



Carolina Power & Light Company

Robinson Nuclear Plant
3581 West Entrance Road
Hartsville SC 29550

Serial: RNP-RA/00-0185

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United States Nuclear Regulatory Commission
Attn: Document Control Desk
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: RELIEF FROM ASME BOILER AND
PRESSURE VESSEL CODE, SECTION XI, REGARDING
SYSTEM PRESSURE TESTING - REQUEST NO. 25, REVISION 1**

Ladies and Gentlemen:

This letter contains responses to the NRC Request for Additional Information (RAI) regarding Carolina Power & Light (CP&L) Company's request for relief in accordance with 10 CFR 50.55a(a)(3) from the requirements of American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components." The relief request involves alternatives to hydrostatic testing for the H. B. Robinson Steam Electric Plant (HBRSEP), Unit No. 2 and was submitted by letter dated July 28, 2000.

Attachment I to this letter contains the responses to the NRC RAI in support of alternative examinations from those specified in Code Case N-498-1, "Alternative Rules for 10-Year System Hydrostatic Testing for Class 1, 2, and 3 Systems." Attachments II and III provide situation and system specific relief information.

If you have any questions concerning this matter, please contact Mr. H. K. Chernoff.

Sincerely,

A handwritten signature in cursive script that reads "R. L. Warden" followed by "(acting)" in parentheses.

R. L. Warden
Manager - Regulatory Affairs

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Attachments

- I. Response to Request for Additional Information: Relief from ASME Boiler and Pressure Vessel Code, Section XI, Regarding System Pressure Testing - Request No. 25, Revision 1
 - II. Relief Request No. 25, Revision 1, Revised Situation and System Specific Relief Information-Class 1
 - III. Relief Request No. 25, Revision 1, Revised Situation and System Specific Relief Information-Classes 2 and 3
- c: Mr. L. A. Reyes, NRC, Region II
Mr. R. Subbaratnam, NRC, NRR
NRC Resident Inspector, HBRSEP

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

RESPONSE TO REQUEST FOR ADDITIONAL
INFORMATION: RELIEF FROM ASME BOILER AND
PRESSURE VESSEL CODE, SECTION XI, REGARDING
SYSTEM PRESSURE TESTING - REQUEST NO. 25, REVISION 1

The NRC issued a Request for Additional Information (RAI) regarding Carolina Power & Light (CP&L) Company's request for relief in accordance with 10 CFR 50.55a(a)(3) from the requirements of American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components." The relief request involves alternatives to accepted Code Case N-498-1, "Alternative Rules for 10-Year System Hydrostatic Testing for Class 1, 2, and 3 Systems," for hydrostatic testing for the H. B. Robinson Steam Electric Plant (HBRSEP), Unit No. 2 and was submitted by letter dated July 28, 2000. The alternatives are to not pressurize to the second Class 1 isolation device and to pressurize certain portions of Class 2 and 3 systems with a hold time of 10 minutes as required by the 1986 Edition of the Code, no addenda, instead of the code case requirement of 4 hours. Responses to the RAI are provided below.

NRC Question:

1. "Class 1 Systems - The licensee states that '... relief is requested for Class 1 systems to avoid placing the plant in a condition in violation of the Technical Specifications.' Describe how the Technical Specifications will be violated if Code Case N-498-1 examination requirements are imposed on the subject Class 1 piping segments. Provide further information that describes all difficulties that may be associated with breeching the double isolation valves during operation, i.e., radiological conditions, problems with reseating of valves during operations, etc. In addition, for each of the Class 1 piping segments listed in the licensee's request, provide the piping diameter(s) and schedules, and the overall length of these segments."

Response:

Code Case N-498-1 Paragraph (a)(2) states, "The boundary subject to test pressurization during the system leakage test shall extend to all Class 1 pressure retaining components within the system boundary." In most instances, the H. B. Robinson Steam Electric Plant (HBRSEP), Unit No. 2 primary system boundary consists of a single vent or drain valve as the first barrier and a cap as the second barrier. In order to meet Code Case N-498-1 Paragraph (a)(2), vent valves and drain valves with a cap as the second isolation device would be required to be opened to allow the Reactor Coolant System (RCS) pressure to extend out to the caps. Once the VT-2 examinations were complete, the valves would be required to be closed. This test would be performed with the RCS system at a pressure of 2235 psig and at a temperature greater than 500°F. The Technical Specifications require that the primary system be operable under these conditions. Because no plant condition or required action is

allowed in Technical Specifications to voluntarily open one of the two primary system isolation devices under these conditions, opening of these valves to perform testing at these primary system conditions is prohibited by the Technical Specifications.

