



*A Member of the  
Constellation Energy Group*

June 30, 2000

U. S. Nuclear Regulatory Commission  
Washington, DC 20555

**ATTENTION:** Document Control Desk

**SUBJECT:** Calvert Cliffs Nuclear Power Plant  
Unit Nos. 1 & 2; Docket Nos. 50-317 & 50-318  
Relief Request for the Second ten-year Inservice Inspection Interval Concerning  
Volumetric Examination Coverage

Pursuant to 10 CFR 50.55a(g)(5)(iv), Baltimore Gas and Electric Company (BGE) hereby proposes alternatives to certain requirements of Section XI of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (1983 Edition through Summer 1983 Addenda).

Per the ASME Code Section XI, when volumetric examination is required for weld examination "essentially 100% of the weld length" should be examined. In Code Case N-460, ASME Code Committees further clarified the examination requirement stating that an examination is complete if the coverage is reduced by less than 10%. The proposed alternative applies to those welds where it was impractical to perform a complete examination (i.e., at least 90% of the weld length) due to the limitations of design, geometry, and materials of construction that are characteristic of a plant of our vintage. Pursuant to 10 CFR 50.55a(g)(4), ASME Code Class 1, 2, and 3 components (including supports) shall meet the requirements, except the design and access provisions and the pre-service examination requirements, set forth in the ASME Code Section XI, "Rules for Inservice Inspection (ISI) of Nuclear Power Plant Components," to the extent practical within the design, geometry, and materials of construction for the components.

The regulations require that inservice examination of components and system pressure tests conducted during the first ten-year interval and subsequent intervals comply with the requirements of the latest edition and addenda of Section XI of the ASME Code, incorporated by reference in 10 CFR 50.55a(b) twelve months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein. The applicable edition of Section XI of the ASME Boiler and Pressure Vessel Code for Calvert Cliffs Nuclear Power Plant Units 1 and 2, second ten-year ISI interval is the 1983 edition through Summer 1983 Addenda. American Society of Mechanical Engineers Section XI, Tables IWB-2500-1 and IWC-2500-1 provide the ISI examination requirements for code class 1 and 2 components.

Attachment (1) provides details of the proposed alternatives to ASME Section XI, Tables IWB-2500-1 and IWC-2500-1 for code class 1 and 2 components. To achieve the requirements of "essentially 100% coverage" would require modifications to the plant which would not be practical and would most likely

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be detrimental to the components. The proposed alternatives provide an acceptable level of quality and safety since the welds listed represent a small portion of the welds examined and they were all subjected to the pressure testing requirements of ASME Section XI.

The proposed alternatives are submitted for the second ten-year ISI interval of CCNPP Unit Nos. 1 and 2.

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

Very truly yours,



CHC/ALS/bjd

Attachment: (1) Volumetric Examination Coverage Relief Request No. ISI-6

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**ATTACHMENT (1)**

**VOLUMETRIC EXAMINATION COVERAGE**

**RELIEF REQUEST NO. ISI-6**

ATTACHMENT (1)

**VOLUMETRIC EXAMINATION COVERAGE  
RELIEF REQUEST NO. ISI-6**

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**SYSTEM(S)/COMPONENT(S) FOR WHICH RELIEF IS REQUESTED**

This relief request applies to the components identified in Tables 1 and 2.

**CODE REQUIREMENTS FOR WHICH RELIEF IS REQUESTED**

American Society of Mechanical Engineers (ASME) Section XI, Tables IWB-2500-1 and IWC-2500-1 provide the inservice inspection examination requirements for code class 1 and 2 components. When volumetric examination is required for weld examination the tables typically require "essentially 100% of the weld length" be examined. American Society of Mechanical Engineers Code Committees further clarified the examination requirement in Code Case N-460 which was approved by the Nuclear Regulatory Commission (NRC) in Regulatory Guide 1.147. The Code Case states that an examination is complete if the coverage is reduced by less than 10%.

**PROPOSED ALTERNATIVE**

Calvert Cliffs Nuclear Power Plant (CCNPP) proposes to examine the welds in Tables 1 and 2 to the maximum extent practical taking into consideration the limitations of design, geometry, and materials of construction which are characteristic of a plant of our vintage.

