UNITED STATES
NUCLEAR REGULATORY COMMISSION
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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO THE INSERVICE TESTING PROGRAM REQUESTS FOR RELIEF

WOLF CREEK NUCLEAR OPERATING CORPORATION

WOLF CREEK GENERATING STATION

DOCKET NO. 50-482

1.0 INTRODUCTION

The Code of Federal Regulations, 10 CFR 50.55a, requires that inservice testing (IST) of certain ASME Code Class 1, 2, and 3 pumps and valves be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code and applicable addenda, except where relief has been requested and granted or proposed alternatives have been authorized by the Commission pursuant to 10 CFR 50.55a(f)(6)(i), (a)(3)(i), or (a)(3)(ii). In order to obtain authorization or relief, the licensee must demonstrate that: (1) conformance is impractical for its facility; (2) the proposed alternative provides an acceptable level of quality and safety; or (3) compliance would result in a hardship or unusual difficulty without a compensating increase in the level of quality and safety. Section 50.55a(f)(4)(iv) provides that inservice tests of pumps and valves may meet the requirements set forth in subsequent editions and addenda that are incorporated by reference in 10 CFR 50.55a(b), subject to the limitations and modifications listed, and subject to Commission approval.

NRC guidance contained in Generic Letter (GL) 89-04, "Guidance on Developing Acceptable Inservice Testing Programs," provided alternatives to the Code requirements determined to be acceptable to the staff and authorized the use of the alternatives in Positions 1, 2, 6, 7, 9, and 10 provided the licensee follow the guidance delineated in the applicable position. When an alternative is proposed which is in accordance with GL 89-04 guidance and is documented in the IST program, no further evaluation is required; however, implementation of the alternative is subject to NRC inspection. Generic Letter 89-04, Supplement 1, and NUREG-1482, "Guidelines for Inservice Testing at Nuclear Power Plants," give further guidance.

Section 50.55a authorizes the Commission to grant relief from ASME Code requirements or to approve proposed alternatives upon making the necessary findings. The NRC staff's findings with respect to granting or not granting the relief requested or authorizing the proposed alternative as part of the licensee's IST program are contained in this safety evaluation (SE).

2.0 BACKGROUND

By letter dated December 1, 1992, Wolf Creek Nuclear Operating Corporation submitted Relief Request VR-24 for the Wolf Creek Generating Station IST program. VR-24 requested Commission approval to allow implementation of OM Part 10 for inservice testing of valves, but without immediate implementation of the requirements of OM-1 for inservice testing of safety and relief valves. OM-1 was to be incorporated into the IST program at the beginning of the second ten-year interval which began September 4, 1995. In NRC's letter dated March 12, 1993, the use of OM-10 for inservice testing of valves, without implementing OM-1 at that time, was approved pursuant to 10 CFR 50.55a, paragraph (f)(4)(iv), noting that the licensee should submit relief requests for any requirements that are determined to be impractical. In the licensee's letter of December 14, 1993, it was noted that the revision of the IST program to meet the requirements of OM-10 was completed October 13, 1993, with initial testing to the new requirements scheduled for completion by March 31, 1994. The NRC issued a safety evaluation dated February 22, 1995, for the relief requests associated with the implementation of OM-10. In its letter dated August 31, 1995, the licensee submitted the second ten-year interval program for the Wolf Creek Generating Station IST program. The revised program meets the requirements of the 1989 Edition of Section XI which references OM-6 for IST of pumps, OM-10 for IST of valves, and OM-1 for IST of safety and relief valves.

3.0 EVALUATION OF VALVE RELIEF REQUESTS

The relief requests reviewed in the February 22, 1995, safety evaluation covered Relief Request 2VR-1 (previously numbered VR-6) and Relief Request 2VR-2 (previously numbered VR-11). The evaluations of these two relief requests are repeated here for completeness. Relief Requests VR-25, 26, and 27, related to disassembly and inspection of check valves, were evaluated in the February 22, 1995, safety evaluation, but are replaced by a general relief request 2VR-6 which is evaluated below.

3.1 RELIEF REQUEST 2VR-1

Relief from the testing requirements of Part 10, Section 4.2.1.4 for valve exercising and stroke time measurements is requested for the diesel air start solenoid valves.

Basis for Relief: The licensee stated "Valve stroke time cannot be measured. These valves are solenoid operated and are enclosed with the solenoid. The valves have no position indication devices. These air start valves are required to start the associated diesel. Diesel start time is affected by valve stroke time. Valve degradation can be detected by ensuring the diesel comes up to speed in $\leq$12 seconds and by observing approximately equal pressure drops in the starting air tanks. Therefore, diesel start time and starting air tank pressure changes will provide indication of valve performance and identify significant degradation. Reference NUREG-1482, Section 3.4."

Alternate Testing: The licensee proposed "Proper operation of these valves will be verified by measuring Diesel Start Times and observing Starting Air Tank Pressure changes.

Also, according to Valve Table Note 37, the parameters will be monitored during each monthly test of the diesel generators."

Evaluation

The design of the diesel air start system does not include features to enable measurement of the stroke times for the air-start solenoid valves and, therefore, it is impractical to meet the code requirements. The solenoid valves are enclosed, precluding observation of travel, and have no position indicating devices. However, the diesel generator is tested monthly to ensure that the diesel achieves operating speed within 12 seconds. Any test of the diesel that fails the 12-second criteria will require corrective actions, including determination of the condition of the solenoid valves. Additionally, the starting air tank pressure changes will be observed during diesel testing for information on valve performance. Imposition of the code requirements would be a burden on the licensee, necessitating replacement of the valves or design changes to the system.

