UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

OF THE

THIRD 10-YEAR INTERVAL INSERVICE INSPECTION PLAN

REQUESTS FOR RELIEF NOS. RI-13, RI-17, AND RI-25

FOR

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

DOCKET NO. 50-298

1.0 INTRODUCTION

Tilte 10 of the Code of Federal Regulations (10 CFR) Section 50.55a, requires that the inservice inspection of the American Society of Mechanical Engineers (ASME) Code Class 1, 2, and 3 components shall be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code (ASME Code) and applicable addenda as required by Section 50.55a(g), except where relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i). Section 50.55a(a)(3) states that alternatives to the requirements of paragraph (g) may be used, when authorized by the Nuclear Regulatory Commission (NRC), if (i) the proposed alternatives would provide an acceptable level of quality and safety or (ii) compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Pursuant to 10 CFR 50.55a(g)(4), ASME Code Class 1, 2, and 3 components (including supports) shall meet the requirements, except the design and access provisions and the preservice examination requirements, set forth in the ASME Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," to the extent practical within the limitations of design, geometry, and materials of construction of the components. The regulations require that inservice examination of components and system pressure tests conducted during the first 10-year interval and subsequent intervals comply with the requirements in the latest edition and addenda of Section XI of the ASME Code incorporated by

Enclosure 1

reference in 10 CFR 50.55a(b) 12 months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein. The applicable edition of Section XI of the ASME Code for the Cooper Nuclear Station (CNS) third 10-year inservice inspection (ISI) interval is the 1989 Edition.

2.0 EVALUATION

By letter dated April 23, 1998, as supplemented by letter dated September 21, 1998, Nebraska Public Power District (NPPD, the licensee) submitted its Third Ten-Year ISI Program Plan Requests for Relief Nos. RI-13, RI-17, and RI-25 for CNS. The staff has evaluated the submittals in support of Relief No. RI-13. The Idaho National Engineering and Environmental Laboratory (INEEL) has evaluated the information provided by the licensee in support of its Third Ten-Year ISI Program Requests for Relief Nos. RI-17 and RI-25. Based on the results of the review, the staff adopts the contractor's conclusions and recommendations presented in the Technical Letter Report (TLR) enclosed.

The information provided by the licensee in support of the requests for relief from Code requirements has been evaluated and the basis for disposition is documented below.

Request for Relief No. RI-13, Revision 2: With respect to Request for Relief RI-13, Revision 2, NPPD proposed an alternative examination and testing of snubbers as submitted in a letter dated April 23, 1998. Request for Relief RI-13, Revision 0, was previously approved through the end of the third 10-year inservice inspection interval in the staff's safety evaluation dated February 27, 1996. Request for Relief RI-13, Revision 2 requires the same visual inspection and functional testing as did Revision 0. Submission of Revision 2 was necessary due to the relocation of snubber inspection and testing requirements cited in Request for Relief RI-13 from the Technical Specifications to the Technical Requirements Manual (TRM) as authorized by Amendment Number 178, dated July 31, 1998. Amendment Number 178 involved the conversion to the Improved Technical Specifications.

The proposed alternative set forth in NPPD's letter dated April 23, 1998, provides, in paragraph three under the surveillance requirements heading, that at least once per 18 months during shutdown, a representative sample of 10 percent of the total of each type of snubber (hydraulic or mechanical) in use in the plant shall be functionally tested. For each type of snubber that does not meet the functional test acceptance criteria of paragraph five, Hydraulic Snubbers Functional Test Acceptance Criteria, or paragraph six, Mechanical Snubbers Functional Test Acceptance Criteria, as applicable, an additional 10 percent of that type of snubber shall be functionally tested. The representative sample selected shall include the various configurations, operating environments, and the range of size and capacity of snubbers.

Paragraph 4. sub-paragraph (a) under surveillance requirements, specifies that in addition to the regular sample, snubbers that failed the previous functional test shall be retested during the next test period. If a spare snubber has been installed in place of a failed snubber, then both the failed snubber (if it is repaired and installed in another location) and the spare snubber shall be retested. Test results of these snubbers shall not be part of the sample expansion.

