May 26, 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 (CNP), Units 1 and 2, for review by the U.S. Nuclear Regulatory Commission (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 request for additional information (RAI) is from CNP LRA Sections 3.2, 3.4, and 3.3 (Enclosure).

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 Improvement Programs
Office of Nuclear Reactor Regulation

Docket Nos.: 50-315 and 50-316

Enclosure: As stated

cc w/encl: See next page

May 26, 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 (CNP), Units 1 and 2, for review by the U.S. Nuclear Regulatory Commission (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 request for additional information (RAI) is from CNP LRA Sections 3.2, 3.4, and 3.3 (Enclosure).

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
Accession no. ML041480115
DISTRIBUTION: See next page

Document Name: C:\ORPCheckout\FileNET\ML041480115.wpd

OFFICE	PM:RLEP	LA:RLEP	SC:RLEP
NAME	JRowley	MJenkins	SLee
DATE	5/25/04	5/25/04	5/26/04

OFFICIAL RECORD COPY

DISTRIBUTION: Ltr. to M. Nazar, Dated: May 26, 2004

Accession no. ML041480115

HARD COPY
RLEP RF
J. Rowley (PM)

E-MAIL:
RidsNrrDrip
RidsNrrDe
G. Bagchi
K. Manoly
W. Bateman
J. Calvo
R. Jenkins
P. Shemanski
J. Fair
RidsNrrDssa
RidsNrrDipm
D. Thatcher
R. Pettis
G. Galletti
C. Li
M. Itzkowitz (RidsOgcMailCenter)
R. Weisman
M. Mayfield
A. Murphy
S. Smith (srs3)
S. Duraiswamy
Y. L. (Renee) Li
RLEP Staff

M. Schneider
C. Marco
J. Strasma, RIII
OPA

cc:

Regional Administrator, Region III
U.S. Nuclear Regulatory Commission
801 Warrenville Road
Lisle, IL 60532-4351

Attorney General
Department of Attorney General
525 West Ottawa Street
Lansing, MI 48913

Township Supervisor
Lake Township Hall
P.O. Box 818
Bridgman, MI 49106

U.S. Nuclear Regulatory Commission
Resident Inspector's Office
7700 Red Arrow Highway
Stevensville, MI 49127

David W. Jenkins, Esquire
Indiana Michigan Power Company
One Cook Place
Bridgman, MI 49106

Mayor, City of Bridgman
P.O. Box 366
Bridgman, MI 49106

Special Assistant to the Governor
Room 1 - State Capitol
Lansing, MI 48909

Mr. John A. Zwolinski
Director, Design Engineering and
Regulatory Affairs
Indiana Michigan Power Company
Nuclear Generation Group
500 Circle Drive
Buchanan, MI 49107

Michigan Department of Environmental
Quality
Waste and Hazardous Materials Div.
Hazardous Waste & Radiological
Protection Section
Nuclear Facilities Unit
Constitution Hall, Lower-Level North
525 West Allegan Street
P.O. Box 30241
Lansing, MI 48909-7741

David A. Lochbaum
Nuclear Safety Engineer
Union of Concern Scientists
1707 H Street NW, Suite 600
Washington, DC 20036

Michael J. Finissi, Plant Manager
Indiana Michigan Power Company
Nuclear Generation Group
One Cook Place
Bridgman, MI 49106

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

Mr. Fred Emerson
Nuclear Energy Institute
1776 I Street, N.W., Suite 400
Washington, DC 20006-3708

Richard J.Grumbir
Project Manager, License Renewal
Indiana Michigan Power Company
Nuclear Generation Group
500 Circle Drive
Buchanan, MI 49107

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

Donald C. Cook (CNP) LRA Section 3.2, "Engineered Safety Features Systems"

RAI 3.2-1

LRA Section 3.2.2.2.1 identifies the applicant's aging management for cumulative fatigue damage for components in the ESF systems. In the discussion the LRA refers to Section 4.3 which states that based on a screening criteria, the applicant determined that components in the ECCS system exceeded the screening criteria. The piping components that exceeded the screening criteria were evaluated by the applicant for their potential to exceed 7000 thermal cycles in sixty years of plant operation.

The applicant determined that none of the piping components in the EFS system exceeded 7000 cycles during the period of extended operation. The applicant is requested to provide the highest estimated number of thermal cycles and the basis for derivation for each component type identified in Tables 3.2.2-1, -2, -3 and -4 of the LRA for which TLAA-Metal Fatigue has been designated as the aging management program. For those components whose material or aging effect is not specified in NUREG-1801 (designated as 'F' and 'I' respectively in the notes), clarify whether or not the applicant performs the thermal cycle evaluation in accordance with NUREG-1801, Section 4.3-1.12. If so, is the applicants TLAA program consistent with NUREG-1801. If not explain any differences. Also the applicant is requested to address how unanticipated transients and thermal stratification are accounted for in the estimation where applicable.