Conclusion

Relief is granted to test the diesel air-start solenoid valves and monitor the condition by monitoring the diesel start times monthly, with acceptance criteria based on the diesel start times, pursuant to 10 CFR 50.55a(f)(6)(i) based on the impracticality of performing the stroke time measurement in accord with Code requirements and the burden on the licensee if the code requirements were imposed. The alternative testing provides adequate assurance of the operational readiness of the valves.

3.2 RELIEF REQUEST 2VR-2

An alternative method of performing the position indication verification for the pressurizer safety relief valves is proposed. The test requirement specifies that valves with remote position indicators shall be observed locally at least once every 2 years to verify that valve operation is accurately indicated (Part 10, Section 4.1).

Basis for Relief: The licensee stated "Actuation of these valves for position indication verification would require retesting to ensure the Set Relief Pressure is correct. This would result in increased testing and unnecessary radiation exposure to test personnel."

Alternate Testing: The licensee proposed "Each valve's lift indicating switch assembly will be detached from the valve spindle. A magnet and a lift indicating switch setting tool will be used to simulate valve open and closed positions which verifies lift indicating switch assembly position with remote position indication."

Evaluation

The pressurizer safety relief valves provide overpressure protection for the primary system and are self-actuating on rising pressure. Position indicating devices will inform operators when the valve has opened, though other indications would also make the operator aware that the reactor coolant system pressure is being relieved through the valves (e.g., cessation of increasing pressure). To test the position indicating device on a pressurizer safety valve locally involves opening the valves as installed whether (1) by increasing primary system/pressurizer pressure to the lift setpoint, or (2) by using a hydraulic lift device. Lift setpoint testing may be performed using such an assist device, but may also be performed offsite at a test facility. Although the code does not specifically require that after any actuation of the valve, the lift set pressure must be reverified, industry experience has shown that valve seat leakage can occur after valve lift, damaging the valve seat if not repaired expeditiously. Therefore, unnecessary lifts at pressure are avoided. Performing a position indication verification by lifting the valve as installed could necessitate (1) maintenance to perform seat lapping or machining, or (2) adjustment of the valve settings which would require reverification of the lift setpoint. As the licensee indicates in the basis for the proposed alternative, increased testing, possibly further damaging the valves, and unnecessary maintenance, with accompanying radiation exposure to test personnel, could result.

As an alternative to actually lifting the valve, the licensee proposes to simulate valve opening and closing, and observe the lift indicating switch assembly position and indication at the remote panel. This simulated test will verify that the device is properly indicating the position when the switch is actuated. Under actual operating conditions, the compression of the spring would actuate the switch for indicating valve opening. The simulated test verifies that the indicating system from switch actuation at the valve to the remote indication is working properly, meeting the intent of the periodic verification requirement. Requiring the licensee to perform the verification by lifting the valve creates a hardship or unusual difficulty without a compensating increase in the level of quality and safety that can be achieved by the proposed alternative.

Conclusion

The alternative to perform position verification for the pressurizer safety valves by simulating opening and closing and actuating the indicating switch is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) based on the hardship or unusual difficulty without a compensating increase in the level of quality and safety that could result if verification by actual actuation of the valves were required.

3.3 RELIEF REQUEST 2VR-3

Relief from the requirements for the accuracy of set pressure measurement (OM-1-1987, Paragraph 1.4.1.2) was proposed for the component cooling water (CCW) surge tank vacuum relief valves EGV-0305 and EGV-0306 and the containment

spray additive tank vacuum relief valves ENV-0058 and ENV-0106. Paragraph 1.4.1.2, along with the tolerance limits in applicable paragraphs for acceptance criteria, requires that the overall combined accuracy ensure that the limits of the actual set pressure be in the range of 1 percent above to 2 percent below the indicated (measured) set pressure. Valves EGV-0305 and EGV-0306 open to prevent a vacuum from forming inside the CCW surge tanks which could cause the tanks to implode and collapse. Valves ENV-0058 and ENV-0106 open to allow flow from the sodium hydroxide spray additive tank and prevent tank collapse should the vacuum inside the tank exceed the design limits of the tank.

Basis for Relief: The licensee stated "Characteristically, vacuum breakers are set to relieve at very low differential pressures. In these cases the set pressures are:

6 psi	CCW Surge Tanks
2" Hg (0.98 psi)	Spray Additive Tanks

In order to meet the Code accuracy requirements for testing these valves the instrument accuracies would be 0.06 psig and .0098 psig, respectively. Instrumentation providing this level of accuracy is not typically maintained in a power plant facility.

The functional requirement of a vacuum breaker is only relevant in the opening direction. The closure characteristics are generally irrelevant - so long as the valve remains closed under operating conditions. There is no concern related to premature opening (e.g., inventory loss). Thus, it is possible to establish the lower limit for opening such that there is considerable margin to the maximum opening value without affecting the required valve performance with respect to system function."

Alternate Testing: The licensee proposed "Instrument accuracy and "target setpoint" for these vacuum relief valves will be established such that the overall combined accuracy specified in the test procedure will limit the actual set pressure to 1% above the stamped set pressure."

Evaluation

The test device exerts a force on the disc and opens the valve. The setpoint of the vacuum breaker is tested by setting the force of the test device and then opening the valve. Adjustments to the valves are made as necessary. The test device may be adjusted so that the output force can be made to account for the inaccuracies in the test device. The licensee indicates that the setup will be such that the valves will be set from the actual stamped set pressure (which is given in vacuum - per teleconference with the licensee on September 18, 1995) for the valves and will be 1 percent in the nonconservative direction (i.e., the valves will open to relieve vacuum no more than 1 percent greater vacuum pressure than the stamped set pressure in vacuum).

