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April 14, 2000
NG-00-0648

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

Subject: Duane Arnold Energy Center
Docket No: 50-331
Op. License No: DPR-49
Inservice Inspection Program
NDE-037, NDE-038, NDE-039 and NDE-040

File: A-100, A-286

By Federal Register Notice (64FR51370) dated September 22, 1999, the NRC amended 10CFR50.55a to require licensees to implement performance demonstration methods for ultrasonic examination systems. Licensees are required to implement either Appendix VIII, "Performance Demonstration for Ultrasonic Examination Systems," to Section XI, 1995 Edition with the 1996 Addenda, or Appendix VIII as executed by Performance Demonstration Initiative (PDI). Section 50.55a(g)(6)(ii)(C) of the final rule incorporates a phased implementation of Appendix VIII over a three-year period, requiring implementation of Supplement 4 by November 22, 2000.

During discussions held on January 12, 2000, between the NRC Staff, PDI and representatives from the Electric Power Research Institute (EPRI), it was identified that the length sizing used in the PDI qualification process for Supplement 4 had not been appropriately included in the amended rule. Accordingly, as discussed in NDE-037 (attached), IES Utilities requests relief from the inappropriate sizing requirement in accordance with 10CFR50.55a(a)(3)(i). Similar relief has recently been granted for the Davis-Besse Nuclear Power Station (Docket Number 50-346) by an NRC Safety Evaluation dated March 24, 2000.

10CFR50.55a(a)(3)(i) states that proposed alternatives may be used when authorized by the Director of the Office of Nuclear Reactor Regulation provided that the proposed alternatives provide an acceptable level of quality and safety. IES Utilities requests NRC authorization to use the alternative requirements of Code Case N-583 in lieu of those specified in ASME Section XI, Appendix VII-4240 (1989 Edition). As discussed in NDE-038 (attached), the requirements of this code case parallel those of amended Section 50.55a (b)(2)(xiv) regarding personnel qualification, and thereby provide an acceptable level of quality and safety.

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Pursuant to 10CFR50.55a(a)(3)(i), IES Utilities also requests authorization to use the alternative requirements of Code Case N-613. This code case reduces the volume adjacent to certain welds that must be examined with ultrasonic techniques. As discussed in NDE-R039 (attached), use of this code case will provide an acceptable level of quality and safety, while reducing personnel radiation exposure. Code Case N-613 was approved for use at the St. Lucie Plant, Unit 2, by letter dated October 4, 1999.

The implementation of Appendix VIII, 1995 Edition with 1996 Addenda, would require the development of a written practice for personnel qualifications based on ANSI/ASNT CP-189. As discussed in NDE-040 (attached), the DAEC currently has a written practice for the DAEC's inservice inspection (ISI) program, as well as for the IWE program, based on SNT-TC-1A. The NRC approved relief request MC-R001 to allow the use of SNT-TC-1A for the DAEC's IWE Program. The development of a written practice based on CP-189 for Appendix VIII implementation would duplicate efforts already in place for the ISI and IWE programs. Pursuant to 10CFR50.55a(a)(3)(ii), IES Utilities Inc requests approval of NDE-040.

IES Utilities requests approval of these requests prior to November 1, 2000. Should you have any questions regarding this matter, please contact this office.

Sincerely,

A handwritten signature in black ink, appearing to read "Kenneth E. Peveler", with a small "AES" mark to the right.

Kenneth E. Peveler
Manager, Regulatory Performance

Attachment

cc: G. Park (w/a)
C. Rushworth (w/a)
E. Protsch (w/o)
G. VanMiddlesworth (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
(1989 Edition)
Examination Category: B-A, B-D
Item Number: B1.11, B1.12, B1.21, B1.22, B1.30, B1.40, B1.51, B3.90, and
B3.100
Description: Alternative Requirement to Appendix VIII, Supplement 4
“Qualification Requirements for the Clad/Base Metal Interface of
Reactor Vessel”
Component Numbers: All

CODE REQUIREMENT

Section XI (1989 Edition), IWA-2232 states “Ultrasonic examination shall be conducted in accordance with Appendix I.”

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 $-1/4$ inch $+1$ inch.”

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, Supplements 4 and 6, 1995 Edition with the 1996 Addenda. The required implementation date for Supplements 4 and 6 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 (RMS) 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.

Qualifications administered by the Performance Demonstration Initiative (PDI) have used a length sizing acceptance criteria of 0.75 inch RMS since the inception of these demonstrations in 1994. This length sizing tolerance is included in ASME Code Case N-622. The NRC has approved the use of Code Case N-622 for Florida Power and Light Company's St. Lucie Plant Unit 2 (TAC No. MA5041).