For double check valve arrangements, the portions of piping on the upstream side would require a temporary spool piece to be installed through a vent or drain valve while the primary system is at a pressure of 2235 psig and at a temperature greater than 500°F. Additionally, installation of an alternate pump source would be required to achieve the required pressure of 2235 psig. The caps are seal welded, providing additional difficulty with the installation. Because no plant condition or required action is allowed in Technical Specifications to voluntarily open a vent or drain valve and cap to install a spool piece not designed to original primary system specifications, with the primary system under these conditions, the installation of a spool piece is prohibited by the Technical Specifications. Because extending the test boundary to the second Class 1 isolation device is prohibited in Technical Specifications, the occupational dose for this procedure was not estimated.

Additionally, opening and closing of vent and drain lines in order to pressurize to the ASME B&PV Code boundary represents a hazard in the following outage due to the pressurized slug of water contained in the "dead legs" that would remain. To reduce the hazard from this condition, an additional valve manipulation would be required in order to relieve the pressure in the "dead leg" at the next outage, once the RCS was depressurized.

The piping diameters, schedules, and overall length for Class 1 piping segments are listed in Attachment II.

NRC Question:

2. "Class 2 Systems - The licensee states that 'These pumps are capable of operating for extended periods under low flow conditions, to perform their safety function, however, it is imprudent to incur the economic risk of extended operation of these pumps in the minimum flow recirculation mode during a test.' It is understood that conditions may exist (heat loading, etc.) which may make running the subject pumps in mini-flow unsuitable. However, economic issues are not considered hardships for elimination of examination requirements. Provide clarification explaining why an extended run time of the subject pumps is considered a hardship. In addition, describe how the subject tests were performed during the first and second intervals, i.e., by running of the pumps or by using externally applied hydro pumps via pressure taps, etc."

Response:

The proposed relief for Class 2 systems is to be applied only to the Safety Injection Pumps' and Containment Spray Pumps' discharge piping. Situation and system specific relief information is provided in Attachment III. The first and second 10-year Inservice Inspection (ISI) interval tests were performed by externally applying hydrostatic pumps to raise the

pressure to 1.25 times the design pressure. Hence, the installed Class 2 pumps have not been required to be run in mini-flow recirculation in order to perform hydrostatic testing. These pumps are prohibited by site operating procedures and manufacturers operation instructions from extended pump operation in the mini-recirculation mode. The Safety Injection pumps' operating procedure requires that the pumps be stopped immediately if the discharge pressure exceeds 1500 psig and the pump casing or recirculation piping is too hot to touch. The containment spray pumps are prohibited by procedures from running longer than 30 minutes in the mini-recirculation mode.

The current (i.e., 1986 Edition, no addenda) ASME B&PV Code requirements for the first and second periods of the third 10-year ISI interval, require a 10 minute hold time when performing the functional test specified by IWC-2500-1, Category C-H. Newer ASME B&PV Code editions, including the Code years and addenda approved in 10 CFR 50.55a, do not require hold times once the required pressure and temperature are reached.

NRC Question:

3. "Class 2 Systems - The licensee states that ' . . . a proposed minimum ten (10) minute hold time is sufficient to detect small leaks that might originate from small through-wall cracks of the pressure boundary.' The Staff agrees, provided the pressure boundary is non-insulated, and the examination conditions are such that adequate lighting, visibility, etc. are achievable (these are the current Code requirements). However, the Staff does not believe that a ten-minute hold time will allow moisture from small leaks to penetrate/saturate insulated systems sufficiently to allow leakage to be identified and the source located. The Staff also believes that industry experience supports the Code Case requirement for a four (4) hour hold time for insulated systems. It is understood from the licensee's submittal that this request for relief is for insulated systems. Therefore, provide evidence supporting the claim that a minimum ten minute hold time is sufficient to detect small leaks that might originate from small through-wall cracks of the pressure boundary of insulated systems or present discussion that demonstrates why compliance with the applicable code case requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety."

Response:

The proposed relief for Class 2 systems is to be applied only to the Safety Injection Pumps and Containment Spray Pumps discharge piping. These pumps are prohibited by site operating procedures and manufacturers operation instructions from extended pump operation in the mini-recirculation mode to avoid excessive heat build-up caused by reduced flow through the recirculation lines and to avoid hydraulic instability. NRC Bulletin No. 88-04, "Potential Safety-Related Pump Loss," addresses problems associated with Emergency Core Cooling System pumps and specifically identifies HBRSEP, Unit No. 2 as having the potential for pump damage due to the configuration of the recirculation piping.

