



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

February 26, 2010

Mr. Joseph N. Jensen
Senior Vice President and
Chief Nuclear Officer
Indiana Michigan Power Company
Nuclear Generation Group
One Cook Place
Bridgman, MI 49106

SUBJECT: DONALD C. COOK NUCLEAR PLANT, UNIT 1 – EVALUATION OF
RELIEF REQUEST (ISIR-32) (TAC NO. ME2304)

Dear Mr. Jensen:

By letter dated September 15, 2009, as supplemented by letter dated February 16, 2010, Indiana Michigan Power Company (the licensee) submitted a request to the U.S. Nuclear Regulatory Commission (NRC) for relief from the requirements of the 1989 Edition of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, as it pertains to the volumetric examination of steam generator (SG) inlet and outlet primary manway studs at the Donald C. Cook Nuclear Plant, Unit 1 (CNP-1).

Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Section 50.55a(a)(3)(ii), the licensee requested to use an alternative on the basis that complying with the specified requirement would result in hardship or unusual difficulty. The proposed alternative would delay the volumetric examination until the first refueling outage (U1C24) of the fourth 10-year inservice inspection (ISI) interval to re-align the inspection with scheduled SG eddy current testing to maintain personnel radiation dose as low as reasonably achievable.

The NRC staff has reviewed the proposed request and concludes, as set forth in the enclosed safety evaluation, that the licensee has adequately addressed all the regulatory requirements set forth in 10 CFR 50.55a(a)(3)(ii), and is in compliance with ASME Code requirements. Therefore, the NRC staff authorizes the licensee's proposed alternative for the third 10-year ISI interval at CNP-1 which ends on February 28, 2010.

J. Jensen

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If you have any questions, please contact Terry Beltz of my staff at (301) 415-3049.

Sincerely,



Robert J. Pascarelli, Chief
Plant Licensing Branch III-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-315

Enclosure:
Safety Evaluation

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELIEF REQUEST ISIR-32

REGARDING ALTERNATIVE TO THE INSERVICE INSPECTION PROGRAM FOR
EXAMINATION OF STEAM GENERATOR INLET AND OUTLET PRIMARY MANWAY STUDS

INDIANA MICHIGAN POWER COMPANY

DONALD C. COOK NUCLEAR PLANT, UNIT 1

DOCKET NO. 50-315

1.0 INTRODUCTION

By letter dated September 15, 2009 (Reference 1), as supplemented by letter dated February 16, 2010 (Reference 2), Indiana Michigan Power Company (the licensee) requested relief from the requirements of the 1989 Edition of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code), Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," regarding a proposed alternative to the inservice inspection (ISI) program for volumetric examination of the Donald C. Cook Nuclear Plant, Unit 1 (CNP-1) steam generator (SG) inlet and outlet primary manway studs.

Specifically, pursuant to Title 10 of *The Code of Federal Regulations* (10 CFR), Part 50, Section 50.55a(a)(3)(ii) (10 CFR 50.55a(a)(3)(ii)), the licensee requested to use the proposed alternative on the basis that complying with the specified requirement would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. The proposed alternative would delay the volumetric examination from the spring 2010 refueling outage (U1C23) until the fall 2011 refueling outage (U1C24) to re-align the inspection with scheduled SG eddy current testing to maintain personnel radiation exposure as low as reasonably achievable.

The licensee's proposed alternative to the volumetric examination requirements is described in relief request ISIR-32. The licensee requested implementation of this alternative during the third 10-year ISI interval.

2.0 REGULATORY EVALUATION

Pursuant to 10 CFR 50.55a(g), ISI of nuclear power plant components shall be performed in accordance with the ASME Code, Section XI, 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 states that alternatives to the requirements of paragraph (g) may be used, when authorized by the Nuclear Regulatory Commission (NRC), if (i) the proposed alternatives would provide an

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acceptable level of quality and safety, or (ii) compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Pursuant to 10 CFR 50.55a(g)(4), ASME Code Class 1, 2, 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 components. The regulations require that ISI of components and system pressure tests conducted during the first 10-year interval and subsequent intervals comply with the requirements of the latest edition and addenda of Section XI of the ASME Code, incorporated by reference in 10 CFR 50.55a(b) 12 months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein.

