March 16, 2001

Mr. J. W. Moyer, Vice President
Carolina Power & Light Company
H. B. Robinson Steam Electric Plant,
Unit No. 2
3581 West Entrance Road
Hartsville, South Carolina 29550

SUBJECT: H. B. ROBINSON ELECTRIC PLANT, UNIT NO. 2, REQUEST FOR RELIEF (RELIEF REQUEST NO. 25, REVISION 1) FROM AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME) BOILER AND PRESSURE VESSEL (B&PV) CODE, SECTION XI, RE: SYSTEM HYDROSTATIC TESTS (TAC NO. MA9602)

Dear Mr. Moyer:

By letter dated July 28, 2000, the licensee for H. B. Robinson Steam Electric Plant, Unit 2 (HBRSEP2) submitted Request for Relief No. 25, Revision 1, from requirements of Section XI of the ASME B&PV Code system hydrostatic tests, in accordance with Examination Category B-P, paragraph IWB-5222, and Code Case N-498-1 for Class 1 systems and components in Part A, and Examination Categories C-H, D-A, D-B, and D-C, paragraphs IWC-5222 and IWD-5223, and Code Case N-498-1 for Class 2 and 3 systems and components in Part B. Additional information was provided by the licensee in letters dated November 16, 2000, and January 24, 2001.

Based on the information provided in the licensee's request, the staff authorizes relief from the Code and Code Case N-498-1 requirements and authorizes the licensee-proposed alternatives to the examination requirements for examination categories B-P (Part A) of the relief request (for Class 1 systems and components, see table in section 2.1 for details of granted relief) and category C-H, D-A, D-B and D-C (Part B) of the relief request (for Class 2 and 3 systems and components, see table in section 2.2 for details of granted relief). The staff has concluded that imposition of these Code requirements on the licensee would cause a significant burden that would not be compensated by an increase in the level of quality and safety. Therefore, the staff authorizes the licensee's proposed alternative pursuant to 10 CFR 50.55a(a)(3)(ii). The staff has concluded that the alternative procedure will provide reasonable assurance of structural integrity.

This relief is authorized for the third 10-year inservice inspection interval for HBRSEP2, which began on February 19, 1992. Further details regarding the staff's conclusion are contained in the enclosed Safety Evaluation.

Sincerely,

/RA by K. Jabbour Acting for/

Richard P. Correia, Chief, Section 2
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-261

Enclosure: Safety Evaluation

cc w/encl: See next page

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

THIRD 10-YEAR INTERVAL INSERVICE INSPECTION PROGRAM

RELIEF REQUEST NO. 25, REV. 1 FROM ASME CODE,SECTION XI REQUIREMENTS

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

DOCKET NUMBER 50-261

1.0 INTRODUCTION

Inservice inspection (ISI) of the American Society of Mechanical Engineers (ASME) Code Class 1, 2, and 3 components is to be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel (B&PV) Code and applicable addenda as required by 10 CFR 50.55a(g), except where specific written relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i). 10 CFR 50.55a(a)(3) states that alternatives to the requirements of paragraph (g) may be used, when authorized by the NRC, if the licensee demonstrates that: (i) the proposed alternatives would provide an acceptable level of quality and safety or (ii) compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

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 limitations of design, geometry, and materials of construction of the components. The regulations require that inservice examination of components and system pressure tests conducted during the first 10-year interval and subsequent intervals comply with the requirements in the latest edition and addenda of Section XI of the ASME Code incorporated by reference in 10 CFR 50.55a(b) 12 months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein. The Code of record for the H. B. Robinson Steam Electric Plant, Unit 2 (HBRSEP2) third 10-year ISI interval is the1986 Edition of the ASME B&PV Code.

2.0 EVALUATION

The NRC staff has reviewed the information concerning third 10-year ISI program Request for Relief No. 25, Revision 1, for HBRSEP2 in Carolina Power & Light Company (CP&L, the licensee) letter dated July 28, 2000. Additional information was provided by the licensee in its letters dated November 16, 2000, and January 24, 2001.

