



**Indiana Michigan
Power Company**
Nuclear Generation Group
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October 7, 2008

AEP-NRC-2008-4
10 CFR 50.55a

Docket No. 50-315

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

SUBJECT: Donald C. Cook Nuclear Plant Unit 1
Relief Requests for Reactor Vessel Shell-to-Flange, and Nozzle to Safe-end Weld
Examination

Dear Sir or Madam:

Pursuant to 10 CFR 50.55a(a)(3)(i), Indiana Michigan Power Company (I&M), the licensee for Donald C. Cook Nuclear Plant Unit 1, hereby requests Nuclear Regulatory Commission approval of the following requests for the third ten-year interval inservice inspection testing program:

Relief Requests ISIR-26 and ISIR-27 for use of proposed alternatives to volumetric examination of American Society of Mechanical Engineers (ASME) Code, Section XI, Table IWB-2500-1, Category B-A, Item B1.30, Pressure Retaining Welds in Reactor Vessel, and ASME Section XI, Table IWB-2500-1, Category B-F, Item B5.10, Reactor Vessel Nozzle to Safe-end Butt Welds. The proposed alternative provides an acceptable level of quality and safety in accordance with 10 CFR 50.55a(a)(3)(i). The details of the 10 CFR 50.55a requests are enclosed.

I&M requests approval by September 8, 2009, to allow use of the alternatives during the Unit 1 Cycle 23 refueling outage.

This letter contains no new or revised commitments. Should you have any questions, please contact John A. Zwolinski, Manager of Regulatory Affairs, at (269) 466-2478.

Sincerely,

A handwritten signature in black ink, appearing to read "J. Jensen", written over a circular stamp or seal.

Joseph N. Jensen
Site Support Services Vice President

RSP/rdw

A047
NRR

Enclosures:

1. ISIR-26
2. ISIR-27

c: T. A. Beltz – NRC Washington, DC
J. L. Caldwell – NRC Region III
K. D. Curry – AEP Ft. Wayne
J. T. King – MPSC
MDEQ – WHMD/RPS
NRC Resident Inspector

10 CFR 50.55a Relief Request Number ISIR-26

***Proposed Alternative
In Accordance with 10 CFR 50.55a(a)(3)(i)***

--Alternative Provides Acceptable Level of Quality and Safety--

Background

Indiana Michigan Power Company (I&M) is submitting a request for the use of an alternative to the examination requirements of American Society of Mechanical Engineers (ASME) Code, Section XI, at Donald C. Cook Nuclear Plant (CNP) Unit 1. This request supports the examination of the reactor vessel shell-to-flange welds during the next scheduled ten-year reactor vessel examinations, performed from the inside surface. I&M has determined the proposed alternative provides for an acceptable level of quality and safety, consistent with 10 CFR 50.55a(a)(3)(i).

1.0 Applicable Code Edition and Addenda

CNP is currently in the third ten-year inservice inspection (ISI) interval that began on July 1, 1996, and is scheduled to end on February 28, 2010. The ASME Boiler and Pressure Vessel Code (ASME Code) of record for the current ten-year ISI interval is the 1989 Edition of Section XI of the ASME Code (no Addenda).

2.0 Applicable Code Requirement

ASME Section XI, Table IWB-2500-1, Category B-A, Item B1.30, Pressure Retaining Welds in Reactor Vessel, specifies volumetric examination. The 1989 Edition of ASME Section XI, Subsection IWA-2630, requires ultrasonic examination of the Reactor Pressure Vessel (RPV) shell-to-flange weld to be in accordance with ASME Code, Section V, Article 4.

3.0 Alternative

I&M proposes to perform automated ultrasonic examinations of the RPV shell-to-flange weld using procedures, personnel, and equipment that have been demonstrated and qualified in accordance with ASME Section XI, 1995 Edition with 1996 Addenda, Appendix VIII, Supplements 4 and 6 as amended by 10 CFR 50.55a.

