



Carolina Power & Light Company

Robinson Nuclear Plant
3581 West Entrance Road
Hartsville SC 29550

Serial: RNP-RA/00-0138

AUG 04 2000

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

REVISED REQUEST FOR RELIEF FROM ASME BOILER AND
PRESSURE VESSEL CODE, SECTION XI, REGARDING INSERVICE
INSPECTION OF LARGE VALVES AND INSERVICE TESTING OF CHECK VALVES

Ladies and Gentlemen:

This letter contains two requests 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 first relief request for the H. B. Robinson Steam Electric Plant (HBRSEP), Unit No. 2 involves postponing the required VT-3 internal surface examination specified in ASME B&PV Code for large valves until such time that the valve is disassembled for maintenance or repair. The second relief request involves qualification of an alternative to full flow testing for certain check valves.

HBRSEP, Unit No. 2 is currently in its Third Ten Year Inservice Inspection Interval, which began on February 19, 1992. These relief requests, if approved, will be implemented during the HBRSEP, Unit No. 2 Third Ten Year Inservice Inspection Interval. These relief requests are requested to be approved by February 1, 2001.

Attachment I contains the request for relief concerning postponing the required VT-3 internal surface examination for large valves until such time that the valve is disassembled for maintenance or repair.

Attachment II contains the relief request involves qualification of an alternative to full flow testing for three Safety Injection (SI) system check valves.

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

Sincerely,



R. L. Warden
Manager - Regulatory Affairs

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Attachments

- I. Relief Request No. 28, "VT-3 Internal Examination of Valve Bodies Greater Than 4 Inches"
- II. Relief Request No. SI-VRR-4, "Alternative to Full Flow Testing of Check Valves"

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

RELIEF REQUEST NO. 28

VT-3 INTERNAL EXAMINATION OF VALVE BODIES GREATER THAN 4 INCHES

Code Requirements for Which Relief is Requested

American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," 1986 Edition with no addenda, Table IWB-2500-1, "Examination Categories," Examination Category B-M-2, Item B12.50, "Valve Body Exceeding NPS 4," requires a VT-3 visual examination for the internal surface of one valve in each group of valves for the category of four (4) inch valves or larger, during the interval.

Examination Category B-M-2, Item B12.50, examinations are limited to at least one valve within each group of valves that are of the same size, construction design (such as a globe, gate or check), and manufacturing method, and that perform similar functions in the system (such as containment isolation and system overpressure protection).

Specific Relief Requested

Relief is requested from the VT-3 internal surface examination specified in ASME Section XI, 1986 Edition no Addenda, Examination Category B-M-2, Item B12.50, until such time that the valve is disassembled for maintenance or repair.

Alternative Examinations

No alternative examination is proposed in the event that no valves in this category are disassembled for maintenance and repair.

Basis for Requesting Relief

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.

Justification for Granting Relief

There are two valves for which the relief request would apply (i.e., RHR-750 and RHR-751). These valves are the inlet valves to the Residual Heat Removal (RHR) System loop. The size of these valves is 14-inch nominal diameter. There is only one RHR loop inlet connection from the Reactor Coolant System (RCS), and therefore, the reactor core must be off-loaded to

the spent fuel pool in order to disassemble these valves to perform the required examination. Neither of these valves has been opened during the current Third Ten Year Interval.

Disassembly and re-assembly of these valves, solely for the purpose of performing the required examinations, would adversely affect occupational radiation dose. Disassembly and re-assembly of these valves will incur a significant occupational dose to plant personnel to accomplish the ASME B&PV Code required VT-3 examination.

The maintenance associated with disassembly and re-assembly of one valve, considering the plant conditions required to remove the bonnets and perform the VT-3 internal surfaces examination, would likewise incur undue hardship and difficulty. The disassembly and reassembly could possibly damage the valves requiring re-work to correct any problems identified during post maintenance testing. Re-assembly of the bonnet to the body could result in leakage, but the leakage may not be detected until the RHR system is pressurized. In such case, discovered leakage from the examined valve may require reactor disassembly and core offload in order to correct the deficiency.

This request for relief is in general agreement with later Editions and Addenda of the ASME B&PV Code, which only require the inspection to be performed when the valves are disassembled for maintenance or repair.

Implementation Schedule

This relief will be implemented during the HBRSEP, Unit No. 2 Third Ten Year Inservice Inspection Interval. This relief is requested to be approved by February 1, 2001.

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

RELIEF REQUEST NO. SI-VRR-4

ALTERNATIVE TO FULL FLOW TESTING OF CHECK VALVES

Code Requirements for Which Relief is Requested

American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," 1986 Edition with no addenda, Paragraph IWV-3520, "Tests for Check Valves," specifies frequency and method requirements for inservice testing of check valves.

