May 6, 2004

Mr. Mano K. Nazar
Senior Vice President and Chief Nuclear Officer
Indiana Michigan Power Company
Nuclear Generation Group
One Cook Place
Bridgman, MI 49106

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION FOR THE REVIEW OF THE DONALD C. COOK NUCLEAR PLANT, UNIT 1 AND 2 LICENSE RENEWAL APPLICATION

Dear Mr. Nazar:

By letter dated October 31, 2003, Indiana Michigan Power Company submitted an application pursuant to 10 CFR Part 54, to renew the operating licenses for the Donald C. Cook Nuclear Plant, Units 1 and 2, for review by the U.S. Nuclear Regulatory Commission's (NRC). The NRC staff is reviewing the information contained in the license renewal application (LRA) and has identified, in the enclosure, areas where additional information is needed to complete the review. Specifically, the enclosed requests for additional information (RAIs) are Enclosure 1 and Enclosure 2 from the Mechanical and Civil Engineering Branch (EMEB) and the Electrical & Instrumentation and Controls Branch (EEIB) respectively.

Based on discussions with Richard Grumbir of your staff, a mutually agreeable date for your response is within 30 days of the date of this letter. If you have any questions regarding this letter or if circumstances result in your need to revise the response date, please contact me at (301) 415-1471 or by e-mail at jhe@nrc.gov.

Sincerely,

/RA/ Jonathan Rowley for

Johnny Eads, Project Manager
License Renewal Section A
License Renewal and Environmental Impacts Program
Division of Regulatory Improvements Programs
Office of Nuclear Reactor Regulation

Docket Nos.: 50-315 and 50-316

Enclosure: As stated

cc w/encl: See next page

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DONALD C. COOK NUCLEAR PLANT, UNITS 1 AND 2
LICENSE RENEWAL APPLICATION
REQUEST FOR ADDITIONAL INFORMATION (RAI)
MECHANICAL AND CIVIL ENGINEERING BRANCH

General

RAI 3.3.2-1

In Tables 3.3.2-1 through Table 3.3.2-11 for the auxiliary systems, the applicant lists several components having environments and applicable aging effects with associated aging management programs. In the same columns, for the same component, material, and environment, the applicant list no aging effects and no aging management programs (i.e., Table 3.3.2-11, Page 3.3-130, stainless steel bolting with a function of pressure boundary exposed to an external environment of air is credited with experiencing loss of material managed by Bolting and Torquing Activities. The same item in the table on Page 3.3-130 for the same component exposed to the same environment has no aging effects and therefore no aging management program required; Table 3.3.2-6, Page 3.3-77, copper alloy valves exposed to an external condensation environment experiences loss of material. The same item in the table on Page 3.3-77 for the same component exposed to the same environment has no aging effects and therefore no aging management program required; etc.). Justify these discrepancies or revise the tables to correct the errors.

RAI 3.3.2-2

Page B-96 of the LRA states that the Service Water System Reliability program, B.1.29, will be enhanced to check for evidence of selective leaching during visual inspections. However, NUREG-1801, XI.M33, "Selective Leaching of Material," recommends a visual inspection and a hardness measurement of selected components to determine whether loss of material due to selective leaching is occurring. Provide justification for excluding a hardness measurement from the Service Water System Reliability program to detect selective leaching.

Spent Fuel Pool System (Section 3.3.2.1.1)

RAI 3.3.2.1.1-1

The applicant's Auxiliary Systems Water Chemistry Control program, B.1.40.3, Water Chemistry Control – Auxiliary Systems Water Chemistry Control, Page B-128 of the LRA, states the program's purpose as managing loss of material and fouling. The program description further states that it does not provide for detection of aging effects, such as loss of material and cracking. LRA Table 3.3.2-1, Page 3.3-32 identifies cracking as a spent fuel pool poison aging effect and Water Chemistry Control as the applicable AMP. Identify the AMP utilized to manage cracking of SFP poison and provide justification that the program will ensure the components intended function is maintained within accident design limits.

