January , 1997

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

SUBJECT: ISSUANCE OF AMENDMENTS FOR CALVERT CLIFFS NUCLEAR POWER PLANT UNIT NO. 1 (TAC NO. M96514) AND UNIT NO. 2 (TAC NO. M96515)

Dear Mr. Cruse:

The Commission has issued the enclosed Amendment No.218 to Facility Operating License No. DPR-53 and Amendment No.195 to Facility Operating License No. DPR-69 for the Calvert Cliffs Nuclear Power Plant, Unit Nos. 1 and 2, respectively. The amendments consist of changes to the Technical Specifications (TSs) in response to your application transmitted by letter dated September 10, 1996.

The amendments extend the automatic actuation logic channel functional test interval of the Engineering Safety Features Actuation System and the surveillance test interval of the containment sump isolation valves from monthly to quarterly.

A copy of the related Safety Evaluation is enclosed. A Notice of Issuance will be included in the Commission's next regular biweekly Federal Register notice.

Sincerely,

/S/

Alexander W. Dromerick, Senior 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. Amendment No.218 to DPR-53
2. Amendment No.195 to DPR-69
3. Safety Evaluation

cc w/encls: See next page

DOCUMENT NAME: CCM96514.AMD
To receive a copy of this document, indicate in the box: "C" = Copy without attachment/enclosure "E" = Copy with attachment/enclosure "N" = No copy

OFFICE	PM:PDI-1	E	LA:PDI-1		OGC		D:PDI-1			
NAME	ADromerick:mw		SLittle		R Bachmann		SBajwa			
DATE	12/18/96		12/18/96		~~12/ /96~~ 1/9/97		1/23/96		12/ /96	

Official Record Copy

9701290185 970123
PDR ADOCK 05000317
P PDR

NRC FILE CENTER COPY

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

January 23, 1997

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

SUBJECT: ISSUANCE OF AMENDMENTS FOR CALVERT CLIFFS NUCLEAR POWER PLANT UNIT NO. 1 (TAC NO. M96514) AND UNIT NO. 2 (TAC NO. M96515)

Dear Mr. Cruse:

The Commission has issued the enclosed Amendment No.218 to Facility Operating License No. DPR-53 and Amendment No.195 to Facility Operating License No. DPR-69 for the Calvert Cliffs Nuclear Power Plant, Unit Nos. 1 and 2, respectively. The amendments consist of changes to the Technical Specifications (TSs) in response to your application transmitted by letter dated September 10, 1996.

The amendments extend the automatic actuation logic channel functional test interval of the Engineering Safety Features Actuation System and the surveillance test interval of the containment sump isolation valves from monthly to quarterly.

A copy of the related Safety Evaluation is enclosed. A Notice of Issuance will be included in the Commission's next regular biweekly Federal Register notice.

Sincerely,

Alexander W. Dromerick

Alexander W. Dromerick, Senior 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. Amendment No. 218 to DPR-53
2. Amendment No. 195 to DPR-69
3. Safety Evaluation

cc w/encls: See next page

cc:

President
Calvert County Board of
Commissioners
175 Main Street
Prince Frederick, MD 20678

D. A. Brune, Esquire
General Counsel
Baltimore Gas and Electric Company
P.O. Box 1475
Baltimore, MD 21203

Jay E. Silberg, Esquire
Shaw, Pittman, Potts, and Trowbridge
2300 N Street, NW
Washington, DC 20037

Mr. Terrence J. Camilleri, Director,
NRM
Calvert Cliffs Nuclear Power Plant
1650 Calvert Cliffs Parkway
Lusby, MD 20657-47027

Resident Inspector
U.S. Nuclear Regulatory
Commission
P.O. Box 287
St. Leonard, MD 20685

Mr. Richard I. McLean
Administrator - Radioecology
Department of Natural Resources
580 Taylor Avenue
Tawes State Office Building, B3
Annapolis, MD 21401

Regional Administrator, Region I
U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

Mr. Joseph H. Walter, Chief Engineer
Public Service Commission of
Maryland
Engineering Division
6 St. Paul Centre
Baltimore, MD 21202-6806

Kristen A. Burger, Esquire
Maryland People's Counsel
6 St. Paul Centre
Suite 2102
Baltimore, MD 21202-1631

Patricia T. Birnie, Esquire
Co-Director
Maryland Safe Energy Coalition
P.O. Box 33111
Baltimore, MD 21218

Mr. Larry Bell
NRC Technical Training Center
5700 Brainerd Road
Chattanooga, TN 37411-4017

DATED: January 23, 1997

AMENDMENT NO.218 TO FACILITY OPERATING LICENSE NO. DPR-53-CALVERT CLIFFS UNIT 1
AMENDMENT NO.195 TO FACILITY OPERATING LICENSE NO. DPR-69-CALVERT CLIFFS UNIT 2

DISTRIBUTION:
Docket File
PUBLIC
PDI-1 Reading
S. Varga, 14/E/4
S. Bajwa
S. Little
A. Dromerick
OGC
G. Hill (2), T-5 C3
C. Grimes, 013/H15
S. Mazumdar
M. Khanna
ACRS
L. Doerflein, Region I

cc: Plant Service list

DF01 1/1

290034

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

BALTIMORE GAS AND ELECTRIC COMPANY

DOCKET NO. 50-317

CALVERT CLIFFS NUCLEAR POWER PLANT UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No.218
License No. DPR-53

