

Indiana Michigan
Power Company
Cook Nuclear Plant
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Buchanan, MI 49107
616-465-5901



September 12, 2002

AEP:NRC:2055-05
10 CFR 50.55a

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

SUBJECT: Donald C. Cook Nuclear Plant Units 1 and 2
Docket Nos. 50-315, 50-316
Relief Requests for the Third Ten-Year Inservice Inspection
Interval for Pressure Retaining Bolting Inspections

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 Units 1 and 2, hereby requests Nuclear Regulatory Commission approval of the following requests for the third ten-year interval inservice inspection testing program:

Relief Requests ISIR-11, ISIR-12, and ISIR-13 for use of proposed alternatives to the pressure retaining bolting inspection requirements of the American Society of Mechanical Engineers (ASME) Code, Section XI, subsections IWB, IWC, and IWD. 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 February 1, 2003, to allow use of the alternatives during the Unit 2 Cycle 14 refueling outage.

This letter contains no new commitments. Should you have any questions, please contact Mr. Brian A. McIntyre, Manager of Regulatory Affairs, at (269) 697-5806.

Sincerely,

A handwritten signature in black ink, appearing to read "S. A. Greenlee", with a large, stylized flourish at the end.

S. A. Greenlee
Director of Nuclear Technical Services

RV/dmb

A047

Enclosures

Relief Request ISIR-11

Relief Request ISIR-12

Relief Request ISIR-13

c: K. D. Curry, w/o attachments
J. E. Dyer
MDEQ – DW & RPD
NRC Resident Inspector
J. F. Stang, Jr., - NRC Washington, DC
R. Whale, w/o attachments

Relief Request ISIR-11

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

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

1. ASME Code Component(s) Affected

Code Class: 1, 2 and 3

Examination Category: B-P, C-H, D-A, D-B, and D-C

Item Number: B15.50, B15.60, B15.70, C7.10, C7.30, C7.50, C7.70, D1.10, D2.10, and D3.10

Description: VT-2 visual examination of Classes 1, 2 and 3 insulated pressure retaining bolted connections

2. Applicable Code Edition and Addenda

ASME Code Section XI 1989 Edition (no addenda)

3. Applicable Code Requirement

IWA-5242(a) requires:

“For systems borated for the purpose of controlling reactivity, insulation shall be removed from pressure retaining bolted connections for visual examination VT-2. For other components, visual examination VT-2 may be conducted without the removal of insulation by examining the accessible and exposed surfaces and joints of the insulation. Essentially vertical surfaces of insulation need only be examined at the lowest elevation where leakage may be detectable. Essentially horizontal surfaces of insulation shall be examined at each insulation joint.”

Additionally, Table IWB-2500-1 specifies that Class 1 connections be VT-2 examined each outage, and Tables IWC-2500-1 and IWD-2500-1, for Class 2 and 3 connections respectively, require that Class 2 and 3 connections be VT-2 examined each inspection period.

4. Proposed Alternative

Indiana Michigan Power Company (I&M) proposes the use of ASME Code Case N-616 for Class 1, 2, and 3 insulated systems borated for the purpose of controlling reactivity. VT-2 visual examinations during the system pressure tests required by IWB-5000, IWC-5000, and

IWD-5000 would be performed without insulation removal, when the bolting material is resistant to boric acid degradation.

In accordance with the conditions listed in Draft Regulatory Guide DG-1091, Table 2 (Proposed Revision 13 of Regulatory Guide 1.147), I&M will not apply this alternative to the following:

- SA-564 Gr. 630, (Type 17-4PH) heat treated below 1100 degrees Fahrenheit (° F) or with a hardness (Rc) greater than 30.
- SA-193 Gr. B6 (Type 17-4PH) heat treated below 1100° F or with Rc greater than 30.
- A-286 (SA-453 Gr. 660) preloaded above one hundred thousand pounds per square inch (Ksi).
- Bolted connections where the associated valve bodies, pump casings and piping contain less than 10% chromium and are not in the proper heat treatment condition.

