

March 24, 2000

Mr. Guy G. Campbell, Vice President - Nuclear
FirstEnergy Nuclear Operating Company
5501 North State Route 2
Oak Harbor, OH 43449-9760

SUBJECT: DAVIS-BESSE NUCLEAR POWER STATION - SAFETY EVALUATION OF
ALTERNATIVE TO ASME CODE, RELIEF REQUEST RR-A21
(TAC NO. MA8294)

Dear Mr. Campbell:

By letter dated February 27, 2000 (Serial Number 2644), the FirstEnergy Nuclear Operating Company (FENOC) requested relief from the American Society of Mechanical Engineers Boiling and Pressure Vessel Code (Code) requirements for certain ultrasonic testing (UT) qualifications at the Davis-Besse Nuclear Power Station. FENOC has proposed using the qualification tolerance for length sizing from Appendix IV to Code Case (CC) N-622, "Ultrasonic Examination of RPV and Piping and Bolts and Studs, Section XI, Division 1." CC N-622 provides criteria for UT performance-based qualifications of procedures, equipment, and personnel. On the basis of the attached safety evaluation, the staff has determined that the proposed alternative would provide an acceptable level of quality and safety. Pursuant to 10 CFR 50.55a(a)(3)(i), the staff authorizes the use of the proposed alternative.

Sincerely,

/RA/

Anthony J. Mendiola, Chief, Section 2
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-346

Enclosure: Safety Evaluation

cc w/encl: See next page

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**See previous concurrence

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Davis-Besse Nuclear Power Station, Unit 1

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

USE OF ALTERNATIVE TO CERTAIN ULTRASONIC TESTING REQUIREMENTS

DAVIS-BESSE NUCLEAR POWER STATION

FIRSTENERGY NUCLEAR OPERATING COMPANY

DOCKET NO. 50-346

1.0 INTRODUCTION

By letter dated February 27, 2000, the First Energy Nuclear Operating Company, the licensee, requested relief from certain American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code) ultrasonic testing (UT) qualification requirements at Davis-Besse Nuclear Power Station (DBNPS). The licensee proposed using the qualification tolerance for length sizing from Appendix IV, "Qualification Requirements for the Clad-to-Base Metal Interface of Reactor Vessel," to Code Case (CC) N-622, "Ultrasonic Examination of RPV and Piping and Bolts and Studs, Section XI, Division 1," as an alternative to the Code. Code Case N-622 provides criteria for UT performance-based qualifications of procedures, equipment, and personnel.

2.0 BACKGROUND

10 CFR 50.55a(g)(4) states that ASME Code Class 1, 2, and 3 components (including supports) must meet the requirements, except design and access provisions and preservice examination requirements, set forth in Section XI of editions of the Code and addenda that become effective subsequent to the editions specified in paragraphs (g)(2) and (g)(3) of that section and that are incorporated by reference in paragraph (b) of that section, to the extent practical within the limitations of design, geometry and materials of construction of the components.

10 CFR 50.55a(a)(3) states that alternatives to the requirements of 10 CFR 50.55a(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 of this section would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

2.1 Code Requirements

10 CFR 50.55a(b)(2) was amended to reference Section XI of the Code through the 1995 Edition with the 1996 Addenda (64 FR 51370).

Enclosure

As amended, 10 CFR 50.55a(b)(2)(xv)(C)(1) requires a depth sizing acceptance criterion of 0.15 inch root mean square (RMS) be used in lieu of the requirements of Subparagraph 3.2(b) to Supplement 4 to Appendix VIII of Section XI of the 1995 Edition with 1996 Addenda of Code.

