

March 28, 2003

Mr. David L. Wilson
Site Vice President
Monticello Nuclear Generating Plant
Nuclear Management Company, LLC
2807 West County Road 75
Monticello, MN 55362-9637

SUBJECT: MONTICELLO NUCLEAR GENERATING PLANT - RELIEF REQUEST
NOS. 3 AND 6 FOR THE FOURTH 10-YEAR INTERVAL OF THE INSERVICE
INSPECTION EXAMINATION PLAN (TAC NO. MB6896)

Dear Mr. Wilson:

Nuclear Management Company's, LLC (NMC's) letter of December 6, 2002, submitted Relief Request Nos. 3, 4, 5 and 6 requesting relief from certain requirements of the American Society of Mechanical Engineers *Boiler and Pressure Vessel Code* (ASME Code), Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components." The requests applied to the fourth 10-year interval of the inservice inspection (ISI) examination plan for the Monticello Nuclear Generating Plant (Monticello). NMC requested relief pursuant to 10 CFR 50.55a(a)(3)(i). This letter and the enclosed safety evaluation address Relief Request Nos. 3 and 6, only. We will address Relief Request Nos. 4 and 5 by separate correspondence.

In Relief Request No. 3, NMC requested to use the root-mean-square error calculations of 10 CFR 50.55a(b)(2)(xv)(C)(1) for reactor vessel flaw sizing. This is in lieu of the statistical parameters identified in subparagraph 3.2(c) of Supplement 4, "Qualification Requirements for the Clad/Base Metal Interface of Reactor Vessel," Appendix VIII, "Performance Demonstration for Ultrasonic Examination Systems," of the 1995 edition, 1996 addenda of ASME Code, Section XI.

In Relief Request No. 6, NMC requested to use the annual training requirements of 10 CFR 50.55a(b)(2)(xiv) for personnel qualified to perform ultrasonic examinations in lieu of the annual training requirements of ASME Code, Section XI, 1995 Edition, 1996 addenda, Appendix VII, "Qualification of Nondestructive Examination Personnel for Ultrasonic Examination," Subparagraph VII-4240.

D. Wilson

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The NRC staff concludes that NMC's proposed alternatives provide an acceptable level of quality and safety. Therefore, in accordance with 10 CFR 50.55a(a)(3)(i), the NRC staff authorizes NMC to use the proposed alternatives during the forth 10-year ISI interval at Monticello.

Enclosed is the NRC's safety evaluation.

Sincerely,

/RA/

L. Mark Padovan, Project Manager, Section 1
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-236

Enclosure: Safety Evaluation

cc w/encl: See next page

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cc w/encl: See next page

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*Provided SE input by memo

OFFICE	PDIII-1/PM	PDIII-1/LA	EMCB*	OGC/NLO	PDIII-1/SC
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Monticello Nuclear Generating Plant

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March 2003

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELIEF REQUEST NO. 3 AND RELIEF REQUEST NO. 6

FOR THE FOURTH 10-YEAR INTERVAL INSERVICE INSPECTION EXAMINATION PLAN

NUCLEAR MANAGEMENT COMPANY, LLC

MONTICELLO NUCLEAR GENERATING PLANT

DOCKET NO. 50-263

1.0 INTRODUCTION

Nuclear Management Company's, LLC (NMC's) letter of December 6, 2002, submitted Relief Request Nos. 3, 4, 5 and 6 requesting relief from certain requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components." The requests applied to the fourth 10-year interval of the inservice inspection (ISI) examination plan for the Monticello Nuclear Generating Plant (Monticello). NMC requested relief pursuant to 10 CFR 50.55a(a)(3)(i). This safety evaluation addresses Relief Request Nos. 3 and 6, only.

2.0 REGULATORY EVALUATION

ISI of ASME Code Class 1, 2, and 3 components are performed in accordance with Section XI of the ASME Code and the applicable addenda as required by 10 CFR 50.55a(g), except where written relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i). The regulation at 10 CFR 50.55a(a)(3) states that alternatives to the requirements of paragraph (g) may be used, when authorized by the 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 pre-service examination requirements, set forth in the ASME Code, Section XI, 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 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 Code of record for the fourth 10-year inservice inspection for Monticello is the 1995 Edition, 1996 addenda of the ASME Code, Section XI,.

