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AEP:NRC:6055-21
10 CFR 50.55a

Docket No.: 50-316

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Stop O-P1-17
Washington, DC 20555-0001

Donald C. Cook Nuclear Plant Unit 2
PROPOSED ALTERNATIVE TO THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS CODE, SECTION XI SUPPLEMENTAL INFORMATION (TAC No. MC9305)

References:
1. Letter from Joseph N. Jensen, Indiana Michigan Power Company (I&M), to Nuclear Regulatory Commission (NRC) Document Control Desk, "Donald C. Cook Nuclear Plant Unit 2, Proposed Alternative to the American Society of Mechanical Engineers Code, Section XI Repair Requirements, Request for Additional Information," AEP:NRC:6055, Accession Number ML060620063, dated March 1, 2006.

2. Electronic Transmission from Peter. S. Tam, NRC, to Michael K. Scarpello, I&M, "D. C. Cook – Information Needed to Close Review on Preemptive Weld Overlay (TAC MC9305)," Accession Number ML063190130, dated November 14, 2006.

In Reference 1, Indiana Michigan Power Company (I&M) requested relief from the provisions of the American Society of Mechanical Engineers (ASME) Code, Section XI in order to apply preemptive weld overlays on the Unit 2 pressurizer piping dissimilar metal welds. As part of the relief request, I&M proposed performing an ultrasonic examination (UT) of an area that extended beyond the weld overlay by 1.5 times the wall thickness of the pressurizer nozzle (1.5T band) to the extent practical. This proposal was made because the configuration of the area covered by the weld overlays prevented a 100 percent UT of the 1.5T band required by Code Case N-638-1. In a March 21, 2006, telephone conversation, I&M informed the Nuclear Regulatory Commission (NRC) that I&M was having difficulty in obtaining a calibration block that met the requirements of ASME SA-388, "Recommended Practice for Ultrasonic Testing and Inspection of Heavy Steel Forgings," and I&M agreed to perform a "best effort" examination. In Reference 2, the NRC requested additional information regarding the calibration block used during the UT examination of 1.5T bands. The requested information is provided in the attachment to this letter.

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This letter contains no new commitments. Should you have any questions, please contact Ms. Susan D. Simpson, Regulatory Affairs Manager, at (269) 466-2428.

Sincerely,

Joseph N. Jensen
Site Support Services Vice President

RV/rdw

Attachment

c: R. Aben – Department of Labor and Economic Growth
J. L. Caldwell – NRC Region III
K. D. Curry – AEP Ft. Wayne
J. T. King – MPSC
MDEQ – WHMD/RPMWS
NRC Resident Inspector
P.S. Tam – NRC Washington, DC

Attachment to AEP:NRC:6055-21

Preemptive Weld Overlay Ultrasonic Examinations
Supplemental Information

In Reference 1, Indiana Michigan Power Company (I&M) requested relief from the provisions of the American Society of Mechanical Engineers (ASME) Code, Section XI in order to apply preemptive weld overlays on the Unit 2 pressurizer piping dissimilar metal welds. As part of the relief request, I&M proposed performing an ultrasonic examination (UT) of an area that extended beyond the weld overlay by 1.5 times the wall thickness of the pressurizer nozzle (1.5T band) to the extent practical. This proposal was made because the configuration of the area covered by the weld overlays prevented a 100 percent UT of the 1.5T band required by Code Case N-638-1. In a March 21, 2006, telephone conversation, I&M informed the Nuclear Regulatory Commission (NRC) that I&M was having difficulty in obtaining a calibration block that met the requirements of ASME SA-388, "Recommended Practice for Ultrasonic Testing and Inspection of Heavy Steel Forgings," and I&M agreed to perform a "best effort" examination. In Reference 2, the NRC requested additional information regarding the calibration block used during the UT examination of 1.5T bands. The following provides the requested information.

NRC Request

Provide "a written summary of the procedure used to generate the acoustic comparison results [between the calibration block material and the pressurizer nozzle material] listed in the table that was provided to the NRC on August 31, 2006 [Table 1 of this attachment], and a justification that the results satisfy the requirements of [ASME] SA-388."

I&M Response

The Unit 2 pressurizer material is ASME SA-508. The calibration block used to perform the UT of the 1.5T band was fabricated from ASME SA-216 material.

A comparison was made between calibration blocks fabricated of ASME SA-216 material (calibration block MP-20) and ASME SA-508 material (calibration block RV-3). Both calibration blocks contained a 0.5 thickness (0.5T) side-drilled hole (SDH) and a 0.75T SDH. The following describes the comparison process.

