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410 495-4455



June 20, 1997

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
Resubmittal of Request for Approval: Revision to Reactor Vessel Surveillance
Capsule Withdrawal Schedule

By letter dated February 23, 1996 (Reference a), we withdrew our October 27, 1995 (Reference b) request for approval of a revision to our schedule for withdrawal of reactor vessel material surveillance capsules for Calvert Cliffs Units 1 and 2. As stated in Reference (a), the reason for the withdrawal was a decision made by the Atomic Safety and Licensing Board against the Commission, which forced the NRC staff to consider requests such as Reference (b) only if they were processed as license amendment requests. Our October 27, 1995 request was made in accordance with Appendix H of 10 CFR Part 50, and not as a license amendment request, since the surveillance capsule withdrawal schedule is no longer part of the Calvert Cliffs Technical Specifications (Reference c).

The Atomic Safety and Licensing Board decision, which was made in response to intervenors' request regarding the Perry Nuclear Power Plant's reactor vessel material specimens withdrawal schedule, has since been reversed and vacated (Reference d). Therefore, Pursuant to Appendix H of 10 CFR Part 50, we hereby resubmit for approval a revision to our schedule for withdrawal of reactor vessel material surveillance capsules for Calvert Cliffs Units 1 and 2. The proposed withdrawal schedule is based on ASTM [American Society for Testing and Materials] E185-82 recommendations (Reference e), and reflects updated fluence information from the surveillance capsules removed in 1992 and 1993 from Unit 1 and Unit 2, respectively. The details of the proposed revision are contained in the attachment to this letter. The attachment also includes a withdrawal schedule for the Calvert Cliffs Unit 1 supplemental surveillance program described in References (f) and (g).

SCHEDULE

Based on the current reactor vessel surveillance capsule withdrawal schedule, the Calvert Cliffs Unit 1 capsule located at the 284° location is required to be withdrawn during the 1998 refueling outage scheduled to begin on March 13, 1998. However, in the proposed capsule withdrawal schedule, the next Unit 1 capsule scheduled to be withdrawn is the capsule located at the 83° location in the year 2004.

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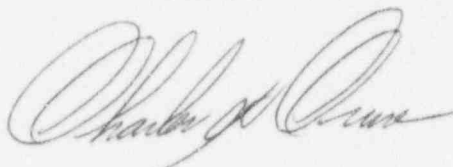


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Therefore, we request that you complete the review of our application by October 31, 1997, to allow us time to prepare for the 1998 outage, should you disagree with our proposed withdrawal schedule.

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

Very truly yours,



CHC/GT/dlm

Attachment

cc:	R. S. Fleishman, Esquire	H. J. Miller, NRC
	J. E. Silberg, Esquire	Resident Inspector, NRC
	A. W. Dromerick, NRC	R. I. McLean, DNR
	Director, Project Directorate I-1, NRC	J. H. Walter, PSC

- REFERENCES:
- (a) Letter from Mr. C. H. Cruse (BGE) to NRC Document Control Desk, dated February 23, 1996, "Withdrawal of Request for Approval: Revision to Reactor Vessel Surveillance Capsule Withdrawal Schedule"
 - (b) Letter from Mr. R. E. Denton (BGE) to NRC Document Control Desk, dated October 27, 1995, "Revision to Reactor Vessel Surveillance Capsule Withdrawal Schedule"
 - (c) Letter from Mr. D. G. McDonald, Jr. (NRC) to Mr. G. C. Creel (BGE), dated July 30, 1991, "Issuance of Amendments for Calvert Cliffs Nuclear Power Plant, Unit No. 1 [TAC No. 80488] and Unit No. 2 [TAC No. 80489]"
 - (d) United States of America Nuclear Regulatory Commission, Memorandum and Order, CLI-96-13, Docketed and Served December 6, 1996, In the Matter of The Cleveland Electric Illuminating Company, Perry Nuclear Power Plant, Unit 1, Docket No. 50-440-OLA-3
 - (e) ASTM E185-82, "Conducting Surveillance Tests for Light-Water Cooled Nuclear Power Reactor Vessels"
 - (f) Letter from R. E. Denton (BGE) to Document Control Desk (NRC), dated November 29, 1993, "Request for Approval to Use Plant-Specific Data for Reactor Vessel Fracture Toughness Analysis"
 - (g) Letter from M. L. Boyle (NRC) to R. E. Denton (BGE), dated July 29, 1994, "Request for Approval to Use Plant-Specific Data for Reactor Vessel Fracture Toughness Analysis, Calvert Cliffs Nuclear Power Plant, Unit No. 1"

