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JOSEPH A. TIERNAN
VICE PRESIDENT
NUCLEAR ENERGY

January 14, 1988

U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

ATTENTION: Document Control Desk

SUBJECT: Calvert Cliffs Nuclear Power Plant
Units Nos. 1 & 2; Docket Nos. 50-317 & 50-318 Inservice Inspection
Program Request For Relief and Inservice Inspection Plans

ENCLOSURES: (1) Relief Requests for Calvert Cliffs Nuclear Power Plant, Units 1 and 2

(2) Program Plan for the Second Inservice Inspection Interval for Calvert Cliffs Nuclear Power Plant, Units 1 and 2

Gentlemen:

This letter forwards several related submittals required by 10 CFR 50 and ASME Code Section XI. These submittals are applicable to the second Inservice Inspection interval of Calvert Cliffs Units 1 and 2. This submittal does not address the Inservice Testing Program for pumps and valves; submittals pertaining to pump and valve testing have been filed separately.

As provided by 10 CFR 50.55 a(g)(6)(i), we are requesting relief from ASME Code Section XI requirements that have been determined to be impractical. In accordance with 10 CFR 50.55 a(g)(5)(iii) and (iv) and NRC Staff Guidance letter dated November 24, 1976, the details for each exemption request are provided in Enclosure 1. These requests are based on experience gained in the course of inspections to date. Additional requests will be submitted as needed.

In addition to the above relief requests, two specific requests which apply to portions of the second inspection interval were previously filed and approved. These were non-generic, one time requests which identified specific requirements which were impractical. By letter dated March 26, 1987, from Mr. A. C. Thadani to Mr. J. A. Tiernan, relief was granted concerning the requirement to show that primary stress limits were satisfied for a Calvert Ciffs Unit 1 main steam pipe area with reduced wall thickness. By letter dated October 31, 1987, from R. A. Capra to J. A. Tiernan, relief was granted from the requirement to perform hydrostatic

A047 w/check $150
1/1 # 1914614

testing of an unisolatable portion of replaced steam generator blowdown piping. These two relief provisions are retained for the applicable periods.

During the second inservice Inspection interval we intend to implement certain NRC approved Code Cases. The proposed change to Footnote 6 of 10 CFR 50.55(a) (ref: FR Doc. 87-14599 Filed 6-25-87) would incorporate NRC Regulatory Guide 1.147, "Inservice Inspection Code Case Acceptability - ASME Section XI Division 1," as a reference which identifies the Code Cases acceptable to the NRC for implementation in the ISI program of light-water-cooled nuclear power plants. According to the supplementary information accompanying the proposed rule making, Code Cases listed in Regulatory Guide 1.147 may be used without specific requests to the NRC.

Once the proposed rule is issued in final form, as is expected by March 31, 1988, we intend to adopt the following Code Cases which are approved in Regulatory Guide 1.147.

Code Case N-307-1	"Revised Ultrasonic Examination Volume for Class 1 Bolting, Table IWB-2500-1, Examination Category B-G-1, When the Examinations are Conducted From the Center-Drilled Hole"
Code Case N-408	"Alternative Rules for Examination of Class 2 Piping"
Code Case N-416	"Alternative Rules for Hydrostatic Testing of Repair or Replacement of Class 2 Piping"
Code Case N-424	"Qualification of Visual Examination Personnel"

A copy of each is included in Table 6 of Enclosure 2 for your reference.

As required by ASME Code Section XI in the 1983 Edition with Addenda through Summer 1983 subparagraph IWA-1400(c), Enclosure 2, <u>Program Plan for the Second Inservice Inspection Interval for Calvert Cliffs Nuclear Power Plant, Units 1 and 2</u> is submitted herewith. This plan outlines the minimum criteria which will be applied to Calvert Cliffs Units 1 and 2 Inservice Inspection Programs throughout the second interval. This plan does not address the Inservice Testing Program for pumps and valves; that program has been filed separately.

The Program Plan is responsive to ISI examination requirements invoked by 10 CFR 50.55a and is in keeping with our commitment to adhere to ASME Code rules. This Plan reflects our minimum obligations. We fully expect that these minimum requirements will be exceeded as has occured throughout our first inspection interval. Long Term ISI Examination Schedules for each of the Calvert Cliffs Units will be prepared in accordance with the ISI Program Plan. Following completion and review, the Long Term Examination Schedule summary will be filed under separate cover.

Should you, in the course of your review, have any questions regarding this submittal, please do not hesitate to contact us.

We have determined that this request constitutes an amendment for Calvert Cliffs Unit Nos. 1 and 2, pursuant to 10 CFR 170.21. Accordingly, Baltimore Gas & Electric Check No. 1914614 in the amount of $150.00 is enclosed.

Very truly yours,

JATiernan

JAT/LMD/jaf

Enclosures

cc: D. A. Brune, Esquire (w/o enclosures)
J. E. Silberg, Esquire (w/o enclosures)
S. A. McNeil, NRC
T. Foley/D.C. Trimble, NRC (w/o enclosures)
W. T. Russell, NRC
R. A. Capra, NRC (w/o enclosures)

ENCLOSURE ONE

RELIEF REQUESTS FOR CALVERT CLIFFS

NUCLEAR POWER PLANT,

UNITS 1 AND 2

ENCLOSURE ONE

Table of Contents

SUMMARY OF RELIEF REQUESTS

Relief Request Number	Section XI Reference	Component	ASME Requirement For Which Relief Is Requested	Reason for Relief Request	Proposed Alternate Examination
1	IWB-2500-1 Cat. B-J	42" and 30" Reactor Coolant Pipe Welds in Reactor Vessel Annulus.	Surface Examination.	Difficult access from the outside surface and prohibitive radiation environment.	Examine using UT near outside surface technique from inside surface.
2	IWB-2500-1 Cat. B-L-1, B-L-2	Pump Case Welds and Internals of Reactor Coolant Pumps.	Volumetric of case welds and visual of internals.	Complex pump configuration and cast stainless material.	Hydrostatic test, surface, and visual examinations of outside surface of one pump.
3	IWB-2500-1 Cat. B-O	Welds in CRD Housings.	Surface examination of 10% (three) peripheral CRD housings.	Portions of all CRD housing welds inaccessible due to to closure head configuration.	Surface examination on five CRD housing welds to compensate for inaccessible portions.
4	IWA-5000, IWC-5000	Portions of Class 2 HPSI, Aux HPSI, and LPSI.	Class 2 Hydrostatic Pressure Test every 10 years.	Class 2 portions cannot be isolated from Class 1 due to check valve isolations.	Perform hydrostatic pressure tests to Class 1 hydrostatic pressure requirements.
5	IWA-5200, IWD-5200	Class 3 Portions of Component Cooling Water, Service Water, and Salt Water Cooling.	Hydrostatic Test every 10 years.	These systems not practically isolated.	System inservice pressure testing annually in lieu of hydrostatic test.

RELIEF REQUEST NUMBER ONE:

I. COMPONENT FOR WHICH RELIEF IS REQUESTED:

A. Name and Number

Calvert Cliffs' Reactor Coolant System 42" and 30" piping welds located in the reactor vessel cavity annulus. The following welds are affected:

UNIT 1

Line	Weld	Type
42-RC-11	1	Nozzle-to-Transition Piece
42-RC-11	2	Transition Piece-to-Pipe
42-RC-11	2 LD-1	Longitudinal Seam
42-RC-11	2 LD-2	Longitudinal Seam
42-RC-12	1	Nozzle-to-Transition Piece
42-RC-12	2	Transition Piece-to-Pipe
42-RC-12	2 LD-1	Longitudinal Seam
42-RC-12	2 LD-2	Longitudinal Seam
30-RC-11A	12 LU-1	Longitudinal Seam
	12 LU-2	Longitudinal Seam
	12	Elbow-to-Transition Piece
	13	Transition Piece-to-Nozzle
30-RC-11B	12 LU-1	Longitudinal Seam
	12 LU-2	Longitudinal Seam
	12	Elbow-to-Transition Piece
	13	Transition Piece-to-Nozzle
30-RC-12A	12 LU-1	Longitudinal Seam
	12 LU-2	Longitudinal Seam
	12	Elbow-to-Transition Piece
	13	Transition Piece-to-Nozzle
30-RC-12B	12 LU-1	Longitudinal Seam
	12 LU-2	Longitudinal Seam
	12	Elbow-to-Transition Piece
	13	Transition Piece-to-Nozzle

UNIT 2

Line	Weld	Type
42-RC-21	1	Nozzle-to-Transition Piece
42-RC-21	2	Transition Piece-to-Pipe
42-RC-21	2 LD-1	Longitudinal Seam
42-RC-21	2 LD-2	Longitudinal Seam
42-RC-22	1	Nozzle-to-Transition Piece
42-RC-22	2	Transition Piece-to-Pipe
42-RC-22	2 LD-1	Longitudinal Seam
42-RC-22	2 LD-2	Longitudinal Seam
30-RC-21A	12 LU-1	Longitudinal Seam
	12 LU-2	Longitudinal Seam
	12	Elbow-to-Transition Piece
	13	Transition Piece-to-Nozzle
30-RC-21B	12 LU-1	Longitudinal Seam
	12 LU-2	Longitudinal Seam
	12	Elbow-to-Transition Piece
	13	Transition Piece-to-Nozzle
30-RC-22A	12 LU-1	Longitudinal Seam
	12 LU-2	Longitudinal Seam
	12	Elbow-to-Transition Piece
	13	Transition Piece-to-Nozzle
30-RC-22B	12 LU 1	Longitudinal Seam
	12 LU-2	Longitudinal Seam
	12	Elbow-to-Transition Piece
	13	Transition Piece-to-Nozzle

B. Function

The reactor coolant system piping transfers reactor coolant from the reactor vessel outlets to the steam generator (S/G) inlets (42") and from the S/G outlets to the reactor coolant pumps (30") and from the coolant pumps to the reactor vessel inlet (30").

C. Code Class

Current ISI Class: Class 1

Original Design: B31.7, Class 1 (1969)

II. CODE REQUIREMENT FROM WHICH RELIEF IS REQUESTED:

ASME Code Section XI, 1983 Edition with Addenda through Summer 1983, Category B-J, Item B9.11 and B9.12 requires that these welds receive both a surface and volumetric examination. The surface examination is impractical to perform.

III. BASIS FOR RELIEF:

In order to perform the required surface examination, the examiners must gain access to the reactor vessel annulus area housing these reactor coolant piping welds. This area is very difficult to enter, provides marginal room for mobility, and has high radiation.

IV. ALTERNATIVE EXAMINATIONS:

As an alternate to performing a surface examination, a 45-degree shear-wave UT examination of the outside surface will be performed by utilizing mechanized ultrasonic techniques from the inside of the pipe. This method of examination has been qualified for the detection of unacceptable outside surface flaws through the use of a mock-up with induced cracks ranging from 1/2 the maximum to the maximum allowable Code flaw depth. The use of this examination method will cause a significant reduction in radiation exposure.

RELIEF REQUEST NUMBER TWO:

I. COMPONENT FOR WHICH RELIEF IS REQUESTED:

A. Name and Number

Calvert Cliffs Unit 1 Reactor Coolant Pumps (RCP's) #11A, #11B, #12A, and #12B, and Calvert Cliffs Unit 2 Reactor Coolant Pumps #21A, #21B, #22A, and #22B. All pumps are identical in design and function and are Byron-Jackson Type DFSS Reactor Coolant Pumps, Serial Numbers 681N-0437 through 44, Size 35 x 35 x 43.

B. Function

Each Calvert Cliffs unit has four reactor coolant pumps which are welded to the 30" recirculation loop. These pumps function during normal reactor operation to provide forced recirculation through the core.

C. Code Class

Current ISI Class: Class I

Original Design: ASME Code Section III, 1965 Edition with Addenda through Winter 1967, Class 1.

II. CODE REQUIREMENT FROM WHICH RELIEF IS REQUESTED:

ASME Code Section XI, 1983 Edition with Addenda through Summer 1983, Examination Categories B-L-1 and B-L-2, requires volumetric examination of casing welds and visual examination of internal pressure boundary surfaces of one pump casing in each of the pump groups performing similar system functions during each inspection interval. These examinations are impractical for the Reactor Coolant Pumps at Calvert Cliffs Units 1 and 2.