Because the function of these valves is to open to relieve vacuum, the function of the valves will be met even if the valves lift early, and a tolerance of 1 percent greater vacuum pressure, accounting for inaccuracies, is consistent with the requirements of OM-1. It would be a hardship to require the licensee to purchase or contract for instrumentation with an accuracy that would fully comply with the code because such instrumentation is generally of laboratory standards quality rather than power plant use. There would not be a compensating increase in the level of quality and safety if the code requirements were imposed on the licensee since the alternative testing maintains a level that will ensure that the valves will relieve vacuum within no more than 1 percent greater vacuum pressure than the stamped set pressure. Additionally, there would be no adverse impact on safety to waive the requirement to assure a limit of 2 percent below the indicated set pressure. Operational problems would be indicative of set pressure drift to a low value (i.e., a lower vacuum pressure causing early opening) because the affected valve would open under conditions which did not require it to relieve vacuum and corrective actions could be taken at such time.

Conclusion

Based on the hardship without a compensating increase in the level of quality and safety if the code requirements were imposed, the alternative testing is authorized pursuant to 10 CFR 50.55a(a)(3)(ii).

3.4 RELIEF REQUEST 2VR-4

Relief is requested from the requirements of OM-1-1987, Paragraph 8.1.2.2, "Accumulator Volume," for a minimum accumulator volume below the valve inlet, based on the valve capacity and a calculation according to a given formula. The request is applicable to all testing of safety and relief valves used for compressible fluid services other than steam.

Basis for Relief: The licensee stated "The accumulator volume requirement is not required for simple determination of the valve set pressure. This was recognized by the [ASME OM] Code Committee and corrected in more recent versions of the OM Code."

Alternate Testing: The licensee proposed "The volume of the accumulator drum and the pressure source flow rate shall be sufficient to determine the valve set-pressure. (Ref. ASME OM Code-1990, OMc-1994 Addenda, Paragraph I 8.1.2)."

Evaluation

The licensee proposes to use the provisions of the 1994 Addenda to the OM Code related to the accumulator volume for valves in compressible fluid services other than steam. The NRC has not yet incorporated the OM Code (including any addenda) into 10 CFR 50.55a; however, the NRC agrees with the change to Paragraph 8.1.2. The 1994 Addenda included a substantial revision to Appendix I (previously OM-1) to correct a number of editorial errors, clarify a number

of issues, and incorporate feedback from licensees who have updated to OM-1 (1986 Edition and 1989 Edition of ASME Code) and encountered problems in implementing the requirements.

The remaining provisions in Paragraph 8.1.2 for valves in compressible fluid services other than steam do not appear to bear any relation directly to the accumulator volume. The other changes in this paragraph relate to thermal equilibrium, correlation factors for the test media, and control rings. Therefore, the change related to accumulator volume can be used without any other related requirements from the later addenda of the code (i.e., OM-1-1987 requirements will continue to apply for these items). Testing with only the volume of the accumulator drum and the pressure source flow rate will give an acceptable level of quality and safety for the minimum accumulator volume below the valve inlet as determined by the OM Committee in the 1994 Addenda of the OM Code.

Conclusion

The alternative to use the 1994 Addenda of OM-1 is authorized pursuant to 10 CFR 50.55a(a)(3)(i) based on the acceptable level of quality and safety assured by the alternative set pressure testing.

3.5 RELIEF REQUEST 2VR-5

Relief is requested from the requirements of OM-1-1987, Paragraph 8.1.3.4, "Temperature Stability," for all safety and relief valves tested under ambient conditions using a test medium at ambient conditions. Paragraph 8.1.3.4 requires that the test method shall be such that the temperature of the valve body shall be known and stabilized before commencing set pressure, with no change in measured temperature of more than 10 degrees F in 30 minutes.

Basis for Relief: The licensee stated "For valves tested under normal prevailing ambient conditions with test medium at approximately the same temperature the requirement for verifying temperature stability is inappropriate. There is little or no consequence of any minor changes in ambient temperature. This has been identified by the OM-1 Code Working Group and the ASME [OM] Code Committees and is reflected in the latest version of the Code (OM Code - 1995), Paragraphs I 8.1.2(d) and I 8.1.3(d). Reference NUREG-1482."

Alternate Testing: The licensee proposed "For safety and relief valves tested under ambient conditions using a test medium at ambient conditions, the test temperature will be recorded prior to each test but there will be no verification of thermal equilibrium performed."

Evaluation

Paragraph 8.1.3.4 of OM-1-1987 requires that the tested valve be at a thermal equilibrium condition prior to testing. The 1994 Addenda and the 1995 Edition of the OM Code added a clarification for valves in compressible fluid services other than steam or in liquid service. Specifically, verification of thermal

equilibrium is not required for valves which are tested at ambient temperature using a test medium at ambient temperature. The addition to Appendix I was made because these valves would already be at thermal equilibrium. Testing may commence after recording the temperature. Taking a temperature measurement and waiting at least 30 minutes to ensure thermal stability is an unnecessary delay for these service valves. The intent for thermal equilibrium continues to be met.

