

June 30, 2004

Mr. Mano K. Nazar
Senior Vice President and Chief Nuclear Officer
Indiana Michigan Power Company
Nuclear Generation Group
500 Circle Drive
Buchanan, MI 49107

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION FOR THE REVIEW OF
DONALD C. COOK NUCLEAR PLANT, UNITS 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 areas where additional information is needed to complete the review. Specifically, the requests for additional information (RAIs) are from CNP LRA Sections 3.1 and B.1.31 (Enclosure).

Based on discussions with Mr. 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

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

Donald C. Cook (CNP) LRA Section 3.1, "Reactor Vessel, Internals, and Reactor Coolant System" (as applies to Steam Generators)

RAI 3.1-1

Augmented inspection is recommended for the steam generator shell assembly, item 3.1.1-2 in Table 3.1.1 of the Aging Management Review (AMR). The aging effect is loss of material due to pitting and crevice corrosion, which may not be detected by the inservice inspection and water chemistry control programs. The Standard Review Plan (NUREG-1800) subsection 3.1.2.2.2 recommends an augmented inspection for this aging effect. The applicant states that the Water Chemistry Control Program will be supplemented by the Steam Generator Integrity Program for secondary side components. Neither the Steam Generator Integrity Program description, NEI 97-06, or the EPRI Steam Generator Examination Guidelines explain such an inspection. Describe the details of the augmented inspection and explain how it will manage the aging effect.

RAI 3.1-2

According to Item Number 3.1.1-21 in Table 3.1.1 of the LRA, the feedwater inlet rings and supports were not included in the scope of the AMR because the aging concern in the GALL (flow accelerated corrosion of the feedwater inlet ring and support) applies only to CE System 80 steam generators. Although the D. C. Cook plant has different steam generator models, there is still a potential for degradation of the feedwater inlet rings that may affect safe operation. As cited in a letter from Progress Energy (ML032650884, response to open and confirmatory items, H. B. Robinson Steam Electric Plant, Unit 2), operating experience compiled by the Institute of Nuclear Power Operations (INPO) and the World Association of Nuclear Operators (WANO) indicates two cases of feedwater assembly degradation in Westinghouse Model 51 steam generators. The first case, in 1989, involved erosion corrosion of the J-nozzles, which were replaced. The second case, in 1995, was a leak at a previously plugged bottom spray hole. Although no loose parts were reported in these incidents, corrosion or cracking of the J-nozzles could generate loose parts that affect steam generator tube integrity.

How will aging of the feedwater ring assembly, including the J-nozzles, be managed? If these components were omitted from the scope due to design features, please provide a description of these features and the technical basis for why they eliminate the need for aging management of the feedwater ring assembly.

RAI 3.1-3

According to the AMR Results, LRA Table 3.1.2-5, the applicant credits the Water Chemistry Control program (with the Steam Generator Integrity Program in some cases) for managing loss of material during the extended operating period. Since water chemistry control is a

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preventative strategy, and the Steam Generator Integrity Program does not specify how to detect these aging effects, the staff requests that the applicant identify the aging mechanisms and explain how the aging effects would be detected and monitored if prevention fails. This applies to the following components:

- stainless steel cladding on the primary head in borated water;
- stainless steel cladding on primary nozzles in borated water;
- stainless steel primary nozzle safe ends in borated water;
- nickel-base alloy partition plates and nozzle dam retention rings in borated water;
- nickel-base alloy and stainless steel primary manway insert plates in borated water;
- nickel-base alloy tubes and plugs in borated water and in treated water;
- nickel-base alloy tubesheet cladding in borated water;
- low alloy steel tubesheet in treated water;
- low alloy steel feedwater nozzles in treated water;
- nickel-base alloy feedwater nozzle thermal sleeve (Unit 1) in treated water;
- nickel-base alloy feedwater safe ends (Unit 1) in treated water;
- low alloy steel blowdown, instrument and other connections in treated water;
- low alloy steel handhole, inspection, and recirculation port covers in treated water;
- stainless steel steam flow restrictors (Unit 1) in treated water;
- nickel-base alloy feedwater liner piston rings (Unit 2) in treated water;
- carbon steel tube wrappers (shroud) in treated water;
- stainless steel tube support plates and anti-vibration bars (Unit 2) in treated water;
- carbon steel tube support plate stayrods, spacers (Unit 2), and stayrod nuts in treated water;
- nickel-base alloy tube support plate stayrod washers and AVB retaining rings (Unit 2) in treated water;
- carbon steel lattice grid rings, lattice grid ring studs (Unit 1), and U-bend arch bars (Unit 1) in treated water; and
- stainless steel lattice grid bars, U-bend flat bars, and J-tabs (Unit 1) in treated water

