UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

THE THIRD 10-YEAR INTERVAL INSERVICE INSPECTION PLAN

REQUEST TO USE CODE CASE N-522 AS AN ALTERNATIVE FOR PRESSURE TESTING

INDIANA MICHIGAN POWER COMPANY

DONALD C. COOK NUCLEAR PLANT, UNITS 1 AND 2

DOCKET NUMBERS: 50-315 AND 50-316

1. INTRODUCTION

The Technical Specifications for Donald C. Cook Nuclear Station, Units 1 and 2, state that the inservice inspection and testing of the American Society of Mechanical Engineers (ASME) Code Class 1, 2, and 3 components shall be performed in accordance with Section XI of the ASME *Boiler and Pressure Vessel Code* (Code) and applicable Addenda as required by 10 CFR 50.55a(g), except where specific written relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i). Section 50.55a(a)(3) of 10 CFR Part 50 states that alternatives to the requirements of paragraph (g) may be used, when authorized by the NRC, if (i) the proposed alternatives would provide an acceptable level of quality and safety, or (ii) compliance with the specified requirements would result in hardship or unusual difficulties without a compensating increase in the level of quality and safety.

Pursuant to 10 CFR 50.55a(g)(4), ASME Code Class 1, 2, and 3 components (including supports) shall meet the requirements, except the design and access provisions and the preservice examination requirements, set forth in the ASME Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," to the extent practical within the limitations of design, geometry, and materials of construction of the components. The regulations require that inservice examination of components and system pressure tests conducted during the first 10-year interval and subsequent intervals comply with the requirements in the latest edition and addenda of Section XI of the ASME Code incorporated by reference in 10 CFR 50.55a(b) on the date 12 months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein. The applicable edition of the ASME Code, Section XI, for Donald C. Cook Nuclear Plant, Units 1 and 2, during the third 10-year inservice inspection interval, is the 1989 edition. The components (including supports) may meet the requirements set forth in subsequent editions and addenda of the ASME Code incorporated by reference in 10 CFR 50.55a(b) subject to the limitations and modifications listed therein and Commission approval.

Pursuant to 10 CFR 50.55a(g)(5), if the licensee determines that conformance with an examination requirement of Section XI of the ASME Code is not practical for its facility, information shall be submitted to the Commission in support of that determination and a

request made for relief from the ASME Code requirement. After evaluation of the determination, pursuant to 10 CFR 50.55a(g)(6)(i), the Commission may grant relief and may impose alternative requirements that are determined to be authorized by law, will not endanger life, property, or the common defense and security, and are otherwise in the public interest, giving due consideration to the burden upon the licensee that could result if the requirements were imposed.

By letters dated November 27, 1996 (AEP:NRC:0969AZ) and January 27, 1997 (AEP:NRC:0969BA), Indiana Michigan Power Company, the licensee for the Donald C. Cook Nuclear Plant, Units 1 and 2, requested relief from the requirements of the 1989 edition of the ASME Code, Section XI, in regard to conducting system pressure testing of Class 2 components at containment penetrations and proposed to implement Code Case N-522 as an alternative which allows the use of 10 CFR 50, Appendix J, leak rate testing of the non-code containment penetration piping and isolation valves.

The Civil Engineering and Geosciences Branch, Division of Engineering, has reviewed and evaluated the licensee's request and the supporting information on the relief request for the Donald C. Cook Nuclear Plant, Units 1 and 2, pursuant to the provisions of 10 CFR 50.55a(a)(3).

2.0 DISCUSSION

System/Component for Which Relief is Requested: (As stated)

"Code relief is requested for Unit 1 and Unit 2, class 2 systems and components at containment penetrations."

Code Requirements: (As stated)

"ASME Section XI, 1989 edition with no addenda, examination category C-H, items C7.40, C7.70 and C7.80 in conjunction with ASME Code Case N-498-1 requires system pressure testing of class 2 components at containment penetrations."

Licensee's Basis for Code Relief: (As stated)

"The requirement to perform system pressure testing on class 2 containment penetrations that would otherwise be classified as non-code class piping or components is a duplication of Cook Nuclear Plant Appendix J leak rate testing. The additional ASME Section XI system pressure test increases radiation exposure and extends outage time without providing a compensating increase in the level of safety or quality.