For visual examination of snubbers, Request for Relief RI-13, Revision 2, dated April 23, 1998, adopts the guidelines of NRC Generic Letter (GL) 90-09, "Alternative Requirements for Snubber Visual Inspection Intervals and Corrective Actions," dated December 11, 1990. GL 90-09 was issued to reduce the burden of the overly restrictive visual examination schedule in the first addenda to ASME/ANSI OM-1987, Part 4 (OM Part 4), for licensees that use a large number of snubbers. This is acceptable to the staff.

The staff has reviewed the applicable NPPD submittals and has determined that the Request for Relief RI-13, Revision 2, dated April 23, 1998, meets the intent of the ASME Code Section XI requirements and provides assurance of snubber operability and component integrity. Therefore, the staff finds that the alternative proposed in Request for Relief RI-13, Revision 2, provides an acceptable level of quality and safety and is authorized pursuant to 10 CFR 50.55a(a)(3)(i).

Request for Relief No. RI-17, Revision 1: ASME Code Case N-509, *Alternative Rules for the Selection and Examination of Class 1, 2, and 3 Integrally Welded Attachments*, Table 2500-1, requires 100 percent surface examination, as defined by Figures IWB-2500-13, -14, or -15, as applicable, for selected integrally welded attachments to piping.

The licensee was authorized to use Code Case N-509 in an NRC Safety Evaluation dated October 23, 1997. At that time, the licensee committed to perform examinations on a minimum of 10 percent of all Class 1, 2, and 3 piping, pump, and valve integrally welded attachments to satisfy NRC implementation concerns.

In accordance with 10 CFR 50.55a(a)(3)(ii), the licensee proposed to examine the following integral attachment welds, to the extent shown below, without removal of clamps or restraints, in lieu of the 100 percent Code-required surface examinations:

Weld Number	Completed	Basis for Limitation
FWB-BK1-8	82%	Pipe clamp obstructs portion of welds
RR-BK1-4A	87%	Pipe clamp obstructs portion of welds
RHA-CE1-2	85%	Pipe clamp obstructs portion of welds
SDS-CE1-21	83%	Box restraint obstructs portion of welds

The acceptable application of Code Case N-509 requires that licensees examine a minimum of 10 percent of all Class 1, 2, and 3 integral attachment welds associated with piping, pumps, and valves. The licensee was authorized to use this Code Case in an NRC Safety Evaluation dated October 23, 1997, as N-509 had not been published in Regulatory Guide (RG) 1.147 at that time. However, many of the attachments are designed such that removal of a pipe clamp or whip restraint would be required to access the entire welded region. The subject piping systems are located in relatively high radiation fields, and many worker-hours would be necessary to install temporary supports, erect scaffolding, and remove the clamps or restraints that restrict access for examination. If required, removal of these appurtenances would result in a burden on the licensee.

The licensee has proposed to examine the subject integral attachment welds to the extent accessible, without removal of clamps or restraints, in lieu of the 100 percent Code-required surface examinations. A significant portion (82 to 87 percent) of the subject welded attachments has been examined. In addition, the alternative includes performing additional examinations to increase the overall number of welded attachments examined on these systems, where feasible. These measures should detect any significant patterns of degradation and provide reasonable assurance of the continued structural integrity of the components. Requiring the licensee to remove pipe clamps or restraints for the sole purpose of increasing existing examination coverage on the subject integrally welded attachments would not result in a compensating increase in the level of quality and safety. Therefore, the staff concluded that the licensee's proposed alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) for the current interval.

Request for Relief RI-25, Revision 0: ASME Code Case N-509, *Alternative Rules for the Selection and Examination of Class 1, 2, and 3 Integrally Welded Attachments*, Table 2500-1, requires 100 percent VT-1 visual examination of the length of each attachment weld selected for examination, as defined by Figure IWD-2500-1. In addition, 10 percent of all integrally welded attachments, proportional to the total number of nonexempt attachments connected to pumps located within each system, shall be selected for examination.

