

November 14, 2000
NG-00-1822

Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Mail Station 0-P1-17
Washington, DC 20555-0001

Subject: Duane Arnold Energy Center
Docket No: 50-331
Op. License No: DPR-49
Inservice Inspection (ISI) Program Revised Relief Requests
NDE-R037, NDE-R038, NDE-R039 and NDE-R040
Reference: NG-00-0648, dated April 14, 2000, letter from
K. Peveler (IES Utilities) to NRC; ISI Relief Requests
NDE-R037, NDE-R038, NDE-R039 and NDE-R040
File: A-100, A-286

The referenced letter submitted Duane Arnold Energy Center (DAEC) inservice inspection (ISI) relief requests NDE-R037, NDE-R038, NDE-R039 and NDE-R040 for the Staff's review. These relief requests were developed using guidance contained in the draft version of the Electric Power Research Institute (EPRI) Performance Demonstration Initiative (PDI) ASME Section XI, Appendix VIII Implementation Guideline. Since that time, several minor changes to the Implementation Guideline and the associated sample requests for relief have been made. Also, on October 11, 2000, in a public meeting between PDI and NRC, a discrepancy between the PDI program and Subparagraph 3.2(c) of Supplement 4 to Appendix VIII was identified. Nuclear Management Company, LLC (NMC) has therefore revised relief requests NDE-R037 and NDE-R038 to resolve this discrepancy and to reflect the latest EPRI guidance. Revised relief requests NDE-R037 and NDE-R038 are attached. Revised relief request NDE-R037 is consistent with relief granted to Edwin I. Hatch Nuclear Plant on September 14, 2000. Revised relief request NDE-R038 is similar to relief granted to Indian Point Unit 2 on October 27, 2000.

The referenced letter, which was submitted on April 14, 2000, also requested authorization to use the alternative requirements of Code Case N-613 (NDE-R039). Since then, the Staff has indicated that authorization for licensees to use Code Case N-613 is not currently justified. NMC therefore withdraws relief request NDE-R039.

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NMC has also reevaluated the need for approval of Relief Request NDE-R040. The only requirements of the Rule are for the implementation of the ASME Section XI Appendix VIII Supplements in accordance with the expedited implementation schedule. The requirements associated with the qualification and certification of NDE personnel remain the same as those included in the DAEC's ASME Section XI Code of Record (1989 Edition). Therefore, Relief Request NDE-R040 is not needed and is hereby withdrawn.

NMC requests approval of revised requests NDE-R037 and NDE-R038 prior to February 15, 2001 to support the DAEC's upcoming Spring refueling outage. Should you have any questions regarding this matter, please contact this office.

Sincerely,



Kenneth E. Peveler
Manager, Regulatory Performance

Attachment

cc: G. Park (w/a)
C. Rushworth (w/a)
M. Wadley (w/o)
G. Van Middlesworth (w/o)
B. Mozafari (NRC-NRR) (w/a)
J. Dyer (Region III) (w/a)
NRC Resident Office (w/a)
Docu (w/a)

ALTERNATIVE TESTING NUMBER: NDE-R037

SYSTEM/COMPONENT(S) FOR WHICH ALTERNATIVE EXAMINATION WILL BE USED

Code Class: Class 1
Reference: ASME, Section XI, Tables IWB-2500-1
(1995 Edition with the 1996 Addenda)
Examination Category: B-A
Item Number: B1.11, B1.12, B1.21, B1.22, B1.51
Description: Alternative Requirement to Appendix VIII, Supplement 4
"Qualification Requirements for the Clad/Base Metal Interface of
Reactor Vessel"
Component Numbers: All

CODE REQUIREMENT

10CFR50.55a(b)(2) was amended to reference Section XI of the Code through the 1995 Edition with the 1996 Addenda (64 FR 51370). 10CFR50.55a provides an implementation schedule for the supplements to Appendix VIII of Section XI (1995 Edition with the 1996 Addenda).

Section XI, 1995 Edition, 1996 Addenda, Appendix VIII, Supplement 4, Subparagraph 3.2(b) requires "flaw lengths estimated by ultrasonics be the true length $-\frac{1}{4}$ inch +1 inch."

As amended, 10CFR50.55a(b)(2)(xv)(C)(1) requires a depth sizing acceptance criteria of 0.15 inch root mean square (RMS) be used in lieu of the requirements of Subparagraphs 3.2(a) and 3.2(b) to Supplement 4 to Appendix VIII. Subparagraph 3.2(c) contains additional requirements for statistical parameters.

BASIS FOR ALTERNATIVE EXAMINATION

10CFR 50.55a, as amended by Federal Register Notice (64 FR 51370) dated September 22, 1999, requires the implementation of the ASME Code Section XI, Appendix VIII, Supplement 4, 1995 Edition with the 1996 Addenda. The required implementation date for Supplement 4 is November 22, 2000.

10CFR50.55a(b)(2)(xv)(C)(1), as amended by Federal Register Notice, (64 FR 51370) dated September 22, 1999, requires that when applying Appendix VIII, Supplement 4, a depth sizing acceptance criterion of 0.15 inch Root Mean Square Error (RMSE) be used in lieu of the requirements of Subparagraph 3.2(a) and 3.2(b) of the 1995 Edition, 1996 Addenda of ASME BPV Code Section XI, Appendix VIII. This depth sizing criterion of 0.15 inch RMS is appropriate to Subparagraph 3.2(a), but is not appropriate to Subparagraph 3.2(b) because Subparagraph 3.2(b) addresses length sizing, not depth sizing.

