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VICE PRESIDENT  
SUPPLY

February 25, 1983

U.S. Nuclear Regulatory Commission  
Region I  
631 Park Avenue  
King of Prussia, PA 19406

ATTENTION: Mr. Ronald C. Haynes, Director

SUBJECT: Calvert Cliffs Nuclear Power Plant  
Unit Nos. 1 & 2; Docket Nos. 50-317 & 50-318  
1982 Results of Steam Generator Eddy Current Examinations

REFERENCES: (a) Technical Specification 4.4.5.5 Calvert Cliffs Unit 1; Docket No. 50-317  
(b) Technical Specification 4.4.5.5 Calvert Cliffs Unit 2; Docket No. 50-318

ENCLOSURES: (1) Calvert Cliffs Unit 1 Eddy Current Inspection of Steam Generators #11 & 12 Final Report, Prepared by Zetec, Inc., May 1982  
(2) Calvert Cliffs Unit 2 Eddy Current Inspection of Steam Generators #21 & 22 Final Report, Prepared by Zetec, Inc., November 1982  
(3) Combustion Engineering Series 67 Steam Generator Tube Sheet Pattern  
(4) Tubes Plugged #11 Steam Generator  
(5) Tubes Plugged #12 Steam Generator

Gentlemen:

References (a) and (b) require that we report, on an annual basis, all steam generator tube examinations conducted in the past year, listing the tubes examined, degradation noted, and identity of tubes plugged.

Calvert Cliffs Steam Generators are Series 67 Combustion Engineering Units and tube locations are referenced to the hot leg or cold leg tube sheet as shown in Enclosure (3). The hot leg tube sheet is divided into quadrants #2 (right) and #3 (left) with Line No. 1 down the center. Whereas the cold leg tube sheet is divided into quadrants #1 (left) and #4 (right) with Line No. 1 down the center. All steam generators at Calvert Cliffs Unit Nos. 1 & 2 were examined by the eddy current method during 1982. Examinations were conducted in accordance with the requirements specified in references (a) and (b), and

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Regulatory Guide 1.83. Enclosures (1) and (2) list the tubes examined and the interpretations of the indications found.

During the spring 1982 Unit 1 outage, both steam generators #11 and 12 were examined. Tubes were probed from the cold leg side of the steam generators with full length tube exams being performed. No service induced degraded tubes as defined by the Technical Specifications ( $\geq 20\%$ ) were found during this inspection. Several tubes, however, were found to be damaged as a result of steam generator preventive maintenance modifications.

Eddy current results of steam generator #11 revealed that of the 886 tubes examined, two (2) tubes were damaged and 146 contained service induced tube denting. In 128 of the 146 dented tubes, the denting occurred at the ninth support on the hot leg side of the tube bundle. Of the 886 total tubes examined, 549 were selected from the region where the ninth support exists. The average dent size of the tubes tested in the ninth support of #11 steam generator was 0.370 mils. All the dented tubes allowed passage of the eddy current probe.

Eddy current results of steam generator #12 revealed that of the 1,038 tubes examined one (1) tube was damaged and 136 contained service induced denting. In 129 of the 136 dented tubes, the denting occurred at the ninth support on the hot leg side of the tube bundle. Of the 1,038 total tubes examined in #12 steam generator, 556 were selected from the region where the ninth support exists. The average dent size of the tubes tested in the ninth support of #12 steam generator was 0.43 mils. All the dented tubes allowed passage of the eddy current probe.

A total of fifteen (15) tubes were plugged in #11 Steam Generator and eleven (11) in #12 Steam Generator. All tubes were plugged as a result of a preventative maintenance modification which reduces the possibility of a Number 9 or Number 10 support plate cracking occurrence. This modification cuts and trims these plates from the baffle wall of the steam generator. Due to denting, high stresses could build-up in the plates if they remain locked to the baffle wall. The cutting and trimming performed will prevent high stress points by allowing the plate to expand more evenly should denting progress. In order to secure the plates adequately after detachment from the baffle wall, selected tubes were then expanded into the support plate with sleeves. These tubes were then removed from service by plugging. Additionally, three tubes were damaged during the cutting of the plate and plate attachment lugs. These tubes were also removed from service by plugging. A list of the tubes plugged are provided as Enclosures (4) and (5).

During the fall 1982 Unit 2 outage both steam generators #21 and 22 were examined. Tubes were probed from the hot leg side of the steam generator with full length tube examinations performed. Service induced degradation was found in both #21 and #22 steam generators. The imperfections found were all of a small volume and small area nature. A small pit on the OD of the tube would produce this type of indication. The flaws were not localized in a particular area of the tube bundle.