The licensee was authorized to use Code Case N-509 in an NRC Safety Evaluation dated October 23, 1997. At that time, the licensee committed to perform examinations on a minimum of 10 percent of all Class 1, 2, and 3 piping, pump, and valve integrally welded attachments to satisfy NRC implementation concerns.

In accordance with 10 CFR 50.55a(g)(6)(i), the licensee requested relief from performing the required VT-1 visual examinations for integral attachment welds on Class 3 Service Water Pumps.

The acceptable implementation of Code Case N-509 requires that 10 percent of all integrally welded attachments of piping, pumps, and valves in each system be examined during each interval. This includes examining 100 percent of the length of each attachment weld selected for examination. The licensee was authorized to use this Code Case in a Safety Evaluation dated October 23, 1997, as N-509 had not been published in RG 1.147 at that time. However, the design of the Service Water Pumps includes a number of integrally attached fillet welds located both inside and outside of a cylindrical pump support column. Access for VT-1 visual examination is limited to the external welds and those portions of the internal welds located near a service port in the support column. Therefore, the staff concluded that it is impractical to examine 100 percent of the length of the internal welded attachments, without a design modification to the pumps and associated support columns. This would result in a burden on the licensee.

The licensee has examined approximately 60 percent of the welded attachments on one of four Service Water Pumps, and has proposed to perform additional VT-1 visual examinations on a

second pump. The staff concluded that examinations completed, along with the licensee's proposed alternative examinations, will detect any significant patterns of degradation, if present, and provide reasonable assurance of the continued structural integrity of the subject components. The staff concluded that the licensee's relief is granted, pursuant to 10 CFR 50.55a(g)(6)(i).

3.0 CONCLUSION

The staff has concluded that with respect to Relief Request RI-13, Revision 2, NPPD has presented an adequate justification for its relief request from the requirements of Section XI of the applicable editions of the ASME Code, with regard to visual examination and functional testing of Code Class 1, 2 and 3 snubbers. The staff concurs with NPPD that the application of the requirements contained in NPPD's letter dated April 23, 1998, for the Code Class snubbers would provide an acceptable level of quality and safety and, therefore, the proposed alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(i), for the duration of the third 10-year ISI interval for CNS.

The staff concludes that for Request for Relief RI-17, Revision 1, imposition of the Code requirements would result in a hardship without a compensating increase in the level of quality and safety. Therefore, the staff concluded that pursuant to 10 CFR 50.55a(a)(3)(ii), the licensee's proposed alternative contained in Request for Relief No. RI-17, Revision 1, is authorized.

The staff also concludes, for Request for Relief RI-25, Revision 0, that the licensee provided information to support the determination that the Code-required VT-1 visual examination is impractical for integrally welded attachments on Class 3 Service Water Pumps. Therefore, the staff concluded that the licensee's Request for Relief No. RI-25 is granted pursuant to 10 CFR 50.55a(g)(6)(i).

The staff has determined that the granting of these reliefs is authorized by law and will not endanger life or property or the common defense and security and is otherwise in the public interest, giving due consideration to the burden upon the licensee that could result if the Code requirements were imposed on the facility.

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TECHNICAL LETTER REPORT

ON THE THIRD 10-YEAR INTERVAL INSERVICE INSPECTION

REQUESTS FOR RELIEF RI-17 AND RI-25

FOR

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

DOCKET NUMBER 50-298

1. INTRODUCTION

By letter dated April 23, 1998, the licensee, Nebraska Public Power District, submitted Requests for Relief Nos. RI-13, Revision 2, RI-17, Revision 1, and RI-25, Revision 0, seeking relief from the requirements of the ASME Code, Section XI, for Cooper Nuclear Station (CNS). In a letter dated September 21, 1998, the licensee responded to an Nuclear Regulatory Commission (NRC) request for additional information. These relief requests are for the third 10-year inservice inspection (ISI) interval. The Idaho National Engineering and Environmental Laboratory (INEEL) staff's evaluation of the subject requests for relief is in the following section. Request for Relief RI-13, Revision 2, pertains to the testing of mechanical snubbers and is evaluated elsewhere by NRC technical staff.

