



**Constellation  
Nuclear**

**Calvert Cliffs  
Nuclear Power Plant**

*A Member of the  
Constellation Energy Group*

June 4, 2001

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

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**REFERENCES:** (a) Letter from Mr. C. H. Cruse (BGE) to NRC Document Control Desk,  
dated June 30, 2000; Relief Request for the Second Ten-year Inservice  
Inspection Interval Concerning Volumetric Examination Coverage  
(b) Phone call between Mr. A. L. Simpson (CCNPP) and  
Mr. A. W. Dromerick (NRC), September 20, 2000

In Reference (a) Baltimore Gas and Electric Company (BGE) proposed 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). Attachment (1) to Reference (a), Relief Request No. ISI-6, proposed alternatives for those welds where it was impractical to perform a complete examination (i.e., at least 90 percent of the weld volume) due to the limitations of design, geometry, and materials of construction that are characteristic of a plant of our vintage. In a phone call with the Staff (Reference b), the Staff identified several areas where additional information was needed. Below are the Staff's requests and the responses.

**NRC Question**

Please provide the staff with the status of the augmented reactor pressure vessel (RPV) examinations required by 10 CFR 50.55a(g)(6)(ii)(A). Discuss the implementation schedule for the augmented RPV examinations, as well as the augmented examination coverages obtained for each Item B1.10 weld at Calvert Cliffs Nuclear Power Plant Unit Nos. 1 and 2.

**CCNPP Response**

In addition to ASME Section XI Inservice Inspection requirements, all licensees must implement, once during the lifetime of the facility, an augmented volumetric examination of the RPV welds in accordance with 10 CFR 50.55a(g)(6)(ii)(A), specified in Code Item B1.10 of Examination Category B-A of the 1989 Edition of the ASME Code, Section XI. Examination Category B-A, Items B1.11 and B1.12,

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require volumetric examination of essentially 100 percent of the RPV circumferential and longitudinal shell welds, as defined by Figures IWB-2500-1 and -2, respectively. Essentially, 100 percent is defined by 10 CFR 50.55a(g)(6)(ii)(A)(2), as greater than 90 percent of the examination volume of each weld.

The examinations required by 10 CFR 50.55a(g)(6)(ii)(A) were completed on both Units 1 and 2 in 1998 and 1999, respectively.

At Calvert Cliffs Nuclear Power Plant (CCNPP) Unit 1, the augmented examination coverage requirements could not be met for one weld (Summary No. 001100, Comp ID 10-203) which was listed in Table 1 of Reference (a). The examination coverage for this weld was limited due to physical restrictions to scanning caused by the core barrel support lugs and the reactor vessel flow skirt. If the required coverage can not be met, 10 CFR 50.55a(g)(6)(ii)(A)(5) requires an alternative to the examination requirements be proposed. To meet the coverage requirements for the subject weld from the inside surface would require design modifications to increase access to the inside diameter surface. Physical modification of the RPV to achieve coverage requirements is not practical.

Examination of the one weld from the outside diameter to increase the percent coverage was evaluated. The evaluation concluded that while supplemental outside examination could increase the total coverage, this examination was considered impractical due to the associated radiation exposure, estimated to be at least 4 Rem(R). The dose estimate includes all of the necessary support activities in addition to the actual examination. However, we were able to examine a considerable portion (76 percent) of the subject weld despite the difficult configuration. Therefore, we propose acceptance of the weld examination, as completed, as an alternative allowed under 10CFR 50.55a(g)(6)(ii)(A)(5).

The examination of the RPV welds provides an acceptable level of quality and safety. We obtained a very high cumulative coverage of all CCNPP Unit 1 RPV shell welds (Items B1.11 and B1.12) of greater than 96 percent. For CCNPP Unit 2, the requirements of 10 CFR 50.55a(g)(6)(ii)(A)(2) were met.

#### **NRC Question**

Describe the proposed alternative as required by 10 CFR 50.55a(g)(6)(ii)(A)(5) for the weld with incomplete augmented examination coverage. Provide a reference to 10 CFR 50.55a(g)(6)(ii)(A)(5) in the proposed alternative.

#### **CCNPP Response**

See response to previous question.

#### **NRC Question**

The limitations listed in Tables 1 and 2 of the request for relief do not provide enough detail to demonstrate the impracticality of performing the subject examinations. Please provide detailed information regarding the limitations associated with the subject welds.

#### **CCNPP Response**

As discussed in Reference (a), 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 percent 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 attached Tables 1 and 2 correct some typographical errors in the Component ID and Description columns from those in Reference (a). In addition, one item (Summary No. 114350) was removed from Table 1 because supplemental examination data was available which showed the examination coverage to be greater than 90 percent.

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

Very truly yours,



CHC/ALS/bjd

Attachments: (1) Table 1 - Relief Request No. ISI-6  
(2) Table 2 - Relief Request No. ISI-6

cc:	R. S. Fleishman, Esquire	H. J. Miller, NRC
	J. E. Silberg, Esquire	Resident Inspector, NRC
	Director, Project Directorate I-1, NRC	R. I. McLean, DNR
	D. M. Skay, NRC	

**ATTACHMENT (1)**

**TABLE 1**

**RELIEF REQUEST NO. ISI-6**

**ATTACHMENT (1)**

**Table 1**  
**Relief Request No. 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	11-5-111A	SG 11 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	11-5-111B	SG 11 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.

\*\* This weld subject to 10 CFR 50.55a(g)(6)(ii)(A)(2) Augmented RPV Examination Requirements.

**ATTACHMENT (1)**

**Table 1**  
**Relief Request No. ISI-6**

Unit	Summary No	Comp ID	Description	Category Item No.	Exam Coverage	Reason for Limitation
1	005450	11-5-111C	SG 11 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.
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					Deleted
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.

**ATTACHMENT (1)**

**Table 1**

**Relief Request No. 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.

**ATTACHMENT (2)**

**TABLE 2**

**RELIEF REQUEST NO. ISI-6**



**ATTACHMENT (2)**

**Table 2**  
**Relief Request No. 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.

**ATTACHMENT (2)**

**Table 2**  
**Relief Request No. 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.

**ATTACHMENT (2)**

**Table 2  
Relief Request No. 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.