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American Electric Power System
INDIANA & MICHIGAN ELECTRIC COMPANY
DONALD C. COOK NUCLEAR PLANT
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October 10, 1983

Mr. J.G. Keppler, Regional Administrator
United States Nuclear Regulatory Commission
Region III
799 Roosevelt Road
Glen Ellyn, IL 60137

Dear Mr. Keppler:

The purpose of this letter is to inform you of actions taken by Indiana and Michigan Electric Company during the scheduled refueling outage of the Unit 1 reactor at the Donald C. Cook Nuclear Plant. This outage commenced on July 15, 1983. Our initial plans were to perform an Eddy Current Examination utilizing Westinghouse Corporation on two steam generators prior to refueling activities and upon completion of the refueling to perform an eddy current inspection of the two remaining steam generators. Upon disassembly of Reactor Coolant Pump No. 12, it became apparent that the repairs needed on our Reactor Coolant Pumps would extend this outage and a decision was made to perform Eddy Current examinations on all four (4) steam generators prior to refueling.

The performance of Eddy Current Testing in the steam generators was not required during this outage by ASME Code Section XI, 1974 Edition, 1975 Addenda, Regulatory Guide 1.83 or the Unit 1 Technical Specifications. However, Plant Management and Senior American Electric Power Corporation Management had planned an eddy current inspection program for the Unit 1 Steam Generators.

The scheduled steam generator (S/G) eddy current testing (ECT) on Cook Unit 1 started July 23 and was completed August 8. Two thousand seven hundred and forty (2740) tubes in each S/G were inspected. Indications of imperfections (<20% through-wall damage), degradation (20-39% through-wall damage), and defects (≥40% through-wall damage) were found in the hot legs of all four S/G's. The indications can be divided into two groups: 1) those occurring in the anti-vibration bar zone near the top of the tube bundle, and 2) those occurring on top of the tube sheet. In addition to these indications, tube denting at the top of the tube sheet, primarily in the sludge pile region, was reported. Totals for each of the four S/G's and the remedial action taken when necessary are identified in the following data summarization.

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	Hot Leg Indications				Dents
	<20%	20-39%	≥40%	Total	
S/G No. 11	31	1	2	34	127
S/G No. 12	43	8	2	53	153
S/G No. 13	22	32	5	59	233
S/G No. 14	34	8	2	44	132

Breakdown Of Hot Leg Indications (AVB/TTS*)

	<20%	20-39%	≥40%
S/G No. 11	1/30	0/1	0/2
S/G No. 12	2/41	3/5	0/2
S/G No. 13	2/20	32/0	5/0
S/G No. 14	4/30	3/5	0/2

*Top of Tubesheet

Designated Tubes Plugged

S/G No. 11

	Indication
Row 18, Column 56	44% H/L - Mechanical Plug - C/L - Mechanical Plug
Row 2, Column 84	68% H/L - Mechanical Plug - C/L - Mechanical Plug

S/G No. 12

Row 14, Colum 83	80% H/L - Mechanical Plug - C/L - Mechanical Plug
Row 13, Column 85	64% H/L - Mechanical Plug - C/L - Mechanical Plug
Row 14, Column 82*	20% H/L - Mechanical Plug - C/L - Mechanical Plug

*Plugged by mistake.

S/G No. 13

Row 1, Column 19**	N/A H/L - Mechanical Plug - C/L - Mechanical Plug
Row 1, Column 60*	N/A H/L - Mechanical Plug - C/L - Mechanical Plug

S/G No. 13 Con't

	Indication
Row 1, Column 63[1]	N/A H/L - Mechanical Plug - C/L - Mechanical Plug
Row 1, Column 66[2]	N/A H/L - Mechanical Plug - C/L - Mechanical Plug
Row 36, Column 38	42% H/L - Mechanical Plug - C/L - Mechanical Plug
Row 36, Column 45	51% H/L - Mechanical Plug - C/L - Mechanical Plug
Row 41, Column 55	41% H/L - Mechanical Plug - C/L - Mechanical Plug
Row 36, Column 62	80% H/L - Mechanical Plug - C/L - Mechanical Plug
Row 36, Column 63	54% H/L - Mechanical Plug - C/L - Mechanical Plug

[1] Plugged because of unmeasurable indications on inside of tubes
[2] Plugged because of partial restriction

S/G No. 14

Row 12, Column 17	70% H/L - Mechanical Plug - C/L - Mechanical Plug
Row 21, Column 31*	84% H/L - Welded Plug - C/L - Mechanical Plug (See Note 1)
Row 17, Column 33*	N/A H/L - Welded Plug - C/L - Mechanical Plug
Row 18, Column 33*	N/A H/L - Welded Plug - C/L - Mechanical Plug

* 116 inches of tube removed from H/L side
Note 1 - This tube was initially plugged with a mechanical plug and subsequently with a welded plug after tube removal.

The 11 tubes having through-wall defects greater than 40% were plugged. Additionally, four row 1 tubes in S/G No. 13 were plugged, 3 due to unmeasurable indications of cracking on the inside of the tube at the U-bend hot leg tangent point and one because of a partial restriction (probably due to ovaling) at the U-bend cold leg tangent point. Also, an additional tube was mistakenly plugged by Westinghouse in S/G No. 12.

A meeting was held with Westinghouse on August 8 to discuss the results of this eddy current inspection, particularly the unexpected damage found at the top of the tube sheet. In order to evaluate the severity of this potential problem, we removed three tubes from the hot leg side of S/G No. 14 on September 9, 1983.

The three tubes were designated as Row 21 Column 31, Row 17 Column 33 and Row 18 Column 33. The tube designated Row 21 Column 31 was previously plugged because of a 84% tubesheet indication. The plug on the hot leg side required removal prior to pulling this tube and the plug in the cold leg side remained in place. The tube removal required the mechanical plugging of the additional two tubes on the cold leg side of the steam generator.

All three tubes were cut just below the second support plate and then were pulled through the tubesheet opening by means of an integral gripper attached to a hydraulic ram system.

Once the tubes were removed the tube sheet holes were prepared, and a semi-automatic welding tool was installed in the channel head. The welding tool was remotely controlled from an area away from the steam generator platform. The weld plugs were installed in the prepared tube sheet holes and welded into place.

The equipment and procedures were qualified by Indiana and Michigan Electric Company Maintenance personnel and the welding was performed by our Maintenance personnel with direction being provided by Westinghouse personnel.

The final step in the process was a visual inspection of the welds by a Westinghouse Quality Assurance Engineer who indicated that the welds were acceptable. In addition, the steam generator was filled with water to 45 feet above the tubesheet and a leak test was performed around the welded plugs with no evidence of leakage noted.

The tube samples were shipped to the Remote Metallography Facility of the Westinghouse Research and Development Center for nondestructive and destructive examination.

Plant and AEPSC personnel are currently waiting for a report from Westinghouse. It is anticipated that this report will assist us in characterizing this tube degradation mechanism and help us to formulate a corrective action program for this problem.

Respectfully,

W.G. Smith, Jr.
Plant Manager

/jas

cc: See Attached Distribution

cc: B.A. Svensson
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