III. BASIS FOR RELIEF:

A. The design configuration of each pump, as shown in Attachment (1), corresponds to a Type E pump illustrated in Figure NB-3442.5-1 (1977 Edition, ASME Code Section III). No practical technique exists to perform Inservice Inspection Radiographic Examination (RT) or Ultrasonic Examination (UT) of this type pump.

B. The presence of the diffuser vanes precludes conventional RT. The vanes and radiation field prevent placement of the RT film cassettes inside the pump. Placement of the film on the outside of the pump is feasible, but there is no radiographic source suitable for placement inside the pump. Standard gamma sources are of limited use for penetrating the thick casting, and background radiation from the inside surface of the pump impairs film sensitivity. The Miniature Linear Accelerator (MINAC) was considered, but the Type E pump design precludes positioning of the accelerator inside the pump. Double wall radiography utilizing the MINAC may be useful for a portion of the casing welds. This technique has not been qualified and may not be adequate.

C. The coarse grain structure inherent in thick stainless steel castings precludes the use of conventional UT. Developments in ultrasonic techniques to date have not provided a method to examine thick stainless steel castings; ultrasonic examination would be preferred over the difficulties and dangers of thick wall radiography.

D. The pump casing is fabricated from cast stainless steel (ASTM A351, Grade CF8M). The material is essentially a cast-type 316 stainless steel. This material is widely used in the nuclear industry and no industry failures of this type material in reactor coolant pumps have been noted. The presence of delta ferrite (typically 15% or more) imparts increased resistance to intergranular stress corrosion cracking (IGSCC). The delta ferrite also improves resistance to pitting corrosion.

E. Report Number ERP-06-102, Revision 0, August 1983, prepared for the Electric Power Research Institute by NUTECH Engineers, Incorporated, concludes that:

1. Based on the generic pump casing analysis, there is justification for the extension of the pump-casing examination up to 15 years.

2. Plant-unique analysis probably will show greater margins of safety.

3. The fracture mechanics analysis shows that large, final flaw sizes can be tolerated in the pump casing before fracture is predicted

4. The recent 10-year Inservice Inspection of several pump casings (Type F) indicates no detectable flaw growth from base line inspections, which corroborates the above analytical conclusion.

F. Pump disassembly for a limited visual examination of the interior pressure boundary surfaces of a reactor coolant pump is of little merit. Over 700 manhours and over 20 person/rem is estimated for disassembly, visual inspection, and reassembly of one reactor coolant pump. Additional manhours and person-rem will be expended by Radiation Protection personnel providing direct coverage of this work. Most of the work would be performed under full face mask conditions. The radiation exposure cannot be justified considering the limitations of the internal visual examination.

IV. <u>ALTERNATIVE EXAMINATIONS</u>:

A. One pump interior will be inspected to the extent practical (in recognition of the vanes therein) only if any pump be disassembled for any other reason.

B. The reactor coolant pumps shall be hydrostatically tested per the requirements of ASME Code Section XI.

C. A surface examination of one RCP in each unit shall be performed once each interval on the exterior casing weld surface areas by the liquid penetrant method.

D. A visual examination of one RCP in each unit shall be performed once each interval on the exterior pump case surfaces.

This exemption was approved for use during our initial Inservice Inspection interval, copies of the approval letters, dated September 18, 1985, from H. R. Denton to Mr. A. E. Lundvall and November 6, 1985, from Mr. E. J. Butcher to Mr. A. E. Lundvall are included in Attachment (2).

RELIEF REQUEST NUMBER THREE:

I. COMPONENT FOR WHICH RELIEF IS REQUESTED:

A. Name and Number

Peripheral Control Rod Housings (28)

B. Function

The reactor vessel head contains 85 control rod housings which serve as an extension of the pressure boundary in which control rod extension shafts can be raised and lowered. Each housing extends through a penetration in the reactor vessel head and is welded on the head inside surface with a 'J' groove type weld. The housing contains only one full penetration circumferential butt weld which is shop fabricated and examined prior to assembly into the reactor vessel head. When installed, peripheral housing welds extend partially into the head itself.

C. Code Class

Current ISI Class: Class 1

Original Design: ASME Code Section III, 1965 Edition with Addenda through Winter 1967, Class 1.

II. CODE REQUIREMENT FROM WHICH RELIEF IS REQUESTED:

ASME Code Section XI, 1983 Edition with Addenda through Summer 1983, Examination Table IWB-2500-1, Examination Category B-O, requires a volumetric or surface examination to include 100% of the welds in 10% of the peripheral Control Rod Drive Housings during each inspection interval.

Relief is requested from the Code requirement to examine 100% of 10% of the peripheral Control Rod Drive (CRD) Housing welds.

III. BASIS FOR RELIEF:

A 100% examination of these welds is impractical due to design configuration, accessibility limitations and material of construction. Reference Attachment (3) CE Drawing #233-415.

Ultrasonic examination will not provide meaningful results due to the geometric configuration of the joint and the material properties (Inconel-to-Stainless Steel welds). Radiographic examination cannot be performed due to the design configuration and accessibility. Therefore, a surface examination has been elected as the method of examination.

Three of the 28 peripheral CRD Housing welds should be examined to meet the Code. However, only a portion of each weld is accessible for examination since the welds are partially obstructed because they extend into the Closure Head itself.

IV. ALTERNATIVE EXAMINATIONS:

In order to meet the intent of the ASME requirements, portions of additional CRD Housing welds will be examined to satisfy the equivalent of 100% of three welds. This will be done by examining 75% of three welds and 50% of two welds.

This exemption was approved for use during our first Inservice Inspection interval. A copy of the approval letter, dated May 11, 1987, from Mr. R. A. Capra to Mr. J. A. Tiernan is included in Attachment (4).

RELIEF REQUEST NUMBER FOUR:

I. Component For Which Relief is Requested:

A. Name and Number

Calvert Cliffs piping associated with the High Pressure Safety Injection (HPSI), Auxiliary HPSI, and Low Pressure Safety Injection (LPSI) Loop Isolation MOV's to the Reactor Coolant System, as shown on Attachment (5). The following lines are affected:

UNIT 1

FROM	TO	LINE NOS.
1-SI-118	1-SI-615-MOV 1-SI-616-MOV 1-SI-617-MOV	6"CC-13-1001 2"CC-13-1019 3"CC-13-1014 2"CC-13-1005 2"CC-6-1002
1-SI-128	1-SI-625-MOV 1-SI-626-MOV 1-SI-627-MOV	6"CC-13-1002 2"CC-13-1018 3"CC-13-1015 2"CC-13-1006 2"CC-6-1004
1-SI-138	1-SI-635-MOV 1-SI-636-MOV 1-SI-637-MOV	6"CC-13-1003 2"CC-13-1016 3"CC-13-1021 2"CC-13-1007 2"CC-6-1005
1-SI-148	1-SI-645-MOV 1-SI-646-MOV 1-SI-647-MOV	6"CC-13-1004 2"CC-13-1017 3"CC-13-1020 2"CC-13-1008 2"CC-6-1006

UNIT 2

FROM	TO	LINE NOS.
2-SI-118	2-SI-615-MOV	6"CC-13-2001
	2-SI-616-MOV	2"CC-13-2019
	2-SI-617-MOV	3"CC-13-2014
		2"CC-13-2005
		2"CC-6-2002
2-SI-128	2-SI-625-MOV	6"CC-13-2002
	2-SI-626-MOV	2"CC-13-2018
	2-SI-627-MOV	3"CC-13-2015
		2"CC-13-2006
		2"CC-6-2004
2-SI-138	2-SI-635-MOV	6"CC-13-2003
	2-SI-636-MOV	2"CC-13-2016
	2-SI-637-MOV	3"CC-13-2021
		2"CC-13-2007
		2"CC-6-2005
2-SI-148	2-SI-645-MOV	6"CC-13-2004
	2-SI-646-MOV	2"CC-13-2017
	2-SI-647-MOV	3"CC-13-2020
		2"CC-13-2008
		2"CC-6-2006

B. Function

The Safety Injection systems supply emergency core cooling, in the unlikely event of a loss-of-coolant incident, to limit fuel rod damage and fission product release, and ensure adequate shutdown margin regardless of temperature. The systems also supply continuous long term post-incident cooling of the core by recirculation of borated water from the containment sump.

C. Code Class

Current ISI Class: Class 2

Original Design: B31.7, Class 2 (1969)

II. CODE REQUIREMENT FROM WHICH RELIEF IS REQUESTED:

ASME Code Section XI, 1983 Edition with Addenda through Summer 1983, requires hydrostatic testing of all Class 2 piping and components as set forth in Articles IWA-5000 and IWC-5000. The test requirement for Class 2 piping and components is 1.25 times system pressure P_{sv}, for systems with Design Temperatures above 200^{o} F. The system pressure P_{sv} shall be the lowest pressure setting among the number of safety or relief valves provided for overpressure protection within the boundary of the system to be tested. For systems (or portions of systems) not provided with safety or relief valves, the system design pressure P_d shall be substituted for P_{sv}.

III. BASIS FOR RELIEF:

A. The listed portion of Class 2 piping from HPSI, Aux. HPSI, and LPSI Loop Isolation MOVs to the RCS is isolated from the RCS by two check valves. The higher system pressure test requirements of these portions of Class 2 systems cannot be accomplished because of the lack of positive isolation from the Class 1 system in the test direction.

B. In addition, the portions of piping listed below cannot by hydrostatically tested due to the inability to align the charging pumps to pressurize this piping and the operability requirements of these systems when the RCS is pressurized.

UNIT 1

FROM	TO	LINE NOS.
1-SI-114	1-SI-615-MOV	6"CC-13-1001
1-SI-124	1-SI-625-MOV	6"CC-13-1002
1-SI-134	1-SI-635-MOV	6"CC-13-1003
1-SI-144	1-SI-645-MOV	6"CC-13-1004

UNIT 2

FROM	TO	LINE NOS.
2-SI-114	2-SI-615-MOV	6"CC-13-2001
2-SI-124	2-SI-625-MOV	6"CC-13-2002
2-SI-134	2-SI-635-MOV	6"CC-13-2003
2-SI-144	2-SI-645-MOV	6"CC-13-2004

IV. ALTERNATIVE EXAMINATIONS:

A. Excluding the piping listed in III.B, the remaining piping will be hydrostatically pressure tested to the requirements of IWB-5000 for Class 1 piping. This piping can be pressurized via alignment of the charging system to the Aux. HPSI header.

B. For the portions of piping which cannot be hydrostatically pressure tested, as listed in III.B, a leakage test will be performed each refueling cycle, in accordance with Technical Specification 6.14. In this test the piping will be pressurized to LPSI pump discharge pressure and a VT-2 examination for leakage will be conducted. In addition, welds will continue to be selected and examined per Section XI, Article IWC-2000.

This exemption was approved for use during our initial Inservice Inspection interval. A copy of the approval letter, dated November 14, 1985, from Mr. H. R. Denton to Mr. A. E. Lundvall is included in Attachment (6).

RELIEF REQUEST NUMBER FIVE:

I. COMPONENT FOR WHICH RELIEF IS REQUESTED:

A. Name and Number

Calvert Cliffs' piping associated with the Component Cooling, Service Water, and Salt Water Cooling Systems and currently classified as ASME XI Class 3.

B. Function

The Component Cooling and Service Water Systems remove heat from various auxiliary systems. Items cooled by Component Cooling Water include the letdown and shutdown cooling heat exchangers; reactor and steam generator supports; RCP, HPSI and LPSI seals and coolers; and containment penetrations. The Service Water System removes heat from turbine plant components, blowdown recovery heat exchangers, containment cooling units, spent fuel pool cooling heat exchangers, and emergency diesel generator heat exchangers. The Salt Water Cooling System provides the cooling medium for the component cooling and service water heat exchangers.

C. Code Class

Current ISI Class: Class 3

Original Design: B31.1 (1967)

II. CODE REQUIREMENT FROM WHICH RELIEF IS REQUESTED:

ASME Code Section XI, 1983 Edition with Addenda through Summer 1983, requires hydrostatic pressure testing of all Class 3 systems in accordance with Subarticles IWA-5200 and IWD-5200. Paragraph IWD-5223(a) specifies that the hydrostatic test pressure shall be at least 1.10 times the system pressure, for systems with design temperatures of $200^{o}F$ or less.