2.1 Request for Relief No. 25, Revision 1 (Part A), Alternative Examinations to the 10-Year Hydrostatic Test for Class 1, 2, and 3 Systems

Code Requirement: Examination Category B-P requires system hydrostatic tests in accordance with paragraph IWB-5222, for Class 1 systems and components. In addition,

Code Case N-498-1, "*Alternative Rules for 10-Year System Hydrostatic Testing of Class 1, 2, and 3 Systems*, Section XI, Division 1, has been incorporated into Regulatory Guide 1.147, Revision 12, May 1999. Code Case N-498-1, which provides an alternative to system hydrostatic tests in the form of a system leakage test in accordance with paragraph IWB-5221 for Class 1 systems, has been invoked by the licensee.

The following is a list of Class 1 piping segments for which relief is requested.

Pipe Segment	Code Cat.	Schedule Diameter	Length	Request
Drain legs below Pressurizer safety valve RC-551A (Pipe piece between RC-545 and RC-545A)	B-P	SCH 160 .75" Dia	<1'	Relief is requested from cycling valve RC-545 in order to pressurize downstream pipe piece and RC-545A.
Drain legs below Pressurizer safety valve RC-551B (Pipe piece between RC-546 and RC-546A)	B-P	SCH 160 .75" Dia	<1'	Relief is requested from cycling valve RC-546 in order to pressurize downstream pipe piece and RC-546A.
Drain legs below Pressurizer safety valve RC-551C (Pipe piece between RC-547 and RC-547A)	B-P	SCH 160 .75" Dia	<1'	Relief is requested from cycling valve RC-547 in order to pressurize downstream pipe piece and RC-547A.
Vent valve and blind flange line on Pressurizer Spray Line	B-P	SCH 160 .75" Dia	<1'	Relief is requested from cycling valve RC-527C in order to pressurize downstream pipe piece and blind flange.
Reactor Coolant System (RCS) loop intermediate Loop "A" drain valve and Liquid Waste Disposal Piping	B-P	SCH 160 2" Dia	<1'	Relief is requested from cycling valve RC-505A in order to pressurize downstream pipe piece and RC-505B.
RCS loop intermediate Loop "B" drain valve and Liquid Waste Disposal Piping	B-P	SCH 160 2" .75"	<7" <1"	Relief is requested from cycling valve RC-508A in order to pressurize downstream pipe piece and valves RC-508B, and RC-542.
RCS loop intermediate Loop "C" drain valve and Liquid Waste Disposal Piping	B-P	SCH 160 2" .75"	<7" <1'	Relief is requested from cycling valve RC-515A in order to pressurize downstream pipe piece and valves RC-515B, and RC-601.
Reactor Pressure Vessel (RPV) head vent valves and piping	B-P	SCH 160 .75" 1"	<1' <1'	Relief is requested from cycling valve RC-567 in order to pressurize downstream pipe piece and valves, RC-572, RC-571, RC-569, and RC-570.
Chemical and Volume Control System (CVCS) Reactor Coolant Pump (RCP) "A" seal injection drain valve and blind flange	B-P	SCH 160 .75"	<1'	Relief is requested from cycling valve CVC-300A in order to pressurize downstream pipe piece and flange.
CVCS RCP "A" seal leakoff vent valve and blind flange	B-P	SCH 160 .75"	<1'	Relief is requested from cycling valve CVC-300C in order to pressurize downstream pipe piece and flange.
CVCS RCP "A" seal water bypass drain valve and cap	B-P	SCH 160 .75"	<1'	Relief is requested from cycling valve CVC-307D in order to pressurize downstream pipe piece and cap.

