

LICENSEE: Baltimore Gas and Electric Company

December 11, 1996

FACILITY: Calvert Cliffs Nuclear Power Plant

SUBJECT: SUMMARY OF NOVEMBER 13, 1996, MEETING REGARDING CALVERT CLIFFS
UNIT 2 STEAM GENERATOR INSPECTION SCOPE DURING SPRING OF 1997

On November 13, 1996, the NRC and the Baltimore Gas and Electric Company (BGE), the licensee for the Calvert Cliffs Nuclear Power Plant held a meeting in One White Flint North, Rockville, Maryland. The purpose of the meeting was to discuss the proposed scope of steam generator tube inspections during the Calvert Cliffs Unit No. 2 refueling outage during the spring of 1997. A list of meeting attendees is included as Enclosure 1. Enclosure 2 is a copy of the viewgraphs distributed at the meeting.

The focus of the licensee's presentation during the meeting was a discussion of the steam generator tube inspection scope planned for the upcoming outage. In addition, the licensee presented in-situ pressure testing plans, results of thermal-hydraulic analyses using the ATHOS computer code to establish the freespan plus point probe inspection scope, and plans for tube pulls. The NRC staff requested the licensee outline the eddy current data analysis practices for rotating probe data in the upcoming and most recent inspection outages. The licensee stated that in the spring 1995 refueling outage, eddy current data analysts were required to review both the strip charts and the C-scan plots for the plus point data. This practice would be continued in the outage scheduled for spring 1997.

The licensee indicated that they intend to keep the NRC staff informed regarding any future plans concerning steam generator tube inspections.

Sincerely,

/s/

Alexander W. Dromerick, Sr. Project Manager
Project Directorate I-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket Nos. 50-317
and 50-318

Enclosures: 1. List of meeting attendees
2. Viewgraphs

cc w/encls: See next page

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NAME	ADromerick/rs1	Slittle	SBajwa				
DATE	12/11/96	12/11/96	12/11/96	12/11/96	12/11/96	12/11/96	12/11/96

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UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20565-0001

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Sincerely,

A handwritten signature in cursive script, reading "Alexander W. Dromerick", is written over the typed name.

Alexander W. Dromerick, Sr. Project Manager
Project Directorate I-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket Nos. 50-317
and 50-318

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cc w/encls: See next page

Meeting Summary Memorandum

HARD COPY w/all enclosures

Docket File

PUBLIC

PDI-1 R/F

OGC

ACRS

E-MAIL w/enclosure 1

F. Miraglia/A. Thadani (A)

R. Zimmerman

S. Varga

J. Zwolinski

S. Bajwa

A. Dromerick

S. Little

E. Jordan (JKR)

W. Dean

L. Doerflein

P. Rush

E. Sullivan

J. Tsao

S. Coffin

M. Modes, Region I

9/5/1
1/1

160059

Baltimore Gas & Electric Company

cc:

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Resident Inspector
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Regional Administrator, Region I
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Calvert Cliffs Nuclear Power Plant
Unit Nos. 1 and 2

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Mr. Charles H. Cruse
Vice President - Nuclear Energy
Baltimore Gas and Electric Company
Calvert Cliffs Nuclear Power Plant
1650 Calvert Cliffs Parkway
Lusby, MD 20657-4702

LIST OF ATTENDEES
MEETING WITH REPRESENTATIVES OF
BALTIMORE GAS AND ELECTRIC COMPANY
CONCERNING STEAM GENERATOR
TUBE INSPECTION FOLLOWUP
CALVERT CLIFFS NUCLEAR POWER PLANT

NOVEMBER 13, 1996

<u>NAME</u>	<u>ORGANIZATION</u>
Alexander W. Dromerick	NRR/PDI-1
Alan Thornton	BGE S/G Project
Craig Sly	BGE Licensing
Anthony Soccarino	BGE NDE
Michael E. Dobson	Rockridge/FTI
Brain A. Jones	Rockridge/FTI
Robert F. Cole	Rockridge/FTI
Craig Smith	BGE/S/G PROJ.
Boyd Radford	BGE/S/G PROJ.
Phillip Rush	NRR/EMCB
Edmund Sullivan	NRR/EMCB
John Tsao	NRR/EMCB
Michael Modes	NRR/Region I
Stephanie Coffin	NRR/EMCB