The 1995 Edition, 1996 Addenda of ASME B&PV Code, Section XI, is the currently approved version of the Code in 10 CFR 50.55a. The currently approved edition of the Code requires no hold time for insulated and non-insulated systems. The elimination of the required hold times in later code editions was based on the application of the Class 1 system leakage test parameters, which require no hold time for VT-2 examination after attaining nominal operating pressure. The ASME working group considered that leakage would be detected at static pressures by trained VT-2 personnel in the form of wet insulation or accumulated leakages at, or beneath, the source.

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

RELIEF REQUEST NO. 25, REVISION 1, REVISED
SITUATION AND SYSTEM SPECIFIC RELIEF INFORMATION-CLASS 1

Relief Request No. 25 – Situation and System Specific Relief Information-Class 1

EXCEPTION	CODE CLASS	DIAMETER	PIPE SCHEDULE	LENGTH	CODE CAT.	RELIEF REQUEST
Drain legs below Pressurizer safety valve RC-551A (Pipe piece between RC-545 and RC-545A)	1	0.75"	A376 TP316 SMLS ¹ SCH 160	Approx. less than 1 foot	B-P	CP&L requests relief from cycling valve RC-545 in order to pressurize downstream Class 1 pipe piece and valve RC-545A
Drain legs below Pressurizer Safety Valve RC-551B (pipe piece between RC-546 and RC-546A)	1	0.75"	A376 TP316 SMLS SCH 160	Approx. less than 1 foot	B-P	CP&L requests relief from cycling valve RC-546 in order to pressurize downstream Class 1 pipe piece and valve RC-546A
Drain legs below Pressurizer Safety Valve RC-551C (pipe piece between RC-547 and RC-547A)	1	0.75"	A376 TP316 SMLS SCH 160	Approx. less than 1 foot	B-P	CP&L requests relief from cycling valve RC-547 in order to pressurize downstream Class 1 pipe piece and valve RC-547A
Vent valve and blind flange line on Pressurizer Spray Line	1	0.75"	A376 TP316 SMLS SCH 160	Approx. less than 1 foot	B-P	CP&L requests relief from cycling valve RC-527C in order to pressurize downstream Class 1 pipe piece and blind flange

¹ SMLS: Seamless

Relief Request No. 25 – Situation and System Specific Relief Information-Class 1

EXCEPTION	CODE CLASS	DIAMETER	PIPE SCHEDULE	LENGTH	CODE CAT.	RELIEF REQUEST
Reactor Coolant System (RCS) loop intermediate Loop "A" drain valve and Liquid Waste Disposal Piping	1	2"	A376 TP316 SMLS SCH 160	Approx. less than 1 foot	B-P	CP&L requests relief from cycling valve RC-505A in order to pressurize downstream Class 1 piping and valve RC-505B
RCS loop intermediate Loop "B" drain valve and Liquid Waste Disposal Piping	1	2"	A376 TP316 SMLS SCH 160	Approx. less than 7"	B-P	CP&L requests relief from cycling valve RC-508A in order to pressurize downstream Class 1 piping and valves RC-508B, and RC-542
		0.75"	A376 TP316 SMLS SCH 160	Approx. less than 1"		
RCS loop intermediate Loop "C" drain valve and Liquid Waste Disposal Piping	1	2"	A376 TP316 SMLS SCH 160	Approx. less than 7"	B-P	CP&L requests relief from cycling valve RC-515A in order to pressurize downstream Class 1 piping and valves RC-515B, and RC-601
		0.75"	A376 TP316 SMLS SCH 160	Approx. less than 1 foot		
Reactor Pressure Vessel (RPV) head vent valves and piping	1	0.75"	A376 TP316 SMLS SCH 160	Approx. less than 1 foot	B-P	CP&L requests relief from cycling valve RC-567 in order to pressurize downstream Class 1 piping and valves RC-572, RC-571, RC-569, and RC-570
		1"	A376 TP316 SMLS SCH 160	Approx. less than 1 foot		