4.0 **Basis for Relief**

The ASME Code, Section V, Article 4, prescriptive-based process for qualifying ultrasonic procedures and performing examinations is obsolete. 10 CFR 50.55a requires performance-based methods for examination of RPV shell welds. Appendix VIII requirements were developed and adopted to ensure the effectiveness of ultrasonic examinations within the nuclear industry by means of a rigorous, item-specific performance demonstration containing flaws of various sizes, locations, and orientations. The performance demonstration process has established a high degree of confidence, the capability of personnel, procedures, and equipment to detect and characterize flaws that could be detrimental to the structural integrity of the RPV. The Performance Demonstration Initiative (PDI) approach has demonstrated that for detection and characterization of flaws in the RPV, the ultrasonic examination techniques are equal to or surpass the requirements of the ASME Section V, Article 4 ultrasonic examination requirements.

Though Appendix VIII is not required for the RPV shell-to-flange weld examination, the use of Appendix VIII, Supplements 4 and 6 criteria for detection and sizing of flaws in this weld will be equal to or exceed the requirements of ASME Section V, Article 4. Therefore, the use of the proposed alternative will continue to provide an acceptable level of quality and safety, and approval is requested pursuant to 10 CFR 50.55a(a)(3)(i).

5.0 **ASME Code Components Affected**

- a) Name of Component: RPV shell-to-flange weld

ASME Item	Component ID	Component	Component Description	Exam Method
B1.30	1-RPV-A	RPV	VESSEL TO FLANGE WELD	UT

- b) ASME Code Class: ASME Code Class 1, Pressure Retaining Welds in Reactor Vessel
- c) System: Reactor Coolant System
- d) Code Category: Category B-A, RPV shell-to-flange weld.
- e) Code Item No.: B1.30, Shell-to-Flange Weld

6.0 **Duration of Proposed Alternative**

The proposed alternative to the ASME Code is applicable for the remainder of the third ten-year ISI interval at CNP.

7.0 Precedents

Similar relief requests have been previously approved for:

- (1) Union Electric Company for its Callaway Plant, Unit 1 on April 7, 2004 (ADAMS Accession Nos. ML032340608 and ML041000516).
- (2) V.C. Summer Station in an NRC letter, dated February 3, 2004 (ADAMS Accession No. ML040340450).
- (3) Diablo Canyon, Units 1 and 2 in an NRC letter dated October 26, 2005 (ADAMS Accession No. ML052660331).

8.0 References

- (1) 1989 Edition, ASME Code, Section XI, no Addenda.
- (2) 1995 Edition, ASME Code, Section XI, with the 1996 Addenda, Appendix VIII, Supplements 4 and 6.

10 CFR 50.55a Relief Request Number ISIR-27

***Proposed Alternative
In Accordance with 10 CFR 50.55a(a)(3)(i)***

--Alternative Provides Acceptable Level of Quality and Safety--

Background

Indiana Michigan Power Company (I&M) is submitting a request for the use of an alternative to the examination requirements of American Society of Mechanical Engineers (ASME) Code, Section XI, at Donald C. Cook Nuclear Plant (CNP) Unit 1. This request supports the examination of reactor vessel inlet and outlet nozzle to safe-end (dissimilar metal) welds during the next scheduled ten-year reactor vessel examinations, performed from the inside surface. I&M has determined the proposed alternative provides for an acceptable level of quality and safety, consistent with 10 CFR 50.55a(a)(3)(i).

1.0 Applicable Code Edition and Addenda

CNP is currently in the third ten-year inservice inspection (ISI) interval that began on July 1, 1996, and is scheduled to end on February 28, 2010. The ASME Boiler and Pressure Vessel Code (ASME Code) of record for the current ten-year ISI interval is the 1989 Edition of Section XI of the ASME Code (no Addenda). Section XI Code Case N-695 (Qualification Requirements for Dissimilar Metal Piping Welds) is referenced in the ISI program for examination of dissimilar metal welds. This Code Case is listed in Regulatory Guide 1.147, Rev. 15, Table 1 - "Acceptable Section XI Code Cases."

2.0 Applicable Code Requirement

ASME Section XI, Table IWB-2500-1, Category B-F, Item B5.10, Reactor Vessel Nozzle to Safe-end Butt Welds specifies volumetric examination. The volumetric examination is to be conducted in accordance with Code Case N-695.