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Baltimore Gas and Electric Company (the licensee) dated September 10, 1996, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.2. of Facility Operating License No. DPR-53 is hereby amended to read as follows:

9701290190 970123
PDR ADOCK 05000317
P PDR

2. Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No.218 , are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance and shall be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION

S. Singh Bajwa, Acting Director
Project Directorate I-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: January 23, 1997

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

BALTIMORE GAS AND ELECTRIC COMPANY

DOCKET NO. 50-318

CALVERT CLIFFS NUCLEAR POWER PLANT, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 195
License No. DPR-69

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Baltimore Gas and Electric Company (the licensee) dated September 10, 1996, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.2. of Facility Operating License No. DPR-69 is hereby amended to read as follows:

2. Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 195, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance and shall be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION

S. Singh Bajwa, Acting Director
Project Directorate I-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: January 23, 1997

ATTACHMENT TO LICENSE AMENDMENTS

AMENDMENT NO. 218 FACILITY OPERATING LICENSE NO. DPR-53

AMENDMENT NO. 195 FACILITY OPERATING LICENSE NO. DPR-69

DOCKET NOS. 50-317 AND 50-318

Revise Appendix A as follows:

DPR-53

Remove Pages	Insert Pages
3/4 3-19	3/4 3-19
3/4 3-20	3/4 3-20
3/4 3-21	3/4 3-21
3/4 3-22	3/4 3-22
3/4 5-4	3/4 5-4
3/4 5-5	3/4 5-5
3/4 5-6	3/4 5-6
3/4 6-15	3/4 6-15
3/4 6-16	3/4 6-16
B 3/4 3-1	B 3/4 3-1

DPR-69

Remove Pages	Insert Pages
3/4 3-19	3/4 3-19
3/4 3-20	3/4 3-20
3/4 3-21	3/4 3-21
3/4 3-22	3/4 3-22
3/4 5-4	3/4 5-4
3/4 5-5	3/4 5-5
3/4 5-6	3/4 5-6
3/4 6-11	3/4 6-11
3/4 6-12	3/4 6-12
B 3/4 3-1	B 3/4 3-1

TABLE 4.3-2

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES IN WHICH SURVEILLANCE REQUIRED
1. SAFETY INJECTION (SIAS)				
a. Manual (Trip buttons)	NA	NA	REFUELING INTERVAL	NA
b. Containment Pressure - High	S	REFUELING INTERVAL	Q	1, 2, 3
c. Pressurizer Pressure - Low	S	REFUELING INTERVAL	Q	1, 2, 3
d. Automatic Actuation Logic	NA	NA	Q(1)(2)(3)	1, 2, 3
2. CONTAINMENT SPRAY (CSAS)				
a. Manual (Trip buttons)	NA	NA	REFUELING INTERVAL	NA
b. Containment Pressure - High	S	REFUELING INTERVAL	Q	1, 2, 3
c. Automatic Actuation Logic	NA	NA	Q(1)(6)	1, 2, 3
3. CONTAINMENT ISOLATION (CIS)#				
a. Manual CIS (Trip buttons)	NA	NA	REFUELING INTERVAL	NA
b. Containment Pressure - High	S	REFUELING INTERVAL	Q	1, 2, 3
c. Automatic Actuation Logic	NA	NA	Q(1)(4)	1, 2, 3

TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES IN WHICH SURVEILLANCE REQUIRED
4. MAIN STEAM LINE ISOLATION (SGIS)				
a. Manual SGIS (MSIV Hand Switches and Feed Head Isolation Hand Switches)	NA	NA	REFUELING INTERVAL	NA
b. Steam Generator Pressure - Low	S	REFUELING INTERVAL	Q	1, 2, 3
c. Automatic Actuation Logic	NA	NA	Q(1)(5)	1, 2, 3
5. CONTAINMENT SUMP RECIRCULATION (RAS)				
a. Manual RAS (Trip Buttons)	NA	NA	REFUELING INTERVAL	NA
b. Refueling Water Tank - Low	NA	REFUELING INTERVAL	Q	1, 2, 3
c. Automatic Actuation Logic	NA	NA	Q(1)	1, 2, 3
6. CONTAINMENT PURGE VALVES ISOLATION				
a. Manual (Purge Valve Control Switches)	NA	NA	REFUELING INTERVAL	NA
b. Containment Radiation - High Area Monitor	S	REFUELING INTERVAL	Q	6**

TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES IN WHICH SURVEILLANCE REQUIRED
7. LOSS OF POWER				
a. 4.16 kv Emergency Bus Undervoltage (Loss of Voltage)	NA	REFUELING INTERVAL	Q	1, 2, 3
b. 4.16 kv Emergency Bus Undervoltage (Degraded Voltage)	NA	REFUELING INTERVAL	Q	1, 2, 3
8. CVCS ISOLATION				
West Penetration Room/Letdown Heat Exchanger Room Pressure - High	NA	REFUELING INTERVAL	Q	1, 2, 3, 4
9. AUXILIARY FEEDWATER				
a. Manual (Trip Buttons)	NA	NA	REFUELING INTERVAL	NA
b. Steam Generator Level - Low	S	REFUELING INTERVAL	Q	1, 2, 3
c. Steam Generator ΔP - High	S	REFUELING INTERVAL	Q	1, 2, 3
d. Automatic Actuation Logic	NA	NA	Q(1)	1, 2, 3

TABLE 4.3-2 (Continued)

TABLE NOTATION

\# Containment isolation of non-essential penetrations is also initiated by SIAS (functional units 1.a and 1.c).

