Nebraska Public Power District
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10 CFR 50.55a

NLS2006020
February 24, 2006

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555-0001

Subject: 10 CFR 50.55a Request Number RI-37, Revision 0
Cooper Nuclear Station, Docket No. 50-298, DPR-46

The purpose of this letter is to request that the Nuclear Regulatory Commission (NRC) authorize the Nebraska Public Power District (NPPD) to use an alternative to certain inservice inspection (ISI) code requirements for the Cooper Nuclear Station (CNS) pursuant to 10 CFR 50.55a. This request involves visual examination requirements of Section XI of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code.

10 CFR 50.55a Request Number RI-37, Revision 0, is a request for authorization to use ASME Code Case N-686, "Alternative Requirements for Visual Examinations, VT-1, VT-2, and VT-3," in lieu of the requirements in ASME Section XI, Sections IWA-2210 through IWA-2213 and Table IWA-2210-1. RI-37, Revision 0, including the basis and details of the request, is provided in the attachment. Code Case N-686 is enclosed. This request is applicable to the fourth ten-year ISI interval, which commences on March 1, 2006.

NPPD requests approval of this request by June 2, 2006, in order to support planning for Refueling Outage 23 (tentatively scheduled to commence October 21, 2006). The applicable ASME Code for this interval is the 2001 Edition through the 2003 Addenda.

Should you have any questions concerning this matter, please contact Paul Fleming, Licensing Manager, at (402) 825-2774.

Sincerely,

Randall K. Edington

Randall K. Edington
Vice President - Nuclear and
Chief Nuclear Officer

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Attachment
Enclosure

cc: U.S. Nuclear Regulatory Commission w/attachment and enclosure
Regional Office - Region IV

Senior Project Manager w/attachment and enclosure
USNRC - NRR Project Directorate IV-1

Senior Resident Inspector w/attachment and enclosure
USNRC - CNS

NPG Distribution w/o attachment and enclosure

CNS Records w/attachment and enclosure

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Visual Examinations, VT-1, VT-2, and VT-3

Proposed Alternative in Accordance with 10 CFR 50.55a(a)(3)(ii)
Hardship or Unusual Difficulty without Compensating Increase
in Level of Quality or Safety

ASME Code Component(s) Affected

Code Classes:	1, 2, and 3
Examination Categories:	B-G-1, B-G-2, B-L-2, B-M-2, B-N-1, B-N-2, B-P, C-B, C-H, D-A, D-B, F-A
Item Numbers:	B6.10, B6.50, B6.130, B6.140, B6.160, B6.170, B6.190, B6.200, B6.220, B6.230, B7.10, B7.40, B7.50, B7.60, B7.70, B12.20, B12.50, B13.10, B13.20, B13.30, B13.40, B15.10, C2.33, C7.10, D1.10, D1.20, D1.30, D1.40, D2.10, F1.10, F1.20, F1.30, F1.40
Component Numbers:	Various

Applicable Code Edition and Addenda

ASME Code Section XI, 2001 Edition, 2003 Addenda

Applicable Code Requirement

IWA-2210 through IWA-2213 and Table IWA-2210-1

IWA-2210, "VISUAL EXAMINATIONS," states that:
Visual examinations shall be conducted in accordance with Section V, Article 9, Table IWA-2210-1, and the following.

(a) A written procedure and report of examination results is required.

(b) For procedure demonstration, a test chart containing text with some lower case characters without an ascender or descender (e.g., a, c, e, o) meeting Table IWA-2210-1 is required. Measurements of the test chart shall be made once before initial use with an optical comparator (10X or greater) or other suitable instrument to verify that the height of a representative lower case character without an ascender or descender, for the selected type size, meets the requirements of Table IWA-2210-1.

(c) Remote examination may be substituted for direct examination. The remote examination procedure shall be demonstrated to resolve the selected test chart characters.

(d) Alternatives to the direct visual examination distance requirements of Section V may be used as specified in Table IWA-2210-1.

