Nebraska Public Power District
Always there when you need us

NLS2011085 50.55a
August 24, 2011

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555-0001

Subject: 10 CFR 50.55a Request Numbers RV-07, Revision 0, and RV-01, Revision 1
Cooper Nuclear Station, Docket No. 50-298, DPR-46

Reference: Letter from David Terao, Nuclear Regulatory Commission, to Randall K. Edington, Nebraska Public Power District, dated June 14, 2006, "Cooper Nuclear Station Re: Relief Requests for the Fourth 10-Year Pump and Valve Inservice Testing Program..."

Dear Sir or Madam:

The purpose of this letter is to request that the Nuclear Regulatory Commission (NRC) grant Nebraska Public Power District (NPPD) relief from certain inservice testing (IST) code requirements for Cooper Nuclear Station pursuant to 10 CFR 50.55a. These relief requests are applicable to the fourth ten-year IST interval, which began March 1, 2006.

Attachment 1 provides Request Number RV-07, Revision 0. Approval of this request is needed to support Refueling Outage 27 dose reduction efforts by providing relief from the required two-year test interval for pressure isolation valve leakage rate testing. Attachment 2 provides Request Number RV-01, Revision 1. This attachment replaces Request Number RV-01, Revision 0, which was authorized by the NRC per the Reference letter. Revision 1 to RV-01 requests the frequency for disassembly and examination of the affected components be revised from 18 to 36 months. Revision bars have been provided in the right-hand margin to identify the portions of the submittal that differ from RV-01, Revision 0.

NPPD requests NRC approval of the relief requests by September 1, 2012, which represents a standard twelve-month review period. Should you have any questions concerning this matter, please contact David Van Der Kamp, Licensing Manager, at (402) 825-2904.

Sincerely,

Demetrius Willis for Brian J. O'Grady

Brian J. O'Grady
Vice President - Nuclear and
Chief Nuclear Officer

COOPER NUCLEAR STATION
P.O. Box 98 / Brownville, NE 68321-0098
Telephone: (402) 825-3811 / **Fax:** (402) 825-5211
www.nppd.com

A047
NRR

/bk

Attachments

cc: Regional Administrator w/attachments
USNRC - Region IV

Cooper Project Manager w/attachments
USNRC - NRR Project Directorate IV-1

Senior Resident Inspector w/attachments
USNRC - CNS

NPG Distribution w/ attachments

CNS Records w/attachments

Attachment 1

Relief Request RV-07, Revision 0
Performance-Based Scheduling of Pressure Isolation Valve Leakage Tests

Proposed Alternative in Accordance with 10 CFR 50.55a(a)(3)(i)

Alternative Provides Acceptable Level of Quality and Safety

Attachment 1

Relief Request RV-07, Revision 0
Performance-Based Scheduling of Pressure Isolation Valve Leakage Tests

Proposed Alternative in Accordance with 10 CFR 50.55a(a)(3)(i)

Alternative Provides Acceptable Level of Quality and Safety

1. American Society of Mechanical Engineers (ASME) Code Component(s) Affected

Valve	Class	Category	System
RHR-MOV-MO25A	1	A	RHR
RHR-MOV-MO25B	1	A	RHR
RHR-MOV-MO274A	1	A	RHR
RHR-MOV-MO274B	1	A	RHR
RHR-CV-26CV	1	A/C	RHR
RHR-CV-27CV	1	A/C	RHR
RHR-MOV-MO17	1	A	RHR
RHR-MOV-MO18	1	A	RHR
CS-MOV-MO12A	1	A	CS
CS-MOV-MO12B	1	A	CS
CS-CV-18CV	1	A/C	CS
CS-CV-19CV	1	A/C	CS

2. Applicable Code Edition and Addenda

ASME Code for Operation and Maintenance of Nuclear Power Plants (OM Code) 2001 Edition through 2003 Addenda

3. Applicable Code Requirement

ISTC-3630 – Leakage Rate for Other Than Containment Isolation Valves.

ISTC-3630(a) – Frequency. Tests shall be conducted at least once every two years.