2. EVALUATION

The information provided by the licensee in support of the requests for relief from Code requirements has been evaluated and the bases for disposition are documented below. The Code of record for the CNS third 10-year ISI interval, which began March 1, 1996, is the 1989 Edition of Section XI of the ASME Boiler and Pressure Vessel Code.

2.1 Request for Relief RI-17, Revision 1, Examination Categories B-K-1 and C-C, Items B10.10 through B10.40 and C3.10 through C3.40, Integrally Welded Shear Lugs on Piping

Code Requirement: ASME Code Case N-509, *Alternative Rules for the Selection and Examination of Class 1, 2, and 3 Integrally Welded Attachments*, Table 2500-1, requires 100% surface examination, as defined by Figures IWB-2500-13, -14, or -15, as applicable, for selected integrally welded attachments to piping.

ENCLOSURE 2

Note: The licensee was authorized to use Code Case N-509 in an NRC Safety Evaluation dated October 23, 1997. At that time, the licensee committed to perform examinations on a minimum of 10% of all Class 1, 2, and 3 piping, pump, and valve integrally welded attachments to satisfy NRC implementation concerns.

Licensee's Proposed Alternative: In accordance with 10 CFR 50.55a(a)(3)(ii), the licensee proposed to examine the following integral attachment welds, to the extent shown below, without removal of clamps or restraints, in lieu of the 100% Code-required surface examinations:

Weld Number	Completed	Basis for Limitation
FWB-BK1-8	82%	Pipe clamp obstructs portion of welds
RR-BK1-4A	87%	Pipe clamp obstructs portion of welds
RHA-CE1-2	85%	Pipe clamp obstructs portion of welds
SDS-CE1-21	83%	Box restraint obstructs portion of welds

Licensee's Basis for Proposed Alternative (as stated):
"The welded attachments, FWB-BKI-8, are located on a 12" NPS class 1 Feedwater line in the drywell. This line is connected to the reactor vessel at nozzle N4B. The welded attachments are 2" x 2" x 2" shear lugs adjacent to pipe support RFH-73. The shear lugs on this vertical piping run transfer load from the pipe to the support in the downward direction. Each shear lug is attached with a fillet plus groove weld on three sides. There are no welds on the side of the lug adjacent to the clamp. In order to examine 100% of the surface for ½" on either side of the weld, the pipe clamp must be disassembled. A large temporary support will be required to minimize the impact of the load transfer to the nozzle. The installation and removal of this temporary support will require several man-hours of work in a radiation field. Approximately 82% of welded attachment on this support can be examined without removal of the clamp.

"The welded attachments, RR-BKI-4A, are located on a 24" NPS Class I Recirculation Supply line pipe in the drywell. These attachments are 1"x 3"x 1-1/2" shear lugs adjacent to pipe support RR-H IA. The shear lugs on this vertical piping run transfer load from the pipe to the support in the downward direction. Each shear lug is attached with a fillet plus groove weld on the two sides. There are no welds on the top or bottom of the lug. In order to examine 100% of the surface for ½" beyond the end of the weld, the pipe clamp must be disassembled. A large temporary support will be required. The installation and removal of this temporary support will require several man-hours of work in a radiation field. Approximately 87% of each welded attachment on this support can be examined without removal of the clamp.

"The welded attachments, RHA-CE1-2, are located on a 20" NPS Class 2 Residual Heat Removal line above the Torus. These attachments are 2-1/2" x 2-1/2" x 1-

3/4" shear lugs adjacent to pipe support RHS78. The two sets of shear lugs on this vertical piping run transfer load from the pipe to the support in both the upward and downward directions. Each shear lug is attached with a fillet plus groove weld on the two sides. There are no welds on the top or bottom of the lug. In order to examine 100% of the surface for ½" beyond the end of the weld, the pipe clamp must be disassembled. A large temporary support will be required. The installation and removal of this temporary support will require several man-days of work due to its location directly above the Torus. Approximately 85% of each welded attachment on this support can be examined without removal of the clamp.