3.0 TECHNICAL EVALUATION FOR RELIEF REQUEST 3

ASME Code, Section XI, 1995 Edition, 1996 addenda, Appendix VII, Supplement 4, subparagraph 3.2(c), requires a licensee to report performance demonstration results for qualifying ultrasonic testing techniques. These results must satisfy the following statistical parameters when plotted on a two dimensional plot (Figure VIII-S4-1):

- slope of the linear regression line is not less than 0.7
- mean deviation of flaw depth is less than 0.25 inches
- correlation coefficient is not less than 0.70

3.1 Licensee's Proposed Alternative to ASME Code

In Relief Request No. 3, NMC requested to use the root-mean-square error calculations of 10 CFR 50.55a(b)(2)(xv)(C)(1) for reactor vessel flaw sizing. This is in lieu of the statistical parameters identified in subparagraph 3.2(c) of Supplement 4, "Qualification Requirements for the Clad/Base Metal Interface of Reactor Vessel," Appendix VIII, "Performance Demonstration for Ultrasonic Examination Systems," of the 1995 edition, 1996 addenda of ASME Code, Section XI.

3.2 Licensee's Basis for Relief (as stated)

The U.S. nuclear utilities created PDI [Performance Demonstration Initiative] to implement demonstration requirements contained in Appendix VIII. PDI developed a performance demonstration for qualifying UT [ultrasonic testing] techniques. PDI does not use paragraph 3.2(c) for sizing qualifications. The solution for resolving the differences between the PDI program and the Code was for PDI to participate in the development of a Code case that reflected PDI's program. . . . ASME approved the Code Case and published it as Code Case N-622, "Ultrasonic Examination of RPV [reactor pressure vessel] and Piping, Bolts, and Studs, Section XI, Division 1." . . . The NRC first approved the use of Code Case N-622 for Florida Power and Light Company's St. Lucie Plant Unit 2 (TAC No. MA5041)

Operating in parallel with the actions of PDI, the Staff incorporated most of Code Case N-622 criteria in the Rule published in the Federal Register, 64 FR 51370 Appendix IV to Code Case N-622 contains the proposed alternative sizing criteria which has been authorized by the Staff. However, the sizing parameters printed in the published Rule differed from the sizing parameters implemented by the PDI Program and Code Case N-622.

. . . The Staff agreed that [the omission of the length sizing tolerance of 0.75 inch RMS in the rule and] the inclusion of the statistical parameters of Paragraph 3.2(c) of Supplement 4 to Appendix VIII was an oversight [and this will be corrected in an upcoming rule].

3.3 NRC Staff Evaluation:

In Relief Request No. 3, NMC requested to use the root-mean-square error calculations of 10 CFR 50.55a(b)(2)(xv)(C)(1) for reactor vessel flaw sizing. This is in lieu of the statistical parameters identified in subparagraph 3.2(c) of Supplement 4, Appendix VIII, of the 1995 edition, 1996 addenda of ASME Code, Section XI. NMC requested this relief on the basis that their proposed alternative provides an acceptable level of quality and safety pursuant to 10 CFR 50.55a(a)(3)(i).

In subparagraph 3.2(c), the linear regression line is the difference between measured and true value, plotted along a through-wall thickness. For Supplement 4 performance demonstrations, a linear regression line of the data is not applicable because the performance demonstrations are performed on test specimens with flaws located in the inner 15 percent of the through-wall thickness. The differences between measured and true value produce a tight grouping of results that resemble a shotgun pattern. The slope of a regression line from such data is extremely sensitive to small variations. This makes the parameter of subparagraph 3.2(c)(1) a poor and inappropriate acceptance criterion.

The value used in subparagraph 3.2(c)(2) is too lax with respect to evaluating flaw depths within the inner 15 percent of wall thickness. NMC proposes to use the more appropriate criterion of 0.15 inch RMS of 10 CFR 50.55a(b)(2)(xv)(C)(1), which modifies subparagraph 3.2(a), as the acceptance criterion. Subparagraph 3.2(c)(3) pertains to a correlation coefficient and is inappropriate for this application since it is based on the linear regression from subparagraph 3.2(c)(1).

Therefore, based on the above and pursuant to 10 CFR 50.55a(a)(3)(i), the NRC staff concludes that NMC's proposed alternative to use the criteria of 10 CFR 50.55a(b)(2)(xv)(C)(1) in lieu of subparagraph 3.2(c) of Supplement 4 to Appendix VIII of the ASME Code, Section XI, will provide an acceptable level of quality and safety.