4. Reason for Request

Pursuant to 10 CFR 50.55a, "Codes and standards," paragraph (a)(3), relief is requested from the requirement of ASME OM Code ISTC-3630(a). ISTC-3630(a) requires that leakage rate testing (water) for pressure isolation valves (PIV) be performed at least once every two years. Recent historical data was used to identify that PIV testing alone each refueling outage incurs a total dose of at least 600 millirem (mRem). The reason for this relief request is to reduce outage dose. The basis of this relief request is that the proposed alternative would provide an acceptable level of quality and safety.

5. Proposed Alternative and Basis for Use

The Residual Heat Removal (RHR) and Core Spray (CS) systems at Cooper Nuclear Station (CNS) contain valves that function as PIVs. PIVs are defined as two normally closed valves in series at the reactor coolant system boundary that isolate the reactor coolant system from an attached low pressure system. These affected valves, listed in Section 1, are located on the 'A' and 'B' CS and RHR injection lines and the RHR shutdown cooling line.

PIVs are not specifically included in the scope for performance-based testing as provided for in 10 CFR 50 Appendix J, Option B. The concept behind the Option B alternative for containment isolation valves is that licensees should be allowed to adopt cost effective methods for complying with regulatory requirements. Additionally, NEI 94-01 Revision 0, "Industry Guideline for Implementing Performance-Based Option of 10 CFR Part 50, Appendix J," describes the risk-informed basis for the extended test intervals under Option B. That justification shows that for valves which have demonstrated good performance by passing their leak rate tests (air) for two consecutive cycles, further failures appear to be governed by the random failure rate of the component. NEI 94-01 also presents the results of a comprehensive risk analysis, including the statement that "the risk impact associated with increasing [leakrate] test intervals is negligible (less than 0.1 percent of total risk)." The valves identified in this relief request are in water applications. The PIV testing is performed with water pressurized to normal plant operating pressures. This relief request is intended to provide for a performance-based scheduling of PIV tests at CNS.

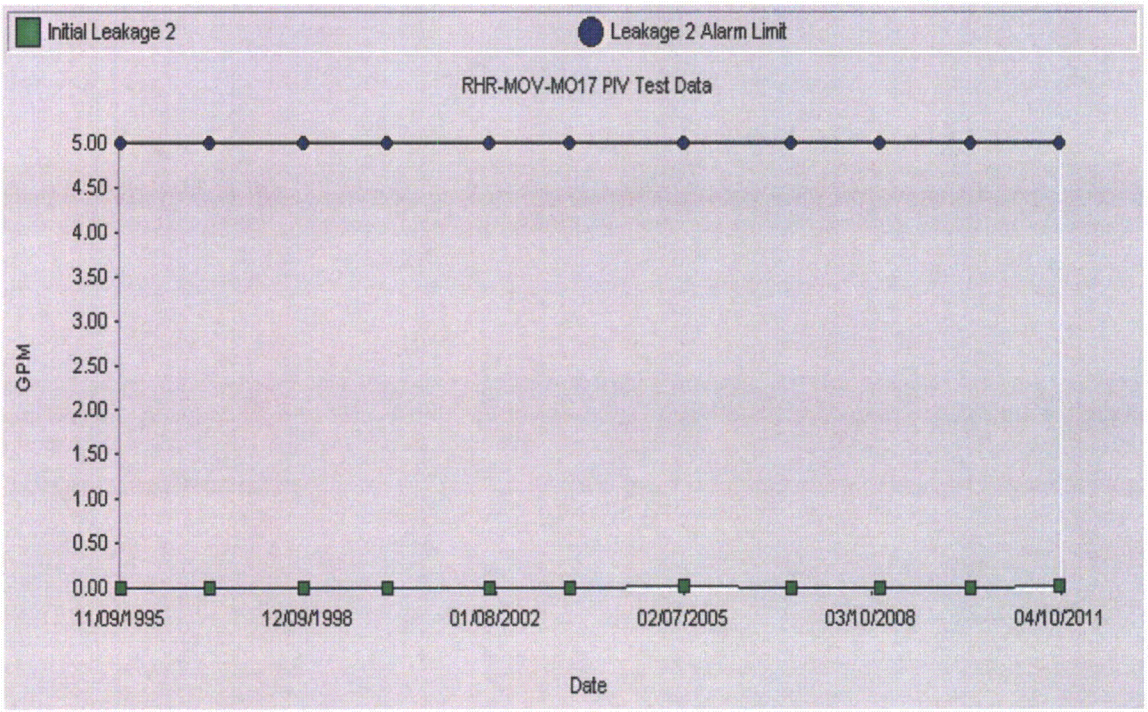
As stated in the previous section, the reason for requesting this relief is dose reduction. Data reviewed from the last two refueling outages identified that PIV testing alone incurred a total dose of approximately 600 mRem in Refueling Outage 26, which benefited from the chemical decontamination that was performed, and approximately 1600 mRem in Refueling Outage 25. Therefore, assuming the PIVs remain classified as good performers, extended test intervals of three refueling outages would provide a savings of at least 1200 mRem over a three-cycle period.