Pipe Segment	Code Cat.	Schedule Diameter	Length	Request
CVCS RCP “B” seal injection drain valve and blind flange	B-P	SCH 160 .75"	<1'	Relief is requested from cycling valve CVC-300D in order to pressurize downstream pipe piece and flange.
CVCS RCP “B” seal leakoff vent valve and blind flange	B-P	SCH 160 .75"	<1'	Relief is requested from cycling valve CVC-300F in order to pressurize downstream pipe piece and flange.
CVCS RCP “B” seal water bypass drain valve and cap	B-P	SCH 160 .75"	<1'	Relief is requested from cycling valve CVC-307E in order to pressurize downstream pipe piece and cap.
CVCS RCP “B” seal water bypass drain valve and cap	B-P	SCH 160 .75"	<1'	Relief is requested from cycling valve CVC-307F in order to pressurize downstream pipe piece and cap.
CVCS RCP “C” seal injection drain valve and blind flange	B-P	SCH 160 .75"	<1'	Relief is requested from cycling valve CVC-300G in order to pressurize downstream pipe piece and flange.
CVCS RCP “C” seal leakoff vent valve and blind flange	B-P	SCH 160 .75"	<1'	Relief is requested from cycling valve CVC-300J in order to pressurize downstream pipe piece and flange.
CVCS RCP “C” seal water bypass drain valve and cap	B-P	SCH 160 .75"	<1'	Relief is requested from cycling valve CVC-307C in order to pressurize downstream pipe piece and cap.
CVCS auxiliary spray valve and downstream piping	B-P	SCH 160 2"	500'	Relief is requested from cycling valve CVC-311 in order to pressurize downstream piping to check valve CVC-313.
CVCS letdown drain valve and downstream cap	B-P	SCH 160 .75"	<1'	Relief is requested from cycling valve CVC-460H in order to pressurize downstream pipe piece and cap.
CVCS letdown drain valve and downstream cap	B-P	SCH 160 .75"	<1'	Relief is requested from cycling valve CVC-460G in order to pressurize downstream pipe piece and cap.
CVCS letdown drain valve and downstream cap	B-P	SCH 160 .75"	<1'	Relief is requested 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	B-P	SCH 160 .75"	<1'	Relief is requested from cycling valve SI-875N in order to pressurize downstream pipe piece and cap.
Safety Injection (SI) Loop “B” low head vent valve and cap	B-P	SCH 160 .75"	<1'	Relief is requested from cycling valve SI-875P in order to pressurize downstream pipe piece and cap.
Safety Injection (SI) Loop “C” low head vent valve and cap	B-P	SCH 160 .75"	<1'	Relief is requested from cycling valve SI-875T in order to pressurize downstream pipe piece and cap.
Safety Injection (SI) Loop “A” low head check valve SI-875A and upstream piping	B-P	SCH 160 .75" SCH 120 8" SCH 140 10"	<1' 3' 62'	Relief is requested 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.

Pipe Segment	Code Cat.	Schedule Diameter	Length	Request
Safety Injection (SI) Loop "B" low head check valve SI-875B and upstream piping	B-P	SCH 160 .75" SCH 120 8" SCH 140 10"	<1' 5' 52'	Relief is requested 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.
Safety Injection (SI) Loop "C" low head check valve SI-875C and upstream piping	B-P	SCH 160 .75" SCH 120 8" SCH 140 10"	<1' 8' 63'	Relief is requested from disassembling or installing jumpers in order to pressurize upstream piping and valves SI-875R, SI-873D, SI-850F, SI-875L, and SI-876C, to RCS pressure.
Safety Injection (SI) Loop "B" high head check valve SI-874B and upstream piping	B-P	SCH 160 2"	92'	Relief is requested from disassembling or installing jumpers in order to pressurize upstream piping and valves SI-874C and SI-866B.
Safety Injection (SI) Loop "C" high head check valve SI-874A and upstream piping	B-P	SCH 160 2"	44'	Relief is requested 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	B-P	SCH 140 14"	42'	Relief is requested from cycling valve RHR-750 in order to pressurize downstream piping and valve RHR-751.

Licensee's Proposed Alternative: In accordance with 10 CFR 50.55a(a)(3)(ii), the licensee proposed an alternative to the examination requirements in examination category B-P, and Code Case N-498-1. The licensee stated:

"Small Size Class I System Vent, Drain, Test and Fill Lines

"CP&L has requested relief from fully pressurizing piping between the first and second isolation device on small size vent and drain lines. There are twenty-six vent, drain, test and fill lines in the Reactor Coolant System (RCS) ranging in size from 3/4 inch to two inches. These piping configurations were identified by CP&L letters dated July 28, 2000, and November 16, 2000. The configurations are either two small isolation valves in series, a valve and blind flange, or a valve and cap. In some configurations, the piping between the two vent and drains will tee to a third valve that is also the second isolation boundary. The piping segments provide the design required double isolation barrier for the reactor coolant pressure boundary. The Code Case system pressurization test would be performed in MODE 3 at the normal operating pressure of 2235 psig at a nominal

temperature of about 547°F. Pressure testing of these piping segments at nominal operating pressure in MODE 3 would require the opening of the inboard isolation valve at the normal operating RCS temperature and pressure conditions. In so doing, the design requirement for two primary coolant pressure boundary isolation devices would be violated. Additionally, opening of these valves introduces the potential risk for spills and personnel contamination. For configurations where blind flanges or caps are installed as the isolation device, opening of the inboard valve introduces the possibility of a personnel safety hazard if a flange or cap fails in the presence of inspection personnel.

