

August 22, 2000

Mr. Robert P. Powers, Senior Vice President
Indiana Michigan Power Company
Nuclear Generation Group
500 Circle Drive
Buchanan, MI 49107

SUBJECT: DONALD C. COOK NUCLEAR PLANT (D. C. COOK), UNITS 1 AND 2 -
CLOSURE OF GENERIC LETTER (GL) 97-01, "DEGRADATION OF
CRDM/CEDM NOZZLES AND OTHER VESSEL CLOSURE HEAD
PENETRATIONS" (TAC NOS. M98559 AND M98560)

Dear Mr. Powers:

On April 1, 1997, the U.S. Nuclear Regulatory Commission (NRC) issued Generic Letter (GL) 97-01, "Degradation of CRDM/CEDM Nozzles and Other Vessel Closure Head Penetrations." The purpose of GL 97-01 was to obtain information that would enable the staff to verify compliance with 10 CFR 50.55a and 10 CFR Part 50, Appendix A, GDC-14, for ensuring the timely inspection of pressurized-water reactor (PWR) control rod drive mechanism (CRDM) nozzles and other vessel head penetrations (VHPs). By letter dated April 29, 1997, as supplemented August 1 and November 4, 1997, you responded to GL 97-01. By letter dated November 16, 1998, the NRC issued a request for additional information (RAI). By letter dated June 11, 1999, you responded to the RAI.

In your responses to the GL, you indicated that you were a participant in the voluntary volumetric inspection (voluntary initiative) program proposed by the Nuclear Energy Institute (NEI). The NEI program for assessing the potential for CRDM nozzles and other VHPs to develop stress corrosion cracking (SCC) includes taking credit for volumetric examinations that had been performed prior to issuance of the GL (i.e., at D. C. Cook Unit 2 in 1994, Point Beach Unit 1 in 1994, Oconee Unit 2 in 1994 and 1996, and North Anna Unit 1 in 1996), and a commitment to perform voluntary volumetric inspections of the VHPs at additional facilities. The scope of these examinations is intended to cover inspections of the CRDM nozzles and other VHPs at both Westinghouse, Combustion Engineering, and Babcock and Wilcox designed facilities. Some of these additional inspections have already been completed (i.e., at the Millstone Unit 2, Ginna, and Oconee Unit 2 nuclear plants in 1998 and 1999; others are currently being scheduled for the near term (tentatively at Crystal River Unit 3, Farley Unit 2, and Diablo Unit 2 in 2001, and San Onofre Unit 3 in 2008)). The voluntary initiative program calls for the results of these inspections to be representative of the PWR industry as a whole. NEI has delegated the responsibility for implementing this program to the Materials Reliability Project (MRP) Task Group on Alloy 600. The MRP will perform this task in conjunction with NEI and the PWR Owners Groups (i.e., Westinghouse Owners Group, Babcock and Wilcox Owners Group, and Combustion Engineering Owners Group), and the industry's utilities.

On December 11, 1998, NEI provided additional information in order to clarify its basis for selecting the sites for the voluntary initiative program. In this submittal, NEI indicated that the sites for the additional voluntary volumetric examinations were selected based on the identification of the plants whose CRDM nozzles were expected to be the most highly susceptible to SCC-type cracking. NEI also indicated that the remaining facilities were not selected as sites for the voluntary examinations because: (1) voluntary, volumetric examinations of the CRDM nozzles at a "sister-designed" facility had already been completed or were being scheduled, or (2) the CRDM nozzles at the facilities were not expected to be as highly susceptible to SCC as those at the facilities where the volumetric examinations had been completed or scheduled. NEI has informed the NRC staff that the voluntary initiative program will be modified as necessary based on the results of these inspections. The NRC staff has reviewed this program and concluded that NEI's voluntary initiative program provides an acceptable basis for evaluating the potential for SCC to develop and grow in the CRDM nozzles and other VHP penetrations of PWR-designed facilities. The NRC documented this conclusion in its letter of March 23, 1999, from Mr. Gus Lainas, Acting Director of Engineering, Office of Nuclear Reactor Regulation, to Mr. David Modeen, Director of Engineering, NEI.

The staff has noted that you had performed voluntary inspections of the CRDM nozzles at D. C. Cook Unit 2 in 1994. As a result of the inspections at D. C. Cook Unit 2, you detected and reported SCC in one of the unit's CRDM penetration nozzles. You performed an American Society of Mechanical Engineers (ASME) Code repair of the flawed penetration as the basis for returning the unit to service. Since this repair technique was determined to be an acceptable ASME repair method, you did not submit this repair technique for review and approval by the NRC staff. However, this embedded flaw repair was reviewed by the NRC staff and found to be an acceptable repair technique, as documented in the NRC Safety Evaluation to Virginia Electric Power Company dated February 5, 1996. To date, the D. C. Cook Unit 2 plant is the only domestic facility that has reported the occurrence of SCC-type degradation in any of its VHPs, although very shallow fabrication-induced cracking (i.e., craze cracking) has been confirmed in some of the CRDM nozzles at Oconee Unit 2 and Ginna.

The NEI letter of December 11, 1998, states that the heat of material of the D. C. Cook Unit 1 CRDMs is different from the heat of material used to fabricate the CRDMs at D. C. Cook Unit 2, and that the CRDM penetration nozzles for Unit 1 are not ranked to have as high a susceptibility to develop PWSCC as are the CRDM penetrations at Unit 2. In addition, volumetric inspections completed to date (at Point Beach Unit 1, North Anna Unit 1, Ginna, Oconee Unit 2, and Millstone Unit 2) have not identified the presence of PWSCC-type flaw indications. The staff understands that you are not currently making plans to volumetrically examine the CRDM nozzles of the D. C. Cook Unit 1 upper vessel head, and that you are basing your decision both on the results of volumetric examinations that have been completed on domestic CRDM nozzles to date and on the anticipated results that will come from the planned inspections at Crystal River, Farley Unit 2, Diablo Canyon Unit 2, and San Onofre Unit 3. Since you have indicated that you are a participant in NEI's voluntary program, and

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since the voluntary inspection initiatives are intended to be representative of the PWR industry as a whole, the staff concludes that your responses to GL 97-01 provide reasonable assurance that an adequate inspection program for the CRDM and other VHPs has been established at D. C. Cook, and that the structural integrity for these penetrations is being adequately addressed.

This completes our efforts on TAC Nos. M98559 and M98560.

Sincerely,

/RA/

John F. Stang, Senior Project Manager, Section 1
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-315 and 50-316

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Project Directorate III
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Office of Nuclear Reactor Regulation

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