



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

April 26, 2010

Mr. Brian J. O'Grady  
Vice President-Nuclear and CNO  
Nebraska Public Power District  
72676 648A Avenue  
Brownville, NE 68321

SUBJECT: COOPER NUCLEAR STATION - REQUEST FOR RELIEF NO. RI-06 FOR THE  
FOURTH 10-YEAR INSERVICE INSPECTION INTERVAL REGARDING  
INSPECTION OF REACTOR VESSEL LONGITUDINAL WELDS (TAC  
NO. ME2381)

Dear Mr. O'Grady:

By letter dated October 5, 2009, to the U.S. Nuclear Regulatory Commission (NRC), Nebraska Public Power District (NPPD, the licensee) submitted request for relief No. RI-06 from certain inservice inspection (ISI) requirements of Section XI of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code) at Cooper Nuclear Station (CNS). Specifically, the licensee requested in RI-06 to perform examinations of accessible portions of certain reactor vessel longitudinal welds, due to the impracticality of performing the examinations required by the ASME Code. The applicable ASME Code at CNS for the fourth 10-year ISI interval, which commenced on March 1, 2006, is the 2001 Edition through the 2003 Addenda.

The request for relief was proposed pursuant to the provisions of paragraph 50.55a(g)(6)(i) of Title 10 of the *Code of Federal Regulations* (10 CFR). Based on the information you provided in your request for relief, the NRC staff determined that the ASME Code requirement is impractical and that reasonable assurance of structural integrity of the subject components has been provided by the examinations performed. Granting the request for relief 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 requirements were imposed on the facility. Therefore, request for relief RI-06 is granted pursuant to 10 CFR 50.55a(g)(6)(i) for the fourth 10-year ISI interval.

All other ASME Code, Section XI, requirements for which relief was not specifically requested and approved in this relief request remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.

B. O'Grady

- 2 -

The detailed results of the NRC staff review are provided in the enclosed safety evaluation. If you have any questions concerning this matter, please contact Mr. F. Lyon of my staff at (301) 415-2296 or via e-mail at [fred.lyon@nrc.gov](mailto:fred.lyon@nrc.gov).

Sincerely,

A handwritten signature in black ink, appearing to read "Michael T. Markley". The signature is written in a cursive style with a large, sweeping initial "M".

Michael T. Markley, Chief  
Plant Licensing Branch IV  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-298

Enclosure:  
Safety Evaluation

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

FOURTH 10-YEAR INSERVICE INSPECTION INTERVAL

REQUEST FOR RELIEF NO. RI-06

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

DOCKET NO. 50-298

1.0 INTRODUCTION

By letter dated October 5, 2009 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML092810349), Nebraska Public Power District (NPPD, the licensee) submitted request for relief No. RI-06 for the fourth 10-year inservice inspection (ISI) interval for Cooper Nuclear Station (CNS). The fourth 10-year ISI interval at CNS began on March 1, 2006. Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) paragraph 50.55a(g)(5)(iii), the licensee requested to achieve less than the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code) required examination coverage for reactor pressure vessel (RPV) longitudinal welds for the fourth 10-year ISI interval. The licensee specified that the fourth 10-year ISI examinations of welds, specifically identified as VLA-BA-2, VLA-BA-3, VLAB-BA-1, VLB-BA-3, and VLC-BB-1 longitudinal shell ring welds, did not meet ASME Code requirements for coverage. All of these welds fall under the requirements of the ASME Code, Section XI, IWB-2500-1, Category B-A, Item B1.12.

2.0 REGULATORY EVALUATION

The regulations in 10 CFR 50.55a(g) require that ISI of ASME Code Class 1, 2, and 3 components be performed in accordance with Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," of the ASME Code and applicable addenda, except where specific relief has been granted by the U.S. Nuclear Regulatory Commission (NRC) pursuant to 10 CFR 50.55a(g)(6)(i). The regulations in 10 CFR 50.55a(g)(6)(i) state that the Commission will evaluate determinations under paragraph 50.55a(g)(5) that code requirements are impractical. The Commission may grant such relief and may impose such alternative requirements as it determines are 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 requirements were imposed on the facility.

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

Enclosure

components. The regulations require that inservice examination of component and system pressure tests conducted in 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 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 ASME Code of record for the CNS fourth 10-year ISI interval is the 2001 Edition of the ASME Code, Section XI, with 2003 Addenda.

The regulations in 10 CFR 50.55a(g)(5)(iii) state that, "if the licensee has determined that conformance with certain code requirements is impractical for its facility, the licensee shall notify the Commission and submit...information to support the determinations."

### 3.0 LICENSEE EVALUATION

#### ASME Code Requirement

The 2001 Edition of the ASME Code with 2003 Addenda, Section XI, Category B-A, Table IWB-2500-1, Item No. B1.12 component examinations require a volumetric examination of the RPV longitudinal welds. The extent of the examination is listed in note 2 of Table IWB-2500-1 as essentially 100 percent of the weld length and the examination volume is shown in Figure IWB-2500-2 of the ASME Code.

#### System/Component for Which Relief is Requested

Relief is requested for the examination of certain RPV longitudinal welds. Specifically, these welds are identified as VLA-BA-2, VLA-BA-3, VLB-BA-1, VLB-BA-3, and VLC-BB-1 longitudinal shell ring welds, all of which are Item No. B1.12 components.

#### ASME Code Requirement for Which Relief is Requested

Relief is requested from meeting the required inspection coverage from the ASME Code requirements for these welds.