** Must be **OPERABLE** only in **MODE** 6 when the valves are required **OPERABLE** and they are open.

(1) The logic circuits shall be tested manually at least once per 92 days.

(2) SIAS logic circuits A-10 and B-10 shall be tested quarterly with the exception of the Safety Injection Tank isolation valves. The SIAS logic circuits for these valves are exempted from testing during operation; however, these logic circuits shall be tested at least once per **REFUELING INTERVAL** during shutdown.

(3) SIAS logic circuits A-5, and B-5 are exempted from testing during operation; however, these logic circuits shall be tested at least once per **REFUELING INTERVAL** during shutdown.

(4) CIS logic circuits A-5 and B-5 are exempted from testing during operation; however, these logic circuits shall be tested at least once per **REFUELING INTERVAL** during shutdown.

(5) SGIS logic circuits A-1 and B-1 are exempted from testing during operation; however, these logic circuits shall be tested at least once per **REFUELING INTERVAL** during shutdown.

(6) CSAS logic circuits A-3 and B-3 are exempted from testing during operation; however, these logic circuits shall be tested at least once per **REFUELING INTERVAL** during shutdown.

SURVEILLANCE REQUIREMENTS

4.5.2 Each ECCS subsystem shall be demonstrated **OPERABLE***:

a. At least once per 12 hours by verifying that the following valves are in the indicated positions with power to the valve operators removed:

Valve Number	Valve Function	Valve Position
1. MOV-659	Mini-flow Isolation	Open
2. MOV-660	Mini-flow Isolation	Open
3. CV-306	Low Pressure SI Flow Control	Open

b. At least once per 31 days by:

1. Verifying that each valve (manual, power-operated or automatic) in the flow path that is not locked, sealed, or otherwise secured in position, is in its correct position.

c. At least once per 92 days by:

1. Verifying that upon a Recirculation Actuation Test Signal, the containment sump isolation valves open.

d. By a visual inspection which verifies that no loose debris (rags, trash, clothing, etc.) is present in the containment which could be transported to the containment sump and cause restriction of the pump suctions during LOCA conditions. This visual inspection shall be performed:

1. For all accessible areas of the containment prior to establishing **CONTAINMENT INTEGRITY**, and

2. Of the areas affected within containment at the completion of containment entry when **CONTAINMENT INTEGRITY** is established.

e. Within 4 hours prior to increasing the RCS pressure above 1750 psia by verifying, via local indication at the valve, that CV-306 is open.

---

* Whenever flow testing into the RCS is required at RCS temperatures of 365°F and less, the high pressure safety injection pump shall recirculate RCS water (suction from RWT isolated) or the controls of Technical Specification 3.4.9.3 shall apply.

SURVEILLANCE REQUIREMENTS (Continued)

f. At least once per **REFUELING INTERVAL** by:

1. Verifying the Shutdown Cooling System open-permissive interlock prevents the Shutdown Cooling System suction isolation valves from being opened with a simulated or actual RCS pressure signal of ≥ 309 psia.

2. A visual inspection of the containment sump and verifying that the subsystem suction inlets are not restricted by debris and that the sump components (trash racks, screens, etc.) show no evidence of structural distress or corrosion.

3. Verifying that a minimum total of 289.3 cubic feet of solid granular trisodium phosphate dodecahydrate (TSP) is contained within the TSP storage baskets.

4. Verifying that a sample from the TSP baskets provides adequate pH adjustment of water borated to be representative of the post-LOCA sump condition.

g. At least once per **REFUELING INTERVAL**, during shutdown, by:

1. Verifying that each automatic valve in the flow path actuates to its correct position on a Safety Injection Actuation test signal.

2. Verifying that each of the following pumps start automatically upon receipt of a Safety Injection Actuation Test Signal:

   a. High-Pressure Safety Injection Pump.

   b. Low-Pressure Safety Injection Pump.

SURVEILLANCE REQUIREMENTS (Continued)

h. By performing a flow balance test during shutdown following completion of HPSI System modifications that alter system flow characteristics and verifying the following flow rates for a single HPSI Pump System*:

   1. The sum of the three lowest flow legs shall be greater than 470** gpm.

i. By verifying that the HPSI pumps develop a total head of 2900 ft. on recirculation flow to the refueling water tank when tested pursuant to Specification 4.0.5.

---

* A HPSI Pump System is a HPSI pump and one of two safety injection headers.

** These limits contain allowances for instrument error, drift or fluctuation.

3/4.6.2 DEPRESSURIZATION AND COOLING SYSTEMS

Containment Spray System

LIMITING CONDITION FOR OPERATION

3.6.2.1 Two independent Containment Spray Systems shall be **OPERABLE** with each spray system capable of taking suction from the RWT on a Containment Spray Actuation Signal and Safety Injection Actuation Signal and automatically transferring suction to the containment sump on a Recirculation Actuation Signal. Each spray system flow path from the containment sump shall be via an **OPERABLE** shutdown cooling heat exchanger.

APPLICABILITY: **MODES** 1, 2, and 3*.

