions where the sound beam traveled in fewer than four directions is omitted in the relief request. Additionally, the licensee believes that additional inspection coverage at the expense of hardware redesign and/or modification would only allow incremental increases of examination coverage. No basis for such inference is mentioned in the relief request. It is also not clear whether hardware referred to implies components of the reactor vessel or inspection devices.

The licensee is therefore requested to provide: (1) clear designations of excluded coverage regions during inspection of the circumferential girth Weld PRZ-SC-5-403 and the calculations used to arrive at the 77.0% volume coverage, (2) a description of the portions of the excluded regions, if applicable, for both circumferential girth Weld PRZ-SC-5-403 and longseam Weld PRZ-SL-2-403A, where the sound beam traveled in fewer than four directions, and (3) if applicable, insights into hardware design and/or modification to allow increased coverage volumes.

4. Request for Relief RR-13, Examination Category B-D, Item B3.130, Full Penetration Welds of Nozzles in Vessels

The licensee is seeking relief from the Code-required 100% volumetric coverage, as only 72.4% of nozzle-to-vessel Weld SG-1-N-1 has been completed. The licensee stated that limitations for the inspection of the Weld SG-1-N-1 are caused by nozzle geometry. Though examples of scan paths are included in Attachment D for Welds SG-2-N1 and SG-2-N3, typical portions of the required examination volumes that were either not examined from all directions or not examined at all are not included. The licensee also states that many areas of inaccessibility were so designated not because they could not be examined at all, but because the UT sound beam only traveled in one or two directions, and not the four directions described in the ASME Section XI Code. Information about those regions where the sound beam traveled in fewer than four directions is omitted in the relief request. Additionally, the licensee believes that additional inspection coverage at the expense of hardware redesign and/or modification would only allow incremental increases of examination coverage. No basis for such inference is mentioned in the relief request. It is also not clear whether the hardware referred to implies components of the reactor vessel or inspection devices.

The licensee is therefore requested to provide: (1) clear designations of excluded coverage regions during the inspection of the nozzle-to-vessel welds and the calculations used to arrive at the 72.4% volume coverage, (2) a description of the portions of the excluded region, if applicable, where the sound beam traveled in fewer than four directions, and 3) if applicable, insights into hardware design and/or modification to allow increased coverage volumes.

5. Request for Relief RR-15, Examination Category B-D, Item B3.90, Full Penetration Welds of Nozzles in Vessels

The licensee is seeking relief from the Code-required 100% volumetric coverage, as only 82.0% of nozzle-to-vessel Welds RPV-N-1-A and RPV-N-1-B could be obtained. The licensee stated that the limitation for the inspection of the nozzle-to-vessel welds is caused by the nozzle inner radius buildup. Unambiguous designation of the excluded coverage volume of 18.0% has

been omitted from the licensee's description. The licensee states that the transducers were manipulated on the shell side of the welds and there was no scanning performed from the nozzle side due to the geometry. However, Attachment C appears to show scans from the inside wall of the nozzles. It is also not clear whether the inspection was carried out solely from the inside of the vessel.

The licensee states that many areas of inaccessibility were so designated not because they could not be examined at all, but because the UT sound beam only traveled in one or two directions, and not the four directions described in the ASME Section XI Code. Information about those regions where sound beam traveled in fewer than four directions is omitted in the relief request. Additionally, the licensee believes that additional inspection coverage at the expense of hardware redesign and/or modification would only allow incremental increases of examination coverage. No basis for such inference is mentioned in the relief request. It is also not clear whether hardware referred to implies components of the reactor vessel or inspection devices.

The licensee is therefore requested to provide: (1) a statement of whether examinations from the outside of the pressure vessel was also made, (2) an explanation of the inconsistency in statements and scan plan drawings included in Attachment C, (3) a description of whether an examination from the outside would increase the examination volume, (4) clear designations of excluded coverage regions during the inspection of the nozzle-to-vessel welds and the calculations used to arrive at the 82.0% volume coverage, (5) scan paths in regions for both welds where the sound beam traveled in fewer than four directions, and (6) if applicable, insights into hardware design and/or modification to allow increased coverage volumes.