Pressure testing hold times will comply with ASME Section XI requirements (e.g., 4 hours for insulated components).

5. Basis of Alternative for Providing Acceptable Level of Quality and Safety

Corrosion-resistant bolted connections on borated systems consist of materials with chromium content greater than or equal to 10%. These materials are resistant to boric acid corrosion. The basis for a minimum chromium content being used as a measure of susceptibility to degradation was established in Code Case N-616, "Alternative Requirements for VT-2 Visual Examination of Class 1, 2, and 3 Insulated Pressure Retaining Bolted Connections, Section XI, Division 1." Code Case N-616 was approved by the ASME code committee on May 7, 1999, and is listed in Draft Regulatory Guide DG-1091, Table 2, "Conditionally Acceptable Section XI Code Cases." The stipulations stated in the Draft Regulatory Guide are:

- Insulation must be removed for VT-2 examination during the system pressure test for any 17-4 PH stainless steel of 410 stainless steel stud or bolt aged at a temperature below 1100°F or with hardness above Rc 30.
- For A-286 stainless steel studs or bolts, the preload must be verified to be below 100 Ksi or the thermal insulation must be removed and the joint visually examined.
- For nuts conforming to SA-194, removal of the insulation for visual inspection is not necessary.
- A 4-hour hold time at operating temperature and pressure is required prior to conducting the VT-2 examination.

In previous refueling outages, Class 1 bolted connections have been inspected with insulation removed in accordance with IWA-5242(a). The bolted connections did not exhibit any evidence of degradation due to boric acid corrosion. Where boric acid residues were

identified and corrosion resistant bolting removed, no corrosion was evident on the bolting material. These results were consistent with expectations that no boric acid corrosion degradation exists on the corrosion resistant materials.

Code class systems bolted for the purpose of controlling reactivity are extensive and consist of large systems covering many areas inside containment and on multiple elevations. Scaffolding is required to access many of the bolted connections. In addition, many of the bolted connections are located in medium to high radiation areas with some locations requiring the installation and removal of heavy lead shielding to maintain radiation exposure as low as reasonable achievable. Insulation, scaffolding, and shielding installation/removal is burdensome due to increased outage resource requirements including costs associated with implementation, outage duration, and radiation exposure. Also, there is an increased risk of personnel injury or equipment damage associated with insulation, scaffolding, and shielding installation/removal. Utilizing the alternative provided by Code Case N-616, where the appropriate corrosion-resistant bolting material is used, will reduce these factors significantly and be consistent with maintaining personnel radiation exposure as low as reasonably achievable.

6. Duration of Proposed Alternative

The proposed alternative is requested for the Unit 1 and Unit 2 third 10-year inservice inspection interval.

7. Precedents

The use of Code Case N-616 was approved for use at the Browns Ferry Nuclear Plant, Units 2 and 3, the Sequoyah Nuclear Plant Units 1 and 2, and the Watts Bar Nuclear Plant, Unit 1 in a letter from Thomas Koshy, Nuclear Regulatory Commission (NRC), to Mr. J. A. Scalice, Tennessee Valley Authority, dated April 26, 2002. It was also approved for use at Seabrook in a letter from James W. Clifford, NRC, to Ted C. Feigenbaum, North Atlantic Energy Service Corporation, dated January 28, 2002.

Relief Request ISIR-12

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

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

1. ASME Code Component(s) Affected

Code Class: 1

Examination Category: B-G-1

Item Number: B6.30

Description: Pressure retaining bolting greater than 2 inches in diameter

2. Applicable Code Edition and Addenda

American Society of Mechanical Engineers (ASME) Code Section XI 1989 Edition (no addenda).

3. Applicable Code Requirement

Table IWB-2500-1, Examination Category B-G-1, Item Number B6.30 requires both a volumetric and surface examination when reactor vessel closure studs are removed.

