10 CFR 50.90

CP&L
A Progress Energy Company

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United States Nuclear Regulatory Commission
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Washington, DC 20555

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
DOCKET NO. 50-261/LICENSE NO. DPR-23

RESPONSE TO REQUEST FOR ADDITIONAL
INFORMATION ON AMENDMENT REQUEST REGARDING ONE-TIME
EXTENSION OF CONTAINMENT TYPE A TEST INTERVAL (TAC NO. MB4658)

Ladies and Gentlemen:

On March 26, 2002, in accordance with the provisions of the Code of Federal Regulations, Title 10 (10 CFR), Part 50.90, Carolina Power & Light (CP&L) Company submitted a request for an amendment to the Technical Specifications (TS) for H. B. Robinson Steam Electric Plant (HBRSEP), Unit No. 2, that would permit a one-time extension of the containment Type A test interval. This initial submittal provided the basis and justification for a one-time, five year extension to the 10-year performance-based Type A test interval established in Nuclear Energy Institute (NEI) document 94-01, "Nuclear Energy Institute Industry Guideline for Implementing Performance-Based Option of 10 CFR Part 50, Appendix J," Revision 0, dated July 26, 1995.

By letter dated June 19, 2002, HBRSEP, Unit No. 2, provided the response to an NRC request for additional information (RAI) in support of the requested TS change.

On July 10 and 11, 2002, conference calls were conducted between NRC staff personnel and HBRSEP, Unit No. 2, which identified the need for additional refinements to the calculations performed in support of the requested TS change. The results of these refinements are provided by this letter and demonstrate that a one-time extension of 2.1 years for the containment Type A test will result in an acceptably low level of risk in terms of the postulated Large Early Release Frequency (LERF).

Attachment I provides an Affirmation as required by 10 CFR 50.30(b).

Attachment II provides the HBRSEP, Unit No. 2, response to the RAI.

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Robinson Nuclear Plant
3581 West Entrance Road
Hartsville, SC 29550

Attachment III provides the revised markup of the affected TS page reflecting the refined calculation that assumes a 2.1 year containment Type A test interval extension, rather than the five year interval extension that had been originally proposed.

Attachment IV provides the revised and retyped TS page.

The HBRSEP, Unit No. 2, submittal dated March 26, 2002, included an evaluation of No Significant Hazards to address the proposed TS change which, at that time, considered a one-time extension of the containment Type A test interval of five years. Refinements to the risk estimation associated with this change support a one-time extension of 2.1 years. In consideration of this revision to the proposed containment Type A test interval, a review has been conducted of the No Significant Hazards Consideration Determination provided within the HBRSEP, Unit No. 2, submittal dated March 26, 2002. This review concluded that this RAI response, including the revised containment Type A test interval extension from five years to 2.1 years, does not affect the basis or justification for the proposed TS change, including the evaluation of No Significant Hazards Consideration Determination previously provided within the March 26, 2002, submittal.

The HBRSEP, Unit No. 2, submittal dated March 26, 2002, requested approval of the proposed license amendment by August 1, 2002, with the amendment being implemented within 60 days of approval. In recognition of the additional time required to complete review of this RAI response, HBRSEP, Unit No. 2, requests a revised approval date of September 6, 2002, with the amendment being implemented within 30 days of approval. This requested approval date supports activities associated with Refueling Outage (RO) - 21, which is currently scheduled to begin on October 12, 2002.

In accordance with 10 CFR 50.91(b), CP&L is providing the State of South Carolina with a copy of this response.

If you have any questions concerning this matter, please contact Mr. C. T. Baucom.

Sincerely,

B. L. Fletcher III
Manager - Regulatory Affairs

CTB/ctb

Attachments:

I. Affirmation
II. Response to Request for Additional Information on Amendment Request Regarding One-Time Extension of Containment Type A Test Interval
III. Revised Markup of Affected Technical Specifications Page
IV. Revised and Retyped Technical Specifications Page

c: Mr. L. A. Reyes, NRC, Region II
Mr. H. J. Porter, Director, Division of Radioactive Waste Management (SC)
Mr. R. M. Gandy, Division of Radioactive Waste Management (SC)
Mr. R. Subbaratnam
NRC Resident Inspector
Attorney General (SC)

AFFIRMATION

The information contained in letter RNP-RA/02-0120 is true and correct to the best of my information, knowledge and belief; and the sources of my information are officers, employees, contractors, and agents of Carolina Power and Light Company. I declare under penalty of perjury that the foregoing is true and correct.

Executed on: AUG 0 8 2002

J. W. Moyer
Vice President, HBRSEP, Unit No. 2

H.B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2

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Background

On March 26, 2002, H. B. Robinson Steam Electric Plant (HBRSEP), Unit No. 2, submitted a request for an amendment to the Technical Specifications (TS) that would permit a one-time extension of the containment Type A test interval. This initial submittal provided the basis and justification for a one-time, five year extension to the 10-year, performance-based Type A test interval established in Nuclear Energy Institute (NEI) document 94-01, "Nuclear Energy Institute Industry Guideline for Implementing Performance-Based Option of 10 CFR Part 50, Appendix J," Revision 0, dated July 26, 1995.