Furthermore, the NRC Staff has documented their assessment of the PDI program in their report (No. 999 01288/95-01) dated March 6, 1996 (TAC Number M98046). Table 2 of this report stated that the NRC assessment team reviewed and did not take exception to the PDI position to change the Appendix VIII, Supplement 4 length tolerance to 0.75 inch RMS.

Conversations between NRC Staff and representatives from PDI were held on January 12, 2000. In this conversation it was acknowledged that the 0.75 inch RMS length sizing criteria should have been addressed in the modifications provided for Supplement 4 to Appendix VIII in 10CFR50.55a(b)(2)(xv)(C). It was also stated that this would be corrected in future revisions.

ALTERNATIVE EXAMINATION

Pursuant to 10CFR50.55a(a)(3)(i), the DAEC requests to use the alternative requirements for length sizing in lieu of those found in ASME Section XI (1995 Edition with the 1996 Addenda). 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 acceptance criteria of 0.75 inch RMS will be used. As discussed above and demonstrated by the PDI, the use of a 0.75 inch RMS length sizing criterion 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.

BASIS FOR ALTERNATIVE EXAMINATION

Code Case N-583 provides an alternative to Appendix VII-4240. The alternative is Personnel shall practice UT techniques by examining or by analyzing prerecorded data from material or welds containing flaws similar to those that may be encountered during inservice inspection examinations. This practice shall be at least 8 hours per year and shall be administered by an NDE Instructor or Level III with no examination required. The DAEC feels that a hands-on training forum is a better way of providing annual practical training than being exposed to new techniques or developments in ultrasonic examination by reading reports, articles, or given presentations. Code Case N-583 matches the requirements specified in 10CFR50.55a and was incorporated in the Code in the 1999 Addenda.

10CFR50.55a(b)(2)(xiv) *Appendix VIII personnel qualification* requires 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.

ALTERNATIVE EXAMINATION

Pursuant to 10CFR50.55a(a)(3)(i), the DAEC requests to use the alternative requirements of Code Case N-583 in lieu of those found in ASME Section XI Appendix VII-4240 (1989 Edition). The requirements set forth in Code Case N-583 will be completed no earlier than 6 months prior to performing ultrasonic examinations at the DAEC. This parallels the requirements set forth in 10CFR50.55a.

IMPLEMENTATION SCHEDULE

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

ALTERNATIVE TESTING NUMBER: NDE-R039

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

Code Class: 1
Reference: ASME, Section XI, IWB-2500-1
(1989 Edition)
Examination Category: B-D
Item Number: B3.90
Description: Alternative Requirements to examination volumes are shown in
Figures IWB-2500-7(b)
Component Numbers: All

CODE REQUIREMENT

IWB-2500-1, (1989 Edition) Category B-D, "Full Penetration Welds of Nozzles in Vessels" requires the examination to be performed to cover the volumes specified in Figures IWB-2500-7(a) through (d).

ASME Section V, 1989 Edition, Article 4, paragraphs; T-441.3.2.5 "Angle Beam Scanning", T-441.3.2.6 "Scanning for Reflectors Oriented Parallel to the Weld", and T-441.3.2.7 "Scanning for Reflectors Oriented Transverse to the Weld".

BASIS FOR ALTERNATIVE EXAMINATION

The DAEC is currently required to perform Inservice Examinations of selected welds in accordance with the requirements of the 1989 Edition of ASME Section XI. This Code edition invokes the examination volume requirements of Figure IWB-2500-7(b). This Code edition also invokes the examination requirements of Appendix I, Article I-2000 that references ASME Section V, Article 4 that essentially prescribes twenty (20) year old examination methodology. The DAEC will perform the required examinations using the methodology of Appendix VIII (1995 Edition 1996 Addenda as modified by 10CFR50.55a) including the alternative as presented in Relief Request NDE-R037. This will provide added assurance that the Reactor Nozzle to Vessel Welds have remained free of service related flaws thus enhancing quality and ensuring plant safety and reliability.

The examination volume for the Reactor Nozzle to Vessel Welds extends far beyond the weld into the base metal, and is unnecessarily large. This extends the examination time significantly and results in no net increase in safety as the area being examined is a base metal region which is not prone to in-service cracking and has been extensively examined before the vessel was put into service and during the preservice inspection.

The implementation of Code Case (CC) N-613 is also expected to reduce on-vessel examination time which translates to significant cost savings and reduced personnel radiation exposure.

The UT technique used on the Reactor Nozzle to Vessel Welds (under CC N-613) will be qualified under PDI.