III. BASIS FOR RELIEF:

Hydrostatic pressure on isolated portions cannot be achieved because on the main headers of these systems, butterfly valves are installed, and a sufficient seal cannot be obtained.

IV. ALTERNATIVE EXAMINATIONS:

A system inservice pressure test will be performed on an annual basis for portions of these systems outside of containment and on a refueling outage basis for those portions located inside containment.

This exemption was approved for use during our initial Inservice Inspection interval. Copies of the approval letters, dated January 24, 1983, from Mr. R. A. Clark to Mr. A. E. Lundvall and December 13, 1982, from Mr. R. A. Clark to Mr. A. E. Lundvall, are included in Attachment (7).

ATTACHMENT (1)

REACTOR COOLANT PUMP

Figure NB-3442.5-1

1977 Edition, ASME Code Section III

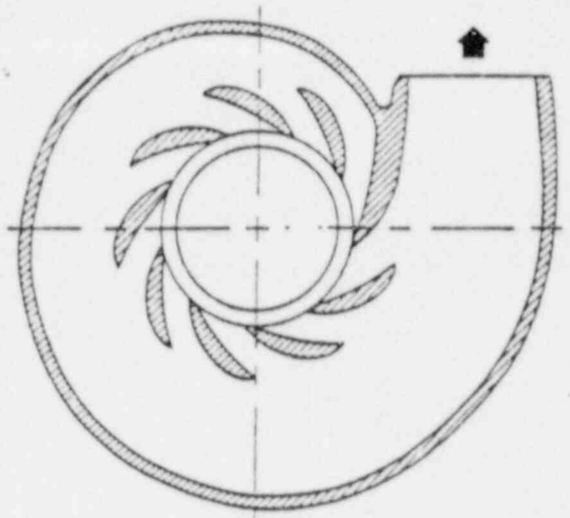

FIG. NB-3442.5-1 TYPE E PUMP

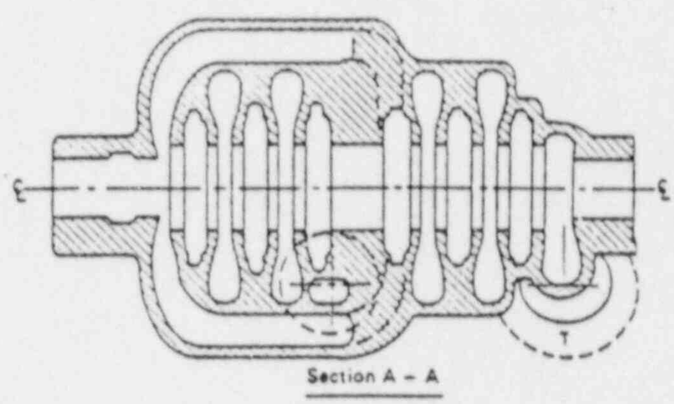

FIG. NB-3442.7(a)-1
AXIALLY SPLIT CASING VOLUTE PUMP,
TYPE G

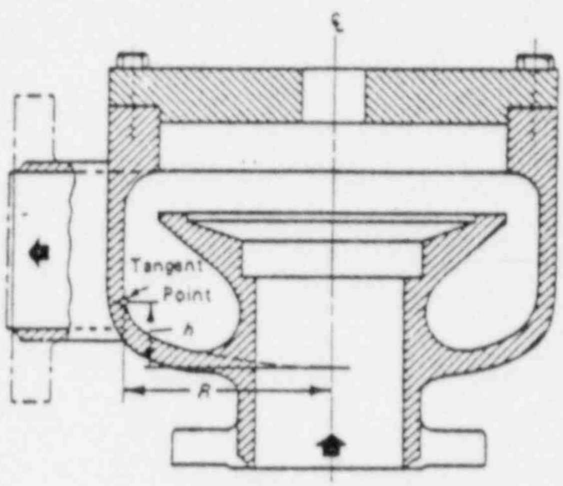

FIG. NB-3442.6(a)-1 TYPE F PUMP

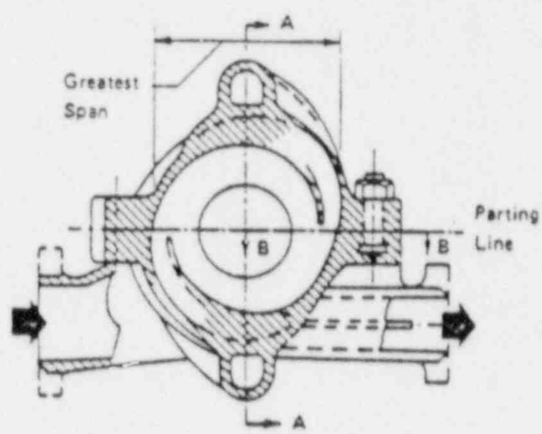

FIG. NB-3442.7(a)-2
AXIALLY SPLIT CASING VOLUTE PUMP,
TYPE G

NB-3442.6 Design of Type F Pumps

(a) Type F pumps are those having radially split, axisymmetric casings with either tangential or radial outlets as illustrated in Fig. NB-3442.6(a)-1. The basic configuration of a Type F pump casing is a shell with a dished head attached at one end and a bolting flange at the other. The inlet enters through the dished head and the outlet may be either tangent to the side or normal to the center line of the casing. Variations of these inlet and outlet locations are permitted.

(b) The design of Type F pumps shall be in accordance with this Subarticle.

NB-3442.7 Design of Type G Pumps[13]

(a) Type G pumps are those having axially split, single, or double volute casings, as illustrated in Figs. NB-3442.7(a)-1 and NB-3442.7(a)-2.

(b) Manufacturers shall review examination requirements for compatibility.

(c) An acceptable method of calculating the stress in highly stressed sections of the pump case, such as

[13] It is recognized that other acceptable procedures may exist which also constitute adequate design methods and it is not the intention to prohibit these alternative methods providing they can be shown to have been satisfactory by actual service experience.

ATTACHMENT (2)

LETTERS FROM THE NRC

TO

BALTIMORE GAS & ELECTRIC COMPANY

September 18, 1985

November 6, 1985

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

September 18, 1985

Docket Nos. 50-317
and 50-318

Mr. A. E. Lundvall, Jr.
Vice President - Supply
Baltimore Gas & Electric Company
P. O. Box 1475
Baltimore, Maryland 21203

Dear Mr. Lundvall:

The NRC has provided relief from a requirement of the ASME Boiler and Pressure Vessel Code, Section XI, which BG&E has determined to be impractical in accordance with your application dated February 4, 1985 as supplemented by your letters dated May 31, 1985 and June 24, 1985.

The code relief, granted in accordance with 10 CFR Part 50, Section 50.55a(g)(6)(i), relates to the requirement for 100% volumetric examination of reactor coolant pump casing welds. You have proposed an acceptable, alternate form of examination consisting of: (1) pump interior examination to the extent practical in the event that a pump is disassembled, (2) hydrostatic testing, and (3) surface examination of one reactor coolant pump's casing welds, per unit, and a 100% visual examination of this pump's exterior.

A copy of our Safety Evaluation is enclosed.

Sincerely,

for Harold R. Denton, Director
Office of Nuclear Reactor Regulation

Enclosure:
Safety Evaluation

cc w/enclosure:
See next page

BCR

TRAINING & TECHNICAL SERVICES
DATE RECEIVED: 9-26
AGS-T&TS ✓ LOGGED ☑
PE-TS RETURN TO CLA ☑
AGS-TRNG
PE-OL&S RESPONSE REQ'D
PE-FCM
PE-IFM FOLLOW-UP
FILE: 60.21.02

~~8510040408~~ 2pp

Mr. A. E. Lundvall, Jr.
Baltimore Gas & Electric Company

Calvert Cliffs Nuclear Power Plant

cc:
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Calvert County Board of
Commissioners
Prince Frederick, Maryland 20768

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Plant Superintendent
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Energy Administration, Power Plant
Siting Program
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Annapolis, Maryland 21204

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION RELATING TO REQUEST FOR RELIEF FROM RADIOGRAPHIC AND VISUAL INSPECTION OF REACTOR COOLANT PUMP CASINGS BALTIMORE GAS AND ELECTRIC COMPANY CALVERT CLIFFS NUCLEAR POWER PLANT, UNIT NOS. 1 AND 2 DOCKET NOS. 50-317 AND 50-318

Background

Section XI of the ASME Code requires examinations of reactor coolant pumps during each 10-year interval of plant operation. By letter dated February 4, 1985, Baltimore Gas and Electric Company submitted requests for relief from the requirements for Calvert Cliffs Units 1 and 2 and provided information in support of the requests. Pursuant to 10 CFR 50.55a(g)(6)(i), this information, together with supplemental information in BG&E's letters dated May 31, 1985 and June 24, 1985, was evaluated to determine if the requirement is impractical to perform on the component and if the necessary findings can be made to grant relief as requested.

Relief Request

ASME Code Section XI 1974 Edition with Addenda through Summer 1975 examination categories B-L-1 and B-L-2 require 100% volumetric examination of casing welds and visual examination of the internal pressure boundary surfaces of one pump casing in each of the pump groups performing similar system functions each inspection interval. The licensee has found this requirement to be impractical and has requested relief. Alternative examinations have been proposed.

Code Class

Current ISI Class: Class 1.

8510040412 upp

Function

Each Calvert Cliffs unit has four reactor coolant pumps which are welded to the 30" recirculation loop. These pumps function during normal reactor operation to provide forced recirculation through the core. All pumps are identical in design and function and are Byron-Jackson Type DFSS.

Licensee Basis for Relief Request

A. The design configuration of the pump corresponds to a Type E pump illustrated in Figure NB-3442.5-1 (1977 Edition, ASME Code Section III). No practical technique currently exists to perform Inservice Inspection Radiographic Examination (RT) or Ultrasonic Examination (UT) of this pump type.

B. The presence of the diffuser vanes precludes conventional RT. The vanes prevent placement of the RT film cassettes inside the pump (as does the radiation field in terms of radiographic film and personnel radiation exposure). Placement of the film on the outside of the pump is feasible, but there is no radiographic source suitable for placement inside the pump. Standard isotopic radiation sources are too weak to penetrate the thick casting and background radiation from the inside surface of the pump would diminish sensitivity. Special strong isotopic sources would be impractical to handle and position inside the pump due to personnel radiological exposure from the radiographic source itself. The recently developed Miniature Linear Accelerator (MINAC) was considered, but the Type E pump design precludes positioning of the accelerator inside the pump. Double wall radiography utilizing the MINAC has also been considered with some hope of attaining meaningful radiographs of a portion of the casing welds. This technique has not been qualified to date and appears to be some time off, if at all possible.

C. The coarse grain structure inherent in thick stainless steel castings precludes the use of conventional UT. Future developments in ultrasonic techniques may provide a method to examine thick stainless steel casting and, if developed, this would be preferred over the difficulties and dangers of thick wall radiography. We are hopeful that the Ultrasonic Data Recording and Processing System (UDRPS) technology may provide some breakthrough in stainless steel casting UT.

D. The pump casing is fabricated from cast stainless steel (ASTM A351, Grade CF8M). The material is essentially a cast-type 316 stainless steel. This material is widely used in the nuclear industry and no industry failures of this type material in reactor coolant pumps have been noted. The presence of delta ferrite (typically 15% or more) imparts increased resistance to intergranular stress corrosion cracking (IGSCC). The delta ferrite also improves resistance to pitting corrosion.

E. Report Number ERP-06-102, Revision 0, August 1983, prepared for the Electric Power Research Institute by NUTECH Engineers, Incorporated, concludes that:

1. Based on the generic pump casing analysis, there is justification for the extension of the pump-casing examination up to 15 years.

2. Plant-unique analysis will show greater margins of safety.

3. The tearing modulus analysis shows that large, final flaw sizes can be tolerated in the pump casing before fracture is predicted.

4. The recent 10-year Inservice Inspection of several pump casings (Type F) indicates no detectable flaw growth from base line inspections, which corroborates the above analytical conclusion.