The Code of Record for the third 10-year ISI program interval and evaluation at CNP-1 for ASME Class 1, 2, and 3 components Section XI of the ASME Code, 1989 Edition (with no Addenda). The ASME Code, Section XI, 1989 Edition, Table IWB-2500-1, Category B-G-1, Item B6.90, requires a volumetric examination of the SG inlet and outlet primary manway studs in accordance with Figure IWB-2500-12. The volumetric examination is required once per ten-year inspection interval. The proposed alternative is sought for the third 10-year ISI interval which ends on February 28, 2010.

3.0 TECHNICAL EVALUATION FOR RELIEF REQUEST (ISIR-32)

3.1 Components for Which Relief is Requested

The ASME Code components affected by this relief request include the CNP-1 SG inlet and outlet primary manway studs. The studs are ASME Class 1 and manufactured from SA 193 Grade B7 material. The affected components are summarized below.

Inlet Manway Studs

STM-11-IMB-1 through 16
STM-12-IMB-1 through 16
STM-13-IMB-1 through 16
STM-14-IMB-1 through 16

Outlet Manway Studs

STM-11-OMB-1 through 16
STM-12-OMB-1 through 16
STM-13-OMB-1 through 16
STM-14-OMB-1 through 16

3.2 Code Requirement for Which Relief is Requested

Relief is requested from ASME Code, Section XI, "Rules and Inservice Inspection of Nuclear Power Plant Components," 1989 Edition (with no Addenda), Table IWB-2500-1, Category B-G-1, Item B6.90, which requires a volumetric examination of the SG inlet and outlet primary manway studs in accordance with Figure IWB-2500-12. The volumetric examination is required once per 10-year inspection interval.

3.3 Licensee Proposed Alternative

The licensee proposed to perform a visual examination for leakage (VT-2) of the SG manway areas with the insulation installed during the U1C23 refueling outage at nominal operating

temperature and pressure and perform volumetric examination of the SG inlet and outlet primary manways during the U1C24 refueling outage.

The SG manway studs were originally scheduled for volumetric examination during the U1C23 refueling outage. The SG manway stud volumetric examinations were scheduled to coincide with other U1C23 SG inspection activities (i.e., primary manway cover and stud removal, eddy current testing, secondary side inspections and cleaning). In September 2008, CNP-1 experienced a failure of the main turbine generator which resulted in an extended maintenance outage. Consequently, the last outage of the third 10-year ISI interval scheduled for U1C23 was moved from fall 2009 to spring 2010. The U1C24 refueling outage (currently scheduled for the fall 2011) will be in the fourth 10-year ISI interval.

3.4 Licensee Basis for the Alternative

The CNP-1 SG inspection activities are currently scheduled for U1C24 as allowed by Technical Specification 5.5.7, "Steam Generator (SG) Program." Performing a volumetric examination of the SG manway studs during U1C23 would require removal of the manways during two consecutive refueling outages (U1C23 and U1C24). The volumetric examination requires equipment setup and teardown; manway and diaphragm removal and reinstallation; and stud and stud hole cleaning and inspection.

The licensee estimates that an additional radiation dose of 5.1 rem could be experienced by not performing the volumetric examinations at the same time as the other SG inspection activities during U1C24. This estimate is based on previous CNP-1 SG evolutions. In addition, the licensee provided operating experience which indicates there is a high likelihood of encountering stuck manway studs. If stuck studs are identified, the result could be an additional dose of 1.0 rem per stud.

3.5 NRC Staff Evaluation

The ASME Code Section XI, Table IWB-2500-1 examination requirement is that the one hundred twenty-eight (128) SG primary manway studs be volumetrically examined once every 10-year ISI interval. The licensee's alternative would mean that the CNP-1 primary manway studs would not be examined in the third 10-year interval. However, the volumetric examination of the SG manway studs will occur in the first outage (U1C24) of the fourth 10-year interval.