(e) It is not necessary to measure illumination levels on each examination surface when the same portable light source or similar installed lighting equipment is demonstrated to provide the illumination specified in Table IWA-2210-1 at the maximum examination distance.

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Visual Examinations, VT-1, VT-2, and VT-3

(f) The adequacy of the illumination levels from battery powered portable lights shall be checked before and after each examination or series of examinations, not to exceed 4 hr between checks. In lieu of using a light meter, these checks may be made by verifying that the illumination is adequate (i.e., no discernable degradation in the visual examination resolution of the procedure demonstration test chart characters).

IWA-2211, "VT-1 Examination," states that:
VT-1 examinations are conducted to detect discontinuities and imperfections on the surfaces of components, including such conditions as cracks, wear, corrosion, or erosion.

IWA-2212, "VT-2 Examination," states that:
(a) VT-2 examinations are conducted to detect evidence of leakage from pressure retaining components, with or without leakage collection systems, as required during the conduct of system pressure test.
(b) VT-2 examinations shall be conducted in accordance with IWA-5000. For direct examination, the Table IWA-2210-1 maximum examination distance shall apply to the distance from the eye to the surfaces being examined.

IWA-2213, "VT-3 Examination," states that:
VT-3 examinations are conducted to determine the general mechanical and structural condition of components and their supports by verifying parameters such as clearances, settings, and physical displacements; and to detect discontinuities and imperfections, such as loss of integrity at bolted or welded connections, loose or missing parts, debris, corrosion, wear, or erosion. VT-3 includes examinations for conditions that could affect operability or functional adequacy of snubbers and constant load and spring-type supports.

Table IWA-2210-1:

Visual Examination	Minimum Illumination,[1] fc	Maximum Direct Examination Distance, ft (mm)	Maximum Procedure Demonstration Lower Case Character Height, in. (mm)
VT-1	50	2 (609.6)	0.044 (1.1)
VT-2	15	6 (1829)	0.158 (4)
VT-3	50	4 (1219)	0.105 (2.7)

NOTE:
(1) Resolution of the specified characters can be used in lieu of illumination measurement to verify illumination adequacy.

10 CFR 50.55a Request Number RI-37, Revision 0 (Continued)
Visual Examinations, VT-1, VT-2, and VT-3

Reason for Request

Pursuant to 10 CFR 50.55a, "Codes and Standards," Paragraph (a)(3), the Nebraska Public Power District (NPPD) requests authorization to use ASME Code Case N-686, "Alternate Requirements for Visual Examinations, VT-1, VT-2, and VT-3, Section XI, Division 1" (enclosed), approved by ASME on February 14, 2003, in lieu of the requirements of ASME Code Section XI, IWA-2210 through IWA-2213 and Table IWA-2210-1, when performing VT-1, VT-2, and VT-3 visual examinations.

In order to meet the distance requirements and to gain access to areas to complete VT-2 and VT-3 visual examinations in accordance with IWA-2210 through IWA-2213 and Table IWA-2210-1, remote visual equipment would have to be used or scaffolding would have to be erected and removed that would cause additional radiation exposure. This requirement will cause a hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Proposed Alternative and Basis for Use

As the proposed alternative, Cooper Nuclear Station (CNS) will use the provisions in Code Case N-686, without exception, in lieu of IWA-2210 through IWA-2213 and Table IWA-2210-1 when performing VT-1, VT-2, and VT-3 visual examinations. Specifically, Code Case N-686 states that *VT-2 examination shall be conducted in accordance with IWA-5000,* and that for VT-3 examination, *there are no direct visual examination distance requirements, provided the examiner can resolve the characters in accordance with Table 1* (shown below). The only difference in the VT-1 examination is that the metric system for distance has been rounded off (slightly different numbers) in Code Case N-686.