F. Pump disassembly for the sole purpose of conducting a very limited visual examination of the interior pressure boundary surfaces of a reactor coolant pump is fruitless, particularly in light of the manhours and radiation exposure that would be expended. The pump has an as-cast surface texture for the most part.

G. Over 1,000 manhours and over 50 person rem are estimated to disassemble, visually inspect, and reassemble one reactor coolant pump. The manhour estimate is based only on on-site outage work performed by Maintenance, Operations, and Nondestructive Testing personnel. The estimate does not include engineering time or pre-outage job planning. Additionally, manhours and person rem will be expended by Radiation Protection personnel providing direct coverage. The time required to perform the disassembly and inspection would be approximately 2 weeks of critical path time. Most of the work would be performed under full face mask conditions.

<u>Alternate Examinations Proposed by Licensee</u>

A. The pump interior will be inspected to the extent practical (in recognition of the vanes therein) should the pump be disassembled for any other reason.

B. The reactor coolant pumps shall be hydrostatically tested per the requirements of ASME Code Section XI.

C. A surface examination of one RCP in each unit shall be performed on the exterior casing weld surface areas by the liquid penetrant method. Also, the pump selected shall receive a 100% visual examination of the exterior pump case surfaces.

The proposed additional examinations will identify flaws that may have propagated or originated at the pump outer surface since preservice examination. Since the Code acceptance standards for allowable surface flaw indication length is significantly less than that allowed for a subsurface flaw, the pump surfaces represent the more critical site for flaw location.

Staff Evaluation and Conclusion

The need for this relief was recognized during the initial Inservice Inspection program development. At that time the NRC Resident Inspector requested that the relief request submittal be delayed in hope that techniques might be developed and qualified by the end of the first 10-year interval. It is now apparent that no such technique applicable to the pumps will be available before the first interval concludes.

During operation, the condition of the pumps is monitored for abnormalities. Each RCP has vibration monitoring instrumentation. The reactor coolant flow is monitored and displayed in the control room. When flow is reduced to 95% of design, the reactor is automatically tripped. The Reactor Coolant System is monitored for impact due to loose parts or foreign objects. In addition to the above, the reactor coolant pump's motor current is monitored. The RCP motors also have high vibration alarms.

Considering the pump design, materials of construction of the pump casing, and the radiation levels associated with performing the required examinations, the staff finds the examinations impractical to perform. In lieu of the volumetric examination of the pump casing weld and visual inspection of the internal surfaces, the licensee has committed to perform a surface examination of the welds. In addition to the surface examination, a visual inspection of the casing exterior surface will be performed and during a the hydrostatic test of the reactor coolant system. In the event that the pump has to be disassembled for operational or maintenance purposes, the required visual inspection of the internal surfaces will be performed.

We conclude that conducting a 100% volumetric examination of pump casing welds is impractical. Moreover, the alternate surface and visual examinations which will be performed on the pump casing will provide adequate assurance of its structural integrity and therefore relief from the volumetric examination of the casing weld and visual inspection of the internal surfaces may be granted.

Therefore, in accordance with 10 CFR 50.55a(g)(6)(i), we find the relief requested may be granted. The relief is authorized by law and will not endanger life or property or the common defense and security and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

Principal Contributor:

B. Turovlin, DE
D. Jaffe, DL

Date: September 18, 1985

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

November 6, 1985

TRAINING & TECHNICAL SERVICES

DATE RECEIVED: 11-14

GS-T&TS ✓ LOGGED
PE-TS QAW RETURN TO CLA
AGS-TRNG
PE-OL&S RESPONSE REQ'D
PE-FCM
PE-IFM FOLLOW-UP
FILE: 60.21.02
BCR
File w/ Exemption Request

Docket Nos. 50-317
and 50-318

Mr. A. E. Lundvall, Jr.
Vice President - Supply
Baltimore Gas & Electric Company
P. O. Box 1475
Baltimore, Maryland 21203

Dear Mr. Lundvall:

Your letter dated October 15, 1985 states that the reactor coolant pumps will be examined in accordance with ASME Code Section XI 1974 edition with Addenda through 1975, Article IWA-5240, during the hydrostatic test. This inspection, together with the visual inspection of the pump casing of one pump per unit (in accordance with IWA-2210) is herein interpreted as sufficient to meet the "visual" inspection requirements for the reactor coolant pump casings as contained in our safety evaluation dated September 18, 1985 concerning relief from certain ASME Boiler and Pressure Vessel Code Requirements

Sincerely,

Edward J. Butcher

Edward J. Butcher, Acting Chief
Operating Reactors Branch No. 3
Division of Licensing

cc: See next page

8511190435 2pp

Mr. A. E. Lundvall, Jr.
Baltimore Gas & Electric Company

Calvert Cliffs Nuclear Power Plant

cc:
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Energy Administration, Power Plant
Siting Program
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Annapolis, Maryland 21204

ATTACHMENT (3)

CLOSURE HEAD ASSEMBLY

COMBUSTION ENGINEERING DRAWING #233-415

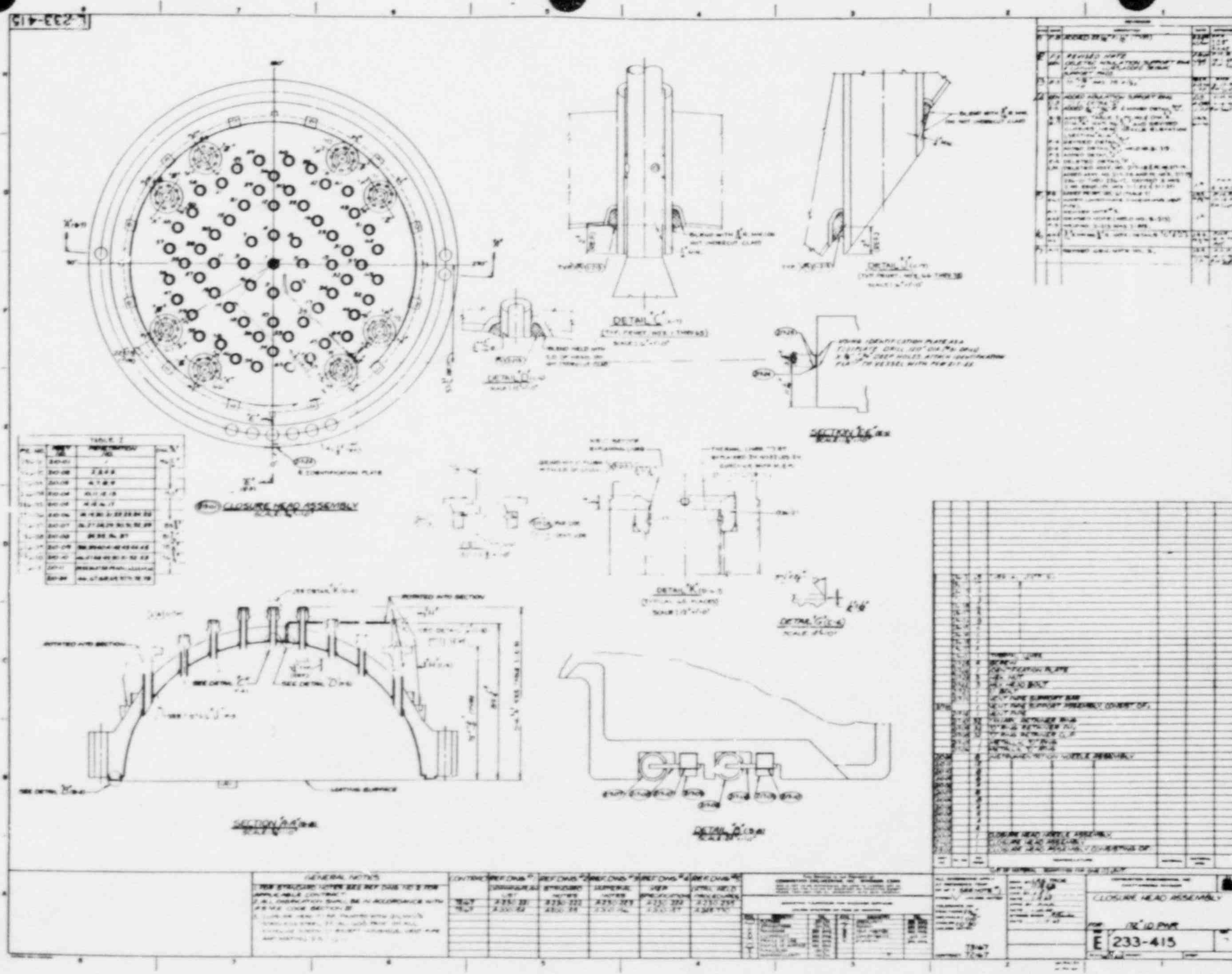

Fig. 8 Closure Head Assembly

FEB 21 1984

ATTACHMENT (4)

LETTER FROM THE NRC

TO

BALTIMORE GAS & ELECTRIC COMPANY

May 11, 1987

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

May 11, 1987

Docket Nos. 50-317
and 50-318

Mr. J. A. Tiernan
Vice President-Nuclear Energy
Baltimore Gas & Electric Company
P. O. Box 1475
Baltimore, MD 21203

Dear Mr. Tiernan:

SUBJECT: RELIEF FROM THE 1974 ASME CODE SECTION XI REQUIREMENTS FOR CLASS 1 AND 2 BOLTING AND CONTROL ROD DRIVE HOUSINGS

The Commission staff has completed their review of your request for ASME Code update and relief as provided in your submittal dated October 2, 1986. This submittal requested that the Section XI requirements of the ASME Code be updated from the 1974 Edition to the 1977 Edition or later approved editions for Class 1 and 2 bolting and for control rod drive housings. These inservice inspections were performed based upon the 1977 ASME Code requirements during the Fall 1986 Unit 1 refueling outage.

Your supplemental letter of December 4, 1986, requested Commission approval of an alternative examination method for the control rod drive housings from that described in IWB-2600, Section XI of the 1977 ASME Code as you had determined that these requirements were impractical to perform (as were the 1974 ASME Code requirements) for the control rod drive housings.

The 1977 ASME Code requires that 100% of the welds on 10% of the peripheral control rod drive housings be examined. This submittal stated that 100% of the welds could not be examined as these welds extended into the reactor vessel head itself. Instead, you proposed to perform an equivalent, alternative examination by inspecting 75% of the welds on three control rod drive housings and 50% of the welds on two control rod drive housings.

In accordance with the provisions of 10 CFR 50.55a(g)(4)(iv), the staff has determined that your requests for ASME Code update of the Section XI requirements for Class 1 and 2 bolting and for the control rod drive housings is acceptable and this partial ASME Code update is hereby approved.

In addition, the staff has reviewed the requirements to examine 100% of the welds on three peripheral control rod drive housings and has determined this requirement to be impractical due to the physical configuration of these housings and the reactor vessel head itself. The Commission finds that the alternative examination method proposed in your December 4, 1986 submittal is acceptable contingent upon your performance of 100% weld examinations on the peripheral control rod drive housings at times when this examination is physically feasible (e.g., if the control rod drive housing was physically removed from the reactor vessel head). This contingency shall be applicable to all future 10-year inservice inspection intervals for each unit.

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The Commission hereby grants this relief from the weld examination requirements for the peripheral control rod drive housings pursuant to 10 CFR 50.55a(g)(6)(i) and finds that this relief is authorized by law and will not endanger life or property or the common defense and security and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

Our Safety Evaluation is enclosed.

Sincerely,

Robert A. Capra

Robert A. Capra, Acting Director
Project Directorate I-1
Division of Reactor Projects, I/II

Enclosure:
Safety Evaluation

cc w/enclosure:
See next page

Mr. J. A. Tiernan
Baltimore Gas & Electric Company

Calvert Cliffs Nuclear Power Plant

cc:

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
BALTIMORE GAS & ELECTRIC COMPANY
CALVERT CLIFFS NUCLEAR POWER PLANT, UNITS 1 AND 2
DOCKET NOS. 50-317 AND 318
RELIEF FROM INSERVICE INSPECTION REQUIREMENTS OF
SECTION XI OF THE ASME CODE

1.0 INTRODUCTION

The Technical Specifications for the Calvert Cliffs Units 1 and 2 require that inservice examination of ASME Code Class 1, 2 and 3 components shall be performed in accordance with Section XI of the ASME Code as required by 10 CFR 50.55a(g)(4) except where specific written relief has been granted by the Commission. Some plants were designed in conformance to early editions of this Code Section, consequently certain requirements of later editions and addenda of Section XI are impractical to perform because of the plant's design, component geometry, and material of construction. Paragraph 10 CFR 50.55a(g)(6)(i) authorizes the Commission to grant relief from those requirements upon making the necessary findings.