Zero-Degree Transducer

The zero degree transducer instrumentation was adjusted to obtain a signal amplitude equal to 80 percent (%) of full screen for the MP-20, 0.5T SDH, and the response of the MP-20, 0.75T SDH obtained.

The MP-20 gain setting required to obtain an 80% of full screen response was 26 decibels (dB). The response from the 0.75T SDH was 50% of full screen at a 26 dB gain setting.

The responses of RV-3 signal amplitudes at a 26 dB gain setting were obtained. These were 70% of full screen for the 0.5T SDH and 25% of full screen for the 0.75T SDH.

Forty Five-Degree Transducer

The forty five-degree transducer instrumentation was adjusted to obtain a signal amplitude equal to 80% of full screen for both the MP-20, 0.5T SDH and the RV-3, 0.5T SDH. The responses of the 0.75T SDHs were then obtained.

The MP-20, 0.5T SDH gain setting for a signal amplitude equal to 80% of full screen was 50 dB. The 0.75T signal amplitude at a 50 dB gain setting was 36% of full screen.

The RV-3, 0.5T SDH gain setting for a signal amplitude equal to 80% of full screen was 44 dB. The 0.75T SDH signal amplitude at a gain setting 44 dB was 50% of full screen.

Sixty-Degree Transducer

The sixty-degree transducer instrumentation was adjusted to obtain a signal amplitude equal to 80% of full screen for both MP-20, 0.5T SDH and RV-3, 0.5T SDH. The responses of the 0.75T SDHs were then obtained.

The MP-20, 0.5T SDH gain setting for a signal amplitude equal to 80% of full screen was 55 dB. The 0.75T SDH signal amplitude at a gain setting of 55 dB was 50% of full screen.

The RV-3 gain setting to obtain a signal amplitude equal to 80% of full screen was 53 dB. The 0.75 T SDH signal amplitude at a gain setting of 53 dB was 58% of full screen.

The calibration requirements of ASME SA-388 require that the calibration standard have the same nominal composition, heat treatment and thickness as the forging that it represents. In the case of I&M's application, the calibration block used for the examination was fabricated from a different material than the pressurizer nozzle forging. However, the data obtained from UT scans of blocks fabricated from ASME SA-216 material (the calibration block material) and from ASME SA-508 material (the nozzle forging material) are similar. Based on the above, the materials are considered acoustically similar for the purpose of the examinations performed. It is I&M's opinion that an examination performed on ASME SA-508 using a calibration developed from ASME SA-216 material is more conservative than an examination performed using a calibration developed from ASME SA-508 material.

References:

1. Letter from Joseph N. Jensen, I&M, to NRC Document Control Desk, "Donald C. Cook Nuclear Plant Unit 2, Proposed Alternative to the American Society of Mechanical Engineers Code, Section XI Repair Requirements, Request for Additional Information," AEP:NRC:6055, Accession Number ML060620063, dated March 1, 2006.

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# TABLE 1
# ULTRASONIC COMPARISON BETWEEN SA-216 and SA-508

| TRANSDUCER ANGLE | CAL BLOCK REFLECTOR | SA-216 BLOCK - MP-20 | | | SA-508 BLOCK - RV-3 | | |
|---|---|---|---|---|---|---|---|
| | | Angle in Material | Sweep Position | Reflector Amplitude | Angle in Material | Sweep Position | Reflector Amplitude |
| 0 Degree | 0.5T SDH (2.5 inches (") Deep) | 0° | 2.30 | 80% @ 26dB | 0° | 2.38 | 70%@ 26dB |
| 0 Degree | 0.75T SDH (3.375" Deep) | 0° | 3.55 | 50%@ 26dB | 0° | 3.70 | 25%@ 26dB |
| 45 Degree | 0.5T SDH (2.5" Deep) | 45° | 3.30 | 80%@ 50dB | 45° | 3.50 | 80%@ 44dB |
| 45 Degree | 0.75T SDH (3.375" Deep) | 45° | 5.30 | 36%@ 50dB | 45° | 5.40 | 50%@ 44dB |
| 60 Degree | 0.5T SDH (2.5" Deep) | 60° | 4.80 | 80%@ 55dB | 60° | 5.60 | 80%@ 53dB |
| 60 Degree | 0.75T SDH (3.375" Deep) | 60° | 7.20 | 50%@ 55dB | 60° | 7.60 | 58%@ 53dB |

**Notes:**

1. The selection of reflectors and transducer angles for this comparison are similar to those used for the examination of the 1.5T band.

2. Based on the above, the materials are considered acoustically similar for the purpose of the examinations performed and no further examination is required.