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VICE PRESIDENT  
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January 11, 1991

U. S. Nuclear Regulatory Commission  
Washington, DC 20555

ATTENTION: Document Control Desk

SUBJECT: Calvert Cliffs Nuclear Power Plant  
Unit Nos. 1 & 2; Docket Nos. 50-317 & 50-318  
Report of Steam Generator Tube Plugging

REFERENCE: (a) Calvert Cliffs Unit 1 Technical Specification 4.4.5.5.a  
(b) Calvert Cliffs Unit 2 Technical Specification 4.4.5.5.a

Gentlemen:

As required by References (a) and (b), this letter reports the number of tubes plugged in the Calvert Cliffs Unit 1 and Unit 2 Steam Generators. Unit 1 has recently completed a five-month maintenance outage. Unit 2 Steam Generators have recently undergone their second inservice inspection during the current outage. The previous examination was completed in April 1989, and the results reported to the NRC.

#### UNIT 1

For Unit 1, seven tubes were found to have indications which exceeded the Technical Specification plugging limit and were plugged. An additional five tubes were plugged as a preventive measure. Of the twelve tubes plugged during this Inservice Inspection, nine tubes were plugged in Steam Generator No. 11 and three tubes were plugged in Steam Generator No. 12.

Attachments (1) and (2) list the tubes plugged during the 1990 Unit 1 Testing and Maintenance Outage along with the reason for plugging each tube. Attachment (3) is a sketch indicating Steam Generator support locations and nomenclature.

All of the tubes in service in each Steam Generator were examined. The 100% standard Bobbin Coil inspection required a total of 16,874 tubes to be examined. Of the 16,874 tubes examined, 222 tubes had indications of 20% or greater through-wall degradation. As stated above seven of these indications exceeded the plugging limit. Five tubes were plugged in Steam Generator No. 11 and two tubes were plugged in Steam Generator No. 12 for this reason.

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In addition to the Bobbin Coil Examination, approximately 2,000 tubes per Steam Generator were examined with a motorized rotating pancake coil in the area of the roll transition at the top of the tubesheet. This examination was performed to verify the absence of circumferential cracking in this region that has been identified at other plants.

As a preventive measure, five additional tubes with distorted Eddy Current testing indications in the sludge pile were plugged. Of these additional five tubes taken out of service, four were in Steam Generator No. 11 and one was in Steam Generator No. 12. Previous metallurgical examination of Unit 1 tubing has shown degradation in the sludge pile area was caused by Intergranular Attack (IGA). These five tubes in the sludge pile region with distorted indications were plugged because of the potential for a local active IGA mechanism.

## UNIT 2

During this inspection of Unit 2 Steam Generators, no tubes were found to exceed the Technical Specification Plugging limit, therefore, no tubes were plugged. The standard Bobbin Coil inspection included 1,422 tubes in Steam Generator No. 21 and 1,246 in Steam Generator No. 22. Of the 2,668 tubes examined, 158 tubes had Eddy Current Indications of wall loss between 20% and 39% of the nominal wall thickness. However, only 20 of these tubes exhibited greater than 10% further wall penetrations from previous outages and were classified as degraded tubes for this inspection. The results of the examination were therefore classified as Category C-1 in accordance with Technical Specification 4.4.5.2.

In addition to the Bobbin Coil Examination, approximately 3,000 tubes per Steam Generator were examined with a Motorized Rotating Pancake Coil in the area of the roll transition at the top of the tubesheet. This examination was performed to verify the absence of circumferential cracking in this region that has been identified at other plants.

During the preparation of this report, it was discovered that we had not met the schedule requirements of Technical Specification 4.4.5.5.a. for submitting this Unit 1 report. This Technical Specification requires that:

"Following each inservice inspection of steam generator tubes, the number of tubes plugged in each steam generator shall be reported to the Commission within 15 days pursuant to Specification 6.9.2."