The 1994 Addenda included a substantial revision to Appendix I (previously OM-1) to correct a number of editorial errors, clarify a number of issues, and incorporate feedback from licensees who have updated to OM-1 (1986 Edition and 1989 Edition of ASME Code) and encountered problems in implementing the requirements. In Section 4.3.9 of NUREG-1482, the NRC indicated that this addition to the OM Code (i.e., thermal equilibrium for valves tested at ambient temperature is not required) was considered one of a number of clarifications to the requirements of earlier editions of OM-1 (i.e., one issue that was not previously addressed). Section 4.3.9 of NUREG-1482 indicates that licensees may use specifically listed clarifications from the later editions or addenda of OM-1 when using the 1981 or the 1987 Edition (of OM-1), and other changes or additions to OM-1 which are determined to be clarifications only. Such clarifications may be used by licensees if the use is documented in their IST program or test procedures, as appropriate.

Conclusion

It is acceptable to follow the requirements of the later edition of the code for thermal equilibrium of valves in compressible fluid services other than steam or in liquid service that are tested at ambient temperatures using a test medium at ambient temperature. Because the NRC considers the addition to the code a clarification, as noted in NUREG-1482, no specific authorization is necessary. By including the relief request in the IST program, the use of the addition to the code is documented by the licensee. Documentation of the determination of which valves meed the criteria must be available for on-site review.

3.6 RELIEF REQUEST 2VR-6

For disassembly and inspection of all check valves, the licensee proposes to follow the sampling plan outlined in the 1994 Addenda to the OM Code.

Basis for Relief: The licensee stated "ASME OMa 1988, Part 10 [OM-10], Section 4.3.2, "Exercising Tests for Check Valves," discusses disassembly and inspection in lieu of check valve exercising. Generic Letter 89-04, Position 2, does not apply to ASME OMa-1988, Part 10. The sampling techniqu allowed by Position 2 of Generic Letter 89-04 is not discussed in ASME OMa-1988, Part 10. ASME OMc-1994, Subsection ISTC 4.5, contains all of the requirements for testing check valves as discussed by ASME OMa-1988, Part 10, Section 4.3.2, and includes the sample disassembly guidance outlined by Position 2 of Generic Letter 89-04. ASME OMc-1994, Subsection ISTC 4.5, contains all of the

requirements for testing check valves set forth in ASME OMa-1988. In addition to the current requirements, guidance is given for the implementation of a sample disassembly examination program."

Alternate Testing: The licensee proposed "Check valve exercising (inspection) will comply with the requirements of ASME OMc-1994, Subsection ISTC 4.5, including the limits and guidance for sample disassembly."

Evaluation

OM-10 allows the use of disassembly and inspection each refueling outage as an acceptable means of exercising check valves to the position required to fulfill their safety function(s). However, OM-10 does not address a sample program as was described in Generic Letter 89-04, Attachment 1, Position 2. If applying a sample plan, similar (e.g., same model number, manufacturer, size) valves in the same service, but in multiple trains, may be grouped such that the disassembly and inspection is scheduled on a rotating basis each refueling outage for the group of valves. Such a plan minimizes the number of times a valve must be disassembled if the valve is in a group (i.e., greater than one valve in the same service in multiple trains). Minimizing the number of disassemblies, while adequately monitoring for degradation based on the group of valves, is desirable because disassembly is an intrusive means of monitoring the valves, though it is an effective means of identifying valve internal problems that might not otherwise be identified.

OM-10 did not specify that disassembly and inspection was an acceptable means of exercising check valves only when it is impractical to test the valves and verify obturator movement by other listed means. However, Subsection ISTC 4.5.4(c) specifies that if the test methods in ISTC 4.5.4(a) and ISTC 4.5.4(b) are impractical for certain check valves, or if sufficient flow cannot be achieved or verified, a sample disassembly examination program shall be used to verify valve obturator movement. Therefore, by extending the disassembly inspection based on grouping valves (ISTC 4.5.4 provisions) from each refueling outage for each valve (OM-10 requirement), an added requirement is that this is acceptable only when testing is impractical. Such a limitation on the use of a sample plan for disassembly and inspection comports with the alternative described in Position 2 of Generic Letter 89-04.

The specific requirements for a sample disassembly examination program delineated in Subsection ISTC 4.5.4 monitor the applicable check valves for degrading conditions when testing is impractical. Therefore, allowing the licensee to implement the provisions of ISTC 4.5 as an alternative to OM-10, Section 4.3.2, will ensure an acceptable level of quality and safety.

Conclusion

The use of ISTC 4.5 of the OM Code, 1994 Addenda, gives an acceptable level of quality and safety and is authorized pursuant to 10 CFR 50.55a(a)(3)(i) for those check valves which fall within the guidance and requirements of ISTC 4.5. The licensee is responsible for justifying and documenting the impracticality for each valve included in a group for purposes of disassembly

and inspection prior to implementing this alternative. Documentation must be available on-site for inspection.

4.0 PUMP RELIEF REQUESTS

The IST program for the Wolf Creek Generating Station includes four pump relief requests which are evaluated below.

4.1 RELIEF REQUEST 2PR-1

Relief is requested from the requirements of OM-6, Paragraph 4.6.4(a), regarding the measurement of pump vibration for centrifugal pumps specifically as applicable to the emergency fuel oil transfer pumps.

Basis for Relief: The licensee stated "The Emergency Fuel Oil Transfer pumps are submerged within the Diesel Fuel Oil tanks, [and] thus [are] inaccessible. Therefore, a vibration measurement is impractical."

Alternate Testing: The licensee proposed "The Emergency Fuel Oil Transfer pumps will be refurbished or replaced during the Technical Specification 4.8.1.1.2.i.1 required drain down and inspection of the Diesel Fuel Oil tanks (reference Regulatory Guide 1.137). Given the history of reliability for these pumps, this periodic replacement will provide adequate assurance that bearing degradation will not result in pump failure.

