

November 7, 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, UNIT 2 - REQUEST FOR ADDITIONAL
INFORMATION (RAI) REGARDING LICENSE AMENDMENT REQUEST,
"STEAM GENERATOR TUBE SURVEILLANCE INTERVAL EXTENSION,"
DATED SEPTEMBER 30, 2000 (TAC NO. MB0156)

Dear Mr. Powers:

On September 30, 2000, Indiana Michigan Power Company submitted a license amendment request that would revise the current licensing basis in the Technical Specifications (TSs) by allowing an extension of the steam generator tube inspection surveillance requirements.

The Nuclear Regulatory Commission (NRC) staff has reviewed your request and concluded that it does not provide technical information in sufficient detail to enable the staff to make an independent assessment regarding the acceptability of the proposal in terms of regulatory requirements and the protection of public health and safety.

The enclosed request was discussed with L. Lahti of your staff on November 1, 2000. A mutually agreeable target date of November 10, 2000, for your response was established. If circumstances result in the need to revise the target date, please contact me at (301) 415-1345 at the earliest opportunity.

Sincerely,

/RA/

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

Docket No. 50-316

Enclosure: Request for Additional Information

cc w/encl: See next page

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

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ACCESSION NO.: ML003767747

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Donald C. Cook Nuclear Plant, Units 1 and 2

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REQUEST FOR ADDITIONAL INFORMATION

D. C. COOK, UNIT 2

STEAM GENERATOR TUBE SURVEILLANCE INTERVAL EXTENSION

DATED SEPTEMBER 30, 2000

1. Provide a condition monitoring and operational assessment for the D. C. Cook steam generators. Ensure that it addresses the applicable questions/issues raised below (e.g., frequency of inspection, etc.)
2. Describe in detail the steam generator tube inspections performed in each steam generator following the replacement along with the results of these inspections. In particular, address the maximum length of time between inspections for all tubes. Discuss the acceptability of the proposed interval between inspections, given the industry guidelines in this area and the observation that wear and loose parts have resulted in degradation in your steam generators. Use these results in the condition monitoring and operational assessment.
3. Please provide a summary (or the report itself) of the Electric Power Research Institute's (EPRI's) findings from their review of your program. The EPRI review was referenced in your license amendment request dated September 30, 2000.
4. Given the lessons learned from Indian Point 2, discuss the extent to which your program is not affected by these concerns (e.g., data quality, noise levels, qualification program did not "bound" site-specific conditions, etc.). Discuss the basis for your conclusions.
5. Page 4 of Attachment 1 of the amendment request indicates that no tubes in service were found to be degraded (i.e., 20 percent or more through-wall). This appears to contradict page 4 of Attachment 6 which indicates that R1C70 was found to have 28 percent through-wall degradation. Please clarify. A similar observation was made in Attachment 4.
6. The wording in the proposed change to the facility operating license (Attachment 3) is not clear. The NRC recommends putting the extension in terms of calendar months consistent with the Technical Specifications (TSs).
7. In Attachment 4, the licensee indicated that offsite dose considerations from steam generator tube failures are limited by the primary-to-secondary leak rate program and not the tube inspection program; therefore, the proposed change has no impact on offsite dose. Please provide the basis for this statement. For example, is this statement implying that a normal operating leak-rate limit (i.e., the limit in the TSs) is sufficient to ensure leakage integrity for steam generators under the full range of accident conditions (e.g., leakage under main steamline break conditions)?

ENCLOSURE

8. In Attachment 4, the licensee indicates that the TS leakage limit of 500 gallons per day in one steam generator is based on ensuring tube integrity in the event of a steamline rupture or loss-of-coolant accident. While this may be the basis for D. C. Cook, Unit 2 (Regulatory Guide 1.121 indicates it should be the leakage associated with a crack size that bursts at three times the normal operating pressure differential), operating experience indicates this not to be the case. Discuss the effect of this observation on your conclusions.