In a letter dated October 2, 1986, as supplemented December 4, 1986, the Baltimore Gas & Electric Company (BG&E), the licensee, identified specific ASME Code requirements that BG&E determined to be impractical to perform at Calvert Cliffs and requested relief from these requirements. The staff has evaluated the licensee's supporting technical justification and finds it to be acceptable.

2.0 EVALUATION OF RELIEF REQUESTS

The licensee requested relief from specific inservice inspection (ISI) requirements and provided supporting technical information. The staff reviewed this information as related to the existing design, geometry and materials of construction of the components.

A. Relief Request No. 1, Examination Categories B-G-1, B-G-2 and C-D, ASME Code Class 1 and 2 Bolting.

Code Requirements: ASME Section XI, 1974 Edition including Addenda through Summer 1975, requires the following:

1. Class 1 Bolting

(a) B-G-1 Volumetric examination is required on pressure-retaining bolting that is 2 inches and larger in diameter.

(b) B-G-2 Visual examination is required for pressure-retaining bolting that is smaller than 2 inches in diameter.

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2. Class 2 Bolting:

C-D Visual and either surface or volumetric examinations are required for pressure-retaining bolting exceeding 1 inch in diameter.

Code Relief Request: The licensee proposed to meet the requirements of the 1977 Edition of Section XI and later editions and addenda of ASME Section XI, in which Examination Categories B-G-1, B-G-2 and C-D are redefined. Category B-G-1 is redefined as pressure-retaining Class 1 bolting, larger than 2 inches in diameter. Category B-G-2 is redefined as pressure-retaining Class 1 bolting, 2 inches and smaller in diameter. Bolting that is exactly 2 inches in diameter is shifted from Category B-G-1 to B-G-2. Similarly, Category C-D is redefined as pressure-retaining Class 2 bolting exceeding 2 inches in diameter. The licensee proposed to adopt the definitions set forth in the later editions and addenda of Section XI Code to define the boundaries for Categories B-G-1, B-G-2 and C-D.

Basis for Relief

Later editions and addenda of the Section XI Code are approved for use, as per paragraph (g) of 10 CFR 50.55a of the Code of Federal Regulations. Paragraph g(4)(iv) allows the adoption of portions of later approved editions and addenda to the Code provided that all related requirements of the respective editions and addenda are met. The licensee feels that the above stated adoptions are in compliance with the stated regulations.

Staff Evaluation

Paragraph 10 CFR 50.55a(g)(4)(iv) states: "Inservice examinations of components, tests of pumps and valves, and system pressure tests, may meet the requirements set forth in subsequent editions and addenda that are incorporated by reference in paragraph (b) of this section, subject to the limitations and modifications listed in paragraph (b) of this section and subject to Commission approval. Portions of editions or addenda may be used provided that all related requirements of the respective editions or addenda are met."

The licensee intends to use provisions from the 1977 and later approved Section XI ASME Code editions and addenda. Even though the extent and method of examinations have been reduced, other licensees with ISI programs based on the later ASME Code documents are following these requirements pursuant to 10 CFR 50.55a(g)(4). The staff has determined that the licensee's proposal conforms to the requirements of the regulation that "all related requirements of the respective editions or addenda are met." Therefore, the staff concludes that the licensee's proposal is acceptable.

B. Relief Request No. 2, Examination Category B-O, Peripheral Control Rod Drive Housings

Code Requirements: Article IWB-2600 of ASME Section XI, 1974 Edition including Addenda through Summer 1975 requires a volumetric examination to include 100% of the welds in 10% of the peripheral control rod drive (CRD) housings during each inspection interval.

Code Relief Request: In the October 2, 1986 submittal, the licensee proposed to meet the requirements of Article IWB-2600 of the 1977 Edition of Section XI and later editions and addenda of the Section XI Code, which require surface or volumetric examination of 100% of the welds in 10% of the peripheral CRD housings. The licensee proposed to perform surface examinations, as per later editions of the code, rather than volumetric examinations.

On December 4, 1986, the licensee modified this relief request after determining that these requirements were impractical due to difficulties experienced in the performance of the surface examinations on the Unit 1 peripheral CRD housings.

There are 28 peripheral CRD housings in the installed configuration. After removal of the reactor vessel (RV) head shroud and insulation, the licensee attempted to inspect 100% of the welds on three peripheral CRD housings and determined that only part of the CRD housing welds could be examined as the welds extend into the RV head itself. An alternative CRD housing surface examination was conducted by inspecting 75% of the welds on three CRD housings and 50% of the welds on two CRD housings.

Basis for Relief

(1) Later editions and addenda of the Section XI Code are approved for use, as per paragraph (g) of 10 CFR 50.55a of the Code of Federal Regulations. Paragraph g(4)(iv) allows the adoption of portions of later approved editions and addenda to the code provided that all related requirements of the respective editions and addenda are met. The licensee feels that the above stated adoptions are in compliance with the stated regulations.

(2) Volumetric examination of these welds is impractical due to design configuration, accessibility and materials of construction as described in CE Drawing No. 233-412, Weld Details, which has been provided to the staff.

(a) Ultrasonic examination will not provide meaningful results due to the geometeric configuration of the joint and material properties (inconel-to-stainless steel welds).

(b) Radiographic examination cannot be performed due to the design configuration and accessibility.

(3) Proposed alternatives to the requirements of Section XI of the ASME Code which are determined to be impractical, may be permitted by 10 CFR 50.55a(g)(6)(i) if the proposed alternatives are determined to be authorized by law and will not endanger life or property or the common defense and security and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

Staff Evaluation

The licensee's letter of October 2, 1986 proposes to use provisions from the 1977 and later approved Section XI ASME Code editions and addenda. The staff has determined that this proposal does conform with the requirements of 10 CFR 50.55a(g)(4)(iv) that "portions of editions or addenda may be used provided that all related requirements of the editions or addenda are met."

In addition, the staff has determined that the requirement to examine 100% of the welds on three peripheral CRD housings is impractical due to the physical constraints of the installed configuration of the housings and the reactor vessel head. The alternative examination method as proposed in the licensee's December 4, 1986 submittal has been determined to be acceptable pursuant to 10 CFR 50.55a(g)(6)(i) and contingent upon the licensee's performance of 100% weld examinations on the peripheral CRD housings in the event this examination is feasible (e.g., if the CRD housing is physically removed from the reactor vessel head). This contingency shall be applicable to all future 10-year inservice inspection intervals for each unit.

3.0 CONCLUSION

The staff has completed the review of the licensee's letters dated October 2, 1986 and December 4, 1986 based on the provisions of 10 CFR 50.55a(g)(6)(i). The staff concludes that the licensee's proposal to update to the 1977 Section XI requirements of the ASME Code for Class 1 and 2 bolting and CRD housings meets the provisions of 10 CFR 50.55a(g)(4)(iv), is acceptable, and therefore, the licensee shall be granted relief to update to the requirements of the 1977 and later editions and addenda of Section XI of the ASME Code for the Class 1 and 2 bolting and the CRD housing examinations. In addition, the staff has determined that the 1977 ASME Code (and 1974 ASME Code, too) requirement to examine 100% of the welds on three peripheral CRD housings is impractical and that this relief shall be granted contingent upon the performance of these 100% CRD housing weld inspections when physically possible. This granting of relief is authorized by law and will not endanger life or property or the common defense and security and is otherwise in the public interest, considering the burden that could result if these ASME Code Section XI requirements for the CRD housing examinations were imposed on the facility. Therefore, in accordance with 10 CFR 50.55a(g)(6)(i), this relief is granted.

Date: May 11, 1987

Principal Contributors:
M. Hum, S. McNeil

ATTACHMENT (5)