Evaluation

Regulatory Guide 1.137, "Fuel-Oil Systems for Standby Diesel Generators," recommends that, as a minimum, the fuel oil stored in the diesel generator fuel oil supply tanks be removed, the accumulated sediment removed, and the tanks cleaned at 10-year intervals. Wolf Creek Generating Station Technical Specification 4.8.1.1.2.i.1 requires that the licensee clean the tanks every ten years. It is possible that the tanks may require cleaning more often, and if so, the pumps should be inspected and maintained at each opportunity. The licensee indicates that the pumps have a history of reliable operation. If future operation indicates that a ten-year interval between inspection and maintenance is too long, the licensee could adjust the tank cleaning schedule to accommodate the pump schedule, if required. With the design configuration such that the pumps are completely submerged in the tanks and inaccessible for monitoring pump bearing vibration, the requirements of the code for vibration measurement are impractical. Imposition of the requirements would require that the system be redesigned. Monitoring the hydraulic performance parameters (i.e., flow rate and pressure differential) quarterly and refurbishing or replacing the pumps at least once every ten years will provide a measure of assurance of the operational readiness of the pumps.

Conclusion

Relief from the requirements of OM-6 to measure the vibration of the diesel fuel oil pumps is granted pursuant to 10 CFR 50.55a(f)(6)(i) based on the impracticalities of meeting the code requirements. The burden on the licensee of imposing the requirements has been considered in evaluating the granting of relief.

4.2 RELIEF REQUEST 2PR-2

Relief is requested for the full scale range requirements for analog instruments used to measure pump discharge pressure for the residual heat removal (RHR) pumps. OM-6, Paragraph 4.6.1.2, requires that the full scale range of each analog instrument shall not be greater than three times the reference value.

Basis for Relief: The licensee stated "Pump discharge pressure is compared to pump suction pressure to determine pump differential pressure. Reference values for discharge pressure for these pumps are between 200 psig and 300 psig. This would require a discharge pressure gauge of 0 - 600 psig maximum. The accuracy required for this gauge would be 2% of 600 psig which is +/- 12 psig. The permanent discharge pressure gauges currently installed are 0 - 700 psig with a tolerance of less than +/- 12 psig. Although the permanent instruments are above the maximum range limits, they are within the accuracy requirements and are therefore suitable for the test. Reference NUREG-1482, Section 5.5.1."

Alternate Testing: The licensee proposed "Use the present permanently installed discharge pressure gauges."

Evaluation

When the range of a permanently installed analog instrument is greater than 3 times the reference value, but the accuracy of the instrument is more conservative than the code required accuracy, the combination of the range and accuracy may yield a reading at least equivalent to the reading that could be achieved when complying with the code. For the RHR pumps, the reference values for discharge pressure could be as low as 200 psig. The code requires a gauge that would have a full scale of 0 - 600 psig maximum (three times 200 psig). The installed gauges have a range of 0 - 700 psig with an accuracy of approximately 1.7 percent full scale or better. The combination ensures that the measured value is within +/- 12 psig of the actual value and has the same tolerance as the combination of the code required range and accuracy. Therefore, the use of the permanently installed gauge as an alternate to the Code-required gauge will provide an acceptable level of quality and safety. The licensee is responsible for ensuring that the instrument reading precision (e.g., reading marks) is acceptable for the testing.

Conclusion

The alternative to the Code requirements for the full-scale range of the RHR pump discharge pressure gauges is authorized pursuant to 10 CFR 50.55a(a)(3)(i). The alternative (i.e., use of the currently installed gauge) provides an acceptable level of quality and safety.

4.3 RELIEF REQUEST 2PR-3

Relief is requested from the requirements for the full-scale range of the analog instruments used to measure suction pressure for the centrifugal charging pumps. OM-6, Paragraph 4.6.1.2, requires that the full scale range of each analog instrument shall not be greater than three times the reference value.

Basis for Relief: The licensee stated "Reference values for suction pressures for these pumps are between 30 psig and 40 psig. This would require suction pressure gauges [with a full-scale range] of 0 - 90 psig maximum. The accuracy required for this gauge would be 2% of 90 psig which is +/- 1.8 psig. The permanent suction pressure gauges currently installed are 0 - 150 psig +/- 1.0 psig. Although the permanent instruments are above the maximum range limits, they are within the accuracy requirements and are therefore suitable for the test. Reference NUREG-1482, Section 5.5.1."

Alternate Testing: The licensee proposed "Use the present permanently installed suction pressure gauges."

Evaluation

When the range of a permanently installed analog instrument is greater than 3 times the reference value, but the accuracy of the instrument is more conservative than the code required accuracy, the combination of the range and accuracy may yield a reading at least equivalent to the reading that could be achieved when complying with the code. For the centrifugal charging pumps, the reference values for suction pressure could be as low as 30 psig. The code requires a gauge that would have a full scale of 0 - 90 psig maximum (three times 30 psig). The installed gauges have a range of 0 - 150 psig with an accuracy of approximately 0.7 percent full scale or better. The combination ensures that the measured value is within +/- 1 psig of the actual value and has a tighter tolerance than the tolerance that the combination of the code required range and accuracy has. Therefore, the use of the permanently installed gauge as an alternate to the Code-required gauge will provide an acceptable level of quality and safety. The licensee is responsible for ensuring that the instrument reading precision (e.g., reading marks) is acceptable for the testing.

Conclusion

The alternative to the Code requirements for the full-scale range of the centrifugal charging pump suction pressure gauges is authorized pursuant to

10 CFR 50.55a(a)(3)(i). The alternative (i.e., use of the currently installed gauge) provides an acceptable level of quality and safety.