4. Proposed Alternative

Indiana Michigan Power Company (I&M) proposes the use of ASME Code Case N-307-3 when conducting ultrasonic examinations from the end or the center drilled hole of the bolt/stud. To satisfy the examination requirements of Table IWB-2500-1, Examination Category B-G-1, the examination volume may be limited to the outside diameter to a radial depth of ¼ inch as defined by A-B-C-D-E-F-A in Figure 1 of Code Case N-307-3. The volumetric examinations shall be performed with procedures and personnel qualified in accordance with ASME Section XI, Appendix VIII.

The surface examination requirement of table IWB-2500-1, Examination Category B-G-1, Item Number B6.30, Reactor Vessel Closure Studs, will be met in accordance with Code Case N-307-3.

5. Basis of Alternative for Providing Acceptable Level of Quality and Safety

ASME Code Case N-307-2, Code Case N-307-3's predecessor, was approved by the ASME code committee on September 24, 1999, and was incorporated into the 2000 Addenda of the

ASME Section XI Code. This code case reduced the examination volume of Class 1 bolting greater than 2 inches in diameter. In the 1989 Edition of ASME Code Section XI, Figure IWB-2500-12 defined the examination volume as the full volume of the load-bearing portion of the stud. Code Case N-307-2 reduced the required examination volume to include the outside diameter to a radial depth of 1/4-inch when performing volumetric examinations. This provision was continued in Code Case N-307-3.

ASME Section XI 1989 Edition (no addenda), Table IWB-2500-1, Examination Category B-G-1, Item Number B6.30, requires both a volumetric and surface examination when reactor vessel closure studs are removed. Table IWB-2500-1, Examination Category B-G-1, Item Number B6.30 in the 2000 Addenda specifies a volumetric or surface examination when the reactor vessel closure studs are removed.

Code Case N-307-3 maintains the provisions of Code Case N-307-2 and eliminates the surface examination when performing the volumetric examinations from the end or the center drilled hole.

Changing the examination requirements to a volumetric examination alleviates a burden for the utility without a decrease in quality or safety. The volumetric examination is intended to detect cracking at the most highly stressed area of the bolt/stud (e.g., thread root).

Typically, the surface examination is a magnetic particle (MT) method which is labor-intensive and generates a large amount of liquid and solid radioactive waste. MT examination preparation requires extensive cleaning of very heavy and contaminated bolts/studs, a designated exam area (tent), and additional manpower for the cleaning and handling of the studs. MT also requires a very clean surface and often re-cleaning or repositioning of the bolt/stud is required to investigate non-relevant indications caused by inadequate cleaning.

The volumetric examination does not require the extensive cleaning that MT does and only one end of the stud is required to be accessible. Eliminating the surface examination eliminates the need to continually reposition the bolt/stud, which in turn reduces the likelihood of damage to the bolt/stud or personnel injury. Since the manpower requirements are reduced as a direct result of eliminating the surface examination, radiation exposure is minimized. Likewise, radioactive waste is reduced. Total preparation and examination time, exposure, and generation of radioactive waste will be significantly reduced.

6. Duration of Proposed Alternative

The proposed alternative is requested for the Unit 1 and Unit 2 third 10-year inservice inspection interval.

7. Precedents

The use of Code Case N-307-3 has been approved for the Edwin I. Hatch Nuclear Plant, Units 1 and 2, in a letter from John A. Nakoski, Nuclear Regulatory Commission (NRC), to H. L. Sumner, Jr., Southern Nuclear Operating Company, dated July 2, 2002. The use of Code Case N-307-2, was also approved for use at the Vogtle Nuclear Plant, Units 1 and 2, in a letter from Richard J. Laufer, NRC, to J. B. Beasley, Jr., Southern Nuclear Operating Company, dated February 20, 2002.

Relief Request ISIR-13

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

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

1. ASME Code Component(s) Affected

Code Class: 1

Examination Category: B-G-1

Item Number: B6.10

Description: Pressure retaining bolting greater than 2 inches in diameter

2. Applicable code Edition and Addenda

ASME Section XI 1989 Edition (no addenda).