Compressed Air Systems (Section 3.3.2.1.4)

RAI 3.3.2.1.4-1

Table 3.3.2-4, Page 3.3-49, identifies change in material properties and cracking as AERMs for elastomer flex hose components in an internal treated air environment. The Preventive Maintenance AMP, B.1.25, Page B-82 of the LRA, is credited in managing these aging effects by periodic visual inspections and replacement as necessary. It is not apparent from the program description if the flex hoses will be inspected both internally and externally. It is also not apparent how effective a visual inspection will be in detecting internal changes in material properties and cracking. Provide justification that the Preventive Maintenance AMP, B.1.25, will adequately identify and manage the identified internal aging effects.

Chemical and Volume Control System (Section 3.3.2.1.5)

RAI 3.3.2.1.5-1

Table 3.3.2-5, Page 3.3-62, identifies the Boric Acid Corrosion Prevention AMP, B.1.4, for managing the loss of material on the internal surface of a carbon steel tank in an air environment. The program description states that periodic visual inspections are performed of components on which borated reactor water may leak. Explain how the visual inspection referred to in the Boric Acid Corrosion Prevention program will adequately identify and manage the internal aging effects for the tank.

Emergency Diesel Generator (Section 3.3.2.1.8)

RAI 3.3.2.1.8-1

Several stainless steel components listed in Table 3.3.2-8, Page 3.3-95 to 3.3-112, identify cracking as an AERM for stainless steel with an internal treated water environment. The Preventive Maintenance Program, B-1.25, Page B-82 of the LRA, is accredited with managing the cracking aging effect by general inspections rather than specific component-by-component listings. The program description states that the AMP will ensure that loss of material, cracking, fouling, and change in material properties are managed for EDG subsystem components. NUREG-1801 recommends management of these aging effects utilizing chemistry control programs supplemented by one-time inspections in low-flow areas. Justify the effectiveness of the Preventive Maintenance Program, B.1.25, to manage the aging effect of cracking for each stainless steel component so identified in Table 3.3.2-8 or revise Table 3.3.2-8 to include an applicable chemistry control program and one-time inspection.

RAI 3.3.2.1.8-2

Table 3.3.2-8, Pages 3.3-95 to 3.3-112, identifies several carbon steel components in a treated water environment utilizing a Water Chemistry Control AMP to manage a loss of material aging effect. NUREG-1801 also supports using a water chemistry program for managing loss of material to carbon steel. Justify excluding an AMP to manage the water chemistry of the treated water environment for the carbon steel sight flow indicator, Table 3.3.2-8, Page 3.3-106.

Security Diesel (Section 3.3.2.1.9)

RAI 3.3.2.1.9-1

Table 3.3.2-9, Page 3.3-115 and Page 3.3-120, identifies loss of material as an aging effect of stainless steel fittings and stainless steel/carbon steel piping in a soil environment. The applicant identifies System Testing, B.1.37, Page B-114, as an applicable AMP for managing these aging effects. System Testing, B.1.37, does not define fitting or pipe condition or approximate rate of degradation as recommended in NUREG 1801, XI.M28 or XI.M34 for buried fittings/piping. Provide justification for exclusion of buried piping/fitting condition assessment in B.1.37 in accordance with NUREG 1801 or revise the AMP accordingly.

RAI 3.3.2.1.9-2

Table 3.3.2-9, Page 3.3-117, identifies the Preventive Maintenance Program, B.1.25, Page B-82 of the LRA, as managing change in material properties and cracking of flex hoses with an internal environment of fuel oil and treated water. The program states that, it will manage these aging effects by visual inspection and replacement as necessary. It is not apparent from the program description if internal and external surfaces will be inspected. Due to different internal and external environmental conditions, external examination may not be representative of internal component condition. Explain how the visual examination referred to in the Preventive Maintenance Program, B.1.25, will ensure management of internal aging effects of these components.