ATTACHMENT

PROPOSED REVISION TO THE SCHEDULE FOR WITHDRAWAL OF
REACTOR VESSEL MATERIAL SURVEILLANCE CAPSULE FOR
CALVERT CLIFFS UNITS 1 & 2

Baltimore Gas and Electric Company
Docket Nos. 50-317 and 50-318
June 20, 1997

**PROPOSED REVISION TO THE SCHEDULE FOR WITHDRAWAL OF
REACTOR VESSEL MATERIAL SURVEILLANCE CAPSULE FOR
CALVERT CLIFFS UNITS 1 & 2**

I. BACKGROUND

Appendix H of 10 CFR Part 50 describes reactor vessel material surveillance program requirements. Paragraph (II)(B)(3) of this Appendix states that a proposed material withdrawal schedule must be submitted with a technical justification and approved prior to implementation.

Table (1) shows the currently approved withdrawal schedule for Calvert Cliffs Units 1 and 2 reactor vessel surveillance capsules (References 1 and 2). The capsules located at the 263° and 97° locations have already been withdrawn from both units, and the capsule analysis results were submitted to the NRC in References (3) through (6).

II. PROPOSED WITHDRAWAL SCHEDULE

Tables (2) and (3) provide the proposed revisions to the reactor vessel surveillance capsule withdrawal schedules for Units 1 and 2, respectively. The revised schedules are based on American Society for Testing and Materials (ASTM) E185-82 recommendations (Reference 7), and reflect updated fluence information from the surveillance capsules removed in 1992 and 1993 from Unit 1 and Unit 2, respectively. The proposed schedules are slightly modified versions of the withdrawal schedule suggested in the latest surveillance capsule reports (References 5 and 6).

III. JUSTIFICATION

A. Change in the Capsule Withdrawal Interval

The current surveillance capsule withdrawal schedule is based on years of operation. The proposed surveillance capsule withdrawal schedule is based on target fluence values rather than years of operation. These target fluence values are projections based on the most recent fluence analyses and are tied to meaningful fluence values (e.g., 1/4T end of license fluence, vessel wall end of license fluence). Removing surveillance capsules based on target fluence values is useful in that it provides material property information and dosimetry results at meaningful fluence values as suggested in ASTM E185-82, "Conducting Surveillance Tests for Light-Water Cooled Nuclear Power Reactor Vessels" (Reference 7). In addition to target fluence values, the proposed withdrawal schedules include the outage cycle and the calendar year in which the capsule target fluence is most closely attained. This assists Baltimore Gas and Electric Company engineers and planners in the execution of surveillance capsule withdrawal and analysis.

B. Change in the Order of Capsule Removal for Unit 1

In accordance with the current Unit 1 capsule withdrawal schedule, the 284° capsule is scheduled to be removed next. However, the most recent fluence analyses show that the lead factor for this capsule is low, and it will not be able to attain enough fluence by the end of the current license to meet any of the pertinent target fluences. Therefore, in the revised withdrawal schedule for Unit 1, it is proposed that the 83° capsule be withdrawn instead. The 83° capsule has a higher lead factor than the 284° capsule and can reach a pertinent target fluence by the year 2004. The two capsules contain identical dosimetry, temperature monitors, and surveillance materials.

PROPOSED REVISION TO THE SCHEDULE FOR WITHDRAWAL OF
REACTOR VESSEL MATERIAL SURVEILLANCE CAPSULE FOR
CALVERT CLIFFS UNITS 1 & 2

C. Standby Surveillance Capsules

Removal and testing of five surveillance capsules from each unit provides sufficient material property changes and fluence information as suggested in ASTM E185-82 (Reference 7). It is prudent to include standby capsules to meet future needs (e.g., life extension, radical fuel management changes). The proposed surveillance capsule withdrawal schedules include a standby capsule for each unit.

