May 7, 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 from the Mechanical and Civil Engineering Branch (EMEB).

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) 415-4053 or by e-mail at jgr@nrc.gov.

Sincerely,

/RA/

Jonathan Rowley, 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 (EMEB)

Donald C. Cook (Cook) LRA Section 2.4, "Scoping and Screening Results: Structures"

RAI 2.4-1

(a) LRA Table 2.2-4 identifies structures that are not wihin the scope of license renewal. The note at the top of the table states "The UFSAR does not contain details of these structures." It is not obvious to the staff that all of the listed structures serve no intended function, e.g., the containment access building, gas cylinder storage building, hazardous storage building, and the loop feed enclosure. Please clarify and provide technical basis for the determination that they are not within the scope of license renewal.

(b) LRA Table 2.2-4 identifies the "Switchyard tower and pedestal for Unit 2 power delivery" as not being within the scope of license renewal. However, LRA Section 2.4.4 "Yard Structures" identifies "Tower: Unit 2 power delivery to switchyard" as within scope and subject to aging management review. Please resolve this apparent discrepancy.

(c) Verify that seismic II over I considerations are not applicable to structures listed in LRA Table 2.2-4 (e.g., meteorological and microwave towers).

(d) Verify that at plant site, is there any site drainage or dewatering system that is relied on to control the groundwater level. If there is such a system, please identify whether this system (or systems) is within the scope of license renewal. Also, please provide the technical basis for either including it in or excluding it from the scope of license renewal. If within the scope, identify the applicable AMR references in LRA Section 3.

RAI 2.4-2

Based on its review of LRA Sections 2.1, 2.2, 2.3, 2.4, and 2.5, the staff identified the following three (3) issues related to scoping and screening:

- It is not clear to the staff if the applicant has addressed thermal insulation on piping and structures in its scoping and screening evaluation.

- LRA Section 2.4.1 (Page 2.4-2) states that, "Seals are provided on the boundary of the lower and upper compartments and on the hatches in the operating deck to limit steam bypassing the ice condenser." However, LRA Table 2.4-1 does not appear to include these seals.

- LRA Section 2.4.1 identifies the equipment hatch as part of the containment structure evaluation boundary. However, LRA Table 2.4-1 does not appear to include the equipment hatch.

For each issue above, the applicant is requested to:

(a) Identify if it is within the scope of license renewal;

(b) If not within the scope of license renewal, provide the technical basis for that determination;

(c) If within the scope of license renewal, identify the specific table and row in LRA Section 2.3 or 2.4 that includes the item; and

(d) If within the scope of license renewal, identify the location in LRA Section 3 that addresses the AMR for the item.

RAI 2.4-3

The staff has reviewed the following information submitted by the applicant, in order to identify all of the structures and components that are essential to ensure access to the ultimate heat sink (Lake Michigan), for safe shutdown following a design basis event:

- LRA Section 2.3.3.2 (Essential Service Water),
- LRA Section 2.3.3.11 (Screen Wash System),
- LRA Section 2.4.3 (Turbine Building and Screenhouse);
- UFSAR Section 9.8.3 (Service Water Systems),
- UFSAR Section 10.6 (Circulating Water System);
- UFSAR Figure 1.3-1 (Plot Plan), and
- UFSAR Figure 10.6-1 (Circulating Water System)

As a result of this review, additional information are needed before the staff can reach a conclusion that all essential elements have been included in the LR scope and have been subject to aging management review.

LRA Section 2.4.3, under "Evaluation Boundaries", lists the structural elements that are evaluated for the turbine building and screenhouse. The following elements in the list appear to directly relate to the availability of cooling water for safe shutdown:

- Screenhouse superstructure, which houses the ESW and CW pumps, as well as the traveling screens, stop logs, and bar grills
- Structural components and commodities from, and including, the intake cribs up to but not including the CW pump intake piping
- Structural components and commodities from, and including, the intake cribs up to but not including the ESW pump intake piping
- Structural components and commodities from, and including, the discharge tunnels up to, and including, the discharge jets

- Structural components and commodities that support CW pumps and intake piping
- Structural components and commodities that support ESW pumps and intake piping
- Structural components and commodities associated with the following:

  Intake cribs; Discharge piping; Forebay; Traveling screens; Trash baskets; Trash collection; Sluice gates; De-icing tunnels; Discharge tunnels; Screenhouse; Piping supports, pump supports, baseplates, and anchors contained within the screenhouse.