"The welded attachments, SDS-CEI-21, are located on 8" NPS Class 2 Scram Discharge Volume pipe support SDV-HGR-PSAI. These attachments are ½" x 1" x 2" shear lugs adjacent to a box restraint. The shear lugs on this vertical piping transfer load from the pipe to the support in the downward direction. The shear lugs are attached with 3/16" fillet welds on all four sides. In order to examine 100% of the surface for ½" on either side of the weld, a temporary support must be installed and the box restraint must be cut off. After completion of the examination the restraint must be reinstalled by welding and the temporary support removed. Approximately 83% of each welded attachment can be surface examined without removing the support.

"The Code does not usually require a component to be disassembled solely for examination. In the 1995 Edition, 1995 Addenda, Figures IWB-2500-15 and IWC-2500-5 for welded attachments were modified to add the following note: "Examination of surface areas may be limited to the portions of these areas that are accessible without removal of support members". Thus this relief request is consistent with the latest Code requirements. Furthermore, disassembly and reassembly of the support introduces the chance of an error or damage to the support during the reconstruction. Transferring load from one support to a temporary support or to other supports in the system may have unintended consequences. Examining the accessible portions of the attachment weld without removing the clamp or restraint clamp will cover most of the required surface, will include the highest stressed regions of the welded attachments, and is sufficient to detect service induced flaws in the welded attachments."

In a portion of the September 21, 1998, response to the NRC's request for additional information, the licensee stated:

"There are 17 integral attachments on the Class 1 Feedwater piping. The Class 1 Feedwater system consists of four loops of piping from each of the Feedwater nozzles, which merge into two main loops before exiting the primary containment. One integral attachment on Loop A and one integral attachment on Loop B were selected for examination. The other integral attachments in the Feedwater system also have access restrictions or were previously excluded from examination. Some of the pipe clamps associated with these integral attachments were installed by welding and cannot easily be disassembled. The accessible portions of an additional integral attachment weld on the Feedwater system will be examined to compensate for the restricted access.

"There are only 2 integral attachments on the Recirculation system piping (the other integral attachments are on the pumps). Both of the attachments are similar in design, but are on different piping loops. The integral attachment on Loop A was selected for examination. The accessible portions of the integral attachment on Loop B will also be examined to compensate for the restricted access on the Loop A attachment.

"The attachment on the Scram Discharge Piping is the only integral attachment weld in the non-exempt portion of this system. Thus there is no other integral attachment weld to be selected.

"There are 94 integral attachments on the Residual Heat Removal piping (the other integral attachments are on the pumps and the heat exchangers). Ten of the pipe integral attachments were selected for examination to meet the 10% sample requirements. The ten attachments consist of four hanger lugs, three elbow lugs, and three stanchions. RHA-CE1-2 was selected because it was previously examined in the second interval and has a high design load. The accessible portions of another similar integral attachment in the RHR system will be examined to compensate for the restricted access on RHA-CE1-2."

Evaluation: The acceptable application of Code Case N-509 requires that licensees examine a minimum of 10% of all Class 1, 2, and 3 integral attachment welds associated with piping, pumps, and valves. The licensee was authorized to use this Code Case in an SER dated October 23, 1997, as N-509 had not been published in Regulatory Guide 1.147 at that time. However, many of the attachments are designed such that removal of a pipe clamp or whip restraint would be required to access the entire welded region. The subject piping systems are located in relatively high radiation fields, and many worker-hours would be necessary to install temporary supports, erect scaffolding, and remove the clamps or restraints that restrict access for examination. If required, removal of these appurtenances would result in a substantial burden on the licensee.

The licensee has proposed to examine the subject integral attachment welds to the extent accessible, without removal of clamps or restraints, in lieu of the 100% Code-required surface examinations. A significant portion (82 to 87%) of the subject welded attachments has been examined. In addition, the licensee has committed to performing additional examinations to increase the overall number of welded attachments examined on these systems, where feasible. These measures should detect any significant patterns of degradation and provide reasonable assurance of the continued structural integrity of the components. Requiring the licensee to remove pipe clamps or restraints for the sole purpose of increasing existing examination coverage on the subject integrally welded attachments would not result in a compensating increase in the level of quality or safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(ii), it is recommended that the licensee's proposed alternative be authorized.