ACTION: With one Containment Spray System inoperable, restore the inoperable spray system to **OPERABLE** status within 72 hours or be in at least **HOT STANDBY** within the next 6 hours and in **COLD SHUTDOWN** within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.6.2.1 Each Containment Spray System shall be demonstrated **OPERABLE**:

a. At least once per 31 days by:

   1. Verifying that each valve (manual, power-operated, or automatic) in the flow path that is not locked, sealed or otherwise secured in position is positioned to take suction from the RWT on a Containment Pressure-High test signal.

b. At least once per 92 days by:

   1. Verifying that upon a Recirculation Actuation Test Signal, the containment sump isolation valves open and that a recirculation mode flow path via an **OPERABLE** shutdown cooling heat exchanger is established.

c. At least once per **REFUELING INTERVAL**, during shutdown, by:

   1. Verifying that each automatic valve in the flow path actuates to its correct position on the appropriate ESFAS test signal.

   2. Verifying that each spray pump starts automatically on the appropriate ESFAS test signal.

---

* With pressurizer pressure $\geq$ 1750 psia.

SURVEILLANCE REQUIREMENTS (Continued)

d. At least once per 5 years by performing an air or smoke flow test through each spray header and verifying each spray nozzle is unobstructed.

3/4.3.1 and 3/4.3.2 PROTECTIVE AND ENGINEERED SAFETY FEATURES (ESF) INSTRUMENTATION

The **OPERABILITY** of the protective and ESF instrumentation systems and bypasses ensure that 1) the associated ESF action and/or reactor trip will be initiated when the parameter monitored by each channel or combination thereof exceeds its setpoint, 2) the specified coincidence logic is maintained, 3) sufficient redundancy is maintained to permit a channel to be out of service for testing or maintenance, and 4) sufficient system functional capability is available for protective and ESF purposes from diverse parameters.

The **OPERABILITY** of these systems is required to provide the overall reliability, redundance and diversity assumed available in the facility design for the protection and mitigation of accident and transient conditions. The integrated operation of each of these systems is consistent with the assumptions used in the accident analyses.

The surveillance requirements specified for these systems ensure that the overall system functional capability is maintained comparable to the original design standards. The periodic surveillance tests performed at the minimum frequencies are sufficient to demonstrate this capability. The quarterly frequency for the channel functional tests for these systems is based on the analysis presented in the NRC-approved Topical Reports CEN-327, "RPS/ESFAS Extended Test Interval Evaluation," as supplemented, and CEN-403, "ESFAS Subgroup Relay Test Interval Extension."

The measurement of response time at the specified frequencies provides assurance that the protective and ESF action function associated with each channel is completed within the time limit assumed in the accident analyses. No credit was taken in the analyses for those channels with response times indicated as not applicable.

Response time may be demonstrated by any series of sequential, overlapping or total channel test measurements provided that such tests demonstrate the total channel response time as defined. Sensor response time verification may be demonstrated by either 1) in place, onsite or offsite test measurements or 2) utilizing replacement sensors with certified response times. The response time limits are contained in UFSAR Chapter 7, and updated in accordance with 10 CFR 50.71(e).

3/4.3.3 MONITORING INSTRUMENTATION

3/4.3.3.1 Radiation Monitoring Instrumentation

The **OPERABILITY** of the radiation monitoring channels ensures that 1) the radiation levels are continually measured in the areas served by the individual channels and 2) the alarm or automatic action is initiated when the radiation level trip setpoint is exceeded.

TABLE 4.3-2

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES IN WHICH SURVEILLANCE REQUIRED
1. SAFETY INJECTION (SIAS)				
a. Manual (Trip buttons)	NA	NA	REFUELING INTERVAL	NA
b. Containment Pressure - High	S	REFUELING INTERVAL	Q	1, 2, 3
c. Pressurizer Pressure - Low	S	REFUELING INTERVAL	Q	1, 2, 3
d. Automatic Actuation Logic	NA	NA	Q(1)(2)(3)	1, 2, 3
2. CONTAINMENT SPRAY (CSAS)				
a. Manual (Trip buttons)	NA	NA	REFUELING INTERVAL	NA
b. Containment Pressure - High	S	REFUELING INTERVAL	Q	1, 2, 3
c. Automatic Actuation Logic	NA	NA	Q(1)(6)	1, 2, 3
3. CONTAINMENT ISOLATION (CIS)#				
a. Manual CIS (Trip buttons)	NA	NA	REFUELING INTERVAL	NA
b. Containment Pressure - High	S	REFUELING INTERVAL	Q	1, 2, 3
c. Automatic Actuation Logic	NA	NA	Q(1)(4)	1, 2, 3

TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES IN WHICH SURVEILLANCE REQUIRED
4. MAIN STEAM LINE ISOLATION (SGIS)				
a. Manual SGIS (MSIV Hand Switches and Feed Head Isolation Hand Switches)	NA	NA	REFUELING INTERVAL	NA
b. Steam Generator Pressure - Low	S	REFUELING INTERVAL	Q	1, 2, 3
c. Automatic Actuation Logic	NA	NA	Q(1)(5)	1, 2, 3
5. CONTAINMENT SUMP RECIRCULATION (RAS)				
a. Manual RAS (Trip Buttons)	NA	NA	REFUELING INTERVAL	NA
b. Refueling Water Tank - Low	NA	REFUELING INTERVAL	Q	1, 2, 3
c. Automatic Actuation Logic	NA	NA	Q(1)	1, 2, 3
6. CONTAINMENT PURGE VALVES ISOLATION				
a. Manual (Purge Valve Control Switches)	NA	NA	REFUELING INTERVAL	NA
b. Containment Radiation - High Area Monitor	S	REFUELING INTERVAL	Q	6**

TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES IN WHICH SURVEILLANCE REQUIRED
7. LOSS OF POWER				
a. 4.16 kv Emergency Bus Undervoltage (Loss of Voltage)	NA	REFUELING INTERVAL	Q	1, 2, 3
b. 4.16 kv Emergency Bus Undervoltage (Degraded Voltage)	NA	REFUELING INTERVAL	Q	1, 2, 3
8. CVCS ISOLATION				
West Penetration Room/Letdown Heat Exchanger Room Pressure - High	NA	REFUELING INTERVAL	Q	1, 2, 3, 4
9. AUXILIARY FEEDWATER				
a. Manual (Trip Buttons)	NA	NA	REFUELING INTERVAL	NA
b. Steam Generator Level - Low	S	REFUELING INTERVAL	Q	1, 2, 3
c. Steam Generator ΔP - High	S	REFUELING INTERVAL	Q	1, 2, 3
d. Automatic Actuation Logic	NA	NA	Q(1)	1, 2, 3

TABLE 4.3-2 (Continued)

TABLE NOTATION

\# Containment isolation of non-essential penetrations is also initiated by SIAS (functional units 1.a and 1.c).

** Must be **OPERABLE** only in **MODE** 6 when the valves are required **OPERABLE** and they are open.

(1) The logic circuits shall be tested manually at least once per 92 days.

(2) SIAS logic circuits A-10 and B-10 shall be tested quarterly with the exception of the Safety Injection Tank isolation valves. The SIAS logic circuits for these valves are exempted from testing during operation; however, these logic circuits shall be tested at least once per **REFUELING INTERVAL** during shutdown.

(3) SIAS logic circuits A-5 and B-5 are exempted from testing during operation; however, these logic circuits shall be tested at least once per **REFUELING INTERVAL** during shutdown.

(4) CIS logic circuits A-5 and B-5 are exempted from testing during operation; however, these logic circuits shall be tested at least once per **REFUELING INTERVAL** during shutdown.

(5) SGIS logic circuits A-1 and B-1 are exempted from testing during operation; however, these logic circuits shall be tested at least once per **REFUELING INTERVAL** during shutdown.

(6) CSAS logic circuits A-3 and B-3 are exempted from testing during operation; however, these logic circuits shall be tested at least once per **REFUELING INTERVAL** during shutdown.

SURVEILLANCE REQUIREMENTS

4.5.2 Each ECCS subsystem shall be demonstrated **OPERABLE***:

a. At least once per 12 hours by verifying that the following valves are in the indicated positions with power to the valve operators removed:

Valve Number	Valve Function	Valve Position
1. MOV-659	Mini-flow Isolation	Open
2. MOV-660	Mini-flow Isolation	Open
3. CV-306	Low Pressure SI Flow Control	Open

b. At least once per 31 days by:

1. Verifying that each valve (manual, power-operated or automatic) in the flow path that is not locked, sealed, or otherwise secured in position, is in its correct position.

c. At least once per 92 days by:

1. Verifying that upon a Recirculation Actuation Test Signal, the containment sump isolation valves open.

d. By a visual inspection which verifies that no loose debris (rags, trash, clothing, etc.) is present in the containment which could be transported to the containment sump and cause restriction of the pump suctions during LOCA conditions. This visual inspection shall be performed:

1. For all accessible areas of the containment prior to establishing **CONTAINMENT INTEGRITY**, and

2. Of the areas affected within containment at the completion of containment entry when **CONTAINMENT INTEGRITY** is established.

e. Within 4 hours prior to increasing the RCS pressure above 1750 psia by verifying, via local indication at the valve, that CV-306 is open.

---

* Whenever flow testing into the RCS is required at RCS temperatures of 301°F and less, the high pressure safety injection pump shall recirculate RCS water (suction from RWT isolated) or the controls of Technical Specification 3.4.9.3 shall apply.

SURVEILLANCE REQUIREMENTS (Continued)

f. At least once per **REFUELING INTERVAL** by:

1. Verifying the Shutdown Cooling System open-permissive interlock prevents the Shutdown Cooling System suction isolation valves from being opened with a simulated or actual RCS pressure signal of ≥ 309 psia.

2. A visual inspection of the containment sump and verifying that the subsystem suction inlets are not restricted by debris and that the sump components (trash racks, screens, etc.) show no evidence of structural distress or corrosion.

3. Verifying that a minimum total of 289.3 cubic feet of solid granular trisodium phosphate dodecahydrate (TSP) is contained within the TSP storage baskets.

4. Verifying that a sample from the TSP baskets provides adequate pH adjustment of water borated to be representative of the post-LOCA sump condition.

g. At least once per **REFUELING INTERVAL**, during shutdown, by:

1. Verifying that each automatic valve in the flow path actuates to its correct position on a Safety Injection Actuation test signal.

2. Verifying that each of the following pumps start automatically upon receipt of a Safety Injection Actuation Test Signal:

   a. High-Pressure Safety Injection Pump.

   b. Low-Pressure Safety Injection Pump.

SURVEILLANCE REQUIREMENTS (Continued)

h. By performing a flow balance test during shutdown following completion of HPSI System modifications that alter system flow characteristics and verifying the following flow rates for a single HPSI Pump System*:

   1. The sum of the three lowest flow legs shall be greater than 470** gpm.

i. By verifying that the HPSI pumps develop a total head of 2900 ft on recirculation flow to the refueling water tank when tested pursuant to Specification 4.0.5.