NUREG 0933, "Resolution of Generic Safety Issues," Issue 105, discusses the need for PIV leak rate testing based primarily on three pre-1980 historical failures of applicable valves industry-wide. These failures involved human errors in either operations or maintenance. None of these failures involved inservice equipment degradation. The performance of PIV leak rate testing provides assurance of acceptable seat leakage with the valve in a closed condition. Typical PIV testing does not identify functional problems which may inhibit the valves ability to re-position from open to closed. For check valves, such functional testing is accomplished per ASME OM Code ISTC-3522 and ISTC-3520. Power-operated valves are routinely full stroke tested per ASME OM Code to ensure their functional capabilities. The periodic functional testing of the PIVs is adequate to identify abnormal conditions that might affect closure capability. Performance of the separate 18-month (or 24-month) PIV leak rate testing does not contribute any additional assurance of functional capability; it only determines the seat tightness of the closed valves.

CNS proposes to perform PIV testing at intervals ranging from every refueling outage to every third refueling outage. CNS anticipates transitioning from 18-month refueling cycles to 24-month refueling cycles following Refueling Outage 27, which is scheduled for the Fall of 2012. The specific interval for each valve would be a function of its performance and would be established in a manner consistent with the containment isolation valve (CIV) process under 10 CFR 50 Appendix J, Option B. Five of the 12 valves listed in Section 1 (RHR-MOV-MO25A, RHR-MOV-MO25B, CS-MOV-MO12A, CS-MOV-MO12B, RHR-MOV-MO17) are also classified as CIVs and are leak rate tested with air at intervals determined by 10 CFR 50 Appendix J, Option B. Appendix J and inservice leak testing program guidance will be established such that if any of those five valves fail either their CIV test or their PIV test, the test interval for both tests will be reduced to every refueling outage until they can be re-classified as good performers per Appendix J, Option B requirements.

The test intervals for the seven remaining valves with a PIV-only function will be determined in the same manner as is done under Option B. That is, the test interval may be extended to every three refueling outages (not to exceed a nominal six year period) upon completion of two consecutive, periodic PIV tests with results within prescribed acceptance criteria. Any test failure will require a return to the initial interval (every refueling outage) until good performance can again be established.

The primary basis for this relief request is the historically good performance of the PIVs. There have been no PIV seat leakage failures since PIV testing began at CNS in 1995 through the present. Leakages recorded have been a very small percentage of the overall allowed leakage. The test results for the PIVs listed in Section 1 have been exceptional. For example, a plot of the RHR-MOV-MO17 test results is shown below:



This graph is typical of the affected PIVs listed in Section 1; however, there have been cases where the CIV air testing has indicated a failure with components identified in this relief request. There is a general industry-wide consensus that CIV air testing is a more challenging and accurate measurement of seat condition, and more likely to identify any seat condition degradation. PIV testing has also been utilized at CNS as a post-maintenance test following packing replacements on the CS and RHR injection check valves to ensure the packing is adjusted adequately at normal system pressure. Therefore, PIV testing will continue to be utilized as post-maintenance testing, as necessary.

NUREG/CR-5928, "ISLOCA Research Program Final Report," evaluated the likelihood and potential severity of inter-system loss-of-coolant accident (ISLOCA) events in boiling water reactors (BWR) and pressurized water reactors. The BWR design used as a reference for this analysis was a BWR/4 with a Mark 1 containment. CNS was listed in Section 4.1 of NUREG/CR-5928 as one of the applicable plants. The applicable BWR systems were individually analyzed and in each case, this report concluded that the system was "...judged to not be a concern with respect to ISLOCA risk." Section 4.3 concluded the BWR portion of the analysis by saying "ISLOCA is not a risk concern for the BWR plant examined here."