**BASIS FOR RELIEF**

Title 10 CFR 50.55a(g)(4) requires that pressurized water reactor (PWR) facilities meet the requirements of ASME Section XI in effect for the facility to the extent practical within the limitations of design, geometry, and material of construction. During the volumetric ultrasonic examination of the components listed in Tables 1 and 2, CCNPP was unable to obtain the volumetric code coverage of "essentially 100% of the weld." The items listed in Tables 1 and 2 represent the welds credited for the Unit Nos. 1 and 2 Inservice Inspection Long-Term Plans, respectively where 90% or less volumetric examination coverage was obtained as required by Code Case N-460. Tables 1 and 2 provide the Long-Term Plan Summary Number, Component ID, Component Description, ASME Code Category, ASME Item Number, Percent Volumetric Examination Coverage Achieved, and the Reason for the examination limitation for the welds which require relief.

The examinations of the ASME Category B-A, "Pressure Retaining Welds In Reactor Vessel" listed in Tables 1 and 2 were all limited by the geometry/configuration of the inside surface of the reactor pressure vessel (RPV) and RPV head shroud support lugs.

The examinations of the ASME Category B-B, "Pressure Retaining Welds In Vessels other than Reactor Vessels" listed in Tables 1 and 2 were limited due to the vessel nozzle configurations and permanent obstructions on the steam generators and the pressurizers.

The examinations of the ASME Category B-D, "Full Penetration Welds of Nozzles in Vessels" listed in Tables 1 and 2 were limited due to the nozzle geometry/configurations and support attachments.

The examinations of the ASME Category B-F, "Pressure Retaining Dissimilar Metal Welds" listed in Tables 1 and 2 were limited due to geometry and materials present in these welds. These welds are typically limited to examination from one side due to the acoustic attenuation characteristic of the cast stainless steel components involved.

**ATTACHMENT (1)**

**VOLUMETRIC EXAMINATION COVERAGE  
RELIEF REQUEST NO. ISI-6**

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The examinations of the ASME Category B-J, "Pressure Retaining Welds in Piping" listed in Tables 1 and 2 were limited due to combinations of the welds geometry and materials of construction.

The examinations of the ASME Category C-A, "Pressure Retaining Welds in Pressure Vessels" listed in Tables 1 and 2 were limited due to the vessel configuration or permanent obstructions on the outside surface.

The examinations of the ASME Category C-B, "Pressure Retaining Nozzle Welds in Vessels" listed in Tables 1 and 2 were limited due to the configuration/geometry of the nozzle welds.

To achieve the requirements of "essentially 100% coverage" would require modifications to the plant which would not be practical and would most likely be detrimental to the components.

The proposed alternative provides an acceptable level of quality and safety because the welds listed in Tables 1 and 2 represent a small portion of the welds examined during the second ten-year inservice inspection interval at CCNPP and they were all subject to the pressure testing requirements of ASME Section XI.

**IMPLEMENTATION SCHEDULE**

Relief is requested for the second ten-year Inspection Interval of Calvert Cliff Nuclear Power Plant Unit Nos. 1 and 2.