Code Case N-686, Table 1:

Visual Examination	Minimum Illumination fc [Note (1)]	Maximum Direct Examination Distance, ft (mm)	Maximum Height, in. (mm) for Procedure Demonstration Characters [Note (2)]
VT-1	50	2 (600)	0.044 (1.0)
VT-3	50	N/A	0.105 (3.0)

NOTES:
(1) Resolution of the specified characters can be used in lieu of illumination measurement to verify illumination adequacy.
(2) For procedure demonstration, a test chart or card containing text with some lower case characters, without an ascender or descender (e.g., a, c, e, o), that meet the specified height requirements is required. Measurement of the test chart or card shall be made once before its initial use with an optical comparator (10X or greater) or other suitable instrument to verify that the height of the lower case characters without an ascender or descender meets the specified requirements.

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Visual Examinations, VT-1, VT-2, and VT-3

CNS will perform VT-2 and VT-3 examinations without direct visual examination distance requirements in accordance with Code Case N-686.

The basis for use is as follows:

The different visual examination techniques have evolved over the years from a single technique (VT-1) to the separate techniques of VT-1, VT-2, and VT-3 with examination requirements commensurate with their application.

ASME Section XI, 1974 Edition, Summer 1975 Addenda, contained only one visual examination:

IWA-2210, "VISUAL EXAMINATION"

(a) A visual examination is employed to provide a report of the general condition of the part, component, or surface to be examined, including such conditions as scratches, wear, cracks, corrosion, or erosion on the surfaces; misalignment or movement of the part or component; or evidence of leaking.

(b) Visual examination shall be conducted in accordance with Article 9 of Section V, except that lighting shall be sufficient to resolve the 1/32-in. line.

The requirements of the corresponding edition of Section V, Article 9, "Visual Examination," are summarily stated as *Direct visual examination may usually be made when access is sufficient to place the eye within 24 in. of the surface to be examined and at an angle not less than 30 deg. to the surface to be examined. Mirrors may be used to improve the angle of vision.... Remote visual examination may use visual aids.... Such systems shall have a resolution capability at least equivalent to that obtainable by direct visual observation.*

This one visual examination contained requirements for physical damage (e.g., scratches, wear, cracks, corrosion, erosion), physical displacement (e.g., misalignment, movement), and evidence of leaking and applied it to all visual examinations required by Section XI, including pressure retaining welds, pressure retaining bolting, vessel cladding, vessel interior, component supports, and leakage tests.

In the 1970s the visual examinations were split into multiple examinations. For example, VT-1 for physical damage, with defined prerequisites; VT-2 for pressure boundary leakage, with fewer defined prerequisites; VT-3 for physical displacement, also with fewer defined prerequisites; and VT-4 for functional adequacy. The reason the visual examinations were separated into multiple methods with appropriate requirements was to apply a level of visual examination commensurate with the application.

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Visual Examinations, VT-1, VT-2, and VT-3

The visual VT-2 examination performed during the Class 1 system leakage test is typically performed after a refueling outage when the unit is at reactor pressure and temperature. Table IWA-2210-1 requires the examiner to be within six feet of the surfaces being examined or use remote examination equipment that provides demonstrated equivalent resolution. For an examiner to be within six feet of the surfaces being examined would require the erection of scaffolding to perform a system pressure test because the piping runs for certain systems may be 20 to 30 feet above the floor. The plant personnel required to erect and take down the scaffolding or the additional plant personnel required to perform remote examinations (for example, personnel to install or hold a light source if the examiner used binoculars) would receive unnecessary radiation exposure. However, ASME Code Case N-686 allows the examiner to conduct VT-2 examinations to detect evidence of leakage from pressure retaining components without a distance limitation and prescribes examinations in accordance with IWA-5000. Paragraph IWA-5241, "Insulated and Noninsulated Components," allows the examiner to perform examinations for leakage "... *by examining the accessible external exposed surfaces of pressure retaining components... for components whose external surfaces are inaccessible for direct VT-2 visual examination, only the examination of the surrounding area (including floor areas or equipment surfaces located underneath the components) for evidence of leakage shall be required.*"

Table IWA-2210-1 also requires a minimum illumination level of 15 footcandles for a VT-2 examination. In order to meet this illumination level, temporary light may have to be provided which, again, involves more plant personnel and causes additional radiation exposure. Experience has shown, however, that there are other effective techniques and tools for locating leakage. For example, when water is illuminated with a flashlight it has a "mirror effect" or shiny reflective area, allowing leaks to be located from distance greater than six feet. Therefore, a VT-2 examination using a flashlight provides a level of quality equivalent to performing the examination with general illumination of 15 footcandles.