#### Licensee's Proposed Alternative Examination

In its submittal, the licensee stated, "[i]n accordance with 10CFR50.55a(g)(5)(iii), CNS proposes to examine the accessible portions of the reactor vessel longitudinal welds in lieu of the impractical Code required examinations." The licensee intends to take credit for the inspection which has been performed as being adequate to ensure the structural integrity of the RPV; therefore, no further alternative actions are planned.

#### Licensee's Basis for Requesting Relief

In its submittal, the licensee stated,

Access to the reactor vessel shell welds from the exterior is limited. Below the top of the biological shield, most of the reactor vessel is insulated with permanent reflective insulation and surrounded by a concrete biological shield. Penetrations through the biological shield provide limited access to some welds. The annular

space between the inside diameter of the insulation and the outside diameter of the reactor vessel is a nominal two (2) inches. There is no working space to remove the insulation panels from the vessel, which precludes both direct and remote examination of the outside surface.

The licensee stated that automated ultrasonic testing (UT) examination of the RPV shell welds was performed and supplemented by manual examinations to obtain additional volumetric coverage.

The licensee also included the results of an analysis completed for an application to exempt the RPV circumferential welds from examination based on the criteria of BWR Vessel and Internals Project (BWRVIP)-05, "Boiling Water Reactor Vessel and Internals Project, BWR RPV Shell Weld Inspection Recommendations"(Reference 1). The analysis compared the probability of failure due to an average reduction in inspection coverage from 90 percent to 55 percent. The analysis concluded that the failure probability was virtually the same for both coverage cases. Specifically, the decreased coverage resulted in a  $6.67 \times 10^{-9}$  increase in failure event per year probability.

#### 4.0 NRC STAFF EVALUATION

The 2001 Edition with 2003 Addenda of the ASME Code, Section XI, requires a volumetric examination of the longitudinal welds that include essentially 100 percent of the weld length. The licensee conducted a volumetric examination of the longitudinal welds via UT. In Table RI-06-01 of its submittal, the licensee cited a list of obstructions to weld examination, including jet pump diffuser and shroud support gussets, insulation supports, the biological shield, surveillance specimen brackets, jet pump riser bracers, guide rods, feedwater spargers, and core spray downcomers. To remove these obstacles to inspection would require the redesign of the welds and reactor vessel support skirt which are both significant tasks.

Of the five welds listed for relief, VLC-BB-1 had the lowest examination coverage at 19.2 percent; however, this weld had 0 percent inspected for the third ISI examination (Reference 2). The other four welds listed for relief had examination volumes between 67.6 percent and 88.7 percent. These examination percentages represent a significant and representative percentage of the weld volume including weld volume in high fluence areas in addition to a significant increase in coverage from the previous ISI interval (particularly when combined with examinations of the acceptably accessible longitudinal welds). The interrogated weld volumes provide adequate assurance that any pattern(s) of degradation in the welds would have been identified.

Based on the above, the NRC staff concludes that increasing examination weld volume coverage would be impractical without a compensating increase in the level of quality or safety, due to the nature of the obstructing components.

#### 5.0 CONCLUSION

Due to the configuration of the CNS, the ASME Code requirements with respect to weld coverage of the longitudinal welds VLA-BA-2, VLA-BA-3, VLB-BA-1, VLB-BA-3, and VLC-BB-1 longitudinal shell ring welds are impractical. An imposition of the ASME Code requirements

## 5.0 CONCLUSION

Due to the configuration of the CNS, the ASME Code requirements with respect to weld coverage of the longitudinal welds VLA-BA-2, VLA-BA-3, VLB-BA-1, VLB-BA-3, and VLC-BB-1 longitudinal shell ring welds are impractical. An imposition of the ASME Code requirements would require that the welds and RPV support skirt be redesigned, which would be a burden on the licensee. The weld coverage that was achieved provides reasonable assurance of the structural integrity of the RPV longitudinal welds. Therefore, the licensee's request for relief is granted pursuant to 10 CFR 50.55a(g)(6)(i) for the fourth CNS 10-year ISI interval. The NRC staff has determined that granting relief pursuant to 10 CFR 50.55a(g)(6)(i) 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 requirements were imposed on the facility.

All other ASME Code, Section XI requirements for which relief was not specifically requested and approved in the subject request for relief remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.

## 6.0 REFERENCES

1. Hiltz, T. G., U.S. Nuclear Regulatory Commission, letter to Stewart B. Minahan, Nebraska Public Power District, "Cooper Nuclear Station - Request for Relief No. RI-29 for Fourth 10-Year Inservice Inspection Interval Regarding Volumetric Examination of Reactor Pressure Vessel Circumferential Shell Welds (TAC No. MD5260)," dated February 6, 2008 (ADAMS Accession No. ML080230288).
2. Gramm, R.A., U.S. Nuclear Regulatory Commission, letter to David L. Wilson, Nebraska Public Power District, "Cooper Nuclear Station - Inservice Inspection Relief Request No. RI-06, Revision 2, for Reactor Pressure Vessel Welds (TAC No. MB2003)," dated November 30, 2001 (ADAMS Accession No. ML013190737).

Principal Contributor: D. Widrevitz

Date: April 26, 2010

B. O'Grady

- 2 -

The detailed results of the NRC staff review are provided in the enclosed safety evaluation. If you have any questions concerning this matter, please contact Mr. F. Lyon of my staff at (301) 415-2296 or via e-mail at [fred.lyon@nrc.gov](mailto:fred.lyon@nrc.gov) .

Sincerely,

/RA/

Michael T. Markley, Chief  
Plant Licensing Branch IV  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-298

Enclosure:  
Safety Evaluation

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\*email dated

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NAME	FLyon	JBurkhardt	MMitchell*	MMarkley
DATE	4/19/10	4/15/10	3/23/10	4/26/10

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