3.0 Alternative

The specific Code Case N-695 requirement for which relief is requested pertains to the qualification requirements for performance demonstration of ultrasonic examination systems for dissimilar metal piping welds as listed below. This same requirement exists in ASME Section XI, 1995 Edition with 1996 Addenda and later editions.

"3 PERFORMANCE DEMONSTRATION,

- 3.3 Depth-Sizing test:

"(c) Examination procedures, equipment, and personnel are qualified for depth-sizing when the RMS error of the flaw depth measurements, as compared to the true flaw depths, do not exceed 0.125 in. (3 mm)."

I&M proposes to use the demonstrated 0.224 inches instead of the 0.125 inches specified for depth sizing. In the event an indication is detected that requires depth sizing, the 0.099-inch difference between the required root mean square error (RMSE) and the demonstrated RMSE ($0.224 \text{ inches} - 0.125 \text{ inches} = 0.099 \text{ inches}$) will be added to the measured through-wall extent for comparison with applicable acceptance criteria. If the examination vendor demonstrates an improved depth sizing RMSE prior to the examination, the excess of that improved RMSE over the 0.125 inch RMSE requirement, if any, will be added to the measured value for comparison with applicable acceptance criteria.

Consequently, I&M proposes to use an alternative through-wall depth sizing criteria for dissimilar metal welds that are examined from the inside surface. Examinations of these components will be performed during the next scheduled ten-year ISI reactor vessel examinations at CNP.

4.0 Basis for Relief

To date, although qualified for detection and length sizing on these welds, the examination vendors have not met the established RMSE requirement for depth sizing (0.125 inches) when examining from the inner diameter. I&M's examination vendor has demonstrated ability to meet the depth sizing qualification requirement with an RMSE of 0.224 inches instead of the required 0.125 inches.

I&M has determined that the alternative in this request will result in an acceptable level of quality and safety, pursuant to the provisions of 10 CFR 50.55a(a)(3)(i). The proposed alternative assures that the subject welds will be fully examined by procedures, personnel, and equipment qualified by demonstration in all aspects except depth sizing. For depth sizing, the proposed addition of the difference between the qualified and demonstrated sizing tolerance to any flaw that is required to be sized compensates for the potential variation and likewise assures an acceptable level of quality and safety.

5.0 ASME Code Components Affected

a) Name of Component:

ASME Item	Component ID	Component	Component Description	Exam Method
B5.10	1-RPV-1-01	RPV	NOZZLE TO SAFE-END "HOT LEG"	UT
B5.10	1-RPV-1-02	RPV	SAFE-END TO NOZZLE "COLD LEG"	UT
B5.10	1-RPV-2-01	RPV	NOZZLE TO SAFE-END "HOT LEG"	UT
B5.10	1-RPV-2-02	RPV	SAFE-END TO NOZZLE "COLD LEG"	UT
B5.10	1-RPV-3-01	RPV	NOZZLE TO SAFE-END "HOT LEG"	UT
B5.10	1-RPV-3-02	RPV	SAFE-END TO NOZZLE "COLD LEG"	UT
B5.10	1-RPV-4-01	RPV	NOZZLE TO SAFE-END "HOT LEG"	UT
B5.10	1-RPV-4-02	RPV	SAFE-END TO NOZZLE "COLD LEG"	UT

b) ASME Code Class: Class 1, Dissimilar Metal Welds

c) System: Reactor Coolant System

d) Code Category: Category B-F, Pressure Retaining Dissimilar Metal Welds in Vessel Nozzles

e) Code Item No.: B5.10

6.0 Duration of Proposed Alternative

The proposed alternative to the ASME Code is applicable for the remainder of the third ten-year ISI interval at CNP.

7.0 Precedents

- (1) V.C. Summer Station in an NRC letter, dated February 3, 2004 (ADAMS Accession No. ML040340450).
- (2) Diablo Canyon, Units 1 and 2 in an NRC letter dated October 26, 2005 (ADAMS Accession No. ML052660331).

8.0 References

- (1) 1989 Edition, ASME Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," no Addenda.
- (2) 1995 Edition, ASME Code, Section XI, with the 1996 Addenda, Appendix VIII, Supplement 10.
- (3) Code Case N-695, Qualification Requirements for Dissimilar Metal Piping Welds, Section XI, Division 1.