Relief Request No. 25 – Situation and System Specific Relief Information-Class 1

EXCEPTION	CODE CLASS	DIAMETER	PIPE SCHEDULE	LENGTH	CODE CAT.	RELIEF REQUEST
Chemical and Volume Control System (CVCS) Reactor Coolant Pump (RCP) "A" seal injection drain valve and blind flange	1	0.75"	A376 TP316 SMLS SCH 160	Approx. less than 1 foot	B-P	CP&L requests relief from cycling valve CVC-300A in order to pressurize downstream pipe piece and flange
CVCS RCP "A" seal leakoff vent valve and blind flange	1	0.75"	A376 TP316 SMLS SCH 160	Approx. less than 1 foot	B-P	CP&L requests relief from cycling valve CVC-300C in order to pressurize downstream pipe piece and flange
CVCS RCP "A" seal water bypass drain valve and cap	1	0.75"	A376 TP316 SMLS SCH 160	Approx. less than 1 foot	B-P	CP&L requests relief from cycling valve CVC-307D in order to pressurize downstream pipe piece and cap
CVCS RCP "B" seal injection drain valve and blind flange	1	0.75"	A376 TP316 SMLS SCH 160	Approx. less than 1 foot	B-P	CP&L requests relief from cycling valve CVC-300D in order to pressurize downstream pipe piece and flange
CVCS RCP "B" seal leakoff vent valve and blind flange	1	0.75"	A376 TP316 SMLS SCH 160	Approx. less than 1 foot	B-P	CP&L requests relief from cycling valve CVC-300F in order to pressurize downstream pipe piece and flange

Relief Request No. 25 – Situation and System Specific Relief Information-Class 1

EXCEPTION	CODE CLASS	DIAMETER	PIPE SCHEDULE	LENGTH	CODE CAT.	RELIEF REQUEST
CVCS RCP "B" seal water bypass drain valve and cap	1	0.75"	A376 TP316 SMLS SCH 160	Approx. less than 1 foot	B-P	CP&L requests relief from cycling valve CVC-307E in order to pressurize downstream pipe piece and cap
CVCS RCP "B" seal water bypass drain valve and cap	1	0.75"	A376 TP316 SMLS SCH 160	Approx. less than 1 foot	B-P	CP&L requests relief from cycling valve CVC-307F in order to pressurize downstream pipe piece and cap
CVCS RCP "C" seal injection drain valve and blind flange	1	0.75"	A376 TP316 SMLS SCH 160	Approx. less than 1 foot	B-P	CP&L requests relief from cycling valve CVC-300G in order to pressurize downstream pipe piece and flange
CVCS RCP "C" seal leakoff vent valve and blind flange	1	0.75"	A376 TP316 SMLS SCH 160	Approx. less than 1 foot	B-P	CP&L requests relief from cycling valve CVC-300J in order to pressurize downstream pipe piece and flange
CVCS RCP "C" sealwater bypass drain valve and cap	1	0.75"	A376 TP316 SMLS SCH 160	Approx. less than 1 foot	B-P	CP&L requests relief from cycling valve CVC-307C in order to pressurize downstream pipe piece and cap

Relief Request No. 25 – Situation and System Specific Relief Information-Class 1

EXCEPTION	CODE CLASS	DIAMETER	PIPE SCHEDULE	LENGTH	CODE CAT.	RELIEF REQUEST
CVCS auxiliary spray valve and downstream piping	1	2"	A376 TP316 SMLS SCH 160	Approx. 500 feet	B-P	CP&L requests relief from cycling valve CVC-311 in order to pressurize downstream piping to check valve CVC-313
CVCS letdown drain valve and downstream cap	1	0.75"	A376 TP316 SMLS SCH 160	Approx. less than 1 foot	B-P	CP&L requests relief from cycling valve CVC-460H in order to pressurize downstream pipe piece and cap
CVCS letdown vent valve and downstream cap	1	0.75"	A376 TP316 SMLS SCH 160	Approx. less than 1 foot	B-P	CP&L requests relief from cycling valve CVC-460G in order to pressurize downstream pipe piece and cap
CVCS letdown drain valve and downstream cap	1	0.75"	A376 TP316 SMLS SCH 160	Approx. less than 1 foot	B-P	CP&L requests relief from cycling valve CVC-475 in order to pressurize downstream pipe piece and cap
Safety Injection (SI) Loop "A" low head vent valve and cap	1	0.75"	A376 TP316 SMLS SCH 160	Approx. less than 1 foot	B-P	CP&L requests relief from cycling valve SI-875N in order to pressurize downstream pipe piece and cap