Summary of bases / rationale for this relief request:

- Performance-based PIV testing would yield a dose reduction of up to 1200 mRem over a three-cycle period.
- Performance of separate functional testing of PIVs per ASME Code.
- Excellent historical performance results from PIV testing for the applicable valves.
- Low likelihood of valve mispositioning during power operations (procedures, interlocks).
- Air testing versus water testing - degrading seat conditions are identified much sooner with air testing.
- Relief valves in the low pressure piping - these relief valves may not provide ISLOCA mitigation for inadvertent PIV mispositioning (gross leakage), but their relief capacity can easily accommodate conservative PIV seat leakage rates.
- Alarms that identify high pressure to low pressure leakage - Operators are highly trained to recognize symptoms of a present or incipient ISLOCA and to take appropriate actions.

The intent of this relief request is simply to allow for a performance-based approach to the scheduling of PIV leakage testing. It has been shown that ISLOCA represents a small risk impact to BWRs such as CNS. CNS PIVs have an excellent performance history in terms of seat leakage testing. The risks associated with extending the leakage test interval to a maximum of three refueling outages (nominal 18 or 24 months) are extremely low. Anticipating CNS moving to 24-month refueling cycles, the performance-based interval shall not exceed 72 months. Standard scheduling practice

may extend the program interval by 25%, not to exceed six months. This relief will provide significant reductions in radiation dose.

6. Duration of Proposed Alternative

This proposed alternative will be utilized for the entire fourth, ten-year interval.

7. Precedents

Fermi 2 received a Safety Evaluation by the Nuclear Regulatory Commission, dated September 28, 2010, on a similar relief request for the performance-based testing of PIVs (TAC NO. ME2558, ME2557, and ME2556).

Attachment 2

Relief Request RV-01, Revision 1
HPCI Solenoid Operated Drain Valve Testing

Proposed Alternative in Accordance with 10 CFR 50.55a(a)(3)(i)

Alternative Provides Acceptable Level of Quality and Safety

Relief Request RV-01, Revision 1
HPCI Solenoid Operated Drain Valve Testing

Proposed Alternative in Accordance with 10 CFR 50.55a(a)(3)(i)

Alternative Provides Acceptable Level of Quality and Safety

1. **ASME Code Component(s) Affected**

Valve	Class	Category	System
HPCI-SOV-SSV64	2	B	HPCI
HPCI-SOV-SSV87	2	B	HPCI

2. **Applicable Code Edition and Addenda**

ASME OM Code 2001 Edition through 2003 Addenda

3. **Applicable Code Requirement**

ISTC-3500 Valve Testing Requirements – Active and passive valves in the categories defined in ISTC-1300 shall be tested in accordance with the paragraphs specified in Table ISTC-3500-1 and the applicable requirements of ISTC-5100 and ISTC-5200.

ISTC-3510 Exercising Test Frequency – Active Category A, Category B, and Category C check valves shall be exercised nominally every 3 months except as provided by ISTC-3520, ISTC-3540, ISTC-3550, ISTC-3560, ISTC-5221, and ISTC-5222.

ISTC-3560 Fail-Safe Valves – Valves with fail-safe actuators shall be tested by observing the operation of the actuator upon loss of valve actuating power in accordance with the exercising frequency of ISTC-3510.

4. **Reason for Request**

Pursuant to 10 CFR 50.55a, "Codes and Standards," paragraph (a)(3), relief is requested from the requirements of ASME OM Code ISTC-3500, ISTC-3510, and ISTC-3560. The proposed alternative would provide an acceptable level of quality and safety.

Relief Request RV-01, Revision 1
HPCI Solenoid Operated Drain Valve Testing
(Continued)

5. Proposed Alternative and Basis for Use

The HPCI turbine and exhaust steam drip leg drain to gland condenser valve (HPCI-SOV-SSV64) and HPCI turbine and exhaust steam drip leg drain to equipment drain isolation valve (HPCI-SOV-SSV87) have an active safety function in the closed position to maintain pressure boundary integrity of the HPCI turbine exhaust line. These valves serve as a Class 2 to non-code boundary barrier.