RAI 3.3.2.1.9-3

Table 3.3.2-9, Page 3.3-118, identifies the System Testing, B.1.37, Page B-114 of the LRA, as being credited in managing fouling of copper alloy heat exchanger tube components. For the same environment, component, and material, the Table 3.3.2-8, Page 3.3-101, identifies Oil Analysis and Water Chemistry Control AMPs to manage fouling and loss of material. Justify the exclusion of Water Chemistry Control and Oil Analysis in managing the security diesel heat exchanger tube heat transfer function in Table 3.3.2-9.

RAI 3.3.2.1.9-4

Table 3.3.2-9, Page 3.3-119, identifies the System Testing, B.1.37, Page B-114 of the LRA, as being credited in managing loss of material of copper alloy heat exchanger tube components in a treated water external environment. For the same environment, component, and material, the Table 3.3.2-8, Page 3.3-102, identifies Heat Exchanger Monitoring and Water Chemistry Control AMPs to manage loss of material and loss of material-wear. Justify the exclusion of Water Chemistry Control and Heat Exchanger Monitoring AMPs in managing the security diesel heat exchanger tube pressure boundary function in Table 3.3.2-9.

RAI 3.3.2.1.9-5

Table 3.3.2-9, Page 3.3-124, identifies the Preventive Maintenance Program, B.1.25, Page B-82 of the LRA, as managing change in material properties and cracking of flex hoses with an internal environment of fuel oil. The program states that it will manage these aging effects by visual inspection and replacement as necessary. It is not apparent from the program

description if internal and external surfaces will be inspected. Due to different internal and external environmental conditions, external examination may not be representative of internal component condition. Explain how the visual examination referred to in the Preventive Maintenance Program, B.1.25, will ensure management of internal aging effects.

RAI 3.3.2.1.9-6

Table 3.3.2-9, Page 3.3-118, identifies the System Testing AMP, B.1.37, to manage the loss of material on the internal surface of the security diesel heat exchanger shell in a treated water environment. The System Testing program manages these aging effects by periodically starting the security diesel and operating it in accordance with manufacturer's recommendations and monitoring system flow and system pressure. Describe how the System Testing program manages aging effects on the internal surfaces of the heat exchanger shell.

Post-accident Containment Hydrogen Monitoring System (Section 3.3.2.1.10)

RAI 3.3.2.1.10-1

Table 3.3.2-10, Page 3.3-127, identifies the Preventive Maintenance Program, B.1.25, Page B-82 of the LRA, as managing change in material properties and cracking of flex hoses with an internal environment of oxygen. The program states that it will manage these aging effects by visual inspection and replacement as necessary. It is not apparent from the program description if internal and external surfaces will be inspected. Due to different internal and external environmental conditions, external examination may not be representative of internal component condition. Explain how the visual examination referred to in the Preventive Maintenance Program, B.1.25, will ensure management of internal aging effects.

Miscellaneous Systems in Scope for 10 CFR 54.4(a)(2) (Section 3.3.2.1.11)

RAI 3.3.2.1.11-1

Table 3.3.2-11, Page 3.3-130 to 3.3-152, identifies the System Walkdown, B.1.38, Page B-119 of the LRA, for management of various aging effects for several components with different internal and external environments. The System Walkdown Program, Section B.1.38 of the LRA, states that the program is only applicable to situations where the internal and external environment is the same. Component external condition may not be representative of internal material conditions in differing environments. Justify utilization of the System Walkdown Program, B.1.38, in managing aging effects for all components identified in Table 3.3.2-11 with differing internal and external environments. Also explain how a system walkdown can inspect and verify proper management of all internal aging effects.