4.4 RELIEF REQUEST 2PR-4

Relief is requested from the requirements for the full-scale range of the analog instruments used to measure suction pressure for the auxiliary feedwater pumps. OM-6, Paragraph 4.6.1.2, requires that the full scale range of each analog instrument shall not be greater than three times the reference value.

Basis for Relief: The licensee stated "Pump discharge pressure is compared to pump suction pressure to determine pump differential pressure [i.e., pump differential pressure = pump discharge pressure minus pump suction pressure]. Reference values for suction pressures for these pumps [are] about 15 psig maximum. This would require suction pressure gauges [with a full-scale range] of 0 - 45 psig maximum. The accuracy required for this gauge would be 2% of 45 psig which is +/- 0.9 psig. The permanent [suction] pressure gauges currently installed are 0 - 60 psig with a tolerance less than +/- 0.9 psig. Although the permanent instruments are above the maximum range limits, they are within the accuracy requirements and are therefore suitable for the test. Reference NUREG-1482, Section 5.5.1."

Alternate Testing: The licensee proposed "Use the present permanently installed suction pressure gauges."

Evaluation

When the range of a permanently installed analog instrument is greater than 3 times the reference value but the accuracy of the instrument is more conservative than the code required accuracy, the combination of the range and accuracy may yield a reading at least equivalent to the reading that could be achieved when complying with the code. For the auxiliary feedwater pumps, the reference values for suction pressure could be as low as 15 psig. The code requires a gauge that would have a full scale of 0 - 45 psig maximum (three times 15 psig). The installed gauges have a range of 0 - 60 psig with an accuracy of approximately 1.5 percent full scale or better. The combination ensures that the measured value is within +/- 0.9 psig of the actual value and has the same tolerance as the combination of the code required range and accuracy. Therefore, the use of the permanently installed gauge as an alternate to the Code-required gauge will provide an acceptable level of quality and safety. The licensee is responsible for ensuring that the instrument reading precision (e.g., reading marks) is acceptable for the testing.

Conclusion

The alternative to the Code requirements for the full-scale range of the auxiliary feedwater pump suction pressure gauges is authorized pursuant to 10 CFR 50.55a(a)(3)(i). The alternative (i.e., use of the currently installed gauge) provides an acceptable level of quality and safety.

5.0 COMMENTS ON TEST DEFERRALS

OM-10 includes provisions that allow a licensee to defer valve exercising in a hierarchy such that if full-stroke exercising cannot be conducted during power operations, partial-stroke exercising can be performed quarterly, with full-stroke at cold shutdown conditions. If neither partial- or full-stroke exercising can be performed during power operations, then exercising can be deferred to cold shutdowns. If full-stroke exercising is impractical during power operations and cold shutdowns, partial-stroke exercising can be performed during cold shutdowns and full-stroke exercising can be performed during refueling outages. If exercising is impractical at conditions other than refueling, the exercising may be deferred to refueling outages. These provisions are included in Paragraphs 4.2.1.2 and 4.3.2.2 for Category A and B valves, and Category C valves, respectively. The test deferrals were initially reviewed in the February 22, 1995, safety evaluation and certain discrepancies were identified which have been addressed by the licensee in the updated program. However, the general comment on the use of notes for test deferrals does not appear to be fully addressed. It is repeated below for consideration by the licensee to improve the quality of the IST program document:

> TEST DEFERRALS - Paragraph 6.2, "Test Plans," of OM-10 requires that the justification for deferral of stroke testing of valves be included in the inservice testing plan. The program document currently includes the test deferrals in the notes at the end of the valve table. While this is an acceptable option for the format, the "Notes" should include the valve numbers and the safety function(s) as well as the information justifying the deferral. Each such note should be identified as a test deferral (e.g. Note 2. Test Deferral:). Additionally, the program document could be enhanced if the function of each of the valves were identified in the valve table, particularly since the program does not include system drawings (e.g., "Main steam to auxiliary feedwater turbine driver").

1. NOTE 9 - Valve V0084 is a 2" Class 1 check valve in the reactor coolant system. Note 9 indicates that this valve is considered passive because it is in series with a normally closed safety-related air-operated valve and is not required to change positions to perform a safety-related function. Check valves are generally considered active valves unless the flow is blocked and the licensee has indicated that such is the case for this valve. The previous revision indicated that the check valve flow was blocked by a nonsafety-related air-operated valve.

2. NOTE 30 - In noting that the exercising of emergency core cooling system valves during power operations would violate Technical Specification, the section of technical specifications is now referenced as recommended in the February 22, 1995, safety evaluation. The recommendation applied to other notes as well and many have been revised to include the specific TS number (e.g., TS 4.4.6.2.2 in Note 63).

3. NOTE 48 - The justification for test deferral referred to Relief Request VR-3 ("using the same logic applied in VR-3"); however, VR-3 had been deleted. Note 48 has now been deleted and this comment is no longer applicable.

4. NOTES 61, 63, 65, and 67 - These notes were revised to properly address the requirements of OM-10 rather than IWV-3522.

5. NOTE 62 - The valves that were also previously covered by Note 45 (i.e., covered by both Note 62 and Note 45) remain in the scope of Note 62. Note 45 has been deleted.