These valves are rapid acting, encapsulated, solenoid-operated valves. Their control circuitry is provided with a remote manual switch for valve actuation to the open position and an auto function which allows the valves to actuate from signals received from the associated level switches HPCI-LS-98 and HPCI-LS-680. Both valves receive a signal to change disc position during testing of drain pot level switches. However, remote position indication is not provided for positive verification of disc position. Additionally, their encapsulated design prohibits the ability to visually verify the physical position of the operator, stem, or internal components. Modification of the system to verify valve closure capability and stroke timing is not practicable nor cost beneficial since no commensurate increase in safety would be derived.

CNS proposes to exercise each valve to the full closed position on a quarterly basis. Although valve stroke timing will not be performed, this test will verify that the valve moves to the safe position. Enhanced maintenance shall be performed on a 36-month frequency by disassembling and examining each solenoid valve to monitor for degradation.

A 36-month frequency for the disassembly and examination surveillance (6.HPCI.404) is an acceptable frequency based upon past examinations and maintenance history for these valves. For instance, solenoid valve, HPCI-SOV-SSV87, was replaced in June 2005, and has had an acceptable disassembly and examination completed in November 2006, March 2008, August 2009, and March 2011. Solenoid valve, HPCI-SOV-SSV64, had acceptable examinations completed in February 2005, November 2006, March 2008, and August 2009, and was replaced for parts reasons with a valve upgrade to match that of HPCI-SOV-SSV87 in March 2011. This history dictates that the 36-month frequency for the internal examinations should identify and correct issues with the solenoid valves prior to them becoming a valve functional issue. The history above demonstrates that no functional issues have been identified in the past six years. Therefore, this periodic examination and refurbishment (if needed) every 36 months, in combination with the quarterly exercise tests, will continue to maintain these valves in a reliable manner.

Relief Request RV-01, Revision 1
HPCI Solenoid Operated Drain Valve Testing
(Continued)

CNS has reviewed the risk implications, work window time-frame, and administrative requirements for performing the proposed enhanced maintenance on-line, if desired, and have determined that this would be an acceptable practice. HPCI-SOV-SSV64 and HPCI-SOV-SSV87 are located on the HPCI turbine exhaust line. If performed on-line, this maintenance activity would require the isolation of steam to the HPCI turbine by closing the manual isolation valves on the HPCI steam line and HPCI turbine exhaust line for personnel protection. HPCI would be inoperable and unavailable during this time-frame. Based on an estimate from the maintenance department, the disassembly and inspection would not be expected to take longer than one shift (12 hours).

Assuming one shift of unavailability for HPCI, Risk Engineering was asked to determine the risk implications for removing HPCI from service. Risk Engineering concluded that CNS would follow the existing 10CFR50.65 (a)(4) process to perform work on these HPCI valves and that the HPCI unavailability time of one shift would not be considered risk significant.

Additionally, CNS routinely removes HPCI from service to perform other maintenance activities, which may take longer than a 12-hour duration. The CNS Work Control process is set up so that the performance of this enhanced maintenance would be scheduled concurrently with these other routine maintenance activities in order to minimize HPCI unavailability. Therefore, the overall impact to HPCI unavailability and risk impact would be negligible.

Using the quarterly exercise testing and the 36-month frequency for enhanced maintenance as an alternative to the specific requirements of ISTC 3500, 3510, and 3560, identified above, will provide an adequate indication of valve performance and will continue to provide an acceptable level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), NPPD requests relief from the specific ISTC requirements identified in this request.

6. Duration of Proposed Alternative

This proposed alternative will be utilized for the entire fourth ten-year interval.

7. Precedents

A version of this relief request was previously approved for the fourth ten-year interval at CNS as Relief Request RV-01, Revision 0 (TAC Nos. MC8837, MC8975, MC8976, MC8977, MC8978, MC8979, MC8980, MC8981, MC8989, MC8990, MC8991, and MC8992, June 14, 2006).

ATTACHMENT 3 LIST OF REGULATORY COMMITMENTS©[4]

Correspondence Number: NLS2011085

The following table identifies those actions committed to by Nebraska Public Power District (NPPD) in this document. Any other actions discussed in the submittal represent intended or planned actions by NPPD. They are described for information only and are not regulatory commitments. Please notify the Licensing Manager at Cooper Nuclear Station of any questions regarding this document or any associated regulatory commitments.

COMMITMENT	COMMITMENT NUMBER	COMMITTED DATE OR OUTAGE
None		