---

* A HPSI Pump System is a HPSI pump and one of two safety injection headers.

** These limits contain allowances for instrument error, drift or fluctuation.

3/4.6.2 DEPRESSURIZATION AND COOLING SYSTEMS

Containment Spray System

LIMITING CONDITION FOR OPERATION

3.6.2.1 Two independent Containment Spray Systems shall be **OPERABLE** with each spray system capable of taking suction from the RWT on a Containment Spray Actuation Signal and Safety Injection Actuation Signal and automatically transferring suction to the containment sump on a Recirculation Actuation Signal. Each spray system flow path from the containment sump shall be via an **OPERABLE** shutdown cooling heat exchanger.

APPLICABILITY: **MODES** 1, 2, and 3*.

ACTION: With one Containment Spray System inoperable, restore the inoperable spray system to **OPERABLE** status within 72 hours or be in at least **HOT STANDBY** within the next 6 hours and in **COLD SHUTDOWN** within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.6.2.1 Each Containment Spray System shall be demonstrated **OPERABLE**:

a. At least once per 31 days by:

   1. Verifying that each valve (manual, power-operated, or automatic) in the flow path that is not locked, sealed or otherwise secured in position is positioned to take suction from the RWT on a Containment Pressure-High test signal.

b. At least once per 92 days by:

   1. Verifying that upon a Recirculation Actuation Test Signal, the containment sump isolation valves open and that a recirculation mode flow path via an **OPERABLE** shutdown cooling heat exchanger is established.

c. At least once per **REFUELING INTERVAL**, during shutdown, by:

   1. Verifying that each automatic valve in the flow path actuates to its correct position on the appropriate ESFAS test signal.

   2. Verifying that each spray pump starts automatically on the appropriate ESFAS test signal.

---

* With pressurizer pressure $\geq$ 1750 psia.

SURVEILLANCE REQUIREMENTS (Continued)

d. At least once per 5 years by performing an air or smoke flow test through each spray header and verifying each spray nozzle is unobstructed.

3/4.3.1 and 3/4.3.2 PROTECTIVE AND ENGINEERED SAFETY FEATURES (ESF) INSTRUMENTATION

The **OPERABILITY** of the protective and ESF instrumentation systems and bypasses ensure that 1) the associated ESF action and/or reactor trip will be initiated when the parameter monitored by each channel or combination thereof exceeds its setpoint, 2) the specified coincidence logic is maintained, 3) sufficient redundancy is maintained to permit a channel to be out of service for testing or maintenance, and 4) sufficient system functional capability is available for protective and ESF purposes from diverse parameters.

The **OPERABILITY** of these systems is required to provide the overall reliability, redundance and diversity assumed available in the facility design for the protection and mitigation of accident and transient conditions. The integrated operation of each of these systems is consistent with the assumptions used in the accident analyses.

The surveillance requirements specified for these systems ensure that the overall system functional capability is maintained comparable to the original design standards. The periodic surveillance tests performed at the minimum frequencies are sufficient to demonstrate this capability. The quarterly frequency for the channel functional tests for these systems is based on the analysis presented in the NRC-approved Topical Reports CEN-327, "RPS/ESFAS Extended Test Interval Evaluation," as supplemented, and CEN-403, "ESFAS Subgroup Relay Test Interval Extension."

The measurement of response time at the specified frequencies provides assurance that the protective and ESF action function associated with each channel is completed within the time limit assumed in the accident analyses. No credit was taken in the analyses for those channels with response times indicated as not applicable.

Response time may be demonstrated by any series of sequential, overlapping or total channel test measurements provided that such tests demonstrate the total channel response time as defined. Sensor response time verification may be demonstrated by either 1) in place, onsite or offsite test measurements or 2) utilizing replacement sensors with certified response times. The response time limits are contained in UFSAR Chapter 7, and updated in accordance with 10 CFR 50.71(e).

3/4.3.3 MONITORING INSTRUMENTATION

3/4.3.3.1 Radiation Monitoring Instrumentation

The **OPERABILITY** of the radiation monitoring channels ensures that 1) the radiation levels are continually measured in the areas served by the individual channels and 2) the alarm or automatic action is initiated when the radiation level trip setpoint is exceeded.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 218 TO FACILITY OPERATING LICENSE NO. DPR-53

AND AMENDMENT NO. 195 TO FACILITY OPERATING LICENSE NO. DPR-69

BALTIMORE GAS AND ELECTRIC COMPANY

CALVERT CLIFFS NUCLEAR POWER PLANT, UNIT NOS. 1 AND 2

DOCKET NOS. 50-317 AND 50-318

1.0 INTRODUCTION

By letter dated September 10, 1996, the Baltimore Gas and Electric Company (BGE) submitted an amendment to the operating license of the Calvert Cliffs Nuclear Power Plant, Units 1 and 2. This amendment proposes to extend the automatic actuation logic channel functional test interval of the Engineering Safety Features Actuation System (ESFAS) and the surveillance test interval of the containment sump isolation valves from monthly to quarterly.