By letter dated June 19, 2002, HBRSEP, Unit No. 2, provided the response to an NRC request for additional information (RAI) that included an estimation of risk due to containment liner corrosion using a method developed by Calvert Cliffs Nuclear Power Plant, Unit No. 1. During conference calls on July 10 and 11, 2002, between NRC staff personnel and HBRSEP, Unit No. 2, it was identified that additional refinements were needed to the HBRSEP, Unit No. 2, calculations performed for the risk estimation associated with containment liner corrosion.

Revisions to Containment Liner Corrosion Base Case

HBRSEP, Unit No. 2, has revised the calculations performed for the risk estimation associated with containment liner corrosion. Table 1 below provides the results of these refinements.

One such refinement includes the use of plant-specific information within Step 5 to address portions of the HBRSEP, Unit No. 2, containment liner that are not readily visible for inspection due to liner insulation. Another refinement involves a revised non-Large Early Release Frequency (non-LERF) Core Damage Frequency (CDF) due to internal events that has been refined to exclude sequences that cannot contribute to LERF.

Table 1
Containment Liner Corrosion Base Case

Step	Description	Containment Cylinder and Dome (83%)		Containment Basemat (17%)	
1	**Historical Liner Flaw Likelihood** Failure Data: Containment location specific. Success Data: Based on 70 steel-lined containments and 5.5 years since the 10 CFR 50.55 requirement for periodic visual inspections of containment surfaces.	Events: 2 (Brunswick 2 and North Anna 2) 2/(70*5.5) = 5.2E-3		Events: 0 (Assume a half failure) 0.5/(70*5.5) = 1.3E-3	
2	**Age Adjusted Liner Flaw Likelihood** During the 15-year interval, the assumed failure rate doubles every five years (14.9% increase per year). The average for the 5th to 10th year was set to the historical failure rate. (See Calvert Cliffs Nuclear Power Plant, Unit No. 1, response.)	Year	Failure Rate	Year	Failure Rate
		1 avg 5-10 15	2.1E-3 5.2E-3 1.4E-2	1 avg 5-10 15	5.0E-4 1.3E-3 3.5E-3
		15 year avg = 6.27E-3		15 year avg = 1.57E-3	
3	**Increase in Flaw Likelihood Between 3 and 15 Years** Uses age adjusted liner flaw likelihood (Step 2), assuming failure rate doubles every five years. (See Calvert Cliffs Nuclear Power Plant, Unit No. 1, response.)	8.7%		2.2%	

Step	Description	Containment Cylinder and Dome (83%)		Containment Basemat (17%)	
4	**Likelihood of Breach in Containment Given Liner Flaw**	Pressure (psia)	Likelihood of Breach	Pressure (psia)	Likelihood of Breach
	The upper end pressure is consistent with the HBRSEP, Unit No. 2, Probabilistic Risk Assessment (PRA) Level 2 analysis. 0.1% is assumed for the lower end. Intermediate failure likelihoods are determined through interpolation. The basemat is assumed to be 1/10 of the cylinder/dome analysis.	20 57 (ILRT) 100 120 145	0.1% 0.8% 8.3% 25.2% 100%	20 57 (ILRT) 100 120 145	0.01% 0.08% 0.83% 2.52% 10.0%
5	**Visual Inspection Detection Failure Likelihood**	77% The containment visual inspection failure likelihood was estimated to be 0.77. Approximately 74% of the containment cylinder and dome liner is covered by insulation and is not readily visible. It was assumed that the remaining approximately 26% which is visible would be visually examined during Refueling Outage (RO) - 21. A 5% probability was then assumed that visible failures would not be detected, and a 5% probability was assumed that flaws could exist, but would not be visible. 0.74 + (0.26 * (0.05 + 0.05))		100% Cannot be visually inspected.	
6	**Likelihood of Non-Detected Containment Leakage** (Steps 3*4*5)	0.054% 8.7% * 0.8% * 77%		0.0018% 2.2% * 0.08% * 100%	

The following values used in Table 1 were developed specifically for HBRSEP, Unit No. 2, while the remaining values in Table 1 were adopted from the methodology used by Calvert Cliffs Nuclear Power Plant, Unit No. 1:

Parameter	Value
Median Containment Failure Pressure	145 psia
ILRT Test Pressure	57 psia
Likelihood of Breach at ILRT Pressure	0.8%/0.08%
Fraction of Liner Area in Basemat Region	0.17
Fraction of Containment Cylinder and Dome Readily Visible	0.257

Based on the above, the total likelihood of corrosion-induced, non-detected containment leakage is the sum of Table 1, Step 6, for the containment cylinder and dome, and the containment basemat:

Total Likelihood of
Non-Detected Containment Leakage = 0.054% + 0.0018% = 0.056%

The non-LERF CDF due to internal events, with sequences excluded that cannot contribute to LERF, is 2.21E-5 per year. If all non-detectable containment leakage events are considered to be LERF, then the increase in LERF associated with containment liner corrosion is:

Increase in LERF (ILRT once
per three years to once per 15 years) = 0.056% * 2.21E-5 = 1.24E-8 per year

Reassessment of Risk Contribution Due to Extended Containment Type A Test Interval

As shown within the HBRSEP, Unit No. 2, submittal dated March 26, 2002, the contribution to Large Early Release Frequency (LERF) due to the postulated containment liner leakage is 1.98E-7 for the 10 year containment Type A test interval, and the net increase over baseline is 1.38E-7 (1.98E-7 minus 5.93E-8). To reduce the relative contribution to LERF associated with the proposed extension to the containment Type A test interval, the proposed extension was reduced from 15 years to 12.1 years. The net increase in LERF due the proposed 12.1 year containment Type A test interval can be calculated in the following manner:

((12.1/10) * 1.98E-7) - 5.93E-8 = 1.8E-7 per year

If the estimated increase in LERF associated with the proposed 12.1 year containment Type A test interval is adjusted by the Visual Inspection Detection Failure Likelihood from the revised Containment Liner Corrosion Base Case described above, the value for delta-LERF due to the proposed change may be determined as follows:

$$1.8E\text{-}7 * 0.77 = 1.4E\text{-}7$$

While NRC Regulatory Guide 1.174, "An Approach For Using Probabilistic Risk Assessments In Risk-Informed Decisions On Plant-Specific Changes To The Licensing Basis," dated July 1998, would define this change as "small," the estimated value is conservative. For example, postulated containment leakage paths can be detected in advance of the required containment Type A test through methods such as monitoring and trending of containment pressure. HBRSEP, Unit No. 2, regularly vents the containment via an operational pressure relief to maintain containment pressure within normal range and analytical limits. Should the postulated containment liner leak occur at HBRSEP, Unit No. 2, the routine operational venting frequency would be affected and investigated, resulting in the postulated containment liner leak being identified before the required containment Type A test.

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Revised Markup of Affected Technical Specifications Page

5.5 Programs and Manuals

5.5.16 Containment Leakage Rate Testing Program

This program provides controls for implementation of the leakage rate testing of the containment as required by 10 CFR 50.54(o) and 10 CFR 50, Appendix J, Option B, as modified by approved exemptions for Type A testing. This program shall be in accordance with the guidelines contained in Regulatory Guide 1.163, "Performance-Based Containment Leak-Test Program," dated September 1995, as modified by the following exception:

a. NEI 94-01 - 1995, Section 9.2.3: The first Type A test performed after the April 9, 1992, Type A test shall be performed no later than May 9, 2004.

. Type B and C testing shall be implemented in the program in accordance with the requirements of 10 CFR 50, Appendix J, Option A.

The peak calculated containment internal pressure for the design basis loss of coolant accident, P_a, is 40.5 psig.

The maximum allowable containment leakage rate, L_a, at P_a, shall be 0.1% of the containment air weight per day.

Leakage rate acceptance criteria are:

a. Containment leakage rate acceptance criteria is $\leq$ 1.0 L_a. During the first unit startup following testing in accordance with this program, the leakage rate acceptance criteria are $\leq$ 0.60 L_a for the Type B and Type C tests, and $\leq$ 0.75 L_a for Type A tests.

The provisions of SR 3.0.3 are applicable to the Containment Leakage Rate Testing Program.

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Revised and Retyped Technical Specifications Page

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5.5.16 Containment Leakage Rate Testing Program

This program provides controls for implementation of the leakage rate testing of the containment as required by 10 CFR 50.54(o) and 10 CFR 50, Appendix J, Option B, as modified by approved exemptions for Type A testing. This program shall be in accordance with the guidelines contained in Regulatory Guide 1.163, "Performance-Based Containment Leak-Test Program," dated September 1995, as modified by the following exception:

a. NEI 94-01 - 1995, Section 9.2.3: The first Type A test performed after the April 9, 1992, Type A test shall be performed no later than May 9, 2004.

Type B and C testing shall be implemented in the program in accordance with the requirements of 10 CFR 50, Appendix J, Option A.

The peak calculated containment internal pressure for the design basis loss of coolant accident, P_a, is 40.5 psig.

The maximum allowable containment leakage rate, L_a, at P_a, shall be 0.1% of the containment air weight per day.

Leakage rate acceptance criteria are:

a. Containment leakage rate acceptance criteria is $\leq$ 1.0 L_a. During the first unit startup following testing in accordance with this program, the leakage rate acceptance criteria are $\leq$ 0.60 L_a for the Type B and Type C tests, and $\leq$ 0.75 L_a for Type A tests.

The provisions of SR 3.0.3 are applicable to the Containment Leakage Rate Testing Program.

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