Review also showed that the Unit 1 1982 report had been submitted late and that we had typically not submitted reports unless tubes had been plugged. Annual reports have been filed each year which describe the Steam Generator inspection activity for the previous year. This ensures that the NRC is informed of the status of each Steam Generator, including any tubes plugged.

The root cause of this problem was personnel error due to inadequate definition of the reporting requirements. The tube inspection procedure (STP-M-574) and the tube plugging procedure (SG-13) will be changed prior to their next use to clearly establish the reporting requirements in order to prevent recurrence.

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Should you have any further questions regarding this matter, we will be pleased to discuss them with you.

Very truly yours,



GCC/PSF/dlm

Attachments: (1) Steam Generator No. 11 Tubes Plugged During the 1990 Outage  
(2) Steam Generator No. 21 Tubes Plugged During the 1990 Outage  
(3) Cutaway View, Steam Generator

cc: D. . . Brune, Esquire  
J. E. Silberg, Esquire  
R. A. Capra, NRC  
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T. T. Martin, NRC  
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ATTACHMENT (1)

STEAM GENERATOR No. 11 TUBES FLUGGED DURING THE 1990 OUTAGE

<u>ROW</u>	<u>LINE</u>	<u>REASON FOR PLUGGING</u>
10	24	Eddy Current testing distorted indication at HTS-SF + 0.0 inches
60	60	Eddy Current testing indication of 63% wall loss originating on the outside diameter of the tube at HTS-SF + 0.80 inches
13	61	Eddy Current testing distorted indication at HTS-SF + 0.0 inches
113	81	Eddy Current testing distorted indication at HTS-SF + 0.0 inches
139	83	Eddy Current testing indications of 67% and 53% wall loss originating on the outside diameter of the tube at HTS-PF + 20.00 inches and HTS-PF + 19.60 inches respectively
70	90	Eddy Current testing indication of 59% wall loss originating on the outside diameter of the tube at HTS-SF + 1.10 inches
129	71	Eddy Current testing distorted indication at C4 + 6.6 inches
51	113	Eddy Current testing indication of 62% wall loss originating on the outside diameter of the tube at HTS-SF + 0.90 inches
53	113	Eddy Current testing indication of 48% wall loss originating on the outside diameter of the tube at HTS-SF + 0.70 inches