RAI 3.3.2.1.11-2

Table 3.3.2-11, Page 3.3-131, identifies the System Walkdown Program, B.1.38, Page B-119 of the LRA, as managing loss of material of a stainless steel filter housing in an untreated water with boron internal environment. This is an example of one of several stainless steel components that identify the System Walkdown AMP, B.1.38, as managing loss of material in internal environments. System Walkdown Program, Section B.1.38, Page B-119 to B-121, does not credit the program with management of loss of material to stainless steel. Justify

utilization of the System Walkdown Program, B.1.38, in managing loss of material to stainless steel components exposed to an untreated water with boron internal environment for each component in Table 3.3.2-1. Also, explain how a system walkdown can inspect and verify proper management of all internal aging effects.

DONALD C. COOK NUCLEAR PLANT, UNITS 1 AND 2
LICENSE RENEWAL APPLICATION
REQUEST FOR ADDITIONAL INFORMATION (RAI)
ELECTRICAL & INSTRUMENTATION AND CONTROLS BRANCH

1. Interim Staff Guidance (ISG) 2, "NRC Staff Position on the License Renewal Rule (10 CFR 54.4) as it relates to The Station Blackout Rule (SBO) (10 CFR 50.63)," states in part that, "The offsite power systems consist of a transmission system (grid) component that provides a source of power and a plant system component that connects that power source to a plant's onsite electrical distribution system which power safety equipment." For the purpose of the license renewal rule, the staff determined that the plant system portion of the offsite power system that is used to connect the plant to the offsite power source should be included within the scope of the rule. This path typically includes the switchyard circuit breakers that connect to the offsite system power transformers (startup transformer), transformers themselves, the intervening overhead or underground circuits between circuit breaker and transformer and transformer and onsite electrical distribution system, and the associated control circuits and structures. In this regard, the portion of the SBO path indicated on the offsite power boundary drawing for license renewal does not include the transmission conductors and connections and the associated control cables from the first breaker (disconnect) from the 345 kV and 765 kV switchyard buses to the 765 kV/34.5 kV and 345 kV/34.5 kV transformers. Revise this drawing to include the above components indicating which components require an aging management review (AMR).

2. Table 2.5-1 of the license renewal application (LRA) lists the electrical and instrumentation and control (I&C) components included in the AMR. This list does not include transmission conductors, and uninsulated ground conductors listed in the LRA Table 2.1.1. With regard to transmission conductor and connectors, it is stated that the transmission conductors have been screened out because they have no aging effect. Transmission conductors have been known to have loss of conductor strength. The most prevalent mechanism contributing to the loss of conductor strength is corrosion, which includes corrosion of steel core and aluminum strand pitting. Explain why no aging effects related to conductor corrosion have been identified that would cause a loss of function for the extended period of operation. Also, explain why no significant aging effects related to wind loading vibration or sway on high voltage connections has been identified. In addition, provide justification for excluding uninsulated ground conductors from the AMR.

3. The paragraph leading to Table 2.1.1, Page 2.1-17, reference to Table 2.1-1 which is not found in the LRA. Clarify if this is a typographical error.

4. LRA section 2.1.3.3, Long-Lived Screening, states that all electrical penetration assemblies are included in the environmental qualification (EQ) program and are not subject to aging management review. Confirm if this statement is applicable to all safety as well as non-safety related electrical penetration assemblies.

5. Explain how non-safety related cables (not in scope of the license renewal) that share conduits or raceways with in-scope cables included in the AMR will be treated?

6. In response to audit team's question on fuse holders, you stated that, you have completed an assessment to identify fuse holders that are subject to AMR based on requirements of license renewal and Interim Staff Guidance (ISG)-5, "Identification and Treatment of Electrical Fuse Holders For License Renewal." The assessment identified fuse holders in scope for license renewal, then screened in fuse holders in-scope based upon whether: (1) they are included in an active component (panels, switchgear, or cabinet), (2) they perform an intended function to meet the criteria of 10 CFR 54.4 (a) (i.e., isolate safety loads from non-safety loads or are used as protective devises to ensure the integrity of containment electrical penetrations), or (3) they have bolted connections, which are not subject to the same aging stressors (i.e., mechanical stress and fatigue) as spring loaded fuse holder clips. The assessment determined that fuse blocks are either an active components, do not perform a license renewal intended function, or have bolted connections. With regard to the fuse holders that have bolted connections, address the aging affects due to vibration, corrosion and fatigue due to thermal cycling identified in the subject ISG and provide justification as to why an additional AMP for bolted connection fuse holders is not required.