"Hydrostatic pressure testing in MODEs 5 and 6 would require a hydrostatic pump to be connected at each segment location. Code case pressure testing while defueled would require re-installation of the reactor vessel head and re-pressurizing the RCS out to the second isolation valve. For vent, drain, test, and fill lines that consist of only a first and second primary isolation device for the reactor coolant pressure boundary, and do not have a third 'tee' connection, a modification for installation of a pump connection would be required to pressurize the segment.

"For vent, drain, test, and fill lines located overhead and away from normal personnel access areas, ladders or scaffolding would have to be installed to provide access to the piping segment in order to open the valve. This process would add to the radiation exposure dose associated with pressure testing these lines.

"The RCS vent, drain, test, and fill lines are located in areas involving occupational radiation exposure, and pressure testing of these lines would increase occupational radiation dose. A breakdown of the occupational does estimates for each type of line is provided below.

1.	Pressurizer safety valve drain legs and spray line vent (4 items)	160 mrem
2.	RCS Loop drain legs (3 items)	400 mrem
3.	Reactor Vessel Head Vents (1 item)	150 mrem
4.	Reactor Coolant Pump (RCP) Seal injection and leakoff vents and drains (10 items)	240 mrem
5.	Chemical and Volume Control (CVCS) letdown vent and drains (3 items)	300 mrem
6.	Safety Injection Loop vents (3 items)	330 mrem

"Based upon these estimated dose rates, a total dose estimate of 1580 mrem is predicted to be required to pressure test small vents, drains, test, and fill lines by opening the primary inboard isolation device. This dose is exclusive of the dose incurred to install scaffolding, which is approximately 3.84 rem. These occupational radiation exposure estimates are based on a pressure test in MODE 5 or 6 when each of the blind flanges, caps, or outboard isolation valves is removed or opened, a test flange installed, and a

hydrostatic pump connected. Personnel would be in the area to install scaffolding where necessary, connect and disconnect the test equipment, perform the test, and restore the system to the pre-test configuration.

"These piping segments are VT-2 inspected through the entire length as part of the Class 1 system inspection at the conclusion of each refueling outage. The proposed system pressure tests will not specifically pressurize past the first isolation valve for this inspection. No external or visible leakage will be allowed for a test to be successful. Since this type of test will assure that the combined first and second isolation devices are effective in maintaining the reactor coolant pressure boundary at normal operating temperature and pressure, the increase in safety achieved from the required Code Case pressure test is not commensurate with the hardship of performing such testing.

"Larger Size Class 1 Piping Segments

"Pressurizer Spray and Auxiliary Spray Lines

"CP&L withdraws its request for relief for the Pressurizer Spray and Auxiliary Spray lines. During MODE 3, the Pressurizer is at the high point of the RCS at normal operating pressure and temperature. In such a condition, the Pressurizer level is normally in automatic pressure control, which will result in system pressurization of the spray lines. The Auxiliary Spray line need only be actuated sufficiently to result in a spray to pressurize that line.

"14 Inch Residual Heat Removal Motor Operated Valves

"This piping segment consists of 42 feet of 10 inch piping between Residual Heat Removal (RHR) inlet valves RHR-750 and RHR-751. These valves are interlocked at a required setpoint of $\leq$ 474 psig to avoid over-pressurization of the RHR system. The interlock prevents manual opening of the valves from the Control Room with RCS pressure above the setpoint. There are no test connection points in this segment of the line. This segment was last tested during the second ten-year Inservice Inspection interval, with the vessel defueled, as part of the RCS hydrostatic test.

"The piping segment is VT-2 inspected through the entire length as part of the Class 1 system inspection at the conclusion of each refueling outage. The proposed system pressure test will not specifically pressurize past the first isolation valve for this inspection. It is possible that the piping becomes pressurized due to minor leakage past the first isolation valve. No external or visible leakage will be allowed for the test to be successful. This test will provide assurance that the combined first and second isolation valves are effective in maintaining the reactor coolant pressure boundary at normal operating temperature and pressure. The segment is inspected again once per period as part of the Class 2 system inspection for the RHR system.