RAI 3.2-2

LRA Table 3.2.2-2 does not list any aging effect requiring management for carbon steel piping with an internal nitrogen environment. The applicant is requested to discuss the potential for moisture in the internal nitrogen and whether or not it is periodically verified.

RAI 3.2-3

LRA Table 3.2.2-2 credits the Containment Leak Rate Testing Program for managing loss of material of carbon steel piping in an air (internal) environment. This is a plant specific program since the comparable environment for carbon steel piping is not evaluated in the GALL report. The applicant is requested to perform a one-time inspection in addition to the Containment Leak Rate Testing Program to identify and mitigate any aging effects due to moisture in the internal air of the carbon steel piping.

RAI 3.2-4

LRA Table 3.2.2-2 credits the Boric Acid Corrosion Prevention Program for managing loss of mechanical closure integrity for carbon steel bolts in an external air environment. This aging management program relies on implementation of recommendations in NRC Generic Letter (GL) 88-05 “Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary Components in PWR Plants.” Since this program addresses components inside the containment, the applicant is requested to discuss the management for the loss of mechanical closure integrity of carbon steel bolts outside the containment.

RAI 3.2-5

LRA Table 3.2.2-2 credits the Bolting and Torquing Activities programs for managing the loss of mechanical closure integrity of carbon steel and stainless steel bolts in an external air environment. The applicant is requested to discuss how cracking and loss of preload resulting in loss of mechanical closure integrity is managed. Also the applicant is requested to provide the inspection activities in its program which are equivalent to the appropriate ASME Section XI requirements. In addition the applicant is requested to address how the aging effects are managed for inaccessible bolts. These include bolts such as those located in cavities or obstructed by other components and devices.

RAI 3.2-6

LRA Table 3.2.2-1 identifies a plant specific In-service Inspection Program for managing the aging effect due to cracking and loss of material of stainless steel thermowells and valves in a sodium hydroxide environment. This combination of environment, material and component is not evaluated in the GALL report. The applicant is requested to discuss the plant specific inspection methods including frequency of inspections and acceptance criteria. Also, identify the differences with the appropriate ASME Section XI requirements, if any, and provide justification for the differences.

RAI 3.2-7

LRA Table 3.2.2-1 identifies a plant specific In-service Inspection Program for managing the aging effect due to cracking and loss of material in stainless steel tanks in an internal sodium hydroxide environment. Neither this component nor the material and environment are evaluated in the GALL report. The applicant is requested to discuss its plant specific inspection methods including frequency of inspections and acceptance criteria. Also, identify the difference with the appropriate ASME XI requirements, if any, and provide justification for the same.

RAI 3.2-8

LRA Table 3.2.2-1 does not identify any aging effect requiring management for stainless steel tanks in a concrete environment. Are periodic thickness measurements taken specially at weld locations and at the tank bottom, to ensure that the integrity of the tank is maintained? If so provide the frequency and method of inspections.

RAI 3.2-9

LRA Tables 3.2.2-1, -2, and -3 do not list the material type for valve bodies. The applicant is requested to identify the material type environment, aging effect and management programs for these valve bodies.

RAI 3.2-10

The GALL report recommends a plant-specific aging management program for loss of material due to general, pitting, and crevice corrosion and microbiologically induced corrosion (MIC) in carbon steel components exposed to lubricating oil that may be contaminated with water. Similar aging effects (except general corrosion) are possible for copper alloy. The NRC staff considers a periodic inspection program appropriate to manage this aging effect. For the oil cooler shell in the emergency core cooling system (LRA Table 3.2.2-3) exposed to an oil environment, the applicant is requested to provide a periodic inspection program in addition to an oil analysis program for aging management for loss of material due to general (carbon steel), pitting, and crevice corrosion and MIC, or provide justification for not managing this aging effect.

RAI 3.2-11

LRA Table 3.2.2-3 states that the copper alloy oil cooler tubes for the pump in a cooling water environment will be managed for loss of material using the Water Chemistry Control Program. For this material type and environment, the staff considers selective leaching to be an aging effect requiring management. The applicant is requested whether selective leaching is considered to be an aging mechanism for the tubes. If so, describe the types of inspections used by the applicant to detect selective leaching in the tubes.