A VT-3 examination is conducted to determine the general mechanical and structural condition of a component or a component support. Table IWA-2210-1 requires the examiner to be within four feet of the surfaces being examined or use remote examination equipment that provides demonstrated equivalent resolution. Again, the piping runs for certain systems may be 20 to 30 feet above the floor. This would require the erection of scaffolding to perform a visual examination of a component support. In addition, as discussed above, the use of remote examination equipment involves more plant personnel.

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Visual Examinations, VT-1, VT-2, and VT-3

The industry has over thirty years of experience performing visual examinations to the less prescriptive requirements for proximity and illumination, and examiners are fully qualified in accordance with IWA-2300, "Qualifications of Nondestructive Examination Personnel." Experience, training, and qualifications of visual examiners provide reasonable assurance that they will apply the appropriate illumination and distance requirements required to perform quality examinations.

The specific requirements of IWA-2210 through IWA-2213 and Table IWA-2210-1 will cause a hardship or unusual difficulty without a compensating increase in the level of quality and safety because of ALARA considerations. Thirty years of industry experience performing system pressure tests demonstrates that an equivalent level of quality and safety can be achieved by performing VT-2 examinations at distances well in excess of six feet and VT-3 examinations at distances well in excess of four feet. These time-proven methods for conducting visual examinations will continue to provide reasonable assurance of structural integrity while preventing plant personnel from receiving excessive radiation exposure.

The 1989 Edition of ASME Section XI, which was the applicable ASME Code for the CNS third ten-year interval, did not specify distance and illumination requirements for VT examinations. ASME Code Case N-686 was prematurely incorporated into ASME Section XI 2001 Edition, 2003 Addenda (Sections IWA-2210 through 2213, including Table IWA 2211-1). In December 2003, an Erratum was issued which restored it back to the 2002 Addenda version, which specifies distance and illumination requirements. Subsequently, Code Case N-686 was incorporated into the 2004 Edition 2005 Addenda of ASME Section XI. However, the applicable code edition and addenda for Cooper Nuclear Station is ASME Code Section XI, 2001 Edition, 2003 Addenda.

Therefore, pursuant to 10 CFR 50.55a(a)(3)(ii), NPPD requests authorization to use ASME Code Case N-686 in lieu of ASME Code IWA-2210 through IWA-2213 and Table IWA-2210-1 requirements.

Duration of Proposed Alternative

The proposed alternative will be used for the entire fourth ten-year interval of the Inservice Inspection Program for CNS.

Precedents

None

Enclosure to NLS2006020

ASME Code Case N-686[†]

Alternative Requirements for Visual Examinations VT-1, VT-2, and VT-3

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Approval Date: February 14, 2003

See Numeric Index for expiration and any reaffirmation dates.

Case N-686
Alternative Requirements for Visual Examinations, VT-1, VT-2, and VT-3 Section XI, Division 1

Inquiry: What alternative to the requirements of IWA-2210, visual examinations, and Table IWA-2210-1, visual examinations, may be used when performing visual examinations in accordance with IWA-2211, VT-1, IWA-2212, VT-2, and IWA-2213, VT-3.

Reply: It is the opinion of the Committee that as an alternative to the requirements of IWA-2210 and Table IWA-2210-1, the following requirements may be used for performing VT-1, VT-2, and VT-3 examinations.

(a) Visual examinations shall be conducted in accordance with Section V, Article 9, T-941 for the written procedure and T-990 for the reporting of the examination results.