CALVERT CLIFFS UNIT 1

SKETCH 1

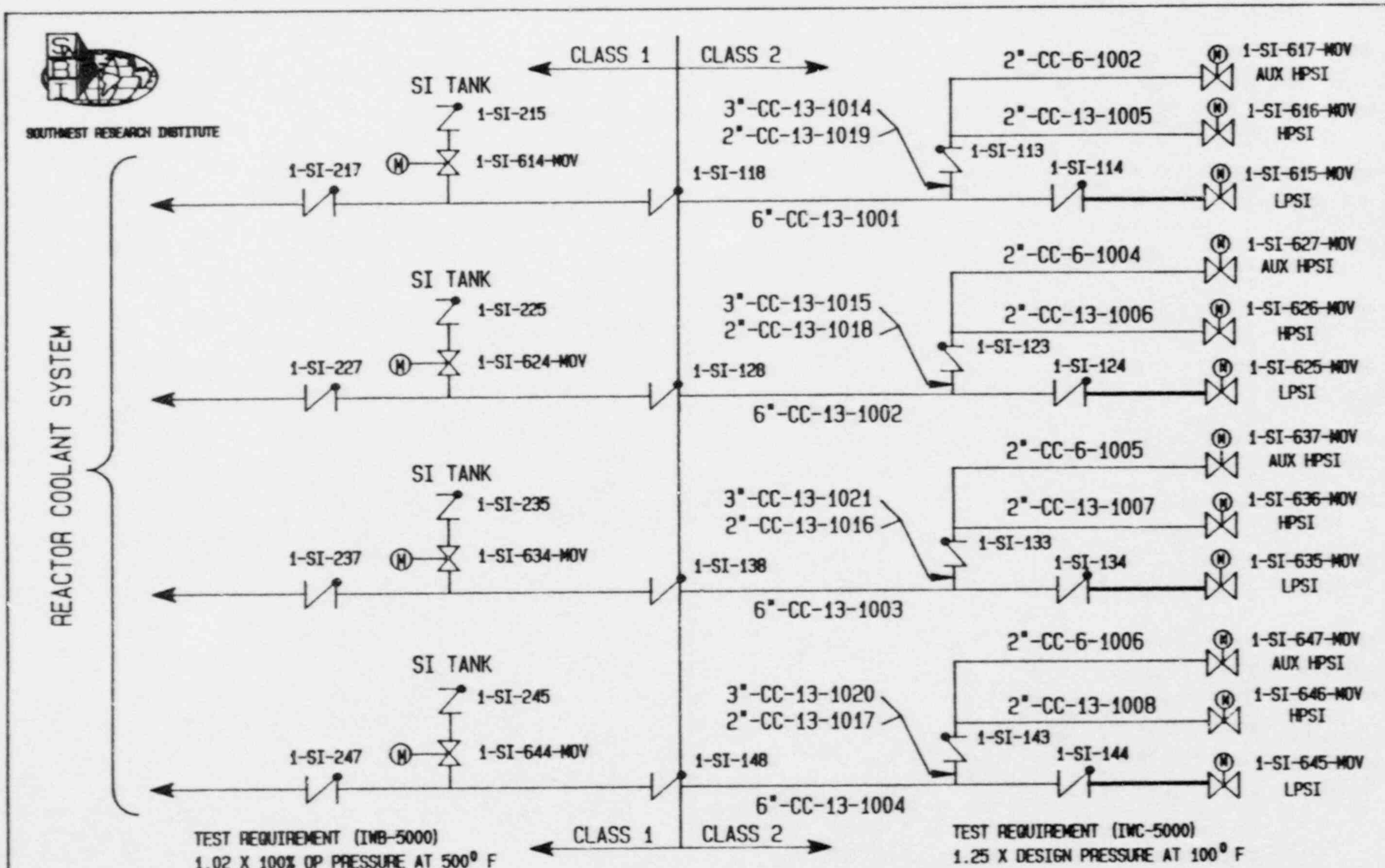
SAFETY INJECTION SYSTEM

and

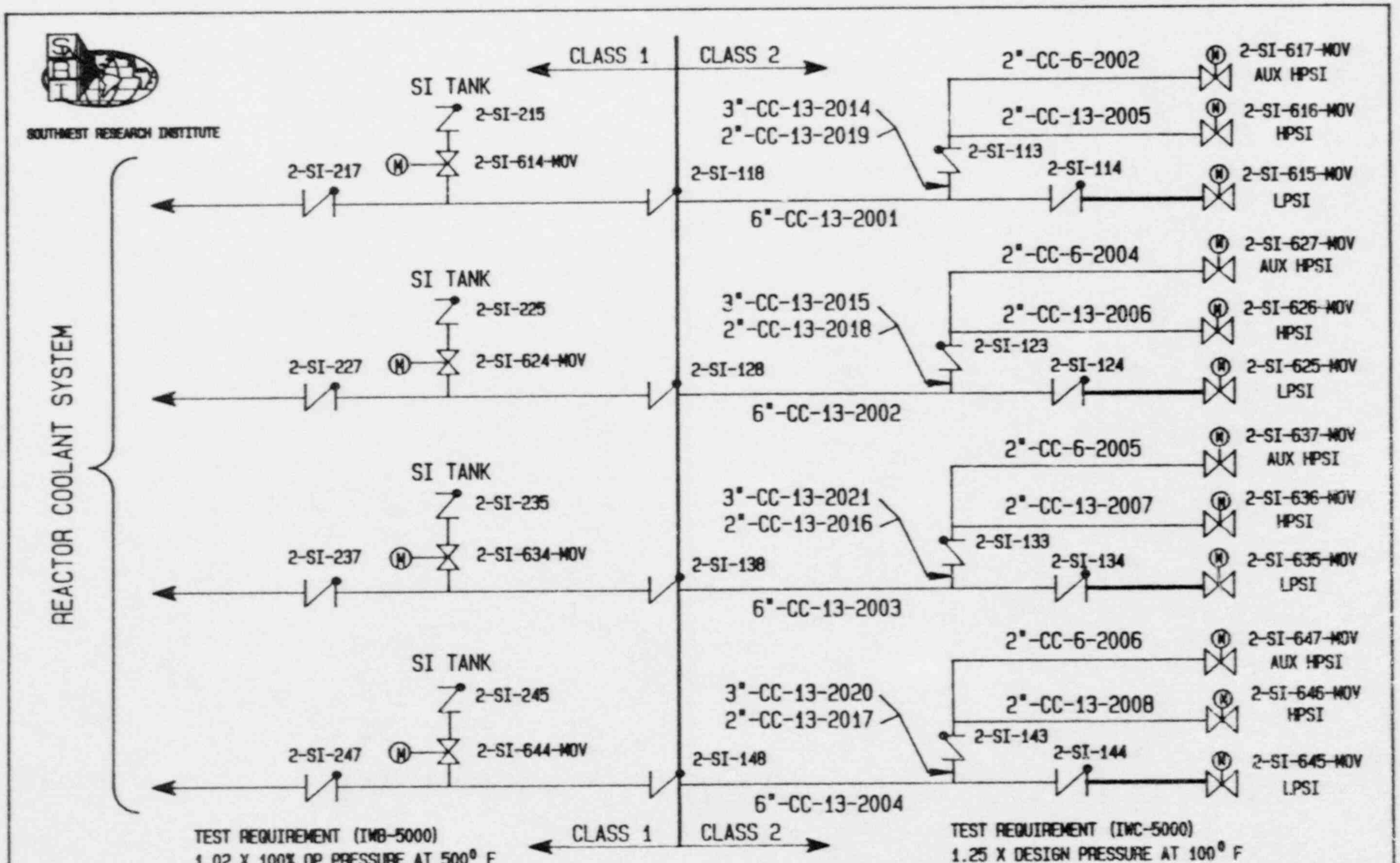
CALVERT CLIFFS UNIT 2

SKETCH 2

SAFETY INJECTION SYSTEM



CALVERT CLIFFS UNIT 1
SKETCH 1



CALVERT CLIFFS UNIT 2
SKETCH 2

ATTACHMENT (6)

LETTER FROM THE NRC

TO

BALTIMORE GAS & ELECTRIC COMPANY

November 14, 1985

Copy to [illegible]
[illegible]

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

November 14, 1985

Rec'd
11/21/85

Docket Nos. 50-317
and 50-318

Mr. A. E. Lundvall, Jr.
Vice President - Supply
Baltimore Gas & Electric Company
P. O. Box 1475
Baltimore, Maryland 21203

Dear Mr. Lundvall:

The NRC has provided relief from a requirement of the ASME Boiler and Pressure Vessel Code, Section XI, which BG&E has determined to be impractical in accordance with your application dated August 28, 1985.

The code relief, granted in accordance with 10 CFR Part 50, Section 50.55a(g)(6)(i), relates to the requirement for pressure testing of Class 2 piping associated with the High Pressure Safety Injection (HPSI), Auxiliary HPSI, and Low Pressure Safety Injection (LPSI) Loop Isolation MOVs to the Reactor Coolant System. You have proposed acceptable, alternate testing as described in the enclosed Safety Evaluation.

We have determined that the testing for which relief has been requested and approved is impractical and pursuant to 10 CFR 50.55a(g)(6)(i), that the granting of this relief is authorized by law and will not endanger life or property or the common defense and security and is otherwise in the public interest. In making this determination, we have given due consideration to the burden that could result if these requirements were imposed on your facility.

Sincerely,

HR Denton

Harold R. Denton, Director
Office of Nuclear Reactor Regulation

Enclosure:
Safety Evaluation

cc w/enclosure
See next page

TRAINING & TECHNICAL SERVICES

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PE-IFM FOLLOW-UP
FILE:

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8511220414

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Mr. A. E. Lundvall, Jr.
Baltimore Gas & Electric Company

Calvert Cliffs Nuclear Power Plant

cc:
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Calvert County Board of
Commissioners
Prince Frederick, Maryland 20768

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Department of Natural Resources
Energy Administration, Power Plant
Siting Program
ATTN: Mr. T. Magette
Tawes State Office Building
Annapolis, Maryland 21204

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

REQUEST FOR RELIEF FROM INSERVICE PRESSURE TEST REQUIREMENTS

BALTIMORE GAS AND ELECTRIC

CALVERT CLIFFS NUCLEAR PLANT UNITS 1 AND 2

DOCKET NOS. 50-317 AND 50-318

INTRODUCTION

The Technical Specifications for the Calvert Cliffs Nuclear Power Plant Units 1 and 2 state that inservice examination of ASME B&PV Code Class 1, 2, and 3 components shall be performed in accordance with Section XI of the Code and applicable Addenda as required by 10 CFR 50.55a(g) except where specific written relief has been granted by the Commission. The Examination Program is based upon the requirements of the 1974 Edition with the Addenda through the Summer of 1975. Certain requirements of this Edition and Addenda of Section XI are impractical to perform on older plants because of the plants' design, component geometry, materials of construction or the need for extensive temporary modifications and the resultant substantial radiation exposure to plant personnel.

By letter dated August 28, 1985, the Baltimore Electric Company requested relief from the pressure test inspection requirements of the Code for sections of pipes determined to be impractical to perform these tests.

Requests for Relief

Relief is requested for Class 2 piping from the High Pressure Safety Injection (HPSI), Auxiliary HPSI, and Low Pressure Safety Inspection (LPSI) Loop Isolation MOVs to the Reactor Coolant System (RCS).

The following lines are affected:

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UNIT 1 FROM	TO	LINE NOS.	UNIT 2 FROM	TO	LINE NOS.
1-SI-118	1-SI-615-MOV	6"CC-13-1001	2-SI-118	2-615-MOV	6"CC-13-2001
	1-SI-616-MOV	2"CC-13-1019		2-SI-616-MOV	2"CC-13-2019
	1-SI-617-MOV	3"CC-13-1014		2-SI-617-MOV	3"CC-13-2014
		2"CC-13-1005			2"CC-13-2005
		2"CC-6-1002			2"CC-6-2002
1-SI-128	1-SI-625-MOV	6"CC-13-1002	2-SI-128	2-SI-625-MOV	6"CC-13-2002
	1-SI-626-MOV	2"CC-13-1018		2-SI-626-MOV	2"CC-13-2018
	1-SI-627-MOV	3"CC-13-1015		2-SI-627-MOV	3"CC-13-2015
		2"CC-13-1006			2"CC-13-2006
		2"CC-6-1004			2"CC-6-2004
1-SI-138	1-SI-635-MOV	6"CC-13-1003	2-SI-138	2-SI-635-MOV	6"CC-13-2003
	1-SI-636-MOV	2"CC-13-1016		2-SI-636-MOV	2"CC-13-2016
	1-SI-637-MOV	3"CC-13-1021		2-SI-637-MOV	3"CC-13-2021
		2"CC-13-1007			2"CC-13-2007
		2"CC-6-1005			2"CC-6-2005
1-SI-148	1-SI-645-MOV	6"CC-13-1004	2-SI-148	2-SI-645-MOV	6"CC-13-2004
	1-SI-646-MOV	2"CC-13-1017		2-SI-646-MOV	2"CC-13-2017
	1-SI-647-MOV	3"CC-13-1020		2-SI-647-MOV	3"CC-13-2020
		2"CC-13-1008			2"CC-13-2008
		2"CC-6-1006			2"CC-6-2006

ISI Code Class 2 Requirements

ASME Code Section XI requires hydrostatic testing of all Class 2 piping and components as set forth in Articles IWA-5000 and IWC-5000. The test pressure requirement for Class 2 piping and components is 1.25 times the design pressure when tested at a temperature not less than 100°F.

Basis for Relief Request

A. The listed portion of Class 2 piping from HPSI, Aux. HPSI, and LPSI Loop Isolation MOV to RCS cannot be isolated from the RCS.

Licensee's Proposed Alternative Tests

The licensee proposes to perform a hydrostatic pressure test of the above listed piping, excluding the piping listed in the relief request Item B. below, to the pressure test requirements of IWB-5000 for Class 1 piping. This piping can be pressurized via alignment of the charging system to the Aux. HPSI header.

B. The portions of piping listed below cannot be hydrostatically tested due to inability to align charging pumps to pressurize this piping and the or- bility requirements of these portions when the RCS is pressurized.

UNIT 1

FROM	TO	LINE NO.
1-SI-114	1-SI-615-MOV	6"CC-13-1001
1-SI-124	1-SI-625-MOV	6"CC-13-1002
1-SI-134	1-SI-635-MOV	6"CC-13-1003
1-SI-144	1-SI-645-MOV	6"CC-13-1004

UNIT 2

FROM	TO	LINE NO.
2-SI-114	2-SI-615-MOV	6"CC-13-2001
2-SI-124	2-SI-625-MOV	6"CC-13-2002
2-SI-134	2-SI-635-MOV	6"CC-13-2003
2-SI-144	2-SI-645-MOV	6"CC-13-2004

Licensee's Proposed Alternate Tests

The following tests and examinations are proposed in lieu of hydrostatic testing for proving the integrity of the piping listed in Item B. above.

1. Each refueling cycle, a leakage test of this piping is performed in accordance with Technical Specification 6.14. In this test the piping listed in Item B. is pressurized to LPSI pump discharge pressure and a visual examination for leakage is conducted.

2. Welds will be selected and examined per Section XI, Article IWC-2000.

Evaluation

The section of piping upstream of check valves SI-118,-128,-138,-148, for Units 1 and 2, cannot be tested at a pressure of 1.25 times design pressure without making extensive temporary modifications to keep the valves closed. The modifications would require: (1) disassembly of the valves, (2), welding of temporary blocks (on the downstream side) inside the valve bodies to hold a "jack screw" type arrangement to keep the valve closed, (3) removal of the temporary blocking devices from the valves after testing and (4) performing necessary nondestructive testing to assure the integrity of the valve bodies before returning them to service. Without the temporary modifications to the check valves, the Class 1 system downstream of the check valves would be pressurized to the test pressure of the Class 2 system. This pressure exceeds the Class 1 hydrostatic pressure requirements.