4.0 TECHNICAL EVALUATION FOR RELIEF REQUEST 6

ASME Code, Section XI, 1995 Edition, 1996 addenda, Appendix VII, Paragraph VII-4240, requires supplemental training on an annual basis to impart knowledge of new developments, material failure modes, and any pertinent technical topics as determined by the employer. The extent of this training shall be a minimum of 10 hours per year. A record of attendance and the topics covered during the training shall be maintained; however, no examination is required. The regulation at 10 CFR 50.55a(b)(2)(xiv) requires that all personnel qualified to perform ultrasonic examinations in accordance with Appendix VIII receive 8 hours of annual hands-on training on specimens that contain cracks. This training must be completed no earlier than 6 months prior to performing ultrasonic examinations at a licensee's facility.

4.1 Licensee's Proposed Alternative

Pursuant to 10 CFR 50.55a(a)(3)(i), NMC proposes to use the more detailed, hands-on training requirements of 10 CFR 50.55a(b)(2)(xiv)¹, which further permits analyzing prerecorded data

as amended by 67 FR 60520 dated September 26, 2002

from material or welds that contain cracks for meeting annual training requirements, in lieu of the annual training requirements outlined in Appendix VII, paragraph VII-4240 of the ASME Code, Section XI. Training will be completed no earlier than 6 months before performing ultrasonic examinations at Monticello.

4.2 Licensee's Basis for Relief:

NMC requested this relief on the basis that the requirements of 10 CFR 50.55a(b)(2)(xiv) will improve "the performance of Appendix VIII - Supplement examinations by requiring NDE [non-destructive examination] examiners performing Appendix VIII examinations to demonstrate proficiency by analyzing specimens that contain cracks or prerecorded ultrasonic data from material or welds that contain cracks prior to performing actual examinations." NMC states that "[t]he proposed alternative will simplify record keeping, satisfy the needs of maintaining Ultrasonic examiner skills, and also provides an acceptable level of quality and safety."

4.3 Technical Evaluation:

In Relief Request No. 6, NMC requested to use the annual training requirements of 10 CFR 50.55a(b)(2)(xiv) for personnel qualified to perform ultrasonic examinations in lieu of the annual training requirements of ASME Code, Section XI, 1995 Edition, 1996 addenda, Appendix VII, Subparagraph VII. NMC requested this relief on the basis that their proposed alternative will demonstrate proficiency of the NDE examiners by analyzing specimens that contain cracks or prerecorded ultrasonic data from material or welds that contain cracks prior to performing actual examinations. NMC stated their proposed alternative will also provide an acceptable level of quality and safety.

Paragraph 2.4.1.1.1 in the *Federal Register* (64 FR 51370) dated September 22, 1999, which implemented revisions to 10 CFR 50.55a contained the following statement:

The NRC had determined that this requirement (10 hours of training on an annual basis) was inadequate for two reasons. The first reason was that the training does not require laboratory work and examination of flawed specimens. Signals can be difficult to interpret and as detailed in the regulatory analysis for this rulemaking, experience and studies indicate that the examiner must practice on a frequent basis to maintain the capability for proper interpretation. The second reason is related to the length of training and its frequency. Studies have shown that an examiner's capability begins to diminish within approximately 6 months if skills are not maintained.

The NRC determined that the 10 hours of annual training identified in the ASME Code is not sufficient practice to maintain skills and that the annual ultrasonic training shall be conducted in accordance with 10 CFR 50.55a(b)(2)(xiv). In the revision to 10 CFR 50.55a², 10 CFR 50.55a(b)(2)(xiv), further recognizes the use of analyzing prerecorded data from material or welds that contain cracks for meeting annual training requirements. These provisions apply to those facilities implementing the 1997 addenda through the 2000 addenda of the ASME Code. The NRC staff has reviewed the applicability of applying the provisions from the latest revision

published in the Federal Register (67 FR 60520) on September 26, 2002

to 10 CFR 50.55a to the licensee's code of record and has determined it is acceptable. The Code of Record for the 4th ISI interval at Monticello is the 1995 edition, 1996 addenda of the ASME Code. Therefore, on the basis of the above and pursuant to 10 CFR 50.55a(a)(3)(i), the NRC staff concludes that NMC's proposed alternative will provide an acceptable level of quality and safety.

5.0 CONCLUSION

The NRC staff has reviewed Relief Request Nos. 3 and 6 as requested in NMC's letter of December 6, 2002, and concludes that NMC's proposed alternatives provide an acceptable level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), the NRC staff authorizes NMC to use the proposed alternatives for the fourth 10-year ISI interval at Monticello.

Principal Contributor: E. Reichelt

Date: March 28, 2003