The amendment request for the ESFAS actuation logic is primarily based on analysis presented in Combustion Engineering Owners Group (CEOG) Topical Reports CEN-327, "RPS/ESFAS Extend Test Interval Evaluation," CEN-327, Supplement 1, and CEN-403, Revision 1-A, "ESFAS Subgroup Relay Test Interval Extension." These topical reports have been approved by the staff. Topical Report CEN-327 and CEN-327, Supplement 1, established that there was a slight decrease in core melt frequency in extending ESFAS surveillance intervals from monthly to quarterly by comparing the slight increase in core damage frequency (CDF) from system unavailability and the decrease in CDF from reduced test induced plant transients. Topical Report CEN-403, Revision 1-A, supported extending the surveillance test interval for ESFAS actuation relays to each refueling outage on a staggered test basis by considering the mean time between failures (MTBF) for these relays in Combustion Engineering (CE) plants.

The ESFAS design at Calvert Cliffs does not permit testing of the actuation relays separately from the automatic actuation logic circuits. The licensee's review of the Calvert Cliffs Units 1 and 2 Technical Specifications (TSs) indicates that at present, all ESFAS equipment tests are performed at quarterly or longer intervals except for containment sump isolation valves which are tested monthly. To facilitate testing of the ESFAS equipment with the actuation logic circuits, the licensee requested extension of the following surveillance tests intervals from monthly to quarterly:

9701290196 970123
PDR ADOCK 05000317
P PDR

A. Channel Functional Test for Automatic Logic of Safety Injection, Containment Spray, Containment Isolation, Main Steam Line Isolation, Containment Sump Recirculation, and Auxiliary Feedwater in TS Table 4.3-2, Engineered Safety Feature Actuation System Instrumentation Surveillance Requirements.

B. Related surveillance requirements of TS Item 4.5.2 for Emergency Core Cooling Systems and TS Item 4.6.2.1 for Containment Spray Systems.

C. Bases in TS Items 3/4.3.1 and 3/4.3.2, Protective and Engineered Safety Features (ESF) Instrumentation. In paragraph three of page B 3/4 3-1, the licensee stated, "The quarterly frequency for the channel functional tests for these systems is based on analysis presented in the NRC-approved Topical Report CEN-327, "RPS/ESFAS Extended Test Interval Evaluation," as supplemented and CEN-403, "ESFAS Subgroup Relay Test Interval Extension." The licensee will revise this sentence to indicate that the frequency for functional tests is based on analysis presented in CEN-403, Revision 1-A, rather than CEN-403.

The licensee further requested that the containment sump isolation valve automatic opening verification be extended to preclude having to continue monthly testing of the containment sump recirculation automatic actuation logic. BGE proposed to extend the surveillance test interval for the containment sump isolation valves from monthly to quarterly, to achieve consistency with the ESFAS automatic actuation test. The valves that are involved in the evaluation of this proposed TS include containment sump isolation valves 1-MOV-4144, 2-MOV-4144, 1-MOV-4145 and 2-MOV-4145.

2.0 EVALUATION

A-ESFAS

In Generic Letter 83-28, "Required Actions Based on Generic Implications of Salem ATWS Events," dated July 8, 1983, NRC requested that licensees review the Reactor Protective System (RPS) test intervals to determine if they were consistent with achieving high RPS availability. Subsequently, in Topical Reports CEN-327 and CEN-327, Supplement 1, the Combustion Engineering Owners Group (CEOG) presented an analysis of the effects on CDF in extending the RPS/ESFAS channel functional test interval from monthly to quarterly using fault tree analysis. The report revealed that for Calvert Cliffs there would be a slight decrease in CDF.

In a letter dated November 6, 1989, the NRC staff approved these topical reports. The approval was contingent on the licensee's confirming that instrument drift occurring over the proposed surveillance test interval would not cause the values to exceed the values assumed in the safety analysis and the data specified in the TS. The licensee stated that ESFAS actuation logic circuitry was composed of digital logic gates that were not susceptible to time related instrument drift. Furthermore, the licensee conducted an instrument drift analysis on each sensor loop which indicated that the

instrument drift for 150 days, including a 25 percent maximum allowable extension permitted by TS, did not exceed the 30-day setpoint assumptions. The licensee also found that in the last three years, as-found and as-left monthly drift data on each channel were within the permissible limits.

The ESFAS actuation relays were specifically excluded from the CEN-327 and CEN-327, Supplement 1, evaluation. Topical Report CEN-403, Revision 1-A, provided an analysis based on mean time between component failures which addressed the effects of the ESFAS actuation relay surveillance test interval extension. In a letter dated February 27, 1996, NRC approved CEN-403, Revision 1-A which recommended an extension of the surveillance test interval for these relays to each refueling outage on a staggered test basis. The report identifies the MTBF of ESFAS subgroup relays at Calvert Cliffs, Unit 2 as the longest and the MTBF at Calvert Cliffs, Unit 1 as the fourth longest among all CE plants in the USA. Allowing for a 25 percent margin as permitted by TS, the acceptable MTBF for a quarterly surveillance frequency is 3.75 months which is far short of the MTBFs reported in the CEN-403, Revision 1-A, for ESFAS subgroup relays at Calvert Cliffs.