Enclosure 1

ENCLOSURE 2

CALVERT CLIFFS

UNIT 2

1997

S/G OUTAGE
SCOPE

NRC PRESENTATION
WHITE FLINT, MARYLAND
13 NOVEMBER 1996



STEAM GENERATOR INSPECTION TEAM

Al Thornton S/G Project Manager

Craig Smith Senior Engineer

Boyd Radford Senior Engineer

Anthony Saccavino NDE Engineer

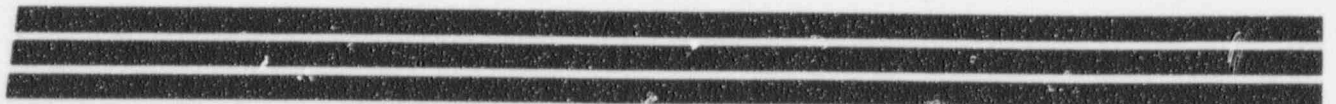
Craig Sly Nuclear Regulatory Matters

Rick Coe S/G Engineer (FTI)

Mike Dobson NDE Level III (FTI)

Brian Jones S/G Task Manager(FTI)

Bob Cole Site S/G Project Manager (FTI)



NRC MEETING AGENDA

Wednesday , November 13th

10:00am - 12:00am

- | | | |
|--|--------------------|--------------|
| <i>I. Introduction</i> | <i>A. Thornton</i> | <i>5min</i> |
| <i>II. 1997 RFO</i> | <i>B. Radford</i> | <i>10min</i> |
| <i>A. S/G work scope</i> | | |
| <i>B. Eddy current scope</i> | | |
| <i>C. Inspection Technology</i> | <i>M. Dobson</i> | <i>5min</i> |
| <i>III. Inspection Plan Influences</i> | <i>B. Radford</i> | <i>10min</i> |
| <i>A. Unit 1 1996 experience</i> | | |
| <i>B. Evaluations/Modeling</i> | <i>R. Coe</i> | <i>10min</i> |
| <i>C. Industry Experiences</i> | | |
| <i>IV. Inspection Plan</i> | <i>B. Radford</i> | <i>15min</i> |
| <i>A. Inspection Strategy</i> | | |
| <i>B. Expansions Strategy</i> | | |
| <i>C. Bounding Strategy</i> | | |
| <i>D. Repair Strategy</i> | | |
| <i>IV. NRC Interactions</i> | <i>C. Smith</i> | <i>5min</i> |





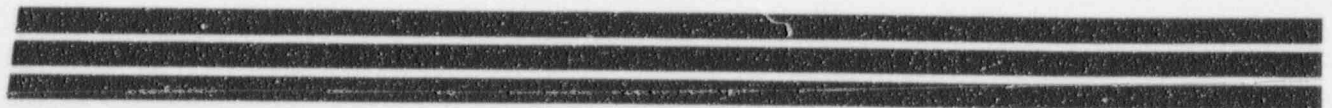
Calvert Cliffs S/G's Background

ℓ **CE Model 67**

- 8519 tubes per steam generator
- tube OD-.75"
 ,.048 wall thickness
- tube material alloy 600 HT/MA
- recirculating type

ℓ **14.6 EFPY**
(effective full power years)

ℓ **T_{HOT} 594F** (Since Start up)



 *1997 RFO*

S/G work scope

Work Scope Objectives

- ℓ Ensure S/G tube integrity is maintained between inspections.
 - ℓ Operate full cycle between inspections
Maintain a proactive approach to the inspection plan and implementation
 - ℓ Meet NRC/Regulatory requirements and commitments.
 - ℓ Address site and industry concerns and issues.
 - ℓ Maximize S/G performance for the next cycle.
- .
-
-
-



1997 RFO

S/G work scope

Primary Side:

- ℓ* Eddy current examination
- ℓ* Insitu pressure testing
- ℓ* Tube removal
- ℓ* Tube plugging/repair

Secondary Side:

- ℓ* Secondary side visual inspection
- ℓ* S/G feed-ring UT inspection.
- ℓ* Steam separation system cleaning.