7. With regard to non-EQ cables sensitive to a reduction in insulation resistence, confirm consistency with the proposed ISG-15, Revision of Generic Aging Lessons Learned (GALL) Aging management Program (AMP) XI.E2,"Electrical Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used in Instrumentation Circuits."

8. In response to an audit team's question on inaccessible medium voltage cables within the scope of license renewal that are exposed to significant moisture simultaneously with applied voltage, it was stated that, the AMP for inaccessible medium voltage cables will test the cables as well as inspect for water in the manholes. It was also stated that, inspection of water in the manholes associated the GALL XI.E3 AMP would be performed every 10 years. The frequency to inspect for water in manholes every ten years may be too long. Justify the frequency of inspecting manholes for water every 10 years in addition, provide your current criteria for inspecting manholes for water.

9. In response to an audit team's question on inaccessible medium voltage cables, it was stated that the cables from transformer TR 201 AB to bus 2A run in conduits are sealed on both ends and have been inspected for water and that the lack of water precludes any aging mechanisms on the cables that would make them subject to an AMP. It is not clear to the staff how often these seals are inspected for water damage and how often they are replaced. An AMP would be needed to assure that the seals remain intact to prevent intrusion of water in the conduits. Provide a description of the AMP that will be relied upon to require periodic inspections of these seals or provide justification for not having an AMP. In addition, describe how the cables from: (1) start-up transformers TR 201 CD, 101 AB, and 101 CD to the safety buses and (2) from transformers TR4 and TR5 to the start-up transformers, are routed.

10. The environmental qualification of electrical equipment results in Section 4.4 indicate that the aging effects of the EQ of electrical equipment identified in the time limited aging analysis (TLAA) will be managed during the extended period of operation under 10 CFR 54.21(c)(1)(iii). However, no information is provided on the attributes for re-analysis of an aging evaluation to extend the qualification life of electrical equipment identified in the TLAA. The important attributes of a re-analysis include analytical

methods, data collection and reduction methods, underlying assumptions, acceptance criteria and corrective actions. Provide information on the important attributes for re-analysis of an aging evaluation of electrical equipment identified in the TLAA to extend the qualification under 10 CFR 50.49(e).

11. The updated FSAR supplement description in the LRA for the non-EQ cable AMP does not provide an adequate description of the program as required by 10 CFR 54.21(d). The description of FSAR supplement for aging management of electrical and instrumentation and controls system should be consistent with Table 3.6-2 of NUREG-1800. Submit a revised FSAR supplement that is consistent with NUREG-1800 to satisfy 10 CFR 54.21(d).

12. Section 4.4 of the LRA identified Environmental Qualification of Electric Equipment as a TLAA requiring an evaluation by 10 CFR 54.21(c)(1). The provisions of 10 CFR 50, Appendix A, General Design Criteria (GDC) 4 require the all equipment related to safety be designed to accommodate the environmental effects of postulated accidents. Similarly, NRC SRP 3.11 (NUREG-0800) applies equally to mechanical and electrical equipment. For mechanical equipment in the LRA that are required to be evaluated as a EQ TLAA, provide a discussion on the materials that are sensitive to environmental effects (e.g., seals, gaskets, lubricants, fluids for hydraulic systems, diaphragms, and wear cycle aging from lubricant deterioration) and the aging analyses that will or have been conducted to satisfy the requirements of 10 CFR 54.21(c)(1) for the period of extended operation.

Donald C. Cook Nuclear Plant, Units 1 and 2

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