RAI 3.2-12

The GALL report recommends further evaluation of programs to manage the loss of material due to pitting and crevice corrosion to verify the effectiveness of the Water Chemistry Control Program. A one-time inspection of select components at susceptible locations is an acceptable method to determine whether an aging effect is occurring or is progressing very slowly so that the intended function will be maintained during the period of extended operation. LRA Tables 3.2.2-1, 3.2.2.-2, and 3.2.2-3 list various carbon steel components in a treated water environment and stainless steel components in a borated water environment with the aging effect being loss of material. The aging management program for these components is the Water Chemistry Control Program but no one-time inspection program is identified in the Tables listed above. However a new plant specific Chemistry One-Time Inspection Program is discussed in LRA Appendix B, Page B-131. It is stated in the description of this program that it is comparable to the NUREG-1801, Section XI.M32, One-Time Inspection Program but less broad in scope than the NUREG-1801 program. The applicant is requested to clarify that the inspections and examinations performed within the scope of its new Chemistry One-Time Inspection Program will verify the effectiveness of the Chemistry Control Program in managing the aging effect of loss of material in the various carbon steel components in a treated water environment and stainless steel components in a borated water environment listed in LRA Tables 3.2.2-1, 3.2.2-2, and 3.2.2-3.

<u>RAI 3.2-13</u>

LRA Table 3.2.2-3 list loss of material and erosion as an aging effects requiring management for the flow orifice/element, but does not list cracking. The staff considers cracking a possible aging effect requiring management for flow orifice/elements. The applicant is requested to describe the flow orifice/element, their location in the system, and why cracking is not considered to be an aging effect requiring management.

<u>RAI 3.2-14</u>

LRA Table 3.2.2-3 states that cracking in the pump casing with an internal stainless steel cladding, in a borated water environments is managed by a plant specific preventive maintenance program. The applicant states that this cracking is not SCC but is a component specific cracking due to stress concentration. The applicant is requested to provide the following information: (a) the inspection frequency of these charging pumps including the bases thereof, (b) operating history of the pumps, and (c) whether or not a fatigue evaluation due to pressure cycling has been performed to rule out fatigue cracking as a factor. If so, provide that evaluation.

CNP LRA Section 3.4, "Steam and Power Conversion Systems"

<u>RAI 3.4-1</u>

LRA Table 3.4.2-3 identifies no aging effects for copper alloy in an outside environment. The outside environment is generally defined as: "An environment where component are exposed to direct sunlight, precipitation, and freezing conditions. The outside environment also conservatively includes components located in sheltered areas where the component is beneath some type of roof structure or outdoor enclosure (such as a valve box) but is otherwise open to the ambient environment." This material is not identified for this environment in the GALL report. However, the GALL report recommends aging management for the loss of material due to general corrosion on the external surfaces of carbon (alloy) steel components exposed to operating temperatures less than 212°F, such corrosion may be due to air, moisture, or humidity. The applicant is requested to provide a program to manage corrosion on the external surface of copper alloy components in an outside environment or to provide justification for not managing this aging effect.

<u>RAI 3.4-2</u>

LRA Table 3.4-1, item 1, identifies the applicant's aging management for cumulative fatigue damage for piping and fittings in the main feedwater line, the steam line, and for AFW piping. In the discussion column for this item, the LRA states, "see Section 4.3 [of the LRA]."

It is stated in Section 4.3 of the LRA that based on a screening criteria, the applicant determined that the main feedwater, main steam, AFW and blowdown systems exceed the screening criteria. The piping components that exceed the screening criteria were evaluated by the applicant for their potential to exceed 7000 thermal cycles in sixty years of plant operation.

The applicant determined that none of the piping components in the steam and power conversion system, mentioned earlier exceeded 7000 cycles during the period of extended operation. The applicant is requested to provide the highest estimated number of thermal cycles and the basis for derivation for each component type identified in Tables 3.4.2-1, -2, -3 and -4 of the LRA for which TLAA -Metal Fatigue has been designated as the aging management program. For certain components either whose material or aging effect is not specified in NUREG-1801(designated as 'F' and 'I' respectively in the notes), clarify whether or not the applicant performs the thermal cycle evaluation as described in NUREG-1801, Section 4.3.1.2. If so, is the applicants TLAA program consistent with NUREG-1801. If not explain any differences. Also the applicant is requested to address how unanticipated transients and thermal stratification are accounted for in the estimation.

RAI 3.4-3

It is stated in Table 3.4.2-3 of the LRA that for stainless steel tanks in an external concrete environment there are no aging effects requiring management and also for this component and material there is no aging management program in NUREG-1801 for this environment. The applicant is requested to identify the specific tanks in the auxiliary feedwater system and discuss how the integrity of the welds and wall thickness in inaccessible locations in the tank is assured including method and frequency of inspections and their bases.

