UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

October 2, 1991

Docket Nos. 50-315
and 50-316

Mr. Gene E. Fitzpatrick, Vice President
Indiana and Michigan Power Company
c/o American Electric Power Service Corporation
1 Riverside Plaza
Columbus, Ohio 43216

Dear Mr. Fitzpatrick:

SUBJECT: THIMBLE TUBE WALL THINNING ROOT CAUSE D.C. COOK UNITS 1 AND 2 (TAC NOS. 80117 AND 80118)

Members of your staff and your contractors met with the NRC on April 11, 1991 to discuss the root cause of the thimble tube wear and resultant leakage which occurred at D.C. Cook Nuclear Plant Unit 2 on June 18, 1990. Previous leakages occurred at Unit 1 in 1983 and 1988. the results of the meeting are contained in meeting minutes dated April 23, 1991 and May 7, 1991. The staff had previously met with members of your staff and your contractors on August 29, 1990. Results of that meeting are contained in meeting summaries dated September 13 and October 10, 1990. At the most recent meeting you committed to provide the staff with the results of metallurgical examinations of two (2) of Unit 2s defective thimble tubes which included surface examination, metallographic examination, detailed wear morphology evaluations, and hardness measurements. You provided this information by letter dated July 15, 1991, AEP:NRC:1059C, with attachment MT-MNA-035 (91), "Metallurgical Investigation of Wall Thinning and Leakage of the BMI Thimble Tubing at D.C. Cook Unit 2", dated January 1991, which contained the results of the Westinghouse hot cell laboratory analysis.

The primary cause attributed to the thimble tube wear as described in your report appears to be flow-induced vibration. There appeared to be relatively low impact loads involved with two different types of wear conditions depending on location and depth of the wear suggesting varying degrees of displacement, contact loads and fluid jetting conditions along the length of the thimble tubes at the nozzle penetration.

We have reviewed your consultant's report and your corrective actions as described during the April 11, 1991 meeting. This includes the repositioning and replacement of thimble tubes, as necessary, during the upcoming 1992 refueling outages for D.C. Cook Units 1 and 2. Additionally, you described your intention to chrome plate replacement thimble tubes to enhance the wear resistance. You further described your inspection plans including base line



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eddy current examinations and additional eddy current examinations after one cycle of operation to quantify the benefit of the wear resistant design features and to determine if addition hardware fixes may be warranted. We understand that you do not intend any lower core plate and fuel assembly lower nozzle modifications at this time and that pending your eddy current results after one cycle of operation with new thimble tubes, these may be reevaluated. We also understand that as described by your staff, you have the capability to isolate leaking thimble tubes should they occur during the remainder of the operating cycle or during future operating cycles and that procedures are in place and training has been completed for performing this evolution, if necessary.

Based on the above discussion, we consider your actions responsive to the staff concerns in this area and consider this item closed for your facilities. Please keep us apprised of new developments or inspection findings, particularly if they shed any more light on the perceived "accelerated" wear aspects of the thimble tube thinning.

Sincerely,

Original signed by

Timothy G. Colburn, Sr. Project Manager
Project Directorate III-1
Division of Reactor Projects III, IV, V
Office of Nuclear Reactor Regulation

cc w/enclosures:
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