3. Applicable Code Requirement

Table IWB-2500-1, Examination Category B-G-1, Item Number B6.10, "Reactor Vessel Closure Head Nuts Examination Method," requires that an examination of reactor vessel head nuts be performed.

4. Proposed Alternative

Indiana Michigan Power Company (I&M) proposes the use of ASME Code Case N-627, VT-1 visual examination in lieu of the surface examination requirements of the 1989 Edition of ASME Section XI, Table IWB-2500-1, Examination Category B-G-1, "Reactor Vessel Closure Head Nuts."

The reactor vessel closure head nuts will be examined to the requirements of Code Case N-627 and any indications evaluated to the 1995 Edition, 1996 Addenda of the ASME Section XI Code. The VT-1 visual examination acceptance criteria of IWB-3517 in the 1995 Edition, 1996 Addenda of ASME Section XI includes the requirements for evaluation of crack-like indications and other relevant conditions requiring corrective action, such as deformed or sheared threads, localized corrosion, deformation of part and other degradation mechanisms.

The proposed alternative to utilize ASME Code Case N-627, VT-1 visual examination provides a comprehensive assessment of the condition of the reactor vessel closure head nut without the need for continual cleaning, re-examination, and handling required by the surface examination method. Therefore, a VT-1 visual examination of the reactor vessel closure

head nuts in accordance with Code Case N-627, and evaluation of indications to the ASME Section XI 1995 Edition, 1996 Addenda, IWB-3517, provides an acceptable level of quality and safety.

5. Basis of Alternative for Providing Acceptable Level of Quality and Safety

Code Case N-627 requires a VT-1 visual examination of the reactor pressure vessel closure head nuts as an alternative to the code-required surface examination. The reactor vessel closure head nut configuration is such that the outside surface is readily available for surface examination. The threaded area on the inside of the nuts is very difficult to clean for both the liquid penetrant (PT) and magnetic particle (MT) examination. The cleaning and preparation of the nuts for surface examination could result in additional damage due to their weight and the difficulty of moving them. Pooling of penetrant and magnetic particle material at the bottom of the nut (which must be placed on its side for examination) could mean additional cleaning time for proper examination of this area. Handling the nuts for additional examination may further damage them.

The ASME Section XI Code Committee determined that for the intended purpose of examination of reactor vessel closure nuts, a VT-1 visual examination is adequate to detect inservice-related degradation. Beginning with the 1989 Addenda of ASME Section XI, the examination requirement for reactor vessel closure head nuts was changed from a surface examination to a VT-1 visual examination.

I&M proposes the use of ASME Section XI Code, 1995 Edition, 1996 Addenda for indication evaluation because the 1989 Edition (no Addenda) does not provide acceptance criteria for Examination Category B-G-1 surface flaws. Beginning in the 1989 Addenda, the acceptance standards of IWB-3517 were adopted, which is the same standard as for Examination Category B-G-2 Bolting. Later code editions and addenda reflect this examination method and acceptance standard. The NRC has endorsed ASME Section XI through the 1995 Edition, 1996 Addenda, without any limitations on the use of Table IWB-2500-1, Examination Category B-G-1 requirements in the current version of 10 CFR 50.55a.

6. Duration of Proposed Alternative

The proposed alternative is requested for the Unit 1 and Unit 2 third 10-year inservice inspection interval.

7. Precedents

The use of Code Case N-627 has been approved for use at Point Beach Nuclear Plant, Units 1 and 2 in a letter from William D. Reckley, Nuclear Regulatory Commission (NRC), to Mark Reddemann, Nuclear Management Company, dated December 13, 2001, and at the Perry

Nuclear Plant, Unit 1 in a letter from Anthony J. Mendiola, NRC, to John K. Wood, First Energy Nuclear Operating Company, dated February 15, 2001.