**Table 1**  
**Relief Request ISI-6**

Unit	Summary No	Comp ID	Description	Category Item No.	Exam Coverage	Reason for Limitation
1	001100	10-203	Reactor Pressure Vessel (RPV) Lower Shell to Lower Head	B-A B1.11	76%	Ultrasonic testing (UT) exam coverage limited due to proximity of core support lugs and flow skirt to weld.
1	001700	1-204A	RPV Lower Head Meridional Weld @ 30 Degrees	B-A B1.22	52%	UT exam coverage limited due to proximity of flow skirt to weld.
1	002300	7-203	RPV Upper Shell to Flange	B-A B1.30	71%	UT exam limited due to inside surface taper.
1	002350	6-209A	RPV Closure Head to Flange	B-A B1.40	65%	UT exam limited due to reactor vessel head shroud supports.
1	004650	11-4-104	Steam Generator (SG) 11 Tubesheet to Lower Extension Ring	B-B B2.40	81%	UT exam limited due to weld geometry.
1	004700	11-4-102	SG 11 Lower Extension Ring to Lower Head	B-B B2.31	76%	UT exam limited due to weld geometry.
1	004900	11-1-111A	SG 11 Lower Head Meridional Weld @ 66 Degrees	B-B B2.32	88%	UT exam limited due to geometry and interference from the outlet nozzle.
1	002400	10-205A	RPV Outlet Nozzle @ 0 Degrees	B-D B3.90	63%	UT exam limited due to nozzle integral extension geometry.
1	002450	10-205B	RPV Outlet Nozzle @ 180 Degrees	B-D B3.90	63%	UT exam limited due to nozzle integral extension geometry.
1	004050	4-404	Pressurizer Surge Line Nozzle	B-D B3.110	71%	UT exam limited due to permanent attachment and one sided exam from vessel side.
1	004100	4-405	Pressurizer Spray Nozzle to Upper Head	B-D B3.110	66%	UT exam limited due to nozzle configuration/ geometry and thermal sleeve.
1	004150	16-405A	Pressurizer Safety & Relief Valve Nozzle to Upper Head	B-D B3.110	77%	UT exam limited by nozzle geometry.
1	004200	16-405B	Pressurizer Safety & Relief Valve Nozzle to Upper Head	B-D B3.110	79%	UT exam limited due to permanent attachment and one sided exam from vessel side.
1	005350	12-5-111A	SG 12 Loop 11A Outlet Nozzle to Shell	B-D B3.130	84%	UT exam limited due to nozzle configuration/ geometry and support skirt attachment to shell.
1	005400	12-5-111B	SG 12 Loop 11B Outlet Nozzle to Shell	B-D B3.130	80%	UT exam limited due to nozzle configuration/ geometry and support skirt attachment to shell.
1	005450	12-5-111C	SG 12 Loop 11 Inlet Nozzle to Shell	B-D B3.130	77%	UT exam limited due to nozzle configuration/ geometry and support skirt attachment to shell.

**Table 1**  
**Relief Request ISI-6**

Unit	Summary No	Comp ID	Description	Category Item No.	Exam Coverage	Reason for Limitation
1	006650	12-5-111A	SG 12 Loop 12A Outlet Nozzle to Shell	B-D B3.130	84%	UT exam limited due to nozzle configuration/ geometry and support skirt attachment to shell.
1	006700	12-5-111B	SG 12 Loop 12B Outlet Nozzle to Shell	B-D B3.130	80%	UT exam limited due to nozzle configuration/ geometry and support skirt attachment to shell.
1	006750	12-5-111C	SG 12 Loop 12 Inlet Nozzle to Shell	B-D B3.130	77%	UT exam limited due to nozzle configuration/ geometry and support skirt attachment to shell.
1	102300	30-RC-11A-7	Elbow to Safe End	B-F B5.130	45%	UT exam limited due to weld geometry.
1	109600	30-RC-12B-7	Elbow to Safe End	B-F B5.130	64%	UT exam limited due to weld geometry.
1	114350	12-SI-1009-16	Safe End to Nozzle	B-F B5.130	65%	UT exam limited due to nozzle side configuration/geometry.
1	118500	4-PS-1003-6	Safe End to Nozzle	B-F B5.40	63%	UT exam limited due to Nozzle configuration/ geometry and thermal sleeve
1	102350	30-RC-11A-8	Safe End to Pump	B-J B9.11	41%	UT exam limited due to weld geometry and material of the Reactor Coolant Pump.
1	102400	30-RC-11A-9	Pump to Safe End	B-J B9.11	50%	UT exam limited due to weld geometry and material of the Reactor Coolant Pump.
1	105600	42-RC-12-2/12-SC-1004	Branch Connection	B-J B9.31	50%	UT exam limited due to nozzle configuration/ geometry.
1	108250	30-RC-12B-1	Nozzle to Transition Piece	B-J B9.11	46%	UT exam limited due to nozzle to transition configuration/geometry.
1	110500	12-PSL-2	Safe End to Pipe	B-J B9.11	83%	UT exam limited due to weld geometry.
1	111150	14-SC-1005-1	Reducer to Pipe	B-J B9.11	50%	UT exam limited due to weld geometry.
1	112800	14-SC-1005-25	Pipe to Elbow	B-J B9.11	68%	UT exam limited due to weld geometry.
1	113700	12-SI-1009-4/6-SI-1001	Branch Connection	B-J B9.31	34%	UT exam limited due to geometry of 6 inch branch connection allows exam from 12 inch pipe side only.
1	116050	12-SI-1012-2	Valve 1-SI-245 to Pipe	B-J B9.11	75%	UT exam limited due to geometry of the weld and the valve material.