Generic Letter (GL) 89-04, "Guidance on Developing Acceptable Inservice Testing Programs," Position 1, "Full Flow Testing of Check Valves," defines a full flow stroke test of a check valve as verifying that the maximum required accident flow through the valve is passed in the test. Position 1 specifies the requirements for documenting the acceptability of an acceptable alternative technique for meeting the full flow test requirement.

GL 89-04, Supplement 1, dated April 4, 1995, endorsed NUREG-1482, "Guidelines for Inservice Testing Programs at Nuclear Power Plants," as containing recommendations that may be followed in developing and implementing inservice testing programs.

HBRSEP, Unit No. 2 currently tests three Safety Injection (SI) system check valves in accordance with NUREG-1482, Section 4.1.2, "Exercising Check Valves with Flow and Non-intrusive Techniques," by performing a reduced flow test with verification by non-intrusive means to indicate adequate disk movement for full stroke exercising of the valve in accordance with the Code.

Specific Relief Requested

Relief is requested by qualifying reduced flow testing of the SI system check valves without verifying obturator position by non-intrusive testing means.

Alternative Testing

Alternative testing is proposed to perform a reduced flow test at refueling intervals at a flow rate determined by calculation and previous test results that are indicative that the valve discs are impacting the backstop.

Basis for Requesting Relief

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 continued use of non-intrusive means to verify the obturator position results in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Justification for Granting Relief

The valves for which the relief request would apply are the SI injection pathway valves from the SI pumps and the accumulators to the Reactor Coolant System (RCS) Loop cold legs. These valves are located downstream of the accumulators and the safety injection pump injection lines. These valves have a safety function to open to admit flow from the SI system to the RCS during a Loss-of-Coolant Accident (LOCA). These valves are also pressure isolation valves for the RCS. These valves are currently tested in accordance with NUREG-1482, Section 4.1.2, and in accordance with Technical Specifications Surveillance Requirements for leak tightness (i.e., closure).

In addition to the reduced flow tests, these valves have undergone detailed inspections, have been included in a check valve condition monitoring program, and have been evaluated in a design review to determine vulnerability to wear.

Increased occupational radiation exposure is currently incurred in order to perform the flow test because test equipment must be installed to measure the flow rate. The reduced flow tests were conducted at a flow rate of at least 3000 gpm, and this flow rate was verified by non-intrusive testing. The minimum flow rate necessary to achieve full disc lift has been determined to be approximately 1700 gpm. The test flow rate exceeds the necessary value by a substantial margin. Test results indicate that the valve discs are impacting the backstop.

In addition to the reduced flow tests, these valves are included in the HBRSEP, Unit No. 2 check valve condition monitoring program developed in response to Institute for Nuclear Power Operations Significant Operating Experience Report (SOER) 86-03 "Check Valve Failures or Degradation," which includes detailed internal inspections consisting of dimensional measurements, visual inspection, freedom of movement, verification of the valve to fully stroke, and a blue check of the disc to seat interface. Dimensional measurements are typically obtained at critical wear points in the "as found" condition, and a component level evaluation is required in order to determine the need for refurbishment. Scope expansion is considered if the results of a planned inspection are unacceptable.

A detailed inspection has been performed on each valve. Measurements taken include the pin to bushing clearance for the left and right side of the hinge pin, the hinge arm clearance at the center of the hinge pin, and the measured disc stud-to-stud hole clearance. These measurements are compared to the vendor recommended (allowable) limits. The results of these measurements indicate that there is a substantial margin between actual field

measurements and the vendor specified criteria. Available maintenance history suggests that there are no known performance problems related to the capability of the valve to fully open.

The design of these valves has been evaluated in accordance with industry guidelines set forth in Electric Power Research Institute, (EPRI) NP-5479, "Application Guidelines for Check Valves." The evaluation of the valve design concluded that the valves were not vulnerable to excessive wear for reasons other than the location of the valves being less than 5 pipe diameters from upstream disturbances. The design evaluation established an initial inspection frequency of six refueling outages. Since the valves are typically closed, they are not subjected to continuous operation, or wear. The nominal flow rates through the valves exceed the minimum flow rate required to achieve stable disc operation, which is an essential design feature to reduce the rate of degradation between mating parts and critical wear points.

The previous test results, the accumulated inspection data which indicate a large margin from measured wear to allowable limits, and the design review which concluded that the valves were not subject to excessive wear, provide justification that a reduced flow test is adequate evidence of check valve operability without further non-intrusive testing to establish obturator position. Non-intrusive testing to verify obturator position would result in the accumulation of unwarranted radiation dose incurred from installation of additional test equipment in high radiation areas. Additionally, to perform the test to verify obturator position, additional operation of safety related pumps is required. Since operational experience, test data, and design information show that the valves will be highly reliable, reduced flow testing is justified and the installation of additional instrumentation to verify obturator position results in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Implementation Schedule

This relief will be implemented during the HBRSEP, Unit No. 2 Third Ten Year Inservice Inspection Interval. This relief is requested to be approved by February 1, 2001.