The licensee stated that Information Notice 91-43 indicated that tubes typically leak before failing, so leak rate monitoring can reduce the probability of a steam generator tube rupture (SGTR). While the staff agrees that leak rate monitoring may reduce the probability of SGTRs, the staff observes that tubes do not necessarily leak at values in excess of TS and/or administrative limits prior to SGTR (i.e., leak rate monitoring and taking action per TS limits will not necessarily prevent an SGTR). Discuss any implications on your conclusions.

Given that primary-to-secondary leak rate monitoring may provide an indication of impending tube failure, discuss the need to reduce the primary-to-secondary leakage limit consistent with current industry guidance.

9. In Attachment 6, the licensee indicates that nine tubes were plugged in 1994 due to mechanical damage during pressure pulse cleaning. Please provide the basis for the conclusion that the damage was mechanical in nature (e.g., Was an inspection done prior to the pressure pulse cleaning indicating no degradation of the tube followed by a subsequent inspection (visual or eddy current) which indicated degradation? What was the nature of the damage? What confidence do you have that the inspections bounded the problem (i.e., all affected tubes were inspected)? Was pressure pulse cleaning performed in the steam generators that were not inspected during this outage?)

As part of this review, the NRC reviewed the D. C. Cook, Unit 2, steam generator inspection summary provided in your 1994 annual report. In this report, you indicated that the inspection for the "mechanical damage" from the pressure pulse cleaning was part of a "special eddy current maintenance inspection." It was during this "special inspection" that the nine tubes requiring plugging were identified. The staff notes that if service-induced degradation was found during these "special inspections," the staff expects that the inspection would be expanded consistent with the TS requirements (i.e., all inspections must follow the TS inspection and repair criteria regardless of whether the inspections are "over and above" TS minimum sample size requirements)

10. In Attachment 6, the licensee indicates that four tubes with volumetric indications were found in one steam generator, but that a through-wall percentage could not be assigned to these indications due to the lack of a qualified sizing technique. The indications were found with a rotating pancake coil near the top of the tubesheet. It was further stated that the indications were plugged as a "conservative measure." Furthermore, the licensee stated that the indications were not considered degraded or defective since the damage was representative of foreign-object-induced wear and was not a result of progressive degradation due to design, manufacturing errors, or typical inservice conditions. With respect to these indications, please address the following concerns:

Given that the sizes are not known, discuss the basis for assuming the indications were not greater than 20 percent or 40 percent through-wall (i.e., defective or degraded). Discuss the implications on the categorization of the results.

Discuss the basis for assuming that the indications were representative of wear. Given that sludge lancing was done in the outage (assuming the presence of sludge at the top of the tubesheet) and pressure pulse cleaning in the previous outage, discuss the possibility that this degradation is an intergranular attack or some other form of volumetric degradation.

If the indications were "wear-like" in nature, why were they not sized? Was the technique used to inspect the steam generators at D. C. Cook, Unit 2, qualified for sizing wear indications?

Given that the indications were found with a rotating pancake coil, discuss the basis for not expanding the inspection at the top of the tubesheet with this technique.

11. The D. C. Cook, Unit 2, steam generators were one of the first installed in the United States with alloy 690 tubes. As a result, the operating experience with this type of material is somewhat limited; however, trends in degradation modes may be inferred from other similarly operated steam generators. Discuss the extent to which the results of steam generator tube inspections from other plants with alloy 690 tubes with similar, or longer, operating times as D. C. Cook, Unit 2, were considered in your analysis. If considered, do they support your conclusion that no active degradation mechanism is occurring? Also discuss the similarity of operating conditions (e.g., T-hot, water chemistry, etc.).
12. In your 1997 annual report, you provided the D. C. Cook, Unit 2, steam generator inspection results. Please discuss the codes used for the indications detected (e.g., MBH, INR, DNH, INF). For those indications demonstrating mechanical damage or manufacturing defects, discuss the extent to which these indications can be traced to the preservice inspection. If they can not be traced back to the preservice inspection, discuss whether further mechanical damage can occur.