

Docket No. 50-298

July 22, 1994

Mr. Guy R. Horn
Vice President - Nuclear Power
Nebraska Public Power District
Post Office Box 98
Brownsville, Nebraska 68321

Dear Mr. Horn:

SUBJECT: EXEMPTION FROM APPENDIX J TO 10 CFR PART 50 TO ALLOW REVERSE DIRECTION LOCAL LEAK RATE TESTING OF FOUR CONTAINMENT ISOLATION VALVES AT COOPER NUCLEAR STATION (TAC NO. M89769)

The NRC staff has completed its review and evaluation of your letter dated June 29, 1994, requesting an exemption from Appendix J to 10 CFR Part 50 to allow Type C (local leak rate) testing of four containment isolation valves in the reverse direction instead of the forward direction.

Based on our evaluation, we are granting the Exemption (Enclosure 1) from the Type C testing requirements of 10 CFR Part 50, Appendix J, Paragraph III.C.1. Our safety evaluation is given in Enclosure 2.

The Commission has granted this exemption pursuant to 10 CFR 50.12. A copy of the Exemption is being forwarded to the Office of the Federal Register for publication.

Sincerely,

Kevin A. Connaughton, Senior Project Manager
Project Directorate IV-1
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

Enclosures:

- 1. Exemption
- 2. Safety Evaluation

cc w/enclosures:
See next page

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

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DIRECTION LOCAL LEAK RATE TESTING OF FOUR CONTAINMENT ISOLATION
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Kevin A. Connaughton, Senior Project Manager
Project Directorate IV-1
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

Enclosures:

1. Exemption
2. Safety Evaluation

cc w/enclosures:
See next page

Mr. Guy R. Horn
Nebraska Public Power Company

Cooper Nuclear Station

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of)	
)	
NEBRASKA PUBLIC POWER DISTRICT)	
)	Docket No. 50-298
(Cooper Nuclear Station))	

EXEMPTION

I.

Nebraska Public Power District (the licensee) is the holder of Operating License No. DPR-46, which authorizes operation of Cooper Nuclear Station (CNS). The operating license provides, among other things, that CNS is subject to all rules, regulations, and orders of the Commission now or hereafter in effect.

The facility consists of a boiling water reactor at the licensee's site in Nemaha County, Nebraska.

II.

One of the conditions of all operating licenses for water-cooled power reactors, as specified in 10 CFR 50.54(o), is that the primary containment shall meet the leakage test requirements set forth in 10 CFR Part 50, Appendix J, Paragraph III.C.1. Type C tests require: "Type C tests shall be performed by local pressurization. The pressure shall be applied in the same direction as that when the valve would be required to perform its safety function, unless it can be determined that the results from the

tests for a pressure applied in a different direction will provide equivalent or more conservative results."

By letter dated June 29, 1994, the licensee requested an exemption from Appendix J to 10 CFR Part 50 to allow Type C (local leak rate) testing of four containment isolation valves in the reverse direction. As stated above, Paragraph III.C.1 of Appendix J requires that for Type C testing the test pressure must generally be applied to the valve from the same side as that when the valve would be required to perform its safety function (i.e., the inside-containment side, also called the accident direction or the forward direction). However, the regulation allows an exception if it can be determined that testing with the pressure applied in the reverse direction provides equivalent or more conservative results. In its letter dated June 29, 1994, the licensee stated that four containment isolation valves cannot now be shown to satisfy the equivalent-or-more-conservative requirement that permits reverse-direction testing. The licensee did, however, provide justification that reverse pressure testing, along with additional measures to ensure the leaktightness of valve packing and body-to-bonnet flanges, provide adequate assurance that the overall objectives of 10 CFR Part 50, Appendix J, will be met.

The NRC staff has performed an evaluation of the exemption request and has determined that the licensee has provided adequate justification for the requested exemption.

III.

According to 10 CFR 50.12(a)(2), the Commission will not consider granting the exemption unless special circumstances are present. Pursuant

to 10 CFR 50.12(a)(2)(ii), special circumstances exist where application of the regulation is not necessary to achieve the underlying purpose of the rule. Based on our evaluation, the NRC staff has concluded that the licensee has taken prudent steps to ensure that containment integrity is preserved in the absence of forward-direction local leakrate testing for the subject valves. Hence, application of the regulation with respect to forward-direction testing is not necessary.

Therefore, the Commission has determined that the requested exemption from the Appendix J forward-direction testing requirements for the subject valves should be granted.

IV.

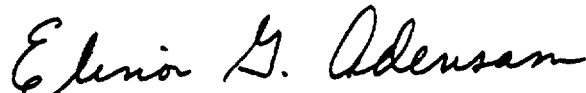
Accordingly, the Commission has determined, pursuant to 10 CFR 50.12(a), that this exemption is authorized by law and will not endanger life or property or the common defense and security, and is otherwise in the public interest. Therefore, the Commission hereby approves the following exemption request.