(b) VT-1 Examination:

(1) VT-1 examination is conducted to detect discontinuities and imperfections on the surfaces of components, including such conditions as cracks, wear, corrosion, or erosion.

(2) The VT-1 examination procedure shall be demonstrated capable of resolving characters in accordance with Table 1.

(3) Direct visual examination distance requirements shall be as specified in Table 1.

(4) Illumination for examination shall meet the requirements specified in Table 1.

(5) It is not necessary to measure the illumination level on each examination surface when the same portable non-battery-powered light source (e.g., drop light) or similar installed lighting equipment is demonstrated to provide the illumination specified in Table 1 at the maximum examination distance.

(6) When a battery-powered light is used, the adequacy of the illumination level shall be checked before and after each examination or series of examinations, not to exceed 4 hr between checks.

(7) Remote visual examination may be substituted for direct examination. The remote examination procedure shall be demonstrated capable of resolving characters in accordance with Table 1. Additionally, the remote visual examination system shall be capable of distinguishing the colors applicable to the component examinations being conducted.

(c) VT-2 Examination:

(1) VT-2 examination is conducted to detect evidence of leakage from pressure retaining components, with or without leakage collection systems, as required during the system pressure test.

(2) VT-2 examination shall be conducted in accordance with IWA-5000.

(d) VT-3 Examination:

(1) VT-3 examination is conducted to determine the general mechanical and structural condition of components and their supports by verifying parameters such as clearances, settings, and physical displacements; to detect discontinuities and imperfections, such as loss of integrity at bolted or welded connections, loose or missing parts, debris, corrosion, wear, or erosion; and to detect conditions that could effect operability or functional adequacy of snubbers and constant load and spring type supports.

(2) The VT-3 examination procedure shall be demonstrated capable of resolving characters in accordance with Table 1.

(3) There are no direct visual examination distance requirements, provided the examiner can resolve the characters in accordance with Table 1.

(4) Illumination for examination shall meet the requirements specified in Table 1.

The Committee's function is to establish rules of safety, relating only to pressure integrity, governing the construction of boilers, pressure vessels, transport tanks and nuclear components, and inservice inspection for pressure integrity of nuclear components and transport tanks, and to interpret these rules when questions arise regarding their intent. This Code does not address other safety issues relating to the construction of boilers, pressure vessels, transport tanks and nuclear components, and the inservice inspection of nuclear components and transport tanks. The user of the Code should refer to other pertinent codes, standards, laws, regulations or other relevant documents.

TABLE 1
VISUAL EXAMINATIONS

Visual Examination	Minimum Illumination fc [Note (1)]	Maximum Direct Examination Distance ft (mm)	Maximum Height, in. (mm) for Procedure Demonstration Characters [Note (2)]
VT-1	50	2 (600)	0.044 (1.0)
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NOTES:
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(5) It is not necessary to measure illumination levels on each examination surface when the same portable non-battery-powered light source (e.g., drop light) or similar installed lighting equipment is demonstrated to provide the illumination specified in Table 1 at the maximum examination distance.

(6) When a battery-powered light is used, the adequacy of the illumination level shall be checked before and after each examination or series of examinations, not to exceed 4 hr between checks.

(7) Remote visual examination may be substituted for direct examination. The remote examination procedure shall be demonstrated capable of resolving characters in accordance with Table 1. Additionally, the remote visual examination system shall be capable of distinguishing the colors applicable to the requirements component examinations being conducted.

Correspondence Number: NLS2006020

The following table identifies those actions committed to by Nebraska Public Power District (NPPD) in this document. Any other actions discussed in the submittal represent intended or planned actions by NPPD. They are described for information only and are not regulatory commitments. Please notify the Licensing Manager at Cooper Nuclear Station of any questions regarding this document or any associated regulatory commitments.

COMMITMENT	COMMITMENT NUMBER	COMMITTED DATE OR OUTAGE
NONE		