RAI 3.4-4

The AMP 1.2 Bolting and Torquing Activities, an existing plant specific programs 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 recommends 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 D. C. 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 D. C. Cook.

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

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

(e) The occurrence of SCC in stainless steel bolts can depend 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.

RAI 3.4-5

The applicant also does not identify any aging effect for stainless steel tube and tube fittings, valves (body only) in the reactor building environment. Provide justification for this omission. If insignificant concentration of contaminants is part of the justification, provide the acceptance criterion and the verification/inspection activities on susceptible locations to justify your judgement.

RAI 3.4-6

The applicant identifies no applicable aging effect for carbon steel components in an embedded environment. If this environment involves concrete, corrosion of carbon steel components embedded in concrete through carbonation etc., is commonly known degradation process. If there are no carbon steel components in an embedded environment in the steam and power conversion systems, then the applicant is requested to validate this statement.

RAI 3.4-7

It is stated in Table 3.4.2-3 of the LRA that Oil analysis and Water Chemistry Control aging management programs will be utilized to manage fouling in heat exchanger with copper alloy tubes in lube oil and treated water environments to assure the heat transfer capability. The applicant is requested to explain how these two aging management programs will manage fouling and assure adequate heat transfer. The applicant is also requested to address whether any cleaning, visual inspections, and thermal performance testing would be performed including the frequency of such inspections and tests and the bases thereof.

RAI 3.4-8

LRA Table 3.4.2-3 identifies loss of material and fouling for copper alloy heat exchanger tubes in treated water environment. The applicant credits the Water Chemistry Control Program to manage this aging effect. This material is not identified for this component in the GALL report, but the GALL report recommends Water Chemistry Control and a one-time inspection to manage loss of material for carbon/alloy steel components in a treated water environment. LRA Table 3.4.2-3 does not identify a one time inspection to verify the effectiveness of the Water Chemistry Control Program. However, a new plant specific one time inspection program is discussed in LRA, Appendix B (B.1.41). The applicant is requested to clarify that this program will include inspections and examinations to verify the effectiveness of the Water Chemistry Control Program to manage loss of material and fouling for copper alloy heat exchanger tubes in treated water environment.

RAI 3.4-9

LRA Table 3.4.2-3 states that Preventive Maintenance Program will manage change in material properties and cracking of elastomeric material of tanks in a treated water environment. However, the Preventive Maintenance Program in Appendix B of the LRA does not provide any discussion of the aging management of pressure retaining elastomeric tanks in a treated water environment. Describe how the applicant will manage the change in material properties and cracking in tanks including inspection methods for inaccessible locations, frequency of inspections and acceptance criteria and the bases thereof.

RAI 3.4-10

LRA Table 3.4.2-1, -2, -3, and -4 identify loss of material and cracking as an aging effect for various stainless steel components in treated water and steam environments. The applicant credits the Water Chemistry Control Program to manage this aging effect. Stainless steels are susceptible to loss of material in this type of environment and the GALL report recommends that, for loss of material due to pitting and crevice corrosion, the effectiveness of the Water Chemistry Control Program should be verified to ensure that significant degradation is not occurring. The applicant is requested to confirm that the one-time inspection program discussed in LRA, Appendix B, will verify the effectiveness of the Water Chemistry Control Program for various stainless steel components in treated water and steam environments.

RAI 3.4-11

LRA Table 3.4.2-1 identifies loss of material as an aging effect for alloy steel steam/fluid traps in a steam and treated water environment. The applicant credits the Water Chemistry Control Program to manage this aging effect. The GALL report recommends Water Chemistry Control and a one-time inspection to manage loss of material for carbon/alloy steel components in a treated water environment. The applicant is requested to confirm that the new one-time inspection program discussed in LRA, Appendix B, will include inspections and examinations to verify the effectiveness of the Water Chemistry Control Program to manage loss of material for alloy steel steam/fluid traps in a steam and treated water environment.

CNP LRA Section 3.3, "Auxiliary Systems"

RAI 3.3.2.1.11-3

LRA Table 3.3.2-11 identifies the System Walkdown Program as managing loss of material, cracking, and change in material properties for the internals of various components such as condenser shell, evaporator housing, filter housing, flex hose, heat exchanger shell, heater coil, heater housing, manifold piping, orifice, piping, pump casing, strainer housing, tank, thermowell, trap, tubing, valve, and ventilation unit housing. The System Walkdown Program performs inspections on accessible surfaces during walkdowns. Explain how the System Walkdown Program will detect loss of material on the internal surfaces of the these components.