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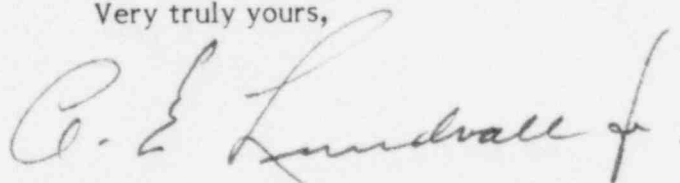
Eddy current results of steam generator #21 showed that of the 832 tubes examined one (1) was defective (imperfection  $\geq 40\%$ ), five (5) were degraded ( $\geq 20\%$ ), nine (9) had imperfections  $< 20\%$  wall thickness, and 29 tubes contained service induced denting. Eighteen of the 29 tubes dented contained dents in the area of the ninth support of the hot leg side of the tube bundle. Of the total 832 tubes examined in #21 steam generator 529 were selected from the region where the ninth support exists. The average dent size of the tubes tested in the ninth support of #21 steam generator was 0.110 mils. All the dented tubes allowed passage of the eddy current probe.

Eddy current results of steam generator #22 revealed that of the 815 tubes examined one (1) was defective ( $\geq 40\%$ ), two (2) were degraded ( $\geq 20\%$ ), 11 contained imperfections  $< 20\%$  wall thickness, and 101 tubes contained service induced denting. Of the 101 dented tubes, 47 had denting in the area of the ninth support of the hot leg side of the tube bundle. Of the total 815 tubes examined in #22 steam generator 529 were selected from the region where the ninth support exists. The average dent size of the tubes tested in the ninth support of #22 steam generator was 0.143 mils. All the dented tubes allowed passage of the eddy current probe.

As stated above, one (1) tube in each of Unit 2's two (2) steam generators contained defects which exceeded the plugging limit of 40% loss of nominal wall thickness. These tubes were removed from service by plugging each end with mechanical tube plugs. The tube numbers are Line 15 Row 136 Quadrant #3 in Steam Generator #21, and Line 46 Row 29 Quadrant #2 in Steam Generator #22. They show tube wall loss of 44% and 59%, respectively. Records show that these tubes had not been inspected by eddy current techniques in the area of the flaws prior to this inspection. Both flaws were small volume, small area flaws. The flaws were not located in the sludge area of the steam generators, nor were they in the area of a tube support.

Should you have further questions regarding this matter, please do not hesitate to contact us.