Code relief has been granted to the Union Electric Company to use this code case as an alternative to ASME Section XI testing, for the Callaway Plant, Unit 1 via NRC letter dated September 12, 1996 (TAC No. M95408)."

Licensee's Proposed Alternate Method: (As stated)

"As an alternative to the requirements of the 1989 edition of the ASME Section XI code, it is proposed to use code case N-522 for all piping and components that penetrate the containment structure. Code case N-522 allows the use of 10 CFR 50, Appendix J leak rate testing of the containment vessel and components as an alternative to the code required VT-2 method of testing of containment penetrations. Appendix J leak testing on containment penetrations will be performed at a frequency consistent with Option B of our Appendix J program commitments. The containment purge, hydrogen sampling, radiation monitoring, and plant air systems are included in this relief request."

3.0 EVALUATION

The system leakage test required by Examination Category C-H provides periodic verification of the leak-tight integrity of Class 2 piping systems or segments once every 40 months. Pipe segments from non-code class systems that penetrate containment are designed and examined as Class 2 piping for the sole purpose of protecting the integrity of containment. The Appendix J pressure testing proposed by the licensee as an alternative to the VT-2 method of testing, provides periodic verification of the leak-tight integrity of the primary reactor containment, and of systems and components that penetrate containment, and provides assurance that the containment pressure boundary is being maintained at an acceptable level while monitoring for deterioration of seals, valves, and piping. The use of Appendix J pressure testing therefore is sufficient to ensure that the containment integrity is maintained and therefore is an acceptable alternative to the requirement of the 1989 edition of the ASME Section XI Code.

The licensee will perform the Appendix J leak testing on containment penetrations at a frequency consistent with Option B, which identifies the performance-based requirements and criteria for preoperational and subsequent periodic leakage-rate testing. Use of Appendix J, Option B, results in Type A tests at intervals not to exceed 10 years and Type B and C tests at intervals not to exceed 5 years. This allows up to a 60 month test interval, as opposed to the Code specified 40 months. Since these test frequencies have been determined acceptable for the containment, they are also considered acceptable for the subject piping.

The containment penetration piping along with the containment isolation valves (CIVs), are part of containment pressure boundary and are classified as Class 2. Hence, the CIVs, along with the connecting pipe segments, must withstand the peak calculated containment pressure related to the containment design pressure. Therefore, when using Code Case N-522, the pressure testing of the CIVs and the connecting piping must be conducted during the Appendix J, Type C, test at the peak calculated containment pressure which has been committed to by the licensee in letter AEP:NRC:0969BA, dated January 27, 1997, to the NRC. The licensee has further committed in the same letter, to include in the test procedure, the methods for detection and location of through-wall leakage in CIVs, and the pipe segment between them, in order to comply with paragraph IWC-5210(b) of ASME Code, Section XI, which requires that when air is used as a testing medium, the test

procedure shall include methods for detection and location of through-wall leaks in system components. Since Appendix J, Type C test, most likely uses air as a test medium, it is appropriate that the requirement is reflected in the test procedure.

4.0 CONCLUSION

The staff has evaluated the information provided by the licensee in support of the Code relief request to use Code Case N-522 as an alternative for pressure testing Class 2 components at containment penetrations in licensee submittals AEP:NRC:0969AZ and AEP:NRC:0969BA for the third 10-year inspection interval of Donald C. Cook Nuclear Plant, Units 1 and 2. The staff concludes that implementation of Code Case N-522, which requires compliance with Appendix J, would provide an acceptable level of quality and safety, provided that the test is conducted at peak calculated containment pressure and that the test procedure includes methods for detection and location of through-wall leakage in CIVs and pipe segments between the CIVs. Therefore, the licensee's proposed alternative, as modified by its commitment stated above, is authorized pursuant to 10 CFR 50.55a(a)(3)(i). The use of Code Case N-522 is authorized for the third inspection interval until such time as the code case is approved by reference in Regulatory Guide 1.147. At that time, if the licensee intends to continue to implement this code case, the licensee is to follow all provisions in Code Case N-522 with limitations issued in Regulatory Guide 1.147, if any.

Principal Reviewer: P. Patnaik
J. Hickman

Date: July 11, 1997