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AUTH.NAME AUTHOR AFFILIATION
ALEXICH,M.P. Indiana & Michigan Electric Co.
RECIP.NAME RECIPIENT AFFILIATION
DENTON,H.R. Office of Nuclear Reactor Regulation, Director

SUBJECT: Forwards response to 850417 Generic Ltr 85-02 on resolution of unresolved safety issues re steam generator tube integrity.No severe steam generator tube degradation problems exist at plant.Insp program adequate.

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INDIANA & MICHIGAN ELECTRIC COMPANY

P.O. BOX 16631
COLUMBUS, OHIO 43216

June 21, 1985
AEP:NRC:0936

Donald C. Cook Nuclear Plant Unit Nos. 1 and 2
Docket Nos. 50-315 and 50-316
License Nos. DPR-58 and DPR-74
Generic Letter No. 85-02

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. Denton:

This letter and its attachment respond to the issues addressed in Generic Letter 85-02, "Staff Recommended Actions Stemming From NRC Integrated Program For The Resolution of Unresolved Safety Issues Regarding Steam Generator Tube Integrity (Generic Letter 85-02)" dated April 17, 1985.

It should be noted that although our current inspection program is above and beyond the minimum requirements of the Plant Technical Specifications, we believe we do not have severe SG tube degradation problems at the Donald C. Cook Nuclear Plant. Currently the number of tubes that have been plugged in Units 1 and 2 are 0.64% and 3.43% of the total number of tubes in all 4 steam generators respectively. Unit No. 1 has operated for ten years and Unit No. 2 has operated for seven years.

This document has been prepared following Corporate procedures which incorporate a reasonable set of controls to insure its accuracy and completeness prior to signature by the undersigned.

Very truly yours,

M. P. Alexich
Vice President

6/21/85

MPA/rjn

cc: John E. Dolan
W. G. Smith, Jr. - Bridgman
R. C. Callen
G. Bruchmann
G. Charnoff
NRC Resident Inspector - Bridgman

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ATTACHMENT TO AEP:NRC:0936

The following are the Indiana & Michigan Electric Company's responses to the items noted in enclosures 1 and 2 of Generic Letter 85-02 dated April 17, 1985. These responses are in the same order as that of the items listed in the subject Generic Letter.

1.a PREVENTION AND DETECTION OF LOOSE PARTS (INSPECTIONS)

Visual inspection on each steam generator secondary side in the vicinity of the tubesheet, both along the entire periphery of the tube bundle and along the tube lane, has been performed on Units 1 and 2 at each refueling outage since 1982. These inspections are done with the aid of fiber optics and/or mini TV cameras.

Although visual inspections have been routinely performed since 1982, it is intended to limit these inspections in the future to specific steam generators after modifications or repairs to steam generator internals, or when eddy current indications on peripheral tubes suggest the possibility of loose parts damage.

The time the secondary side is exposed to air for the purpose of visual inspections is minimized by performing the inspection in conjunction with tubesheet sludge removal. The inspection adds only a few hours to the time that the generators are drained and open for sludge lancing.

1.b PREVENTION AND DETECTION OF LOOSE PARTS (QUALITY ASSURANCE)

The AEPSC Quality Assurance Department has started a review of plant maintenance, modification, refueling, etc. procedures, wherein foreign objects could be introduced into a steam generator via either the primary or secondary side of the steam generators. The purpose of the review is to assure that these procedures contain adequate precaution to preclude introduction of foreign objects into the steam generators as per the recommendations noted in item 1(b) of the Generic Letter. However the current practices do implement the intent of precluding the foreign objects into the steam generators whenever they are opened. Procedures will be updated as required to address the staff's recommendations noted in item 1(b) of the generic letter by the beginning of the next refueling outage of Unit No. 2 of the Donald C. Cook Nuclear Plant.

2.a INSERVICE INSPECTION PROGRAM (FULL LENGTH TUBE INSPECTION)

During the last refueling outages for both Units 1 and 2, we elected to perform full length tube inspections (tube end to tube end). The tube sample selection for these inspections consisted of 100% of the tubes in all steam generators.

Currently this program far exceeds the minimum Technical Specification requirements. However, after reviewing the data from two successive inspection programs it is anticipated that the inspection program will be modified. The scope of inspections will be reduced to key areas of interest where known tube degradation exists, and will more closely conform to the STS requirements.

2.b INSERVICE INSPECTION PROGRAM (INSPECTION INTERVAL)

During the last two refueling outages for Units 1 and 2 we elected to perform inspections in all Unit 1 and 2 steam generators. It is planned to continue inspection of all steam generators for at least one more fuel cycle. At that time, based on review of eddy current data, the program will be modified if warranted. It is anticipated that any modified program would include at least two steam generators each refueling outage. Therefore, inspections will not extend beyond your stated 72 months for any individual steam generator.

3.a SECONDARY WATER CHEMISTRY PROGRAM

There is a secondary water chemistry monitoring program in place. The program generally incorporates the secondary chemistry guidelines in SGOG Special Report EPRI-NP-2704 as amended by Revision 1 dated June 1, 1984. Chemistry limits and progressively more stringent corrective action levels for out-of-specification water chemistry conditions are specified in plant procedures, and include, where appropriate, power reduction and shutdown. Those individuals having the responsibility/authority for interpreting plant water chemistry information and initiating appropriate action to adjust chemistry or order other corrective action are identified.