"Safety Injection Loops Low Head Check Valves SI-875AIBIC and Upstream Piping

"These three piping segments consist of a 3 foot 8 inch piping span connected by a tee to a 10 inch piping span along with a short 3/4 inch connection. These lines are for injecting low head Emergency Core Cooling System (ECCS) water from the accumulators and the low head safety injection system (i.e., RHR system in ECCS configuration). The primary isolation and secondary isolation devices for the 8 inch and 10 inch lines are check valves

oriented to flow into the RCS. The piping segments provide the design required double isolation barrier for the reactor coolant pressure boundary. Pressure testing of these piping segments in MODEs 5 and 6 would require a modification to the plant to allow pressurizing the piping segments between the primary and secondary isolation devices at the hydrostatic pressure without pressurizing the RCS.

"Pressure testing in MODE 3 would require a hydrostatic pump be connected at each segment location. In so doing, the design requirement for two primary coolant pressure boundary isolation devices would be violated. For test locations located overhead and away from normal personnel access areas, ladders or scaffolding would have to be installed to provide access to the piping segment and open the valve. This process would add to the occupational dose associated with pressure testing these lines.

"These lines are located in areas involving occupational radiation exposure and pressure testing of these lines would increase occupational radiation dose. A total dose estimate of 600 mrem is predicted to pressure test these lines by installation of test lines and pressurizing the segments. These occupational radiation exposure estimates are based on a pressure test in MODE 3 when a test connection is installed and a hydrostatic pump connected. Personnel would be in the area to install scaffolding where necessary, connect and disconnect the test equipment, perform the test, and restore the system to the pre-test configuration.

"The piping segments are VT-2 inspected through the entire length as part of the Class 1 system inspection at the conclusion of each refueling outage. The proposed system pressure test will not specifically pressurize past the first isolation valve for this inspection. It is possible that the piping becomes pressurized due to minor leakage past the first isolation valve. Otherwise, the pressure in the segment will be at least at the operating pressure of the Accumulators, which are pressurized to between 600 and 660 psig. No external or visible leakage will be allowed for the test to be successful. Since this test will assure that the combined first and second isolation devices are effective in maintaining the reactor coolant pressure boundary at normal operating temperature and pressure, the increase in safety achieved from the required Code Case pressure test is not commensurate with the hardship of performing such testing. The segment is inspected again once per period as part of the Class 2 system inspection for the SI system.

"*Safety Injection [SI] Loop "B' and 'C' High Head Check Valves SI-874AIB and Upstream Piping*

"These two piping segments consist of a 2 inch piping span between two check valves oriented toward the RCS. These lines are for injecting high head ECCS water into the hot legs after an accident. The primary and secondary isolation devices are an inboard check valve oriented to flow into the RCS and an outboard motor-operated valve. The piping segments provide the design required double isolation barrier for the reactor coolant pressure boundary. Pressure testing of these piping segments at nominal operating pressure in MODE 3 would require a modification to allow pressurizing to the normal operating RCS temperature and pressure conditions. Pressure testing in MODEs 5 and 6 would require a modification to allow a hydrostatic pump to be connected at each segment location.

"The piping segments are VT-2 inspected through the entire length as part of the Class 1 system inspection at the conclusion of each refueling outage. The proposed system

pressure test will not specifically pressurize past the first isolation valve for this inspection. It is possible that the piping becomes pressurized due to minor leakage past the first isolation valve. No external or visible leakage will be allowed for the test to be successful. This test will assure that the combined first and second isolation valves are effective in maintaining the reactor coolant pressure boundary at normal operating temperature and pressure. The segment is inspected again once per period as part of the Class 2 system inspection for the SI system."

Evaluation:
The Code requires that a system hydrostatic test be performed once per interval to include all Class 1, 2, and 3 components within the RCS system boundary. Code Case N-498-1 requires that a system test be performed at or near the end of each inspection interval on all Class 1, 2, and 3 pressure-retaining components within the system boundary. The licensee has requested relief from fully pressurizing piping between the first and second isolation device on selected Class 1 components noted in the table above.