CC N-613 reduces the examination volume next to the widest part of the weld from half of the vessel wall thickness to one-half (1/2) inch. This removes examination from the base metal that was extensively examined during construction and preservice inspection and is not in the high residual stress region associated with the weld. Cracks, should they initiate, occur in the high-stressed areas of the weld. These high-stressed areas are contained in the volume that is defined by CC N-613 and are subject to examination. Axial inner radius thermal cracks, should they occur, would also be detected because they would pass through the examination area defined by CC N-613. CC N-613 also de-emphasizes the requirement to detect flaws perpendicular to the weld-base metal interface, on the grounds that they never occur as a result of the welding process. The likelihood of inservice cracking with this orientation in these regions is very low, having never been observed.

ALTERNATIVE EXAMINATION

Pursuant to 10CFR50.55a(a)(3)(i), the DAEC requests to use the alternative requirements of Code Case N-613 in lieu of those specified in ASME Section XI (1989 Edition). This includes the reference to ASME Section V for scanning requirements. Periodic system pressure tests will be performed in accordance with Category B-P, Table IWB-2500-1.

IMPLEMENTATION SCHEDULE

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

RELIEF REQUEST NUMBER: NDE-R040

SYSTEM/COMPONENT(S) FOR WHICH RELIEF REQUEST WILL BE USED

Code Class: All
Reference: ASME, Section XI, Appendix VIII, VIII-2200
(1995 Edition with the 1996 Addenda)
Examination Category: All
Item Number: All
Description: Alternative Requirements to VIII-2200 "Personnel
Requirements"
Component Numbers: All

CODE REQUIREMENT

10CFR50.55a(g)(ii)(C), dated September 22, 1999, provides an implementation schedule for the supplements to Appendix VIII of Section XI (1995 Edition with the 1996 Addenda).

Appendix VIII (1995 Edition, 1996 Addenda), VIII-2200 "Personnel Requirements" states "Personnel shall meet the requirements of Appendix VII and shall be qualified in accordance with VIII-3000"

Appendix VII-1000 (1995 Edition, 1996 Addenda) specifies personnel qualifications in accordance with IWA-2300 that references the use of ANSI/ASNT CP-189 for the development of a written practice.

BASIS FOR RELIEF REQUEST

10CFR50.55a was amended by Federal Register Notice (64 FR 51370) dated September 22, 1999 to require implementation of Appendix VIII on an accelerated schedule. This means that all associated requirements would require implementation on the same schedule.

The DAEC's Inservice Inspection Program and IWE Program currently have a written practice based on SNT-TC-1A as amended by the requirements of Subarticle IWA-2300 of the 1989 Edition of ASME Section XI. The NRC approved relief Request MC-R001 on April 16, 1998 to allow the use of SNT-TC-1A for the IWE Program. Appendix VII (1989 Edition), has been incorporated into the DAEC written practice and is based on SNT-TC-1A.

A written practice based on the requirements of CP-189, as amended by the requirements of Subarticle IWA-2300, to implement Appendix VIII duplicates efforts already in place for the ISI and IWE Programs. In addition, Subarticle IWA-2300 of the 1995 Edition, 1996 Addenda, states "Certification based on SNT-TC-1A are valid until recertification is required".

Development and administration of a second qualification and certification program would not enhance safety or quality and would serve as a burden, particularly in developing a second written practice, tracking of certifications, and duplication of paperwork.

The basis for a written practice is to establish a criteria/guidelines for the qualification and certification of nondestructive testing personnel. The scope of SNT-TC-1A states "This Recommended Practice has been prepared to establish guidelines for the qualification and certification of nondestructive testing personnel whose specific jobs require appropriate knowledge of the technical principles underlying the nondestructive test they perform, witness, monitor, or evaluate". The scope of CP-189 states "This standard establishes the minimum requirements for the qualification and certification of nondestructive testing (NDT) personnel".

Both SNT-TC-1A and CP-189 when implemented provide criteria for qualification and certification of individuals performing NDT based on education, training, and testing. In addition to the criteria set up in the written practice, regardless of whether SNT-TC-1A or CP-189 is used, personnel performing ultrasonic examinations shall also meet the requirements specified in 10CFR50.55a, as amended by 64 FR 51370, which sets forth the requirements for the qualification of personnel by demonstration. The combination of a written practice based on SNT-TC-1A and a performance based demonstration for personnel performing ultrasonic examination of welds or components will continue to ensure the structural integrity of the systems/components examined under the DAEC Inservice Inspection Program.

Relief is requested in accordance with 10CFR50.55a(a)(3)(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 or safety.

ALTERNATIVE EXAMINATION

Examinations required by Appendix VIII under the accelerated schedule specified in 10CFR50.55a shall be conducted by personnel qualified and certified to a written practice based on SNT-TC-1A to the current Section XI code of record for Subsections IWB, IWC, etc.

IMPLEMENTATION SCHEDULE

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