**Table 1**  
**Relief Request ISI-6**

Unit	Summary No	Comp ID	Description	Category Item No.	Exam Coverage	Reason for Limitation
1	117050	6-SI-1002-27	Valve 1-SI-128 to Pipe	B-J B9.11	87%	UT exam limited due to weld geometry.
1	118200	4-PS-1003M-7	Pipe to Tee	B-J B9.11	88%	UT exam limited due to tee geometry.
1	118300	4-PS-1003-2	Tee to Elbow	B-J B9.11	89%	UT exam limited due to tee geometry.
1	122500	4-SR-1001-5	Pipe to Elbow	B-J B9.11	50%	UT exam limited due to weld geometry.
1	251350	SG-12-8	SG 12 Extension Ring to Tube Sheet	C-A C1.30	66%	UT exam limited due to weld geometry and permanent obstruction at outside surface.
1	252000	SCHE-11-1	11 Shutdown Cooling Heat Exchanger Flange to Channel Barrel	C-A C1.10	77%	UT exam limited due to flange geometry preventing examination from one side of the weld.
1	252350	SCHE-12-2	Tube Sheet To Channel Cover	C-A C1.10	65%	UT exam limited due to tubesheet geometry.
1	253250	RHE-9	Regenerative Heat Exchanger Shell to Tee	C-A C1.10	72%	UT exam limited due to tee geometry.
1	253600	RHE-16	Regenerative Heat Exchanger Tee to Shell	C-A C1.10	82%	UT exam limited due to tee geometry.
1	252450	SCHE-12-N2	Outlet Nozzle to Shell	C-B C2.21	52%	UT exam limited due to nozzle geometry preventing examination from one side of the weld.

**Table 2**  
**Relief Request ISI-6**

Unit	Summary No	Comp ID	Description	Category Item No.	Coverage	Reason
2	001210	1-204A	RPV Lower Head Meridional Weld @ 30 Degrees	B-A B1.22	50%	UT exam limited due to the proximity of the flow skirt on the vessel ID
2	001270	7-203	RPV Flange to Upper Shell	B-A B1.30	84%	UT exam limited due to the inside surface taper.
2	001280	6-209A	RPV Closure Head to Flange	B-A B1.40	65%	UT exam limited due to reactor vessel head shroud supports.
2	103040	2-401D	Pressurizer Lower Shell @ 0 Degrees	B-B B2.12	58%	UT exam limited due to permanent insulation support.
2	104060	21-1-111A	SG 21 Meridional Weld @ 66 Degrees	B-B B2.32	88%	UT exam limited due to coverage proximity of flow skirt to weld.
2	101210	10-205A	RPV Outlet Nozzle @ 0 Degrees	B-D B3.90	62%	UT exam limited due to nozzle configuration/ geometry.
2	101220	10-205B	RPV Outlet Nozzle @ 180 Degrees	B-D B3.90	62%	UT exam limited due to nozzle configuration/ geometry.
2	103080	4-404	Pressurizer Surge Line Nozzle	B-D B3.110	71%	UT exam limited due to permanent attachment and one sided exam from vessel side.
2	103090	4-405	Pressurizer Spray Nozzle to Upper Head	B-D B3.110	66.4%	UT exam limited due to nozzle configuration/ geometry and thermal sleeve.
2	103110	16-405B	Pressurizer Safety and Relief Nozzle to Upper Head	B-D B3.110	41.9%	UT exam limited due to configuration/ geometry.
2	104110	21-5-111A	SG 21 Loop 21A Outlet Nozzle to Shell	B-D B3.130	84%	UT exam limited due to nozzle configuration/ geometry and support skirt attachment to shell.
2	104120	21-5-111B	SG 21 Loop 21B Outlet Nozzle to Shell	B-D B3.130	80%	UT exam limited due to nozzle configuration/ geometry and support skirt attachment to shell.
2	104130	21-5-111C	SG 21 Loop 21 Inlet Nozzle to Shell	B-D B3.130	77%	UT exam limited due to nozzle configuration/ geometry and support skirt attachment to shell.
2	105110	22-5-111A	SG 22 Loop 22A Outlet Nozzle to Shell	B-D B3.130	84%	UT exam limited due to nozzle configuration/ geometry and support skirt attachment to shell.
2	105120	22-5-111B	SG 22 Loop 22B Outlet Nozzle to Shell	B-D B3.130	80%	UT exam limited due to nozzle configuration/ geometry and support skirt attachment to shell.
2	105130	22-5-111C	SG 22 Loop 22 Inlet Nozzle to Shell	B-D B3.130	77%	UT exam limited due to nozzle configuration/ geometry and support skirt attachment to shell.
2	109280	30-RC-21A-7	Elbow to Safe End	B-F B5.130	73%	UT exam limited due to geometry.