Small Size Class I System Vent, Drain, Test and Fill Lines :
There are 26 vent, drain, test and fill lines in the RCS ranging in size from 3/4 inch to 2 inches. The configurations are either two small isolation valves in series, a valve and blind flange, or a valve and cap. In some configurations, the piping between the two vent and drains will tee to a third valve that is also the second isolation boundary. Opening of these valves introduces the potential risk for spills and personnel contamination. For configurations where blind flanges or caps are installed as the isolation device, opening of the inboard valve introduces the possibility of a personnel safety hazard if a flange or cap fails in the presence of inspection personnel. In addition, hydrostatic pressure testing in MODEs 5 and 6 would require a hydrostatic pump to be connected at each segment location. Code case pressure testing while defueled would require re-installation of the reactor vessel head and re-pressurizing the RCS out to the second isolation valve. For vent, drain, test, and fill lines that consist of only a first and second primary isolation device for the reactor coolant pressure boundary, and do not have a third 'tee' connection, a modification for installation of a pump connection would be required to pressurize the segment. The licensee predicted that the total dose to pressure test small vents, drains, and test and fill lines would be 1580 mrem. In addition, the dose to install scaffolding would be approximately 3.84 rem. Based on the above evaluation and the staff's determination, it is found that imposition of the Code requirements on the licensee would cause a hardship that would not be compensated by an increase in the level of quality and safety. The licensee's proposed alternative provides reasonable assurance that the subject line segments' leakage integrity will be maintained.

Pressurizer Spray and Auxiliary Spray Lines :
In its letter dated January 24, 2001, the licensee withdrew its request for relief for the Pressurizer Spray and Auxiliary Spray lines.

14 Inch Residual Heat Removal Motor Operated Valves :
The licensee noted that the subject piping segment consists of 42 feet of 10-inch piping between RHR inlet valves RHR-750 and RHR-751. These valves are interlocked and the interlock prevents manual opening of the valves from the Control Room with RCS pressure above the setpoint. There are no test connection points in this segment of the line. This segment was last tested during the second 10-year ISI interval, with the vessel defueled, as part of the RCS hydrostatic test. This piping segment is VT-2 inspected

through the entire length as part of the Class 1 system inspection at the conclusion of each refueling outage. The proposed system pressure test will not specifically pressurize past the first isolation valve for this inspection and the licensee will not allow external or visible leakage for the test. The segment is inspected again once per period as part of the Class 2 system inspection for the RHR system. Based on the above evaluation and the staff's determination, it is found that imposition of the Code requirements on the licensee would cause a significant burden that would not be compensated by an increase in the level of quality and safety. The licensee's proposed alternative provides reasonable assurance that the subject line segments' leakage integrity will be maintained.

Safety Injection Loops Low Head Check Valves SI-875AIBIC and Upstream Piping
These three piping segments consist of a 3-foot 8-inch piping span connected by a tee to a 10-inch piping span along with a short 3/4-inch connection. Pressure testing of these piping segments in MODEs 5 and 6 would require a modification to the plant to allow pressurizing the piping segments between the primary and secondary isolation devices at the hydrostatic pressure without pressurizing the RCS.

In addition, pressure testing in MODE 3 would require a hydrostatic pump be connected at each segment location. In so doing, the design requirement for two primary coolant pressure boundary isolation devices would be violated. These lines are located in areas involving occupational radiation exposure and pressure testing of these lines would increase occupational radiation dose. A total dose of 600 mrem is estimated to result from the installation of test lines and pressurizing the segments.

The piping segments are VT-2 inspected through the entire length as part of the Class 1 system inspection at the conclusion of each refueling outage. The proposed system pressure test will not specifically pressurize past the first isolation valve for this inspection. The licensee noted that it is possible that the piping becomes pressurized due to minor leakage past the first isolation valve. However, the pressure in the segment will be at least at the operating pressure of the accumulators, which are pressurized to between 600 and 660 psig. The licensee further stated that no external or visible leakage will be allowed for the test to be successful, and the segment is inspected again once per period as part of the Class 2 system inspection for the SI system. Based on the above evaluation and the staff's determination, it is found that imposition of the requirements on the licensee would cause a significant burden that would not be compensated by an increase in the level of quality and safety. The licensee's proposed alternative provides reasonable assurance that the subject line segments' leakage integrity will be maintained.

Safety Injection Loop "B' and 'C' High Head Check Valves SI-874AIB and Upstream Piping

These two piping segments consist of a 2-inch piping span between two check valves oriented toward the RCS. Pressure testing of these piping segments at nominal operating pressure in MODE 3 would require a modification to allow pressurizing to the normal operating RCS temperature and pressure conditions. Pressure testing in MODEs 5 and 6 would require a modification to allow a hydrostatic pump to be connected at each segment location.