An exemption is granted from the requirements of 10 CFR Part 50, Appendix J, Paragraph III.C.1 that requires the conduct of a local leak rate test in the forward direction for containment isolation valves RHR-MOV-M167A, RHR-MOV-M167B, RCIC-V-37, and HPCI-V-44. For good cause shown, this exemption will permit testing of the subject valves in the reverse direction, in lieu of forward-direction testing, provided that the additional measures described in the licensee's June 29, 1994, letter are implemented.

Pursuant to 10 CFR 51.32, the Commission has determined that the granting of this exemption will have no significant impact of the quality of the human environment (59 FR 35952).

Dated at Rockville Maryland this 22nd day of July 1994.

FOR THE NUCLEAR REGULATORY COMMISSION

A handwritten signature in cursive script that reads "Elinor G. Adensam".

Elinor G. Adensam, Acting Director
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO EXEMPTION FROM APPENDIX J TYPE C LOCAL LEAK RATE
TESTING IN THE REVERSE DIRECTION FOR FOUR CONTAINMENT ISOLATION VALVES
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
DOCKET NO. 50-298

1.0 INTRODUCTION

By letter dated June 29, 1994, the licensee requested permanent exemption from certain Type C (local leak rate) testing requirements of Appendix J to 10 CFR Part 50 for four containment isolation valves (CIVs). The exemption would allow reverse-direction testing of the CIVs. Appendix J requires, in Section III.C.1., that Type C test pressure must be applied in the same direction as that which would exist when the valve would be required to perform its safety function, unless it can be determined that the results from the tests for a pressure applied in a different (or reverse) direction will provide equivalent or more conservative results. This generally means that valves must be pressurized on the side of the valve disc that is towards containment; this is often called "forward-direction" testing, in contrast to "reverse-direction" testing which means pressurizing from the side that is away from containment. For the four valves being considered, the licensee wishes to test in the reverse direction, even though it might not give equivalent or conservative results.

2.0 EVALUATION

The licensee is applying for permanent exemption for the following four valves: RHR-MOV-MO167A, RHR-MOV-MO167B, RCIC-V-37, and HPCI-V-44. MO167A and MO167B are 1-inch diameter globe valves. Valves RCIC-V-37 and HPCI-V-44 are stop-check globe valves, with 8-inch and 20-inch diameters, respectively. A stop-check globe valve disk is not connected to the valve stem. Normal flow comes from underneath the seat and pressure on the disk forces it off of the seat causing the valve to open. The disk is guided by a disk skirt in the valve. Under backflow conditions, the pressurization of the torus (during accident conditions), in conjunction with gravity, forces the disk into the seat and closes the valve.

The four valves are not currently testable in the accident direction due to the inability to isolate the valves from the containment and the lack of test connections. In general, Type C testing of globe valves in the reverse

direction is more conservative than testing in the accident direction with respect to seat leakage because the pressurization is under the seat, which tends to unseat the disk and increase leakage. However, by testing in the reverse direction, the valve bonnet and stem packing are not exposed to the test pressure and possible leakage would not show up in the test results. Whereas the testing from the reverse direction of these valves would provide more conservative seat leakage, it cannot quantitatively be demonstrated to provide equivalent or more conservative valve leakage testing results due to the potential for leakage through the packing and bonnet gasket.

Rather than Type C testing of the bonnet and packing boundaries which would require system modifications, the licensee offers several compensating factors, as follows:

- (1) The bonnet and packing are exposed to the test pressure of each Type A Test (integrated leak rate test), currently conducted every three to four years. Although this does not provide an individual leak rate for the valve's boundaries, it assures that the total containment leak rate, which includes the bonnet and packing leakage, is within allowable limits.
- (2) The licensee proposes that a soap bubble test be performed on the pressurized stem bonnet boundaries of the valves during the Type A test. Using the acceptance criterion of zero bubbles for this test, this would provide a direct indication of the leak-tightness of the packing and the bonnet.
- (3) In between the Type A tests, the licensee will specifically observe valves RCIC-V-37 and HPCI-V-44 for indication of leakage through the insulation lagging during scheduled system surveillance tests which subject these valves to pressurization.
- (4) An additional factor is specifically applicable to valves RCIC-V-37 and HPCI-V-44, which are Anchor stop-check globe valves. During plant operation, the stem is in the raised position, which engages the backseat between the stem and the bonnet under the gland area, minimizing the potential leakage through the packing gland.

If the licensee were to make modifications in order to allow forward-direction testing of these valves, such as the addition of block valves and test connections, it would increase design complexity, create additional potential leakage paths, and increase loading on torus attached piping.

Considering that the disk seat is conservatively tested by reverse-direction testing and that the leak-tightness of the bonnet and packing boundaries is reasonably assured by other means as noted above, the staff finds that

permanent exemption from the "equivalent or more conservative results" requirement of Appendix J is justified and, therefore, reverse-direction Type C testing of the four subject valves is acceptable.

3.0 CONCLUSION

Based on the above evaluation, the staff finds that permanent exemption from Appendix J to allow reverse-direction Type C testing of containment isolation valves RHR-MOV-M0167A, RHR-MOV-M0167B, RCIC-V-37, and HPCI-V-44 are acceptable.

Principal Contributor: J. Pulsipher

Date: July 22, 1994