**Table 2**  
**Relief Request ISI-6**

Unit	Summary No	Comp ID	Description	Category Item No.	Coverage	Reason
2	109310	30-RC-21A-10	Safe End to Pipe	B-F B5.130	75.4%	UT exam limited due to configuration/ geometry.
2	110310	30-RC-21B-10	Safe End to Pipe	B-F B5.130	81.1%	UT exam limited due to configuration/ geometry.
2	136090	4-PS-2003-8	Safe End to Nozzle	B-F B5.40	75%	UT exam limited due to nozzle configuration/ geometry and thermal sleeve.
2	108045	42-RC-22- 2/12-SC-2004	Branch Connection	B-J B9.31	35.1%	UT exam limited due to configuration/ geometry.
2	109290	30-RC-21A-8	Safe End to Pump	B-J B9.11	29%	UT exam limited due to configuration/ geometry.
2	110010	30-RC-21B-1	Nozzle to Transition Piece	B-J B9.11	63.6%	UT exam limited due to nozzle configuration/ geometry and proximity adjacent weld.
2	110290	30-RC-21B-8	Safe End to Pump	B-J B9.11	41%	UT exam limited due to weld geometry and material of the Reactor Coolant Pump.
2	111300	30-RC-22A-9	Pump to Safe End	B-J B9.11	55%	UT exam limited due to weld geometry and material of the Reactor Coolant Pump.
2	112290	30-RC-22B-8	Safe End to Pump	B-J B9.11	41%	UT exam limited due to weld geometry and material of the Reactor Coolant Pump.
2	114940	12-SC-2004-5	Valve 2-MOV-652 to Elbow	B-J B9.11	59%	UT exam limited due to valve configuration/ geometry.
2	115010	12-SI-2009-3	Pipe to Valve 2-MOV-614	B-J B9.11	46%	UT exam limited due to valve configuration/ geometry.
2	115030	12-SI-2009- 4/6-SI-2001	Branch Connection	B-J B9.31	50%	UT exam limited due to configuration/ geometry.
2	115090	12-SI-2009-10	Valve 2-SI-217 to Elbow	B-J B9.11	84.2%	UT exam limited due to configuration/ geometry.
2	117030	12-SI-2011- 4/6-SI-2003	Branch Connection	B-J B9.31	50%	UT exam limited due to configuration/ geometry.
2	118030	12-SI-2012- 4/6-SI-2004C	Branch Connection	B-J B9.31	31%	UT exam limited due to branch configuration/ geometry.
2	118060	12-SI-2012-7	Pipe to Valve 2-SI-247	B-J B9.11	80%	UT exam limited due to valve configuration/ geometry.
2	123000	6-SI-2004C-1	Valve 2-SI-148 to Pipe	B-J B9.11	31%	UT exam limited due to valve configuration/ geometry.

**Table 2**  
**Relief Request ISI-6**

Unit	Summary No	Comp ID	Description	Category Item No.	Coverage	Reason
2	136030	4-PS-2003-3	Pipe to Tee	B-J B9.11	67%	UT exam limited due to tee configuration/ geometry.
2	141010	4-SR-2005-2	Pressurizer Safety and Relief Safe End to Elbow	B-J B9.11	63%	UT limited due to safe end configuration/ geometry.
2	202500	RHE-10	Regenerative Heat Exchanger Shell to Tee	C-A C1.10	72%	UT exam limited due to tee configuration/ geometry.
2	201050	SG-22-MS	SG 22 Vessel to Main Steam Nozzle	C-B C2.21	77.8%	UT exam limited due to nozzle configuration/ geometry.
2	201150	SG-22-FW	SG 22 Feedwater Nozzle to Vessel	C-B C2.21	76.2%	UT exam limited due to nozzle configuration/ geometry.
2	201400	SCHE-21-N1	Shutdown Cooling Heat Exchanger Inlet Nozzle	C-B C2.21	44%	UT exam limited due to nozzle geometry preventing examination from one side of the weld.
2	203300	RHE-25	Regenerative Heat Exchanger Pipe to Reducer	C-B C2.21	84%	UT exam limited due to configuration/ geometry.