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 difference 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, $+1$ inch of the true length to the performance demonstration qualification criteria. The rule changed Subparagraph 3.2(b) to a depth sizing requirement of 0.15 inch Root Mean Square (RMS), and the PDI program uses a length sizing tolerance of 0.75 inch RMS for paragraph 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.

In a public meeting on October 11, 2000 at NRC offices in White Flint, MD, the PDI identified the discrepancy between Subparagraph 3.2(c) and the PDI program. The NRC agrees that Paragraph 10 CFR 50.55a(b)(2)(xv)(C)(1) should have excluded Subparagraph 3.2(c) as a requirement.

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 the 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, Bolts and Studs, Section XI, Division 1." The NRC 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. The Staff agrees 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. The Staff will correct the error in an upcoming rule.

ALTERNATIVE EXAMINATION

Pursuant to 10CFR50.55a(a)(3)(i), relief is requested to use a length sizing qualification criteria of 0.75 inch Root Mean Square Error (RMSE) in lieu of Subparagraph 3.2(b), and to use the RMSE calculations of 3.2(a) and 3.2(b) in lieu of the statistical parameters of 3.2(c).

In lieu of the length sizing requirements of Supplement 4 Subparagraph 3.2(b) of the 1995 Edition 1996 Addenda of ASME Section XI Appendix VIII, a length sizing qualification criteria of 0.75 inch RMSE will be used. The RMSE calculation will be used in lieu of Subparagraph 3.2(c). As discussed above and demonstrated by the PDI, this will provide an acceptable level of quality and safety.

IMPLEMENTATION SCHEDULE

Alternative is requested for the third ten-year interval of the Inservice Inspection Program for DAEC.

ALTERNATIVE TESTING NUMBER: NDE-R038

SYSTEM/COMPONENT(S) FOR WHICH ALTERNATIVE EXAMINATION WILL BE USED

Code Class: All
Reference: ASME, Section XI, Appendix VII, VII-4240
(1989 Edition)
Examination Category: All
Item Number: All
Description: Alternative Requirements to VII-4240 "Annual Training"
Component Numbers: All

CODE REQUIREMENT

Appendix VII "Qualification of Nondestructive Examination Personnel for Ultrasonic Examination", paragraph VII-4240 requires supplemental training on an annual basis. The training is required to impart knowledge of new developments, material failure modes, and any pertinent technical topics as determined by the Employer. The extent of the training shall be a minimum of 10 hours per year. A record of attendance and topics covered shall be maintained.

10CFR50.55a(b)(2)(xiv) requires that all personnel qualified for performing ultrasonic examinations in accordance with Appendix VIII shall 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.

BASIS FOR ALTERNATIVE EXAMINATION

10CFR50.55a was amended in the Federal Register (Volume 64, No. 183 dated September 22, 1999) to include the 1995 Edition, with the 1996 Addenda of Section XI. This also imposed additional personnel qualification requirements for all personnel qualified for performing ultrasonic examinations.

10CFR50.55a(b)(2)(xiv) *Appendix VIII personnel qualification* requires that all personnel qualified for performing ultrasonic examinations in accordance with Appendix VIII shall 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 the DAEC.

The current code of record (1989 Edition) for the DAEC includes Appendix VII which requires under VII-4240 supplemental training on an annual basis. The extent of this training shall be a minimum of 10 hours per year.

Paragraph 2.4.1.1.1 in the Federal Register 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. Thus, the NRC had determined that 10 hours of annual training is not sufficient practice to maintain skills, and that an examiner must practice on a more frequent basis to maintain proper skill level...”

The PDI program has adopted a requirement for 8 hours of training, but it is required to be hands-on practice. In addition, the training must be taken no earlier than 6 months prior to performing examinations at a licensee’s facility. The DAEC believes that 8 hours will be acceptable relative to an examiner’s abilities in this highly specialized skill area because personnel can gain knowledge of new developments, material failure modes, and other pertinent technical topics through other means. The NRC has decided to adopt in the Final Rule the PDI position on this matter. These changes are reflected in 10CFR50.55a(b)(2)(xiv).

Implementation of the requirements contained in ASME Section XI and the Final Rule will result in redundant systems. The use of the Final Rule requirements in lieu of additional requirements will simplify record keeping, satisfy needs for maintaining skills, and provide an acceptable level of quality and safety.

ALTERNATIVE EXAMINATION

Pursuant to 10CFR50.55a(a)(3)(i), the DAEC requests approval to use the requirements of the Final Rule in lieu of those found in ASME Section XI Appendix VII-4240. Annual ultrasonic training shall be conducted in accordance with 10CFR50.55a(b)(2)(xiv) in lieu of Section XI, Appendix VII, Paragraph VII-4240. These requirements will be completed no earlier than 6 months prior to performing ultrasonic examinations at the DAEC.

IMPLEMENTATION SCHEDULE

Alternative is requested for the third ten-year interval of the Inservice Inspection Program for DAEC.