1997 RFO

S/G eddy current base scope

- ℓ* 100% bobbin full length
- ℓ* 100% H/L,TTS (+point probe)
- ℓ* 20% C/L ,TTS (+point probe)
- ℓ* 20% U-bend(R 1&2) (+point probe)
- ℓ* 20% Steam blanket (R 7-13) (+point probe)
- ℓ* 20% Dented support intersections
 >5V (+point probe)
- ℓ* 20% Free Span (+point probe)
 - Arc region
 - Stay-dome region

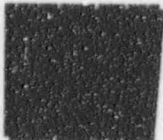


1997 RFO

S/G Inspection Technology

- ℓ* Probe types
- ℓ* Pri/Sec Analysis
- ℓ* Pri/Sec Data Mgt
- ℓ* Remote analysis
- ℓ* Remote acquisition





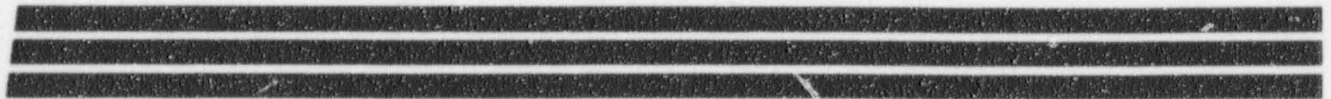
S/G Inspection Plan Influences

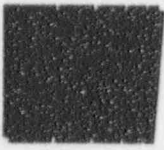
CCNPP Unit 1 1996 experience

Free span Cracking

Axial indications were found in the free span regions in both #11 and #12 steam generators. There were two distinct areas where the free span indications were found; the ARC region & the Stay-Dome region.

20 % of these regions will be inspected in #21 and #22 S/G's in the upcoming outage.





S/G Inspection Plan Influences

CCNPP Unit 1 1996 experience

Drilled Support Plate

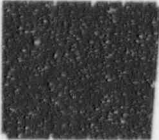
Tube Cracking

Axial and circumferential indications were detected in the 9th solid support dented intersections in both #11 and #12 steam generators.

No crack-like indications were detected in the other solid support (10th) or any of the egg crate supports.

20% of the dented intersections will be inspected on both #21 and #22 steam generators.





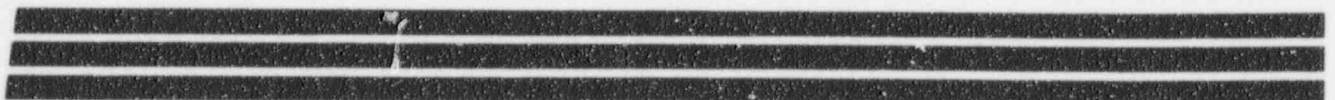
S/G Inspection Plan Influences

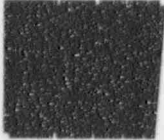
CCNPP Unit 1 1996 experience

Insitu Pressure Tests

Pressure testing of indications was a valuable piece of data that demonstrated the tubing met the structural integrity requirements of NRC REG.Guide 1.121.

**Insitu pressure testing will be conducted on
5-10 of the most limiting flaws**





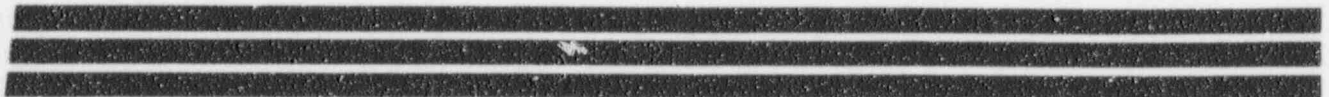
S/G Inspection Plan Influences

CCNPP Unit 1 1996 experience

Tube Pulls

Tube pull analysis provided valuable data on indication morphology, NDE measurements, and the structural condition of the flaws.