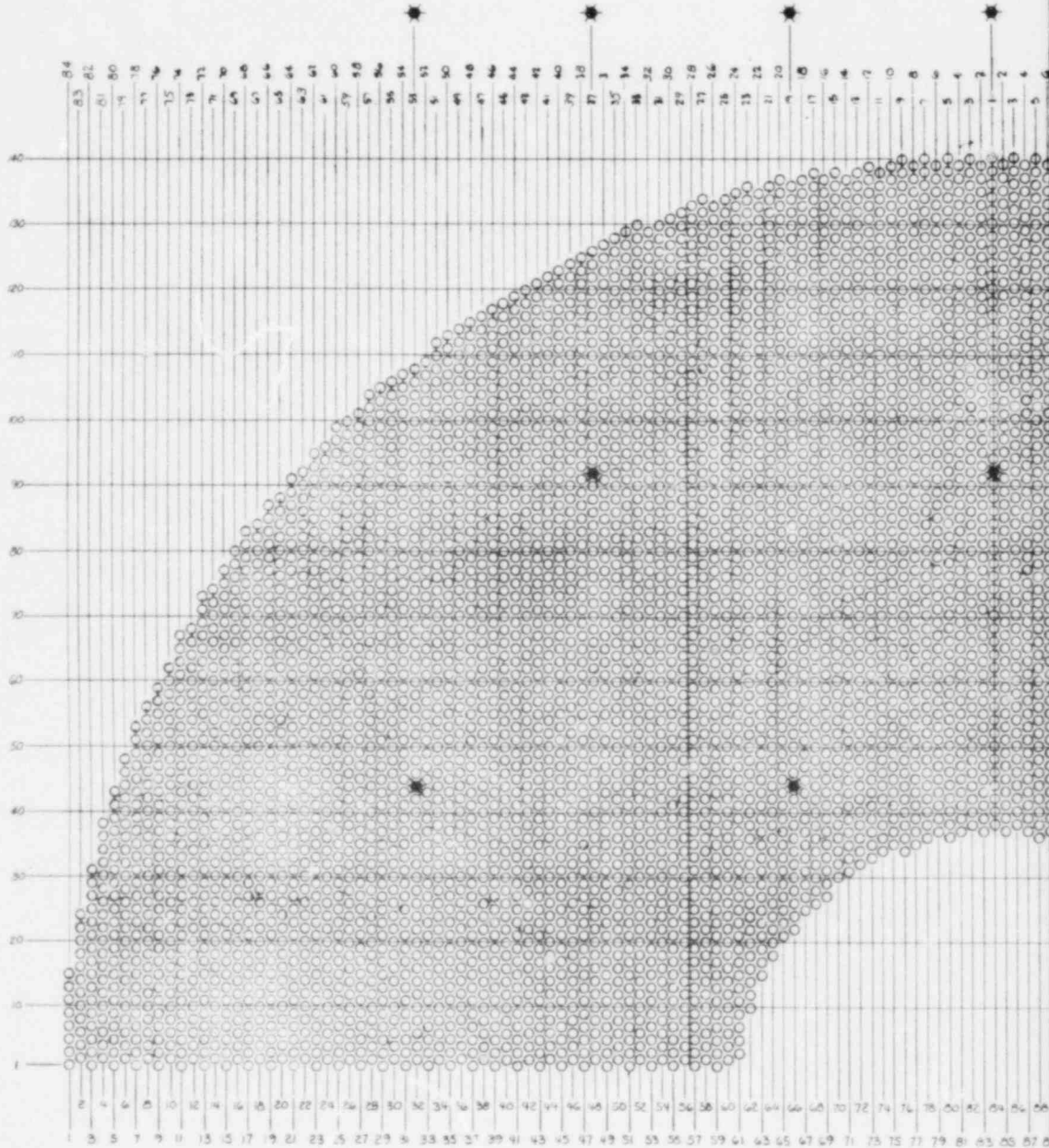
Very truly yours,



Vice President - Supply

cc: J. A. Biddison, Esquire  
G. F. Trowbridge, Esquire  
D. H. Jaffe, NRC  
R. E. Architzel, NRC

3 (Hot Leg Side)  
CARD # 1 (Cold Leg Side)



STEAM GENERATOR  
TUBE SHEET DRAWING FROM

PLANT - CCNPP  
INSPT SUPERVISOR -  
NUMBERING SYSTEM - 8  
COMMENTS -  
DATE



ENCLOSURE (4)

TUBES PLUGGED IN CALVERT CLIFFS UNIT 1  
STEAM GENERATOR NUMBER 11

LINE NO.	ROW NO.	QUADRANT	HL OR CL	DATE PLUGGED
62	95	4	CL	06/11/82
		3	HL	06/10/82
23	136	4	CL	06/11/82
		3	HL	06/10/82
53	104	4	CL	06/11/82
		3	HL	06/10/82
37	120	4	CL	06/11/82
		3	HL	06/10/82
19	134	4	CL	06/11/82
		3	HL	06/10/82
19	104	4	CL	06/11/82
		3	HL	06/10/82
1	120	0 <sup>0</sup>	CL	06/11/82
		0 <sup>0</sup>	HL	06/10/82
19	134	1	CL	06/11/82
		2	HL	06/10/82
19	104	1	CL	06/11/82
		2	HL	06/10/82
37	120	1	CL	06/11/82
		2	HL	06/10/82
53	104	1	CL	06/11/82
		2	HL	06/10/82
20	137	4	CL	06/15/82
		3	HL	06/15/82
21	136	4	CL	06/15/82
		3	HL	06/15/82
22	135	4	CL	06/15/82
		3	HL	06/15/82
24	135	4	CL	06/15/82
		3	HL	06/15/82

ENCLOSURE (5)

**TUBES PLUGGED IN CALVERT CLIFFS UNIT 1  
STEAM GENERATOR NO. 12**

<b>LINE NO.</b>	<b>ROW NO.</b>	<b>QUADRANT</b>	<b>HL OR CL</b>	<b>DATE PLUGGED</b>
64	91	4	CL	06/14/82
		3	HL	06/14/82
51	104	4	CL	06/14/82
		3	HL	06/14/82
35	120	4	CL	06/14/82
		3	HL	06/14/82
17	134	4	CL	06/14/82
		3	HL	06/14/82
17	104	4	CL	06/14/82
		3	HL	06/14/82
3	120	1	CL	06/14/82
		2	HL	06/14/82
21	134	1	CL	06/14/82
		2	HL	06/14/82
21	104	1	CL	06/14/82
		2	HL	06/14/82
39	120	1	CL	06/14/82
		2	HL	06/14/82
55	104	1	CL	06/14/82
		2	HL	06/14/82
3	120	4	CL	06/14/82
		3	HL	06/14/82