RAI 3.1-4

According to the AMR Results, LRA Table 3.1.2-5, the applicant credits the Water Chemistry Control and Steam Generator Integrity programs for managing cracking during the extended operating period. Since water chemistry control is a preventative strategy, and the Steam Generator Integrity Program does not specify how to detect these aging effects, the staff requests that the applicant identify the aging mechanisms and explain how the aging effects would be detected and monitored if prevention fails. This applies to the following components:

- carbon steel tube wrappers (shroud) in treated water;
- stainless steel tube support plates and anti-vibration bars (Unit 2) in treated water;
- carbon steel tube support plate stayrod nuts (Unit 2) in treated water;
- nickel-base alloy tube support plate stayrod washers and AVB retaining rings (Unit 2) in treated water;
- carbon steel lattice grid ring studs (Unit 1) in treated water; and
- stainless steel lattice grid bars, U-bend flat bars, and J-tabs (Unit 1) in treated water

RAI 3.1-5

In Table 3.1.2-5 of the AMR Results, the applicant identifies fouling as an aging effect for steam generator tubes and plugs. The applicant intends to manage this fouling with the Water Chemistry Control and Steam Generator Integrity aging management programs. Please explain how these programs address the cleaning of the components if fouling occurs (i.e. corrective actions).

RAI 3.1-6

Table 3.1.2-5 of the AMR lists both loss of material and cracking as aging mechanisms for carbon steel closure bolts in the external-ambient environment. It is unusual for cracking, especially stress corrosion cracking, to occur in a particular alloy in the same environment that causes substantial general corrosion. What are the mechanisms and specific environments causing each aging effect for carbon steel closure bolts in the external-ambient environment?

RAI 3.1-7

In Table 3.1.2-5 of the AMR, the applicant credits the Steam Generator Integrity Program for managing the loss of mechanical closure integrity for carbon steel tube support plate stayrod nuts (Unit 2) and carbon steel lattice grid ring studs (Unit 1) in treated water. Neither the Steam Generator Integrity Program description, NEI 97-06, nor the EPRI Steam Generator Examination Guidelines discuss mechanical closure integrity. Please describe in detail how the Steam Generator Integrity Program will be used to manage the effects of the loss of mechanical closure integrity on these components.

CNP LRA Section B.1.31, “Steam Generator Integrity”

RAI B.1.31-1

This aging program is called “Steam Generator Integrity,” but the program description addresses only tubes. It is therefore consistent with NUREG-1801, XI.M19, “Steam Generator Tube Integrity,” which also addresses only tubes. However, the applicant credits this program, all or in part, for the following forms of aging other than tube degradation:

- material loss of carbon steel tube wrappers in treated water;
- cracking of carbon steel tube wrappers in treated water;
- material loss of stainless steel tube support plates and anti-vibration bars in treated water;
- cracking of stainless steel tube support plates and anti-vibration bars in treated water;
- material loss of carbon steel tube support plate stayrods and spacers in treated water;
- cracking of carbon steel tube support plate stayrod nuts in treated water;
- loss of mechanical closure integrity of tube support plate stayrod nuts in treated water;
- material loss of nickel alloy tubes support plate stayrod washers and AVB retaining rings in treated water;
- cracking of nickel alloy tubes support plate stayrod washers and AVB retaining rings in treated water; and
- material loss of carbon steel lattice grid ring arch bars in treated water

- cracking of carbon steel lattice grid ring studs in treated water
- loss of mechanical closure integrity of carbon steel lattice grid ring studs in treated water
- material loss of stainless steel lattice grid bars, U-bend flat bars, and J-tabs in treated water
- cracking of stainless steel lattice grid bars, U-bend flat bars, and J-tabs in treated water

The staff requests that the applicant discuss, according to the ten Aging Management Program Elements (NUREG-1800 Section A.1.2.3), how the Steam Generator Integrity Program manages aging of components other than tubes.

RAI B.1.31-2

The UFSAR Supplement item A.2.1.34, Steam Generator Integrity Program, discusses the integrity only of tubes. However, the Steam Generator Integrity Program is credited with managing aging of other components. Please revise the UFSAR Supplement to reflect the full scope of the Steam Generator Integrity program and reference the NEI 97-06 Steam Generator Program Guidelines.