6. NOTE 70 - The correct valves have been identified.

7. NOTE 74 - The valve number has been corrected.

6.0 CONCLUSION

Based on the information provided by the licensee, the staff has determined that, with respect to requests for relief 2VR-4 and 2VR-6, the alternate use of a later edition and addenda of ASME Section XI is authorized pursuant to 10 CFR 50.55a(a)(3)(i) and will provide an acceptable level of quality and safety. For relief requests 2PR-2, 2PR-3, and 2PR-4, the staff has determined that the use of the permanently installed pressure gauges as an alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(i) and will provide an acceptable level of quality and safety. With respect to requests for relief 2VR-1 and 2PR-1, the staff has determined that the testing requirements for the subject components are impractical and pursuant to 10 CFR 50.55a(f)(6)(i), the granting of relief is authorized by law, will not endanger life, property or the common defense and security, and is otherwise in the public interest. This relief has been granted giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility. The staff has determined that with respect to requests for request 2VR-2 and 2VR-3, compliance by Wolf Creek Operating Corporation would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety; therefore, the proposed alternative is authorized, pursuant to 10 CFR 50.55a(a)(3)(ii).

Attachment: Summary of Test Deferrals

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Date: January 10, 1996

Table 1
Summary of Test Deferrals

NOTE: Not all "Notes" are test deferrals.

Note Number	Applicable Valves	Justification	NRC Comments
Note 2	Main and Reheat Steam AB-HV-0011/0014/ 0017/0020	Closure of the main steam isolation valves during unit operation could result in reactor trip and safety injection actuation which would introduce a severe transient in the main steam lines which is unacceptable from an operational viewpoint. Testing by isolating each main steam header is also possible but would cause a power reduction which is also unacceptable from an operational viewpoint. These valves will be partially stroked every three months and full-stroke tested during cold shutdown.	The justification is adequate for deferral of the full-stroke exercising to cold shutdowns. However, NUREG-1431, "Standard Technical Specifications for Westinghouse Plants," Bases section for Surveillance Requirement SR-3.7.2.1, indicates that main steam isolation valves should not be tested at power, since even a part-stroke exercise increases the risk of a valve closure when the unit is generating power.
Note 5	Main Feedwater System AE-FV-0039/40/41/42 AE-V-0120/121/122/123	During normal operation, exercising these valves would be impractical. Closing these valves during operation would isolate feedwater to the steam generators which could result in a severe transient, possibly causing a unit trip. Valves FV-39, 40, 41, and 42 will be partial-stroke tested during normal operation while the remaining testing on all the valves pertaining to this note will be performed during cold shutdown.	The justification is adequate for deferral of the full-stroke exercising to cold shutdowns. However, NUREG-1431, "Standard Technical Specifications for Westinghouse Plants," Bases section for Surveillance Requirement SR-3.7.3.1, indicates that main feedwater isolation valves should not be tested at power, since even a part-stroke exercise increases the risk of a valve closure when the unit is generating power.

Note Number	Applicable Valves	Justification	NRC Comments
Note 6	Main Feedwater System AE-V-0124/125/126/127 Auxiliary Feedwater System AL-V-0030/33/36/42/45 AL-V-0054/57/62/67/72	Exercising these valves during normal operation would introduce cold auxiliary feedwater into the steam generators and therefore would cause an unnecessary thermal shock to the auxiliary feed nozzles. Valve testing will be done during cold shutdown.	The concern of thermal shock to feedwater nozzles is sufficient justification to defer testing to cold shutdowns.
Note 8	Reactor Coolant System BB-PV-8702A/B Residual Heat Removal System - BB-HV-8701A/B	These valves have an interlock which prevents their opening when reactor coolant system pressure is above 360 psig. Valve testing will be performed during cold shutdown.	These valves isolate the high pressure reactor coolant system from the low pressure residual heat removal system and cannot be stroked tested during power operations. The power controls are interlocked to prevent valve opening, and thus minimize the possibility of an intersystem loss-of-coolant accident.
Note 10	Reactor Coolant System BB-PCV-0455A/0456A	The power-operated relief valves (PORVs) have a history of failures and should not be challenged at power. Valve testing will be performed during cold shutdown.	The test deferral is consistent with NRC guidance for surveillance testing of the PORVs given in GL 90-06, "Resolution of Generic Issue 70, 'Power-Operated Relief Valve and Block Valve Reliability,' and Generic Issue 94, 'Additional Low-Temperature Overpressure Protection for Light-Water Reactors.' Note that if the PORVs are leaking, the block valves must be maintained closed and would not be inservice testing quarterly (reference TS 4.4.4.2).

Note Number	Applicable Valves	Justification	NRC Comments
Note 11	Reactor Coolant System BB-HV-0013/14/15/16	Failure of these valves in the closed position during normal operation would inhibit flow to the reactor coolant pump thermal barriers. This is not desirable during pump operation. Valve testing will be performed during cold shutdown.	Due to the sensitivity of reactor coolant pump thermal barriers to temperature transients when cooling is interrupted, the justification for deferring testing is adequate.
Note 12	Reactor Coolant System BB-HV-8351A/B/C/D	Failure of these valves in the closed position during normal operation would inhibit flow to the reactor coolant pump seals which could damage the reactor coolant pump seals. Valve testing will be performed during cold shutdown.	Due to the sensitivity of reactor coolant pump seals to temperature transients when cooling is interrupted, the justification for deferring testing is adequate.
Note 13	Reactor Coolant System BB-HV-8001A/B BB-HV-8002A/B	Stroking these valves during normal operation is impractical. Exercising these valves would allow discharge of uncontrolled radiological releases since the system is vented to containment atmosphere. Also, exercising the "inside" valve at power tends to burp the system which would possibly unseat the closed valve, thus limiting any maintenance activity if problems occur with the valves. Furthermore, failure of any one of these valves in the open position would reduce the system to single-valve protection between the reactor coolant system and containment atmosphere. Valve testing will be performed during cold shutdown.	These valves are the reactor vessel head vent valves and are Target Rock pilot-assisted, directional-dependent, solenoid-operated valves. The HV-8002 valves are in series with the HV-8001 valves (two valves in each of two trains A and B). Opening the inside valve for testing during power conditions can cause the outer valve to unseat for a brief period ("burp" open and then reclose) due to the pressure spike. If the outer valve failed to reclose, there would be only one valve at a reactor coolant system boundary. Therefore, testing these valves during cold shutdown rather than quarterly is justified.