2.2 Request for Relief RI-25, Revision 0, Examination Category D-A, Item D1.30, Integrally Welded Attachments on Service Water Pumps

Code Requirement: ASME Code Case N-509, *Alternative Rules for the Selection and Examination of Class 1, 2, and 3 Integrally Welded Attachments*, Table 2500-1, requires 100% VT-1 visual examination of the length of each attachment weld selected for examination, as defined by Figure IWD-2500-1. In addition, 10% of all integrally welded attachments, proportional to the total number of nonexempt attachments connected to pumps located within each system, shall be selected for examination.

Note: The licensee was authorized to use Code Case N-509 in an NRC Safety Evaluation dated October 23, 1997. At that time, the licensee committed to perform examinations on a minimum of 10% of all Class 1, 2, and 3 piping, pump, and valve integrally welded attachments to satisfy NRC implementation concerns.

Licensee's Code Relief Request: In accordance with 10 CFR 50.55a(g)(6)(i), the licensee requested relief from performing the required VT-1 visual examinations for integral attachment welds on Class 3 Service Water Pumps.

Licensee's Basis for Requesting Relief (as stated):
"There are four vertical service water pumps. Each SW pump has an interior and exterior fillet weld attaching the pump discharge head to the pump column and a fillet weld attaching the pump column to the mounting plate. The portions of these welded attachments inside the discharge head are partially inaccessible due to the limited access through the service port in the discharge head and the configuration of the pump column. A complete examination is not possible. Approximately 60% of the total weld length is accessible for examination.

Licensee's Proposed Alternative Examination (as stated):
"As an alternate examination, CNS will perform a visual examination (VT-1) of the accessible portions of welded attachments on two SW pumps. This is a 50% sample of the welded attachments of the SW pump component supports."

Evaluation: The acceptable implementation of Code Case N-509 requires that 10% of all integrally welded attachments of piping, pumps, and valves in each system be examined during each interval. This includes examining 100% of the length of each attachment weld selected for examination. The licensee was authorized to use this Code Case in an SER dated October 23, 1997, as N-509 had not been published in Regulatory Guide 1.147 at that time. However, the design of the Service Water Pumps includes a number of integrally attached fillet welds located both inside and outside of a cylindrical pump support column. Access for VT-1 visual examination is limited to the external welds and those portions of the internal welds located near a service port in the support column. Therefore, it is impractical to examine 100% of the length of the internal welded attachments, without a design modification to the pumps and associated support columns. This would present a significant burden for the licensee.

The licensee has examined approximately 60% of the welded attachments on one of four Service Water pumps, and has proposed to perform additional VT-1 visual examinations on a second pump. The examinations completed, along with the

licensee's proposed alternative examinations, should detect any significant patterns of degradation, if present, and provide reasonable assurance of the continued structural integrity of the subject components. Based on the impracticality of meeting the Code requirements, and the extent of examinations that will be completed, it is recommended that relief be granted, pursuant to 10 CFR 50.55a(g)(6)(i).

3. CONCLUSION

The INEEL staff has reviewed the licensee's submittals and concludes that for Request for Relief RI-17, Revision 1, imposition of the Code requirements would result in a significant hardship with no compensating increase in quality and safety. Therefore, in accordance with 10 CFR 50.55a(a)(3)(ii), it is recommended that the alternative proposed in RI-17, Revision 1, be authorized. For Request for Relief RI-25, Revision 0, the licensee provided information to support the determination that the Code-required VT-1 visual examination is impractical for integrally welded attachments on Class 3 Service Water Pumps. Therefore, it is recommended that relief be granted pursuant to 10 CFR 50.55a(g)(6)(i). The subject of Request for Relief RI-13, Revision 2, involves snubber testing, and is being evaluated in a separate report by the NRC staff.