Three tubes will be removed from a S/G and analyzed to determine the structural condition of the detected flaws



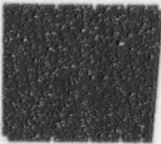
S/G Inspection Plan Influences **Evaluations and Modeling**

ATHOS

- Modeled upper bundle to look for deposit regions
- Unit 2 specific temp, press, and plugging percent
- Results essentially as Unit 1

Eddy Current Review

- Reviewed Unit 2 bobbin free span results in low frequency range to look for deposits
 - Significantly fewer deposit regions noted for Unit 2
 - Some deposits noted in low row numbers in 05H to 06H elevation
-
-
-



S/G Inspection Plan Influences

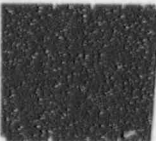
Industry Experiences

Cold Leg Top Of Tube Sheet Indications

Other C.E. utilities have detected crack like indications at the TTS of their cold legs.

**20% of the cold leg TTS will be inspected
in both #21 and #22 steam generators.**





S/G Inspection Plan Influences

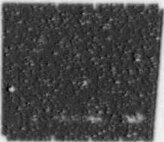
Industry Experiences

Drilled Support Plate Tube Cracking

Many Westinghouse utilities have experienced drilled support plate tube cracking.

20% of the dented intersections will be inspected on both #21 and # 22 steam generators.

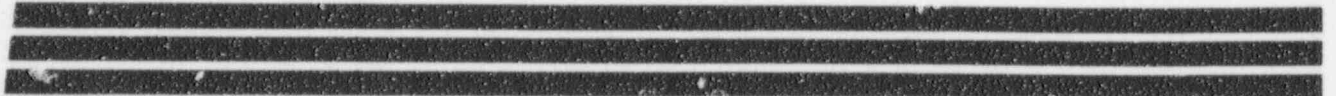
Additional intersections will be inspected during the course of the free span inspection.

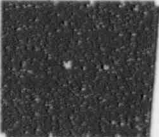


S/G Inspection Plan

Inspection Strategy

- ℓ Perform the 20% free span sample of the Stay-dome and ARC regions first. This will provide data that will define the critical regions of interest.
- ℓ Bobbin examinations will be conducted in parallel with MRPC.

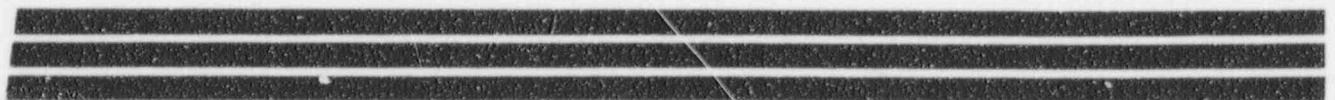


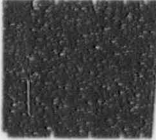


S/G Inspection Plan

Expansion/Bounding Strategy

- ℓ Establish a critical area based on the initial sample results.
- ℓ Examine 100% of critical areas if indications are detected.
- ℓ Ensure all indications are bound by 5 defect free tubes.





S/G Inspection Plan

Repair Strategy

- ℓ Rolled plugs will be installed in all defective tubes.
- ℓ Welded plugs will be installed in all pulled tube locations.
- ℓ Wire rope stabilizers will be installed in all tubes containing circumferential indications/defects.



S/G Licensing Activities

ℓ RCS Flow Reduction

Submittal in January 1997

Needed to support Unit 2 RFO

ℓ Sleeving

Westinghouse LWS - approved (3/96)

ABB/CE TIG - resubmitting RAIs
(11/96)

FTI Electrosleeve - submitted (8/96)

ℓ Alternate Repair Criteria

Free span axial-owners group task (Fall
97)

TTS circumferential-follow industry