In a safety evaluation approving CEN-403, Revision 1-A, the NRC staff asked that licensees referencing this topical report as a basis for TS license amendments to confirm the applicability of CEN-403, Revision 1-A, to their specific plant, and confirm that the applicable setpoint calculations account for any increase in instrument drift caused by the extended surveillance test interval. NRC also required reevaluation of the adequacy of the surveillance test interval in the event two or more ESFAS actuation relays failed within a 12-month period. Additional restrictions were imposed for plants using Potter and Brumfield type MDR relays in ESFAS actuation. These Potter and Brumfield relays are not used in the Calvert Cliffs ESFAS. The Calvert Cliffs licensee confirmed the applicability of CEN-403, Revision 1-A, for Calvert Cliffs. In addition, the licensee's search of the Nuclear Plant Reliability Data System (NPRDS) identified only one ESFAS actuation relay failure in 66 months at Calvert Cliffs, Unit 1, which occurred on April 14, 1996. This failure frequency is substantially below the permissible MTBF of 3.75 months. A plant specific drift analysis indicated that the increased surveillance test interval did not exceed the 30-day setpoint assumptions for ESFAS sensor loops. The ESFAS actuation relays at Calvert Cliffs are Genicom (formerly General Electric) series 3SAA13832A relays and are essentially digital devices not susceptible to time related drifts.

The staff has reviewed the licensee evaluations and justifications and finds that the proposed TS changes for extension of the ESFAS logic functional test interval from monthly to quarterly are in conformance with NRC approved CEOG Topical Reports CEN-327, CEN-327, Supplement 1, and CEN-403, Revision 1-A. The licensee has performed a plant specific review to establish the applicability of these topical reports and NRPDS search as to confirm acceptable failure rates of applicable components, and analysis of component drift. The licensees evaluation confirms that the extension of the ESFAS surveillance test interval will slightly reduce the core damage frequency as noted in the above topical reports. Based on our evaluation, the staff

concludes that the proposed changes to the Calvert Cliffs, Units 1 & 2 TS are in accordance with the NRC-approved topical reports and are, therefore, acceptable.

B-Containment Sump Isolation Valves

The containment sump isolation valves listed above automatically open on receipt of a Recirculation Actuation Signal (RAS). Single failure criteria is satisfied by two redundant valves on each unit. Testing of the automatic opening feature is currently performed monthly in accordance with TS Surveillance Requirements (SR) 4.5.2.b.1 and SR 4.6.2.1.a.1. Verification of valve opening on receipt of an RAS satisfies both specifications, since the containment sump isolation valves are the only components in the flow path which actuate on RAS.

As discussed above, Calvert Cliffs, Units 1 and 2, ESFAS design does not include features for testing the actuation relays separately from the automatic actuation logic circuits. Because of these circumstances, the associated engineered safety features equipment is actuated each time the ESFAS automatic actuation logic channel functional test is performed. BGE performed a review of the Units 1 and 2 TS, and found that all associated ESFAS equipment tests are performed at intervals of at least quarterly or greater, with the exception of the containment sump isolation valve test, which is performed monthly as required by BGE's TS SR 4.5.2.b.1 and SR 4.6.2.1.a.1. Failure to extend the surveillance interval for the containment sump isolation valves would necessitate monthly performance of the ESFAS containment sump recirculation automatic actuation logic channel functional test.

The licensee proposes to change the containment sump isolation valve RAS automatic opening verification surveillance interval from 31 days to quarterly (92 days). This proposed change revises Calvert Cliffs Nuclear Power Plant, Units 1 and 2.

The licensee's justification for extending the containment sump isolation valves test interval from monthly to quarterly is based on review of surveillance test procedures and Nuclear Plant Reliability Data System (NPRDS) data of valve failure history of similar valves. BGE conducted a historical review of the Units 1 and 2 surveillance test procedures supporting successful completion of TS SR 4.5.2.b.1 and SR 4.6.2.1.a.1. No failures of the containment sump isolation valves or associated valve operators were identified. Also, review of NPRDS data revealed no failures of these components. In addition, based on the generic and plant-specific risk evaluations and the demonstrated low failure rate of the components, the licensee determined that the proposed changes do not involve a significant reduction in the margin of safety.

The proposed changes to the surveillance test interval for the subject containment sump isolation valves is in accordance with the inservice testing (IST) requirements of Section XI of the American Society of Mechanical

Engineers (ASME) Boiler and Pressure Vessel Code (ASME Code) (1983 Edition). IST programs are required pursuant to 10 CFR 50.55a. Valves 1-MOV-4144, 2-MOV-4144, 1-MOV-4145, and 2-MOV-4145 are included in the IST program and are stoke tested quarterly in accordance with the ASME Code. Quarterly inservice testing of power-operated valves has been a long-standing requirement of the ASME Code and is considered adequate to assess the operational readiness of valves. As such, the licensee's proposed change is consistent with the level of assurance provided by the IST program requirements. Therefore, based on valve performance and IST requirements, the staff has determined that the licensee's proposed TS SR changes are acceptable.

Based on the above evaluation, the staff agrees that the licensee has demonstrated the adequacy of the proposed changes for the Calvert Cliffs NPP, Units 1 and 2, TS. The proposed changes to the surveillance test interval to demonstrate proper opening capability of the subject containment sump isolation valves (upon a RAS) is in accordance with Section XI of the ASME Code (1983 Edition). Therefore, the proposed TS changes to TS SR 4.5.2.b.1 and SR 4.6.2.1.a.1 for Calvert Cliffs are acceptable.

3.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Maryland State official was notified of the proposed issuance of the amendments. The State official had no comments.

4.0 ENVIRONMENTAL CONSIDERATION

The amendments change a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes surveillance requirements. The NRC staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration, and there has been no public comment on such finding (61 FR 52963). Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

5.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributors: J. Mazumdar
M. Khanna

Date: January 23, 1997