D. Unit 1 Supplemental Surveillance Capsule Withdrawal

Table 4 provides Baltimore Gas and Electric Company's proposed withdrawal schedule for the supplemental surveillance capsule placed in the Unit 1 reactor vessel at the 263° location, following the withdrawal of the original capsule. The supplemental surveillance program provides additional surveillance data for Unit 1 axial weld seams 2-203-A, B, C. When removed in the year 2000, the capsule will be sectioned into two halves, with one-half removed for testing. The second half will be reconstituted for reinstallation in the 263° location and will be removed for final analysis in 2012. Data from this program will be used to verify the embrittlement observed at low to intermediate fluence levels from the McGuire Unit 1 surveillance program. This will support the application of the McGuire Unit 1 surveillance data to predict the embrittlement of Unit 1 weld seams 2-203-A, B, C as discussed in (References 8 and 9).

IV. REFERENCES

- (1) Letter from Mr. D. G. McDonald, Jr. (NRC) to Mr. G. C. Creel (BGE), dated December 23, 1992, "Clarification of Previous Reactor Vessel Surveillance Program Actions and Withdrawal Schedule Change for Unit 2 Reactor Vessel Material Specimens, Calvert Cliffs Nuclear Power Plant Unit No. 1 (TAC No. M85113) and Unit No. 2 (TAC No. M84440)"
- (2) Letter from Mr. D. G. McDonald, Jr. (NRC) to Mr. G. C. Creel (BGE), dated March 11, 1992, "Withdrawal Schedule Change for Reactor Vessel Material Specimens, Calvert Cliffs Nuclear Power Plant, Unit No. 1 (TAC No. M82686)"
- (3) Letter from Mr. R. F. Ash (BGE) to Mr. R. A. Clark (NRC), dated February 4, 1981, transmitting "Perrin, J. S., et al., Calvert Cliffs Unit No. 1 Nuclear Plant Reactor Pressure Vessel Surveillance Program: Capsule 263, Battelle Report, December 1980"
- (4) Letter from Mr. J. A. Tiernan (BGE) to Mr. A. C. Thadani (NRC), dated April 28, 1986, transmitting "Surveillance Capsule Report No. SwRI-7524, Reactor Vessel Material Surveillance Program for Calvert Cliffs Unit 2 Analysis of 263° Capsule, September 1985"
- (5) Letter from Mr. R. E. Denton (BGE) to NRC Document Control Desk, dated, June 22, 1993, transmitting "Lowe, A L, Jr., et al., Analysis of Capsule 97° Baltimore Gas and Electric Company Calvert Cliffs Nuclear Power Plant Unit No. 1, B&W Nuclear Service Company, BAW-2160, June 1993"
- (6) Letter from Mr. R. E. Denton (BGE) to NRC Document Control Desk, dated March 18, 1994, transmitting "Lowe, A L, Jr., et al., Analysis of Capsule 97° Baltimore

PROPOSED REVISION TO THE SCHEDULE FOR WITHDRAWAL OF
REACTOR VESSEL MATERIAL SURVEILLANCE CAPSULE FOR
CALVERT CLIFFS UNITS 1 & 2

Gas and Electric Company Calvert Cliffs Nuclear Power Plant Unit No. 2, B&W Nuclear Service Company, BAW-2199, February 1994"

- (7) ASTM E185-82, "Standard Practice for Conducting Surveillance Tests for Light-Water Cooled Nuclear Power Reactor Vessels," American Society for Testing and Materials, Philadelphia, PA
- (8) Letter from Mr. R. E. Denton (BGE) to NRC Document Control Desk, dated November 29, 1993, "Request for Approval to Use Plant-Specific Data for Reactor Vessel Fracture Toughness Analysis"
- (9) Letter from Mr. M. L. Boyle (NRC) to Mr. R E Denton (BGE), dated July 29, 1994, "Request for Approval to Use Plant-Specific Data for Reactor Vessel Fracture Toughness Analysis, Calvert Cliffs Nuclear Power Plant, Unit No. 1"