The piping segments are VT-2 inspected through the entire length as part of the Class 1 system inspection at the conclusion of each refueling outage. The licensee's proposed system pressure test will not specifically pressurize past the first isolation valve for this

inspection. The licensee noted that it is possible that the piping becomes pressurized due to minor leakage past the first isolation valve. The licensee stated that no external or visible leakage will be allowed for the test to be successful and the segment is inspected again once per period as part of the Class 2 system inspection for the SI system. Based on the above evaluation and the staff's determination, it is found that imposition of the Code requirements on the licensee would cause a significant burden that would not be compensated by an increase in the level of quality and safety. The licensee's proposed alternative provides reasonable assurance that the subject line segments' leakage integrity will be maintained.

Based on the above evaluation and the staff's determination, it is found that compliance with the Code and Code case requirement to perform the system hydrostatic/pressure test on the subject line segments would result in a hardship for the licensee. Based on the above evaluation and the staff's determination, it is found that imposition of the requirements on the licensee would cause a significant burden that would not be compensated by an increase in quality and safety. The licensee's proposed alternatives provide reasonable assurance that the subject line segments' leakage integrity will be maintained. Therefore, the licensee's proposed alternatives are authorized pursuant to 10 CFR 50.55a(a)(3)(ii).

2.2 Request for Relief No. 25 Revision 1 (Part B), Alternative Examinations To The 10-Year Hydrostatic Test For Class 2, and 3 Systems

Code Requirement: Examination Categories C-H, D-A, D-B, and D-C require system hydrostatic tests in accordance with paragraphs IWC-5222 and IWD-5223 for Class 2 and 3 systems and components. In addition, Code Case N-498-1, "*Alternative Rules for 10-Year System Hydrostatic Testing of Class 1, 2, and 3 Systems*," Section XI, Division 1, has been incorporated into Regulatory Guide 1.147, Revision 12, May 1999. Code Case N-498-1 provides an alternative to system hydrostatic tests in the form of a system leakage test in accordance with paragraph IWB-5221 for Class 1 systems and a system pressure test for examination of Class 2 and 3 systems.

Licensee's Proposed Alternative: In accordance with 10 CFR 50.55a(a)(3)(ii), the licensee proposed alternatives to the examination requirements in examination categories C-H, D-A, D-B and D-C and Code Case N-498-1. The licensee stated:

"Class 2 Systems
"CP&L requests that relief be granted from Code Case N-498-1, paragraph (b)(3) to use a ten (10) minute hold time in lieu of the four (4) hour hold time requirement for insulated systems not required to operate during normal reactor operation prior to VT-2 examination.

"Prior to performing the VT-2 visual examination, the system shall be pressurized to nominal operating pressure for a minimum of ten (10) minutes. The system shall be maintained at nominal operating pressure during performance of the VT-2 visual examination.

"*Class 3 Systems*
"CP&L requests that relief be granted from Code Case N-498-1, paragraph (c)(3) to use a ten (10) minute hold time in lieu of the four (4) hour hold time requirement for insulated

systems not required to operate during normal reactor operation prior to VT-2 examination.

"Prior to performing the VT-2 visual examination, the system shall be pressurized to nominal operating pressure for a minimum of ten (10) minutes. The system shall be maintained at nominal operating pressure during performance of the VT-2 visual examination."

The following is a list of class 2 and 3 piping segments requiring relief.

Pipe Segment	Code Cat.	Request
Containment Spray (CS) Pump and associated piping	C-H	The licensee has proposed to use a 10 minute hold time in lieu of the 4 hour hold time for insulated systems prior to VT-2 examination.
SI Pumps and associated piping	C-H	The licensee has proposed to use a 10 minute hold time in lieu of the 4 hour hold time for insulated systems prior to VT-2 examination.
Auxiliary Feedwater (AFW) Pumps and associated piping	D-A	The licensee has proposed to use a 10 minute hold time in lieu of the 4 hour hold time for insulated systems prior to VT-2 examination.
AFW Pump steam supply and associated piping	D-A	The licensee has proposed to use a 10 minute hold time in lieu of the 4 hour hold time for insulated systems prior to VT-2 examination.

Licensee's Basis for Proposed Alternative:
"In accordance with 10 CFR 50.55a(a)(3)(ii), relief is requested for the H.B. Robinson Steam Electric Plant (HBRSEP), Unit No. 2 on the basis that compliance with the specified requirements of the Code would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

"Class 2 and 3 Systems
"Alternative examinations are proposed for Class 2 and Class 3 systems not required to operate during normal reactor operations. These systems are designed to allow testing during normal reactor operation by operating the pumps with flow into minimum flow recirculation piping to preclude deadheading of the pumps. 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.