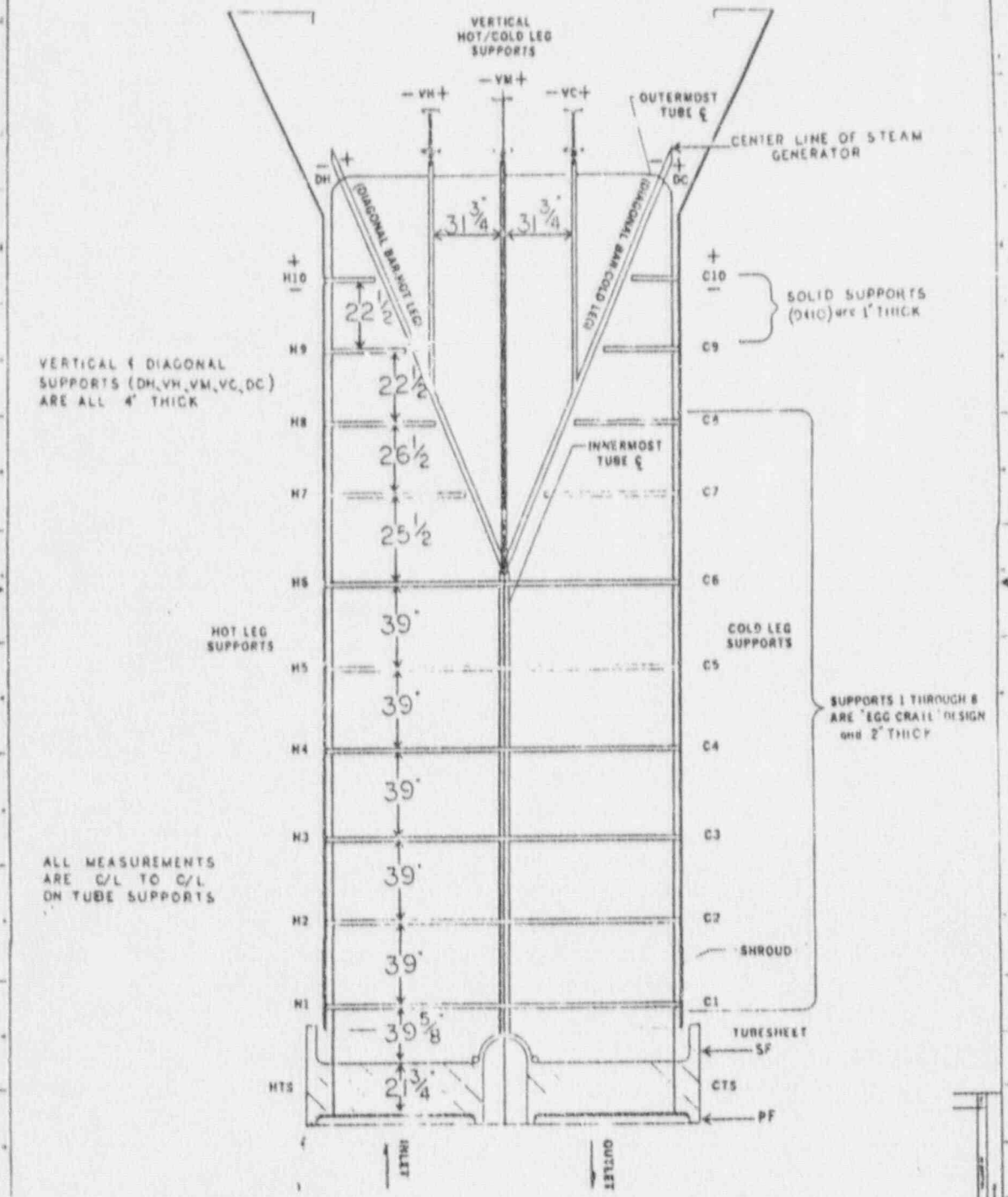
ATTACHMENT (2)

STEAM GENERATOR No. 12 TUBES PLUGGED DURING THE 1990 OUTAGE

<u>ROW</u>	<u>LINE</u>	<u>REASON FOR PLUGGING</u>
72	78	Eddy Current testing indication of 45% wall loss originating on the outside diameter of the tube at HTS-SF + 0.90 inches
74	80	Eddy Current testing indication of 48% wall loss originating on the outside diameter of the tube at HTS-SF + 1.00 inches
123	93	Eddy Current testing distorted indication at HTS-SF + 8.8 inches

# ATTACHMENT (3)

## STEAM GENERATORS CNPP 1#2



VERTICAL & DIAGONAL SUPPORTS (DH, VH, VM, VC, DC) ARE ALL 4" THICK

ALL MEASUREMENTS ARE C/L TO C/L ON TUBE SUPPORTS

SUPPORTS 1 THROUGH 8 ARE "EGG CRILL" DESIGN AND 2" THICK

Rows Contacting Supports Above 6th TS

ROWS	NO. OF SUPPORTS	SUPPORT DESIGNATIONS
1-9	1	VM
10-35	3	DH, VM, DC
36-65	5	H7, DH, VM, DC, C7
66-73	7	H8, H7, DH, VM, DC, C7, C8
74-89	9	VH, H8, H7, DH, VM, DC, C7, C8, VC
90-115	11	H9, VH, H8, H7, DH, VM, DC, C7, C8, VC, C9
116-140	13	H10, H9, VH, H8, H7, DH, VM, DC, C7, C8, VC, C9, C10