6. Request for Relief RR-17, Examination Category B-J, Item B9.11, Pressure Retaining Welds in Piping

In the relief request the licensee states that certain Code-required examinations are impractical at their facility based on limitations due to component configurations. For each of the limited examinations listed in Relief Request RR-17, the licensee has clearly shown how the specific conditions related to these configurations impact the ultrasonic examinations. However, the licensee believes that additional inspection coverage at the expense of hardware redesign and/or modification would only allow incremental increases of examination coverage.

The licensee is seeking relief from the Code-required 100% volumetric coverage, as only 52.4% of circumferential piping Welds MRC-2/08 and MRC-2/20 could be obtained. The licensee stated that limitations for the inspection of the circumferential welds are caused by the adjacent elbow geometry. It appears that while inspecting from the elbow side, increasing the angle of refracted L-wave from 45 degrees would increase the examination volume. Therefore, the licensee is therefore requested to provide (1) a discussion of whether higher angle refracted L-wave transducers was considered for inspection from the elbow side, and (2) if applicable, insights into hardware design and/or modification to allow increased coverage volumes.

7. Request for Relief RR-18, Examination Category B-J, Item B5.70, Pressure Retaining Welds in Piping

In the relief request the licensee states that certain Code-required examinations are impractical at their facility based on limitations due to component configurations. However, in the section titled "Applicable Code Requirements," the item number is quoted as B5.70. Please clarify whether the Code Item number should be 9.31.

8. Request for Relief RR-19, Examination Category B-J, Item B9.11, Pressure Retaining Welds in Piping

In the relief request the licensee states that certain Code-required examinations are impractical at their facility based on limitations due to component configurations. However, for each of the limited examinations listed in Relief Request RR-19, the licensee has not unambiguously shown how the volumetric coverage for ultrasonic inspection of valve-to-elbow Weld 6-SI-22/03 was determined to be 50%. According to the report provided on page 508 of Attachment B, approximate volumetric coverage for the single-sided examination is 85.0%. However, since the maximum allowed coverage is 50.0% for single sided examination, the reviewer believes that credit should be taken for only 42.5% volumetric coverage.

Additionally, the licensee believes that additional inspection coverage at the expense of hardware redesign and/or modification would only allow incremental increases of examination coverage. No basis for such inference is mentioned in the relief request.

The licensee is therefore requested: (1) to clarify whether the volumetric coverage for the inspection of the Weld 6-SI-22/03 should be 42.5%, and (2) to provide, if applicable, insights into hardware design and/or modification to allow increased coverage volumes.

9. Request for Relief RR-22, Examination Category C-F-2 Item C5.11, Pressure Retaining Welds in Carbon or Low Alloy Piping

In the relief request the licensee states that certain Code-required examinations are impractical at their facility based on limitations due to component configurations. However, for each of the limited examinations listed in Relief Request RR-22, the licensee has not clearly shown how the claimed volumetric coverage has been computed. Instead, generic statements regarding the examination volumes have been presented.

The licensee is seeking relief from the Code-required 100% volumetric coverage, as only 41.0% of pipe-to-flange Weld 6-MS-2005/02 and 48.0% of pipe-to-flange Weld 6-MS-2006/02 could be obtained. Similar reduced coverage statements have been made for the required surface examinations. The licensee stated that limitations for the inspection of the welds are caused by the welded lugs located at every 90 degrees. The limitation sketch provided by the licensee for the ultrasonic inspection of Weld 6-MS-2005/02 shows that only 70% of the required volume has been inspected by a single- sided examination. Therefore, it appears that the licensee can claim credit for only 35.0% volume coverage as opposed to 41.0%. Similar conditions exist for Weld 6-MS-2006/02. Additionally, the licensee believes that additional inspection coverage at the expense of hardware redesign and/or modification would only allow

incremental increases of examination coverage. No basis for such inference is mentioned in the relief request.

The licensee is therefore requested to demonstrate how: (1) 41.0% of the required examination volume has been adequately inspected by UT for Weld 6-MS-2005/02, (2) 48.0% of the required examination volume has been adequately inspected by UT for Weld 6-MS-2006/02, and (3) if applicable, insights into hardware design and/or modification to allow increased coverage volume.