"The NRC has recognized that most common causes of failure in Code Class 3 systems are flow-accelerated corrosion (FAC), microbiological induced corrosion (MIC), and general corrosion. HBRSEP, Unit No. 2 has in place procedures for monitoring FAC and for the surveillance and documentation of MIC in raw water systems.

"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 to [sic] hot to touch. The containment spray pumps are prohibited by procedures from running longer than 30 minutes in the 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.

"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 buildup 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.

"Justification for Granting Relief

"The NRC has accepted Code Case N-498-1 in lieu of Code required hydrostatic testing for Class 1, 2, and 3 systems. However, further relief is requested for Class 1 systems to avoid placing the plant in a condition in violation of the Technical Specifications. For Class 2 and 3 systems not required to operate during normal reactor operation, hold times in Code Case N-498-1 require operation of Class 2 and 3 pumps for a time period in excess of prudent operation periods in the recirculation mode. Therefore, the extended hold times from Code Case N-498-1 for certain Class 2 and 3 systems will result in unusual hardships and burden without a compensating increase in the level of safety margin."

Evaluation:

The Code requires that a system hydrostatic test be performed once per interval to include all Class 2 and 3 components within the RCS system boundary. Code Case N-498-1 requires that a system test be performed at or near the end of each inspection interval on all Class 2 and 3 pressure-retaining components within the system boundary. The licensee has proposed an alternative to the Code and Code case requirements for the subject Class 2 and 3 line segments. The subject line segments, as stated by the licensee, include a Safety Injection Pump, Containment Spray Pump and Auxiliary Feedwater Pump. As described by the licensee, the subject pumps are capable of running for extended periods of time under certain low flow conditions to perform their intended safety functions. However, to perform the required testing (4-hour hold time for insulated components) the pumps would be required to run for an extended period of time in the mini-flow condition. Due to excessive heat loading caused by reduced flow through the recirculation lines and the possibility of hydraulic instability, the subject pumps are prohibited by site operating procedures and manufacturers' specifications from running for extended periods of time in the mini-flow condition. Furthermore, the NRC[1] has identified the HBRSEP2 Emergency Core Cooling System pumps as having potential for pump damage due to heat loading. Therefore, running the pumps for the extended time of 4 hours may result in a physical hazard due to overheating of the pumps. Therefore, the Code/Code case requirement to perform the system hydrostatic/system pressure test on the subject line segments presents a significant burden on the licensee. To reduce/eliminate the possible heat loading hazard, the licensee has proposed the use of a 10-minute hold prior to the VT-2 examination in lieu of the required 4-hour hold time. The 10-minute hold time as stated by the licensee has been approved for use in paragraph IWA-5213 of the 1995E, 96A of ASME XI for system leakage tests. Although a 10-minute hold time has been approved for use by this later Code Edition/Addenda, the staff maintains that a 10-minute hold time in many cases will not allow moisture from small leaks to penetrate/saturate insulated systems sufficiently to allow leakage to be identified. However, the staff feels that if major leakage is occurring, a 10-minute hold time will most likely be sufficient to identify the leakage. Considering the potential hazards associated with extended run times of the pumps, and approval for use in later editions of the Code, it is determined that the licensee's proposed alternative will provide reasonable assurance that leakage integrity is maintained on the subject line segments.

Based on the above evaluation, the staff has determined that compliance with the Code and Code case requirement to perform the system hydrostatic/pressure test on the subject line would result in a hardship on the licensee. Based on the above evaluation and the staff's determination, imposition of the requirements on the licensee would cause a significant burden that would not be compensated by an increase in the level of quality and safety. The licensee's proposed alternative will provide reasonable assurance that the subject line segments' leakage integrity will be maintained. Therefore, the licensee's proposed alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(ii).

3.0 CONCLUSION

The staff evaluated the licensee's submittal and concludes that certain inservice examinations cannot be performed to the extent required by the Code at HBRSEP2. For Request for Relief 25, Revision 1 (Parts A and B), the staff concludes that compliance with the Code/Code case

[1] NRC Bulletin No. 88-04, "Potential Safety-Related Pump Loss"

requirements would result in hardship without a compensating increase in the level of quality and safety. Therefore, the proposed alternatives are authorized pursuant to 10 CFR 50.55a(a)(3)(ii) for the third 10-year ISI interval.

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