Relief Request No. 25 – Situation and System Specific Relief Information-Class 1

EXCEPTION	CODE CLASS	DIAMETER	PIPE SCHEDULE	LENGTH	CODE CAT.	RELIEF REQUEST
SI Loop "B" low head vent valve and cap	1	0.75"	A376 TP316 SMLS SCH 160	Approx. less than 1 foot	B-P	CP&L requests relief from cycling valve SI-875P in order to pressurize downstream pipe piece and cap
SI Loop "C" low head vent valve and cap	1	0.75"	A376 TP316 SMLS SCH 160	Approx. less than 1 foot	B-P	CP&L requests relief from cycling valve SI-875T in order to pressurize downstream pipe piece and cap
SI Loop "A" low head check valve SI-875A and upstream piping	1	0.75"	A376 TP316 SMLS SCH 160	Approx. less than 1 foot	B-P	CP&L requests relief from disassembling or installing jumpers in order to pressurize upstream piping and valves SI-873A, SI-850B, SI-876A, SI-875H, and SI-865A to RCS pressure
		8"	A376 TP316 SMLS SCH 120	Approx. 3 feet		
		10"	A376 TP316 SMLS SCH 140	Approx. 62 feet		
SI Loop "B" low head check valve SI-875B and upstream piping	1	0.75"	A376 TP316 SMLS SCH 160	Approx. less than 1 foot	B-P	CP&L requests relief from disassembling or installing jumpers in order to pressurize upstream piping and valves SI-875S, SI-873E, SI-850D, SI-876E, and SI-876B, SI-875J, and SI-875E to RCS pressure
		8"	A376 TP316 SMLS SCH 120	Approx. 5 feet		
		10"	A376 TP316 SMLS SCH 140	Approx. 52 feet		

Relief Request No. 25 – Situation and System Specific Relief Information-Class 1

EXCEPTION	CODE CLASS	DIAMETER	PIPE SCHEDULE	LENGTH	CODE CAT.	RELIEF REQUEST
SI Loop "C" low head check valve SI-875C and upstream piping	1	0.75"	A376 TP316 SMLS SCH 160	Approx. less than 1 foot	B-P	CP&L requests relief from disassembling or installing jumpers in order to pressurize upstream piping and valves SI-875R, SI-873D, SI-850F, SI-875L, SI-875F, and SI-876C to RCS pressure
		8"	A376 TP316 SMLS SCH 120	Approx. 8 feet		
		10"	A376 TP316 SMLS SCH 140	Approx. 63 feet		
SI Loop "B" high head check valve SI-874B and upstream piping	1	2"	A376 TP316 SMLS SCH 160	Approx. 92 feet	B-P	CP&L requests relief from disassembling or installing jumpers in order to pressurize upstream piping and valves SI-874C, and SI-866B
SI Loop "C" high head check valve SI-874A and upstream piping	1	2"	A376 TP316 SMLS SCH 160	Approx. 44 feet	B-P	CP&L requests relief from disassembling or installing jumpers in order to pressurize upstream piping and valves SI-874D, and SI-866A
Residual Heat Removal (RHR) motor operated valves	1	14"	A376 TP316 SMLS SCH 140	Approx. 42 feet	B-P	CP&L requests relief from cycling valve RHR-750 in order to pressurize downstream piping and valve RHR-751

United States Nuclear Regulatory Commission

Attachment III to Serial: RNP-RA/00-0185

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

RELIEF REQUEST NO. 25, REVISION 1, REVISED
SITUATION AND SYSTEM SPECIFIC RELIEF INFORMATION- CLASSES 2 AND 3

Relief Request No. 25 – Revised Situation and System Specific Relief Information- Classes 2 and 3

EXCEPTION	CODE CLASS	CODE CAT.	RELIEF REQUEST
Containment Spray (CS) Pump and associated piping	2	C-H	CP&L requests relief to use a 10 minute hold time in lieu of the 4 hour hold time requirement for insulated systems prior to VT-2 examination
SI Pumps and associated piping	2	C-H	CP&L requests relief to use a 10 minute hold time in lieu of the 4 hour hold time requirement for insulated systems prior to VT-2 examination
Auxiliary Feedwater (AFW) Pumps and associated piping	3	D-A	CP&L requests relief to use a 10 minute hold time in lieu of the 4 hour hold time requirement for insulated systems prior to VT-2 examination
AFW Pump steam supply and associated piping	3	D-A	CP&L requests relief to use a 10 minute hold time in lieu of the 4 hour hold time requirement for insulated systems prior to VT-2 examination