In a few cases, the limits specified in plant procedure (e.g., cation conductivity) are slightly less stringent than the SGOG guidelines; in some cases the corrective action is more stringent. In our judgement the less stringent exceptions are not significant nor do they compromise the protection of the steam generator tubes. Our goal is to continue improvement in water chemistry so as to meet or exceed the SGOG guidelines where applicable.

The impact of material selection on secondary side water chemistry has also been addressed. The condensers on each unit have been retubed with 304 stainless steel (from arsenical copper) to eliminate cooling water inleakage and to remove copper from the secondary side.

3.b CONDENSER INSERVICE INSPECTION PROGRAM

The program presently followed by the plant for both units provides for quick corrective action to be taken upon indication of circulating water inleakage to the steam side of the condenser. Each condenser has six parallel water circuits. The affected circuit can be isolated from the circulating water flow, thereby providing the opportunity to inspect for and repair leaks without taking the unit out of service.

Once the affected water circuit is isolated and drained, the water boxes are opened and entered for inspection. The failed tubes are located by helium testing and/or foam coating the tube

sheets. The tube leaks are repaired by plugging the tubes. After repair is completed the circuit is returned to service. The tube pluggage pattern is recorded and reviewed to determine the probable cause of leakage and to develop preventive measures that can be implemented to prevent or reduce future failures.

During refueling outages and/or other outages, both the steam and water side areas are given a thorough visual inspection, supplemented as needed by tube sampling. In addition, leakage tests are performed during unit outages by flooding the shell sides with water containing dye while inspecting the tubesheets from inside the water boxes. These dye tests have been very effective in establishing the tightness of the condensers. Eddy current tests have been tried. However, our experience with eddy current testing of condenser tubes has not been successful. Such tests have not provided reliable positive indication of tube conditions. Due to the success of our other test methods, we have not pursued eddy current testing further.

Air leakage checks are performed when excessive flow rates are indicated at the discharge of the steam jet air ejectors. Inspections are performed when air inleakage is greater than 10 SCFM. Air inleakage is located by helium checking and is corrected by tightening joints and applying RTV sealant where appropriate.

The condensers on both of the Cook units have been retubed, Unit 2 in 1984 and Unit 1 during the current 1985 refueling outage. The arsenical copper tubes on both units have been replaced with 304 stainless steel tubes throughout to eliminate corrosion and reduce erosion problems experienced on the original copper tubes. Erosion had previously been reduced by the addition of grating and baffling on the basis of inspections made during the various outages. The retubing includes the addition of intermediate tube supports throughout to eliminate failures from mid-span vibration.

Our current monitoring and inspection procedures, combined with the retubing and intermediate support addition, will minimize condenser inleakage.

Based on our preventive maintenance, modifications and inspection program we believe we have adequate controls to identify and repair condenser leaks and as such the staff's recommendation noted in item 3.b.(1) is not necessary.

4. PRIMARY TO SECONDARY LEAKAGE LIMITS

Although the primary to secondary leakage limits in the Donald C. Cook Nuclear Plant Technical Specifications are comparable to those provided in the Standardized Technical Specifications (STS) for Westinghouse Plants (NUREG-0452, Rev. 4) there are differences in wording between the two documents. We do not believe the differences in wording are significant enough to warrant a change to the current plant Technical Specifications.

5. COOLANT IODINE ACTIVITY LIMIT

The Iodine activity limits are the same as those given in the STS. However there are differences in the action statements and the surveillance requirements, between the two documents. We do not believe these differences are significant enough to warrant a change to the current plant Technical Specifications.

6. SAFETY INJECTION SIGNAL RESET

This does not apply to Cook Plant. Our High Head Safety Injection Pumps (termed Centrifugal Charging Pumps) normally take suction from the Volume Control Tank. A safety injection signal automatically switches the suctions to the Refueling Water Storage Tank. After this realignment, no other switchover is necessary during a steam generator tube rupture incident.

REQUEST FOR INFORMATION CONCERNING CATEGORY C-2
STEAM GENERATOR TUBE INSPECTIONS

1. Historically, at the D. C. Cook Plant, we have far exceeded minimum technical specification requirements for S/G inspections in tube sample size, inspection frequency, and the number of S/Gs inspected. The tube sample size and number of S/Gs inspected are based on industry experience, prior plant ECT inspection results and the necessity for us to know as accurately as possible the condition of tubes for proper and continued safe operation of the plant. Our current programs for Unit 1 and 2 incorporate inspection of 100% of the tubes in all S/Gs. The primary factor for this extensive program is our concern over tube degradation found to date.

2. Industry experience and the work of the Steam Generator Owners Group (SGOG I & II) are essential inputs in our determination of tube degradation mechanisms and the potential for tube rupture. Analysis of tube samples has also added to the understanding of the tube problems. A total of 10 tube samples have been removed for analysis, 3 from Unit 1 and 7 from Unit 2. Based on the analysis a number of tubes showing distorted eddy current signals were plugged as a preventive measure on Unit 2.

Another example of our consideration of tube degradation mechanisms is our decision to preventively plug all Unit 2 Row 1 tubes once it became evident that the steam generators in Unit No. 2 was susceptible to Row 1 U-bend cracking. Steam generators in Unit No. 1 have not exhibited significant susceptibility to this problem.