The NRC staff recognizes that removal of the SG manways results in a significant burden in terms of personnel safety, nuclear safety, and radiation exposure. The licensee estimated that the radiation exposure required for removing the primary manways and performing the examination activities to be approximately 5.1 rem. In Reference 2, the licensee provided historical information associated with stuck studs associated with CNP-1 SGs. This information showed that the number of studs that could be found to be stuck may range from four to seventeen. Based on the licensee's estimate of an additional exposure of 1.0 rem per stuck stud, workers could potentially be exposed to an additional 4 to 17 rem to complete the manway removal and reinstallation activities to perform the volumetric examinations. Therefore, the dose that would be required to perform the volumetric examination during U1C23 could range between 5.1 rem and 20 rem. The licensee would once again be required to perform the manway removal and reinstallation activities during U1C24 to accommodate the performance of SG inspection activities, thus resulting in an additional 5.1 rem to 20 rem of radiation exposure.

The licensee's proposed alternative is to perform a visual examination (VT-2) of the SG manway areas for leakage with the insulation installed while CNP-1 is at nominal operating temperature and pressure during U1C23. In Reference 2, the licensee stated that a bare metal visual examination (VT-2) will also be performed in U1C23 during depressurized conditions as required by the CNP-1 Inservice Inspection Program Plan. In addition to the visual examinations that will be performed, there are additional methods available for plant operators to detect a SG manway leak prior to it degrading the structural integrity of the manway joints such as (1) the daily "Reactor Coolant System Leak Rate Test" performed by control room operators; (2) containment airborne radiation monitors; (3) containment temperature, pressure and humidity monitoring; and, (4) containment sump level monitoring. The licensee also states there have been no indications of leakage from the CNP-1 SG primary manways since SG replacement in 2000.

The NRC staff finds the licensee's proposal to perform a visual examination for leakage (VT-2) of the SG manway areas with the insulation installed while CNP-1 is at nominal operating temperature and pressure during the U1C23 outage, along with the bare metal visual examination and the other methods of leak detection, will provide reasonable assurance of structural integrity. Therefore, the NRC staff finds that requiring a volumetric examination of the CNP-1 SG inlet and outlet primary manway studs during U1C23 would result in a hardship or unusual difficulty without a compensating increase in the level of quality and safety.

The volumetric examination of the 128 SG primary manway studs to be performed in U1CR24 will satisfy the ASME Code, Section XI, requirement for the third 10-year inspection interval at CNP-1. As such, this examination cannot be credited toward the CNP-1 fourth 10-year ISI interval examination requirement.

4.0 CONCLUSION

As set forth above, the NRC staff concludes that the proposed alternative described in relief request ISIR-32 demonstrates that the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. The proposed alternative provides reasonable assurance of structural integrity or leak tightness of the CNP-1 SG inlet and outlet primary manway studs. Therefore, the NRC authorizes the proposed alternative in accordance with 10 CFR 50.55a(a)(3)(ii) for the third 10-year inspection interval at CNP-1.

All other ASME Code, Section XI requirements for which relief was not specifically requested and approved in ISIR-32 remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.

5.0 REFERENCES

1. Letter from Raymond A. Hruby, Jr., Indiana Michigan Power Company, to USNRC Document Control Desk, re: "Donald C. Cook Nuclear Plant Unit 1, Docket No. 50-315, Third Ten-Year Interval Inservice Inspection Program Relief Request ISIR-32," dated September 15, 2009 (ADAMS Accession No. ML092680143).

2. Letter from Raymond A. Hruby, Jr., Indiana Michigan Power Company, to USNRC Document Control Desk, re: "Donald C. Cook Nuclear Plant Unit 1, Docket No. 50-315, Response to Request for Additional Information Regarding Third Ten-Year Interval Inservice Inspection Program Relief Request ISIR-32," dated February 16, 2010 (ADAMS Accession No. ML100500973).

Principal Contributor: Keith Hoffman, NRR/DCI/CPNB

Date: February 26, 2010

J. Jensen

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If you have any questions, please contact Terry Beltz of my staff at (301) 415-3049.

Sincerely,

/RA/

Robert J. Pascarelli, Chief
Plant Licensing Branch III-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-315

Enclosure:
Safety Evaluation

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