Conclusion

Based upon a review of the system design, the basis for relief request, and the licensee's proposed alternate tests, the staff concludes that relief granted from examination and pressure test requirements and alternate methods imposed through this document give reasonable assurance of the piping pressure boundary integrity, that granting relief where the Code requirements are impractical is authorized by law and will not endanger life or property, or the common defense and security, and is otherwise in the public interest considering the burden that could result if they were imposed on the facility. Therefore, in accordance with 10 CFR 50.55a (g)(6)(i), relief is granted.

Principal Contributor:

B. Turovlin

Date: November 14, 1985

ATTACHMENT (7)

LETTERS FROM THE NRC

TO

BALTIMORE GAS & ELECTRIC COMPANY

December 13, 1982

January 24, 1983

Dave

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

DEC 13 1982

Docket Nos. 50-317
and 50-318

Mr. A. E. Lundvall, Jr.
Vice President - Supply
Baltimore Gas & Electric Company
P. O. Box 1475
Baltimore, Maryland 21203

Dear Mr. Lundvall:

The NRC has completed its review of the Inservice Inspection (ISI) Program for Calvert Cliffs Units 1 and 2. In the course of our review, we have granted relief relating to the following ASME Boiler and Pressure Vessel Code, Section XI requirements:

- Inspection of the Seal Weld in the Closure Head,
- Inspection of the Primary Nozzle-to-Vessel Welds and the Nozzle Inside Radiused Section,
- Inspection of the Reactor Vessel Cladding,
- Repair of an Arc Strike, Class 2 Pipe,
- Pressure Test Hold Time,
- Class 3 System Pressure Tests,
- Inservice Leak Tests (Hydrostatic Testing) for the Salt Water Cooling System and Service Water Main Headers.
- Ultrasonic Examination Techniques,
- Repair and Hydrostatic Testing for Small Steam and Feedwater Piping, Class 2.

In the course of reviewing these requests for relief, we have found that changes have been needed in these requests to meet our requirements. These changes have been discussed with and agreed to by your staff.

The above requests for relief were submitted pursuant to 10 CFR Part 50, Section 50.55a(g)(5)(iv) in lications dated December 5, 1978, March 29,

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1980, November 19, 1980 and May 29, 1981. These requests for relief are herein granted per 10 CFR Part 50, Section 50.55a(g)(6)(i).

Copies of the Safety Evaluation and Federal Register Notice are enclosed.

Sincerely,

Robert A. Clark

Robert A. Clark, Chief
Operating Reactors Branch #3
Division of Licensing

Enclosures:
As stated

cc: See next page

Nov. 6, 1981

Baltimore Gas and Electric Company

cc:

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Region III Office
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Administrator, Power Plant Siting Program
Energy and Coastal Zone Administration
Department of Natural Resources
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Annapolis, MD 21204

Regional Administrator
Nuclear Regulatory Commission, Region I
Office of Executive Director for Operations
631 Park Avenue

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO REQUESTS FOR RELIEF FROM INSERVICE INSPECTION REQUIREMENTS

BALTIMORE GAS AND ELECTRIC COMPANY

CALVERT CLIFFS UNITS NO. 1 AND NO. 2

DOCKET NOS. 50-317 AND 50-318

INTRODUCTION

Technical Specification 4.0.5 for the Calvert Cliffs Unit Nos. 1 and 2 nuclear plants states that inservice examination of ASME Code Class 1, 2, and 3 components shall be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code and applicable addenda as required by 10 CFR 50.55a(g) except where specific written relief has been granted by the Commission. Certain requirements of later editions and addenda of Section XI are impractical to perform on older plants because of the design, component geometry, and materials of construction. Thus, 10 CFR 50.55a(g)(6)(i) authorizes the Commission to grant relief from those requirements upon making the necessary findings.

By letters dated December 5, 1978, March 29, 1980, November 19, 1980 and May 29, 1981, Baltimore Gas and Electric Company (BG&E) submitted requests for relief from certain Code requirements determined to be impractical to perform on the Calvert Cliffs Unit Nos. 1 and 2 nuclear plants during the inspection interval. Additional information concerning these requests for relief was submitted by BG&E letters dated July 22, 1982, August 30, 1982 and October 29, 1982. The programs are based on the requirements of the 1974 Edition through Summer 1975 Addenda of Section XI of the ASME Code.

EVALUATION

Requests for relief from the requirements of Section XI which have been determined to be impractical to perform have been reviewed by the NRC staff's contractor, Science Applications, Inc. The contractor's evaluations are presented in the Technical Evaluation Report (TER) attached. One request for relief, involving the repair of an arc strike on Class 2 piping, was not reviewed in the TER. This request was granted as shown in Table 2. The staff has reviewed the TER and agrees with the evaluations and recommendations except as indicated. A summary of the determinations made by the staff is presented in the following tables:

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TABLE 1

CLASS 1 COMPONENTS

IWB-2600 ITEM NO.	IWB-2500 EXAM. CAT.	SYSTEM OR COMPONENT	AREA TO BE EXAMINED	REQUIRED METHOD	LICENSEE PROPOSED ALTERNATIVE EXAMINATION	RELIEF REQUEST STATUS
B1.2	B-B	Reactor Vessel Closure Head	5% of Circumferential Weld (G-209B)	Volumetric	Visual During System Pressure Test & Cladding Examination	Granted Provided Examination Sample of Other Category B-B Weld be Increased to Achieve Equivalent Sample Size*
B1.4	B-D	Reactor Vessel Nozzles	Nozzle-To-Vessel Welds And Inside Radiused Sections	Volumetric: 25% of Welds And Radiused Sections During 1st Period, 50% by End of Second Period, 100% by End of Interval	Volumetric: 25% During 1st.Period, None During Second Period 100% During 3rd Period	Granted
B1.14	B-I-1	Reactor Vessel	Vessel Cladding	Visual Examination of Six Patches Distributed Evenly Over Three 40-month Periods	Visual When Core Barrel is Removed	Granted

*Conversations with representatives of BG&E indicated that this provision is acceptable.

TABLE 2

CLASS 2 COMPONENTS*

IWC-2600 ITEM NO.	IWC-2520 EXAM. CAT.	SYSTEM OR COMPONENT	AREA TO BE EXAMINED	REQUIRED METHOD	LICENSEE PROPOSED ALTERNATIVE EXAMINATION	RELIEF REQUEST STATUS
C2.1 (IWC-4000)	(Repair)	Shutdown Cooling-2-inch Cross Connect	Arc Strike Repair Area	Volumetric-Radiography	None	Granted

* Thi_ request for relief is not described in the TER _.d is based upon a request dated May 2?, 1981.

TABLE 3

CLASS-3 COMPONENTS

(SEE TABLE 4)

TABLE 4

PRESSURE TEST

SYSTEM OR COMPONENT	IWC-5000 & IWD-5000 TEST PRESSURE REQUIREMENT	LICENSEE PROPOSED ALTERNATIVE TEST PRESSURE	RELIEF REQUEST STATUS
Class 1, 2 & 3	Hold Time Shall be Four Hours	Perform Test in Accordance with the 1977 Edition, Winter 1978 Addenda	Approved
Class 3, Diesel Generator Components	Test Pressure shall be 1.10 Times the System Design Pressure	Monitor Critical Parameters, weekly Load Test, and Inservice Leak Test Each Inspection Period	Granted*
Salt Water Cooling Systems, Class 3	The System Test Pressure Shall be at Least 1.10 Times The System Design Pressure	Perform an Inservice Leak Test Yearly on Above-Ground Portions to Verify System Integrity	Granted*
Service Water System Main Headers	The System Test Pressure Shall be at Least 1.10 Times The System Design Pressure	Perform an Inservice Leak Test Yearly to Verify System Integrity	Granted*

* By letter dated October 29, 1982, BG&E provided an appropriate basis for determining that the 1977 Edition Summer 1978 Addenda, is impractical for these pressure tests. Accordingly, these requests for relief are granted without additional provisions.

TABLE 4

PRESSURE TEST
(CONTINUED)

SYSTEM OR COMPONENT	IWC-5000 & IWD-5000 TEST PRESSURE REQUIREMENT	LICENSEE PROPOSED ALTERNATIVE TEST PRESSURE	RELIEF REQUEST STATUS
Class 2 Steam And Feedwater Piping 5-inch Nominal Pipe Size And Smaller That Cannot be Isolated From Steam Generator Secondary Side After Repair	The System Pressure Shall be at Least 1.25 Times The System Design Pressure	Examine Components Under Normal Operating Pressure Corresponding to 100% Rated Reactor Power; Perform Liquid Penetrant Examinations on First And Last Weld Pass; Volumetric Examination of Welds Greater Than 1-inch Nominal Pipe Size.	Granted *

* Additional information contained in the BG&E letter dated August 30, 1982 was considered which had not been reviewed in the TER (see NRC letter dated November 19, 1982.)

TABLE 5

ULTRASONIC EXAMINATION TECHNIQUE

SYSTEM OR COMPONENT	REQUIREMENT	LICENSEE PROPOSED ALTERNATIVE TEST PRESSURE	RELIEF REQUEST STATUS
Piping Welds	Section XI, 1974 Edition, Appendix I or Article V of Section V	All Indications Which Exceed 100% of Reference Level Will be Evaluated And All Indications Which exceed 50% of Reference Level Will be Recorded	Granted With Additional Requirement That Indications 20% or Greater of Reference Level That Are Interpreted to be a Crack Must be Identified And Evaluated According to The Rules of Section XI*

* Conversations with representatives from BG&E indicated that this provision is acceptable.

CONCLUSION

The relief from the Code is based upon our review of the information submitted by BG&E to support the determination that compliance with the ASME Code inservice inspection requirements would be impractical for the facility. We have determined that the inspections from which this relief is sought are impractical and pursuant to 10 CFR 50.55a(g)(6)(i), that the granting of this relief is authorized by law and will not endanger life or property, or the common defense and security, and is otherwise in the public interest. In making this determination, we have given due consideration to the burden that could result if these requirements were imposed on the facility. We have determined that the granting of this relief does not involve a significant increase in the probability or consequences of an accident previously evaluated, does not create the possibility of an accident of a type different from any evaluated previously, does not involve a significant reduction in a safety margin, and thus, does not involve a significant hazards consideration. Furthermore, we have determined that the granting of this relief from ASME Code requirements does not authorize a change in effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. We have concluded that the granting of this relief is insignificant from the standpoint of environmental impact and pursuant to 10 CFR 51.5(d)(4) that neither an environmental impact statement nor a negative declaration and environmental impact appraisal needs to be prepared in connection with this action.

Date: DEC 13 1982

Principal Contributors:

G. Johnson
D. Jaffe

Attachment: SAI Technical
Evaluation Report

UNITED STATES NUCLEAR REGULATORY COMMISSION

DOCKET NOS. 50-317 AND 50-318

BALTIMORE GAS AND ELECTRIC COMPANY

NOTICE OF GRANTING OF RELIEF FROM ASME SECTION XI

INSERVICE INSPECTION REQUIREMENTS

The U. S. Nuclear Regulatory Commission (the Commission) has granted relief from certain requirements of the ASME Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components" to Baltimore Gas and Electric Company (the licensee), which revised the inservice inspection program for Calvert Cliffs Nuclear Power Plant, Units No. 1 and No. 2. The ASME Code requirements are incorporated by reference into the Commission's rules and regulations in 10 CFR Part 50. The relief is effective as of its date of issuance.

The NRC has provided a relief from the ASME Boiler and Pressure Vessel Code, Section XI, regarding the requirements for:

- Inspection of Seal Weld in Closure Head,
- Inspection of Primary Nozzle-to-Vessel Welds and Nozzle Inside Radiused Section,
- Inspection of Reactor Vessel Cladding,
- Repair of an Arc Strike, Class 2 Pipe,
- Pressure Test Hold Time,
- Class 3 System Pressure Tests,
- Inservice Leak Test (Hydrostatic Testing) for the Salt Water Cooling System and Service Water Main Headers,
- Ultrasonic Examination Techniques,
- Repair and Hydrostatic Testing for Small Steam and Feedwater Piping, Class 2.

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The Commission has determined that the granting of this relief will not result in any significant environmental impact and that pursuant to 10 CFR §51.5(d)(4) an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with this action.