However, many of the elements listed above are not specifically identified in LRA Table 2.4-3, "Turbine Building And Screenhouse Components Subject to Aging Management Review," and only two (2) items in the table specify an intended function "SCW" (provide source of cooling water for plant shutdown). These are intake corrugated steel piping and intake crib steel framing and plate. LRA Table 2.4-5, "Structural Commodities Components Subject to Aging Management Review", does not list any components specifically related to the availability of cooling water for safe shutdown.

Therefore, the applicant is requested to:

(a) List all structures and components depicted in UFSAR Figure 10.6-1 (Circulating Water System), and any additional structures and components, that are essential to ensure the availability of cooling water for safe shutdown, up to (but not including) the ESW pumps;

(b) Correlate the list developed in response to (a) above with the structures and components identified in LRA Section 2.4.3 "Evaluation Boundaries";

(c) For each listed structure and component, identify the applicable line item in LRA Table 2.4-3 or LRA Table 2.4-5;

(d) If it is not included in either of these tables, identify where it is addressed in the LRA; and

(e) Identify the applicable AMR reference for each structure and component.

RAI 2.4-4

It is not clear to the staff about the scope of load handling systems included in the Cook license renewal scope. LRA Section 2.3.3.12, "Material/Equipment Handling" and "Refueling", identify specific cranes that are in the scope of license renewal, and refer to LRA Section 2.4 for the evaluation. LRA Sections 2.4.1, 2.4.2, 2.4.3, and 2.4.5 all identify load handling systems under "Evaluation Boundaries" and/or in the associated Table 2.4-x. However, there is not a one-to-

one correspondence between all of the cranes listed in LRA Section 2.3.3.12 and the information in LRA Section 2.4. Also, it is not clear if there are additional load handling systems in the LR scope and covered by LRA Section 2.4.

With the concerns stated above, the applicant is requested to:

(a) Provide a listing of all load handling systems in the LR scope;

(b) Identify specific components that are subject to an AMR, for each in-scope load handling system;

(c) Identify the specific line item in LRA Tables 2.4-1, 2.4-2, or 2.4-5 that covers each component; and

(d) Identify the applicable AMR reference for each component.

RAI 2.4-5

Section 2.4 of the LRA does not describe the cable feed-through assembly, which is part of containment electrical penetrations. This assembly serves a pressure boundary intended function. Therefore, the applicant is requested to clarify whether the cable feed-through assembly is in scope or not. If it is in scope, identify the applicable table number and component name in LRA Section 2.4, and the applicable AMR table number and component name in LRA Section 3.5. If it is not in scope, provide the justification for its exclusion.

Cook LRA Section 3.5, "Structures and Components Supports"

RAI 3.5-1

In line item 3.5.1-3 of Table 3.5.1 of the LRA, the applicant indicates that the aging effects related to loss of material due to corrosion of bellows, and dissimilar metal welds are managed consistent with NUREG-1801. NUREG-1801 recommends the examination of penetration bellows and the associated dissimilar welds based on the operating experience with the stress corrosion cracking of bellows as documented in NRC Information Notice 92-20. The applicant is requested to provide the following information related to the examination and/or testing of containment penetration bellows:

How many penetration bellows are in the Cook containments? Please summarize the operating experience related to the examination of these bellows. If provisions are made to assess their leaktightness (as they are not accessible for visual examination), please provide a summary of

these provisions (including frequency of tests), and indicate if such leaktightness assessment of the bellows is part of the LRA AMP B.1.15 or B.1.8.