**PROPOSED REVISION TO THE SCHEDULE FOR WITHDRAWAL OF
REACTOR VESSEL MATERIAL SURVEILLANCE CAPSULE FOR
CALVERT CLIFFS UNITS 1 & 2**

Table (1)

**Current
Capsule Withdrawal Schedule**

<u>YEARS</u>	<u>Capsule Azimuthal Position</u>	
	<u>UNIT 1</u>	<u>UNIT 2</u>
5	263°	263°
14	97°	97°
23	284°	284°
30	104°	104°
35	277°	277°
40	83°	83°

Table (2)

**Proposed Unit 1 Reactor Vessel Surveillance Program
Capsule Removal Schedule**

Capsule Azimuthal Position	Target Fast Neutron Fluence (x 10¹⁹ n/cm²)	Target Fluence Expected at End of Cycle	Projected End of Cycle Date
263°	0.62 ^a	3	1979
97°	2.64 ^b	10	1992
83°	3.47 ^c	16	2004
104°	3.14 ^d	21	2014
277°	4.31 ^d	21	2014
284°	STANDBY		

Notes:

- (a) Actual capsule fluence [Perrin, J S, et al., "Calvert Cliffs Unit No. 1 Nuclear Plant Reactor Pressure Vessel Surveillance Program: Capsule 263," Battelle Columbus Laboratories, December 1980]
- (b) Actual capsule fluence; corresponds to the projected fluence at the vessel 1/4 thickness location for plant life extension (48 EFPY) [Lowe, A L, Jr., et al., "Analysis of Capsule 97° Baltimore Gas and Electric Company Calvert Cliffs Nuclear Power Plant Unit No. 1," B&W Nuclear Service Company, BAW-2160, June 1993]
- (c) Capsule fluence that corresponds to the projected fluence at the vessel inner wall location at end of license (32 EFPY)
- (d) Capsule fluence at end of license

**PROPOSED REVISION TO THE SCHEDULE FOR WITHDRAWAL OF
REACTOR VESSEL MATERIAL SURVEILLANCE CAPSULE FOR
CALVERT CLIFFS UNITS 1 & 2**

Table (3)

**Proposed Unit 2 Reactor Vessel Surveillance Program
Capsule Removal Schedule**

<u>Capsule Azimuthal Position</u>	<u>Target Fast Neutron Fluence (x 10¹⁹ n/cm²)</u>	<u>Target Fluence Expected at End of Cycle</u>	<u>Projected End of Cycle Date</u>
263°	0.806 ^a	4	1982
97°	1.85 ^b	9	1993
284°	2.04 ^c	13	2001
104°	3.02 ^d	17	2009
277°	3.88 ^e	17	2009
83°	STANDBY		

Notes:

- (a) Actual capsule fluence [Norris, E. B., "Reactor Vessel Material Surveillance Program for Calvert Cliffs Unit 2 Analysis of 263° Capsule," Southwest Research Institute, SwRI-7524, September 1985]
- (b) Actual capsule fluence [Lowe, A L, Jr., et al., "Analysis of Capsule 97° Baltimore Gas and Electric Company Calvert Cliffs Nuclear Power Plant Unit No. 2," B&W Nuclear Service Company, BAW-2199, February 1994]
- (c) Capsule fluence that corresponds to the projected fluence at the vessel 1/4 thickness location at end of license (32 EFPY)
- (d) Capsule fluence that corresponds to the projected fluence at the vessel 1/4 thickness location for plant life extension (48 EFPY)
- (e) Capsule fluence that corresponds to the projected fluence at the vessel inner wall location at end of license (32 EFPY)

Table (4)

**Unit 1 Supplemental Reactor Vessel Surveillance Program
Capsule Removal Schedule**

<u>Capsule Identification</u>	<u>Target Fast Neutron Fluence (x 10¹⁹ n/cm²)</u>	<u>Target Fluence Expected at End of Cycle</u>	<u>Projected End of Cycle Date</u>
S1	1.00	14	2000
S2	1.93	20	2012