For further details with respect to this action, see (1) the licensee's request for relief from code requirements dated December 5, 1978, March 29, 1980, November 19, 1980 and May 29, 1981 and additional information submitted by the licensee's letters dated July 22, 1982, August 30, 1982, October 29, 1982 and (2) the Commission's related Safety Evaluation. All of these items are available for public inspection at the Commission's Public Document Room, 1717 H Street, N.W. Washington, D.C. 20555, and at the Calvert County Library, Prince Frederick, Maryland. A copy of item (2) may be obtained upon request addressed to the U. S. Nuclear Regulatory Commission, Washington, D. C. 20555, Attention: Director, Division of Licensing.

Dated at Bethesda, Maryland this 13th day of December, 1982.

FOR THE NUCLEAR REGULATORY COMMISSION

Robert A. Clark

Robert A. Clark, Chief
Operating Reactors Branch #3
Division of Licensing

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

JAN 24 1983

COPY TO KEITH.

Docket Nos. 50-317
and 50-318

Mr. A. E. Lundvall, Jr.
Vice President - Supply
Baltimore Gas & Electric Company
P. O. Box 1475
Baltimore Maryland 21203

Dear Mr. Lundvall:

The NRC has provided relief from requirements of the ASME Boiler and Pressure Vessel Code, Section XI, which BG&E has determined to be impractical, in accordance with your applications dated November 6, 1981 and December 21, 1982.

The code relief, granted in accordance with 10 CFR Part 50, Section 50.55a (g)(6)(i), relates to (1) Examination of reactor vessel closure head cladding, (2) Code Case N-210, "Exemption to Hydrostatic Tests after Repairs," (3) Code Case N-307 for Centerdrilled Hole Ultrasonic Examination of Studs, (4) Increased inservice leak testing in lieu of hydrostatic pressure testing of the Class III component cooling water system, and (5) Hydrostatic testing of welds that cannot be isolated from the steam generators (Unit 2 only).

Copies of our Safety Evaluation and Federal Register Notice are enclosed.

Sincerely,

Robert A. Clark, Chief
Operating Reactors Branch #3
Division of Licensing

Enclosures:
1. Safety Evaluation
2. Federal Register Notice

cc: See next page

TRAINING & TECHNICAL SERVICES

DATE RECEIVED: 2-1

2/2

~~AGS~~ - T&TS		ACTION	
~~PE~~ - TS		NOTE/RETURN	
AGS-~~TRNG~~		NOTE RETAIN	
~~PE~~ - OL&S		YOUR COMMENTS	
S - EP		PLEASE SEE ME	
		RESPONSE REQ'D	
		FOLLOW-UP	

FILE: ISI

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO REQUESTS FOR RELIEF FROM INSERVICE INSPECTION REQUIREMENTS

CALVERT CLIFFS NUCLEAR POWER PLANT UNIT NOS. 1 AND 2

DOCKET NOS. 50-317 AND 50-318

By applications dated November 6, 1981 and December 21, 1982, Baltimore Gas and Electric Company (BG&E) requested relief from inservice inspection requirements of Section XI of the ASME Boiler and Pressure Vessel Code for Calvert Cliffs Units 1 and 2. The proposed relief is described herein.

Discussion and Evaluation

1. Examination Requirements for Reactor Vessel Closure Head Cladding

   The ASME Code Section XI, 1974 Edition, with Addenda through Summer 1975, requires a visual and surface examination or a volumetric examination of the reactor vessel closure head cladding. By application dated November 6, 1981, BG&E requested relief from this examination requirement.

   By adoption of the 1977 Edition of the ASME Code, Section XI, with Addenda through Summer 1978, BG&E is relieved of the requirement to inspect the reactor vessel head cladding. The commitment, contained in the November 6, 1981 application, to perform a visual examination of the cladding is acceptable. Accordingly relief from the required examination of the reactor vessel head cladding is appropriate provided that visual examination is continued.

2. Use of Code Case N-210, "Exemption to Hydrostatic Tests After Repairs"

   By application dated November 6, 1981, BG&E requested relief from the ASME Code in that they desire to utilize Code Case N-210 in the course of performing the Inservice Inspection Program for Calvert Cliffs Units 1 and 2. The use of Code Case N-210 is endorsed by Regulatory Guide 1.147, "Inservice Inspection Code Case Acceptability-ASME Section XI Division 1." Revision 1 of Regulatory Guide 1.147, dated February 1982, indicates that Code Case N-210 has been annulled in that it has been included in the ASME Code by a subsequent revision. In such instances, the continued use of the Code Case intent is sanctioned under the rules of the Code. Accordingly, we conclude that the use of Code Case N-210 for Calvert Cliffs Units 1 and 2 is acceptable, subject to the condition that, for repairs to piping, pumps and valves, the depth of the cavity not exceed 25 percent of the wall thickness.

3. Use of Code Case N-307, "Revised Ultrasonic Examination Volume for Class 1 Bolting Examination Category B-G-1, Division 1, When the Examinations are Conducted from the Center-Drilled Hole"

   By application dated November 6, 1981, BG&E requested relief from the

ASME Code in that they desire to use Code Case N-307 in the course of performing the Inservice Inspection Program for Calvert Cliffs Units 1 and 2. Code Case N-307 allows relief from ultrasonic examination of studs in the volume that extends to within ¼" of the threaded surface. We have previously reviewed the use of Code Case N-307 and have found it acceptable in that indications are most likely to occur within ¼" of the threaded surface (the volume to be inspected) due to the higher stress concentrations associated with the threads. Moreover, Code Case N-307 was subsequently approved by Regulatory Guide 1.147, Revision 1, and is therefore acceptable for use at Calvert Cliffs Units 1 and 2.

4. <u>Increased Inservice Leak Testing in Lieu of Hydrostatic Pressure Testing of Class III Component Cooling Water Systems</u>

By application dated November 6, 1981, BG&E requested relief from the ASME Code as it applies to the inservice inspection of the Class III component cooling water system. Paragraph IWD-2410 requires hydrostatic Pressure Testing of Class III systems to 1.1 times design pressure during every ten year inspection interval. In their November 6, 1981 application, BG&E stated that "on the Component Cooling Water System main headers, where butterfly valves are installed, sufficient seal to maintain pressure on isolated portions of the system cannot be completed. BG&E proposed that the Inservice Leak Test required every 40-month period be performed on an annual basis to substitute for hydrostatic pressure testing of this system."

In our letter and Safety Evaluation (SER) dated December 13, 1982 the NRC approved relief from the hydrostatic test requirements of IWD-2410 for inservice inspection of the Class III service water system. The service water system is similar to the component cooling water system in that both systems rely on butterfly valves for pressure boundary isolation. Our approval of relief in the December 13, 1982 SER was based upon (1) the inability of these butterfly valves to sustain the pressure required for a hydrostatic test (1.1 times the design pressure) and (2) the absence of a reasonable alternative other than annual leakage testing. From the above, we conclude that the relief requested in the November 6, 1981 application, for hydrostatic testing of the component cooling water system, should be granted on the same basis as described in our SER dated December 13, 1982. This relief is based upon the commitment by BG&E to perform the 40-month inservice leak test on an annual basis for the component cooling water system.

5. <u>Hydrostatic Testing of Welds that Cannot be Isolated from the Steam Generator (Unit 2 only)</u>

In our letter and SER dated November 19, 1982, the NRC provided relief from the ASME Code requirement to perform hydrostatic tests on certain welds in lines that cannot be isolated from the steam generator. These welds were associated with modifications to the auxiliary feedwater system. This relief was based upon the desire not to perform a hydrostatic test of the steam generator to test these welds since the steam generators are limited to a total of ten (10) hydrostatic tests during the lifetime of the plant. The next full hydrostatic test of the steam generators is scheduled during the 40-month inspection period which will begin in December 1983.

By application dated December 21, 1982, BG&E identified additional welds associated with the auxiliary feedwater system modifications, for which relief had not previously been requested. These welds are also located such that they cannot be isolated from the steam generator in order to perform the required hydrostatic test. Accordingly, it is appropriate to provide relief from the hydrostatic test requirement for these additional welds based upon the discussion presented in our SER dated November 19, 1982. This relief includes the following additional inspections:

1. Surface Examination after the final weld pass.
2. An Inservice Examination of the components at a pressure corresponding to 100% reactor power. An Inservice Examination of the components in the HOT STANDBY mode (which is approximately 50 psi greater than 100% normal operating pressure).
3. A 100% Volumetric Examination utilizing ultrasonic and/or radiography methods.

A final issue raised by BG&E in their December 21, 1982 application relates to the surface examination of welds after removing half of the first layer by grinding. While this technique was endorsed by the NRC in our November 19, 1982 SER, for welds for which relief from hydrostatic testing was granted, we concur with the licensee that this is not a requirement of the applicable repair code (USAS B 31.7). Accordingly, the removal of weld material and subsequent surface examination is not a required procedure for welds associated with the auxiliary feedwater modification as described in our SER of November 19, 1982 and the BG&E application dated December 21, 1982.

Conclusion

The relief from the Code is based upon our review of the information submitted by BG&E to support the determination that compliance with the ASME Code inservice inspection requirements would be impractical for the facility. We have determined that the inspection from which this relief is sought is impractical and pursuant to 10 CFR §50.55a(g)(6)(i), that the granting of this relief is authorized by law and will not endanger life or property, or the common defense and security, and is otherwise in the public interest. In making this determination, we have given due consideration to the burden that could result if these requirements were imposed on the facility. We have determined that the granting of this relief does not involve a significant increase in the probability or consequences of an accident previously evaluated, does not create the possibility of an accident of a type different from any evaluated previously, and does not involve a significant reduction in a margin of safety; and thus, does not involve a significant hazards consideration. We have 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, and (2) such activities will be conducted in compliance with the Commission's regulations and the issuance of this relief will not be inimical to the common defense and security or to the health and safety of the public. Furtheremore, we have determined that the granting of this relief from ASME Code requirements does not authorize a change in effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. We have concluded that the granting of this relief is insignificant from the standpoint of environmental impact and pursuant to 10 CFR 51.5(d)(4) that neither an environmental impact statement nor a negative declaration and environmental impact appraisal need to be prepared in connection with this action.

Dated: JAN 24 1983

Principal Contributors:

D. Jaffe
G. Johnson

UNITED STATES NUCLEAR REGULATORY COMMISSION

DOCKET NOS. 50-317 AND 50-318

BALTIMORE GAS AND ELECTRIC COMPANY

NOTICE OF GRANTING OF RELIEF FROM ASME SECTION XI

INSERVICE INSPECTION REQUIREMENTS

The U. S. Nuclear Regulatory Commission (the Commission) has granted a relief from certain requirements of the ASME Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components" to Baltimore Gas and Electric Company (the licensee), which revised the inservice inspection program for Calvert Cliffs Nuclear Power Plant, Unit Nos. 1 and 2. The ASME Code requirements are incorporated by reference into the Commission's rules and regulations in 10 CFR Part 50. The relief is effective as of its date of issuance.

The code relief, granted in accordance with 10 CFR Part 50, Section 50.55a(g)(6)(i), relates to (1) Examination of reactor vessel closure head cladding, (2) Code Case N-210, "Exemption to Hydrostatic Tests after Repairs," (3) Code Case N-307 for Centerdrilled Hole Ultrasonic Examination of Studs, (4) Increased inservice leak testing in lieu of hydrostatic pressure testing of the Class III component cooling water system, and (5) Hydrostatic testing of welds that cannot be isolated from the steam generators (Unit 2 only).

The Commission has determined that the granting of this relief will not result in any significant environmental impact and that pursuant to 10 CFR §51.5(d)(4) an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with this action.

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For further details with respect to this action, see (1) the licensee's requests for relief from code requirements dated November 6, 1981 and December 21, 1982 and (2) the Commission's related Safety Evaluation. All of these items are available for public inspection at the Commission's Public Document Room, 1717 H Street, N. W. Washington, D. C. 20555, and at the Calvert County Library, Prince Frederick, Maryland. A copy of item (2) may be obtained upon request addressed to the U. S. Nuclear Regulatory Commission, Washington, D. C. 20555, Attention: Director, Division of Licensing.

Dated at Bethesda, Maryland this 24th day of January, 1983.

FOR THE NUCLEAR REGULATORY COMMISSION

Robert A. Clark

Robert A. Clark, Chief
Operating Reactors Branch #3
Division of Licensing