RAI 3.5-2

For seals and gaskets related to containment penetrations, in Item Number 3.5.1-6 of the LRA, containment ISI and containment leak rate testing have been stated as the aging management programs. For equipment hatches and air-locks at Cook, the staff agrees with the applicant's assertion that the leak rate testing program will monitor aging degradation of their seals and gaskets, as they are leak rate tested after each closing. For other penetrations with seals and gaskets, the applicant is requested to provide information regarding the adequacy of Type B leak rate testing frequency to monitor aging degradation of seals and gaskets at Cook.

RAI 3.5-3

In the discussion of Item 3.5.1-12 in Section 3.5.2.2.1.4, the applicant notes that the moisture barrier is monitored under IWE for aging degradation. The industry experience indicates that the moisture barrier degrades with time, and any moisture accumulation in the degraded barrier corrodes the steel liner. The applicant is requested to provide information regarding the operating experience related to the degradation of moisture barrier and the containment liner plate at Cook. Please include a discussion of acceptable liner plate corrosion before it is reinstated to the nominal thickness.

RAI 3.5-4

In addressing item 3.5.1-27 in table 3.5.2-1, for the reinforced concrete structures subjected to elevated temperatures and high humidity (e.g., primary shield walls, pressurizer and steam generator enclosures, reactor vessel supports) the environment column should read "elevated temperature." For these structures, the applicant is requested to provide the following information:

(a) The method(s) of monitoring temperatures within the primary shield wall concrete, and around the reactor vessel, and in the reactor cavity.

(b) If the primary shield wall concrete (or any other structure within Cook containment is kept below the threshold temperature (i.e., 150°F) by means of air cooling, provide the operating experience related to the performance of the cooling system.

(c) The results of the latest inspection of these structures, in terms of cracking, spalling, and condition of reactor vessel support structures, etc.

RAI 3.5-5

Section 3.5.2.2.2.2, “Aging Management of Inaccessible Areas,” of the LRA (Page 3.5-13) states that inspection of accessible concrete have not revealed degradation related to corrosion of embedded steel. The Cook below-grade environment is not aggressive. Therefore, corrosion of embedded steel is not an applicable aging mechanism for Cook concrete. The staff agrees with this statement only for the case of uncracked reinforced concrete elements. However, the embedded structural foundations may crack due to settlement and corrosion of reinforcing steel may be expected. The applicant is requested to provide additional information to justify the validity of the LRA statement.

RAI 3.5-6

Section B.1.4, “Broic Acid Corrosion Prevention,” of the LRA (Page B-26) states that, the Boric Acid Corrosion Prevention Program is an existing Cook program which is comparable to the program Section XI.M10. This existing program will be revised to include electrical components in addition to ferritic steel. As stated in the GALL (Section XI.M10, “Broic Acid Corrosion”), the program scope covers any carbon steel and low-alloy structures or components, and electrical components, on which borated reactor water may leak. It is the staff’s understanding, based on the conversation between NRC project manager and the applicant, that this program also covers structures and structural components related to or adjacent to the boronic injection system (portions of this system are located in the auxiliary building). However, some structural components, such as anchor bolts (includes switchyard structures and tank anchors), (LRA, Page 3.5-62) are obviously not located in the containment nor in the auxiliary building.

Therefore, the applicant is requested to:

(a) Clearly state that the scope of the boric acid corrosion program will cover these structural components, and

(b) Clarify that are there any other structures and structural components not located in the containment nor auxiliary building and to be covered by this AMP.

RAI 3.5-7

As described in Table 3.5.2-3 and B.1.32 of the LRA, the Structure Monitoring Program (SMP) is consistent with GALL and is to be used for the aging management of water control structures, but the applicant has not compared the SMP with the GALL RG 1.127 Program, as specified in the GALL.

With the concern stated above, the applicant is requested to provide a comparison of the SMP with the GALL RG 1.127 Program and demonstrate that the SMP is suitable for managing the aging effects of water control structures.