2.2 Basis for Alternative

On January 12, 2000, NRC staff, representatives from the Electric Power Research Institute (EPRI) Nondestructive Examination Center, and representatives from the Performance Demonstration Initiative (PDI) participated in a conference call. The discussion during the conference call included the differences between Supplement 4, "Qualification Requirements for the Clad/Base Metal Interface of Reactor Vessel," to Appendix VIII, "Performance Demonstration for Ultrasonic Examination Systems," Paragraph 10 CFR 50.55a(b)(2)(xv)(C)(1) in the rule (*Federal Register*, 64 FR 51370), and the implementation of Supplement 4 by the PDI program. Supplement 4, Subparagraph 3.2(b) imposed a flaw sizing tolerance of $-\frac{1}{4}$ inch, +1.0 inch of true length to the performance demonstration qualification criteria. The rule changed Subparagraph 3.2(b) to a depth sizing requirement of 0.15 inch RMS, and the PDI program uses a length sizing tolerance of 0.75 inch RMS for Subparagraph 3.2(b). The NRC staff acknowledged that Paragraph 10 CFR 50.55a(b)(2)(xv)(C)(1) in the rule was an error and should actually be a length sizing tolerance of 0.75 inch RMS, the same tolerance that was being implemented by the PDI program.

3.0 EVALUATION

3.1 Proposed Alternative Examination

The licensee proposed that the staff accept implementation of a change in Subparagraph 3.2(b) to Supplement 4 of Appendix VIII to a flaw length sizing tolerance of 0.75 inch RMS as estimated by UT.

3.2 Discussion

The U.S. nuclear utilities created the PDI to implement demonstration requirements contained in Appendix VIII. PDI developed a performance demonstration program for qualifying UT techniques. In 1995, the NRC staff performed an assessment of the PDI program and reported that PDI was using a length sizing tolerance of 0.75 inch RMS for reactor pressure vessel performance demonstrations. This criterion was introduced to reduce testmanship (passing the test based on manipulation of results rather than skill). The staff noted in the assessment report dated March 6, 1996, that the length sizing tolerance was not according to Appendix VIII but did not take exception to PDI's implementation of the 0.75 inch RMS length sizing tolerance. The staff requested that the length sizing difference between PDI and the Code be resolved.

The solution for resolving the differences between the PDI program and Code was for PDI to participate in the development of a code case that reflected PDI's program. The code case was presented to ASME for discussion and consensus building. NRC representatives participated in this process. ASME approved the code case and published it as Code Case N-622, "Ultrasonic Examination of RPV and Piping and Bolts and Stubs, Section XI, Division 1."

Subsequently, Florida Power and Light Company (FPL) submitted a request to use selected paragraphs and supplements from Code Case N-622 (Reference 1). The staff approved FPL's request which included the 0.75 inch RMS length sizing tolerance in Supplement 4, "Qualification Requirements for the Clad to Base-Metal Interface of Reactor Vessel," of Code Case N-622 (Reference 2)¹.

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. In a conference call on January 12, 2000, PDI identified the omission of the length sizing tolerance in Paragraph 10 CFR 50.55a(b)(2)(xv)(C)(1) of the rule. The staff agreed that the omission of the length sizing tolerance 0.75 inch RMS in the rule was an oversight, and the inclusion of depth sizing tolerance to Paragraph 3.2(b) of Supplement 4 to Appendix VIII was an error. The staff will correct the error in an upcoming rule. Based on the above discussion, the staff believes that the proposed alternative to use a length sizing tolerance of 0.75 inch RMS in lieu of the requirements in Subparagraph 3.2(b) of Supplement 4 to Appendix VIII of the Code will provide an acceptable level of quality and safety.

4.0 CONCLUSION

Based on the above discussion, the staff believes that the proposed alternative to use a length sizing tolerance of 0.75 inch RMS in lieu of the requirements in Subparagraph 3.2(b) to Supplement 4 to Appendix VIII of the Code will provide an acceptable level of quality and safety. Pursuant to 10 CFR 50.55a(a)(3)(i), the proposed alternative is authorized.

Principal Contributor: Donald Naujock, NRR

Date: March 24, 2000

5.0 REFERENCES

1. Letter to U.S. Nuclear Regulatory Commission, from J. A. Stall, Florida Power and Light Company, dated February 18, 1999.
2. Letter to T. F. Plunkett, Florida Power and Light Company, from S. Peterson, U. S. Nuclear Regulatory Commission, dated September 23, 1999.

¹ Note: FPL used Supplement 4 in their submittal of Code Case N-622. In the ASME published version of Code Case N-622, Supplement 4 is identified as Appendix IV.