RAI 3.5-8

Section 3.5 of the LRA states that at Cook, the concrete is not exposed to flowing water and the below-grade environment is not aggressive (pH is greater than 5.5, chlorides is less than 500ppm, and sulfates is less than 1,500ppm). Therefore, the LRA concludes that increase in porosity and permeability and loss of strength of due to leaching of calcium hydroxide are not applicable aging effects for Cook concrete structures. However, the applicant did not commit, in the SMP to periodically monitor the ground water chemistry, as specified in the GALL.

The applicant is requested to:

(a) Either augment its SMP to include the monitoring program and to ensure that the ground water will continuously be non-aggressive, or

(b) Provide technical basis and justify that there is no need to continuously monitor the ground water chemistry.

Cook LRA Section 4.7.3, "Ice Condenser Lattice Frames"

RAI 4.7.3-1

A line item in Table 3.5.2-1 (page 3.5-31) of the LRA, states that the aging effect considered for ICLF is "loss of material," and that it is monitored under Structural Monitoring Program (SMP). A review of the SMP in Section B1.32 of the LRA indicates that the program is consistent with Section XI.S6 of NUREG-1801. NUREG-1801 (Section XI.S6) does not specifically address the aging management of the components of ice condensers. In order to complete the review of this TLAA, the applicant is requested to provide the following information:

(a) Provide a summary of operating experience related to the condition of ICLF components (out of plumb support columns, lattice frame spacing adjustments, maintenance of hydraulic radius, etc.).

(b) Address specifically, the effects of borated ice and low sustained temperature on ICLF components, and

(c) Provide justification for not considering the fatigue analysis TLAA for the effects of temperature variation on the ICLF components.

Cook LRA Section 4.7.6, "Fatigue Analysis of Cranes"

RAI 4.7.6

(a) It is stated in LRA Section 4.7.6, "Fatigue Analysis of Cranes," that the applicant has taken some limited exceptions with the design standards of CMAA-70, "Specifications for Electric Overhead Traveling Cranes". The applicant is requested to discuss how those exceptions affect the TLAA analyses related to the five cranes includedin the LRA.

(b) The applicant is requested to provide (a) estimated number of load cycles and the bases thereof, for each of the five cranes included in LRA Section 4.7.6 (b) the margins available after 60 years of operation based on design limits in CMAA-70.

Cook LRA Section B.1.2, "Bolting and Torquing Activities"

RAI B.1.2-1

The AMP 1.2, "Bolting and Torquing Activities," an existing plant specific program is credited for managing loss of mechanical closure integrity. The program covers bolting in high temperature systems and in applications subject to significant vibration. The staff notes that NUREG-1801 credits AMP XI.M 18 Bolting Integrity for monitoring loss of material, cracking, and loss of preload. In addition, accepted bolting integrity programs (such as EPRI 104213) recommend monitoring for loss of preload as one of the parameters monitored/inspected. Monitoring for cracking of high strength bolts (actual yield strength equal or greater than 150 ksi) is also recommended.

As such, the applicant is requested to provide the following information:

(a) Identify the areas of the Bolting Integrity Program at Cook which are consistent with the AMP XI.M.18 in the GALL report, and also those aspects in which it is different.

(b) Discuss how the loss of preload aging effect would be managed by the Bolting and Torquing Activities AMP at Cook.

(c) Discuss the inspections associated with the Bolting and Torquing Activities AMP at Cook which may be beyond the requirements of ASME Section XI.

(d) Are there any high strength bolts included within the boundary of these three systems (Engineered Safety Features, Auxiliary, and Steam & Power Conversion Systems)?

(e) The LRA does not identify loss of preload as an AERM for bolts in the Auxiliary System at Cook. Explain how this aging effect would be managed in this system.

(f) SCC in stainless steel bolts can potentially occur depending on a combination of factors such as stainless steel grade, method of hardening (for example, strain, precipitation or age hardening) environment and stress levels. Discuss how these factors were taken into account to determine whether or not SCC is an applicable aging effect.