Note Number	Applicable Valves	Justification	NRC Comments
Note 14	Chemical and Volume Control System BG-HV-8100/8112	Failure of one of these valves in the closed position during normal operation would result in a loss of seal water flow to the reactor coolant pumps and could cause pump seal damage. Valve testing will be performed during cold shutdown.	Due to the sensitivity of reactor coolant pump seals to temperature transients when cooling is interrupted, the justification for deferring testing is adequate.
Note 15	Chemical and Volume Control System BG-HV-8152/8160	Failure of one of these valves in the closed position during normal operation would result in loss of pressurizer level control and may cause plant shutdown. Valve testing will be performed during cold shutdown.	The charging system is in service continuously during power operations to maintain reactor coolant system chemistry and inventory. Deferring testing to cold shutdowns is acceptable to preclude loss of pressurizer level control and possible plant shutdown that could occur by testing these valves.
Note 16	Auxiliary Turbines FCV-001/2/24/25	Full-stroke exercising these valves requires full flow from the turbine-driven auxiliary feedwater pump. Obtaining full flow with this pump during normal operations would cause thermal shocking of the steam generator feedwater nozzles due to the injection of cold water. This is highly undesirable. The valves will be partial stroked quarterly and full stroked during cold shutdowns.	These valves are in the steam supply to the auxiliary feedwater pump turbine driver. Full flow through the valves can only be assured by full-flow testing the auxiliary feedwater pump. Such a test is impractical to perform quarterly without subjecting the feedwater nozzles to a thermal shock. During the quarterly testing of the pump, the valves are partial-stroke exercised. Full-stroke exercising will be performed during cold shutdowns.

Note Number	Applicable Valves	Justification	NRC Comments
Note 17	Chemical and Volume Control System BG-HV-8105/8106	Closure of one of these valves during normal operation would isolate charging flow to the reactor coolant system which could result in loss of pressurizer level control and cause plant shutdown. Valve testing will be performed during cold shutdown.	The charging system is in service continuously during power operations to maintain reactor coolant system chemistry and inventory. Deferring testing to cold shutdowns is acceptable to preclude loss of pressurizer level control and possible plant shutdown that could occur by testing these valves.
Note 18	Chemical and Volume Control System BG-LCV-0112B/C	The normal charging pumps' suction would be isolated upon closure of one of these valves during normal operation. Alternate suction flow paths (e.g., aligned with the refueling water storage tank) would cause a sudden increase in reactor coolant system boron inventory, and thereby, a plant transient. Also, seal water injection to the reactor coolant pumps would be inhibited which could result in damage to the seals. Valve testing will be performed during cold shutdown.	The charging system is in service continuously during power operations to maintain reactor coolant system chemistry and inventory. Isolating the normal suction would cause a transient on the reactor coolant system. Deferring testing to cold shutdowns is acceptable to preclude the chemical transient, and possible plant transient, that could occur by testing these valves at power operations.
Note 19	Chemical and Volume Control System BG-V-0174	Testing this valve during normal operation would introduce boric acid to the primary side causing unwanted negative reactivity addition. Valve testing will be performed during cold shutdown.	Deferring testing of this valve is acceptable to preclude introduction of boric acid to the reactor coolant system which could cause a plant transient.
Note 20	Residual Heat Removal System EJ-HV-8716A/B	Closure or failure of either EJ HV-8716A or B would render both trains of the residual heat removal system inoperable and would require plant shutdown. The valves will be full-stroke exercised during cold shutdowns.	The test deferral is consistent with NRC guidance that valves should not be tested if the testing causes loss of a total system function.

Note Number	Applicable Valves	Justification	NRC Comments
Note 21	Refueling Water Storage BN-HV-8813	Failure of this valve in the closed position during normal operation could cause a failure of both safety injection pumps by isolating the miniflow recirculation path for both pumps. Valve testing will be performed during cold shutdown.	The test deferral is consistent with NRC guidance that valves should not be tested if the testing causes loss of a total system function.
Note 22	Refueling Water Storage BN-LCV-0112D/E	Failure of these valves in the open position during normal operation could result in introduction of borated water into the reactor coolant system which could possibly cause plant shutdown. Valve testing will be performed during cold shutdown.	Deferral of testing this valve is acceptable to preclude introduction of boric acid to the reactor coolant system which could cause a plant transient.
Note 27	Residual Heat Removal System EJ-HV-8804A/B	EJ HV-8804A and B have control interlocks with BN-8813 which is required per technical specifications to remain open during power operations. Closing this valve would render both emergency core cooling system trains inoperable and would require initiation of shutdown. These valves will be exercised during cold shutdowns.	The test deferral is consistent with NRC guidance that valves should not be tested if the testing causes loss of a total system function.
Note 28	Residual Heat Removal System EJ-HV-8809A/B EJ-HV-8840	These valves have their power removed during normal operation so that the emergency core cooling system flowpath can be maintained operable per technical specifications. Valve testing will be performed during cold shutdown.	Testing these valves quarterly would require power to be restored, violating plant technical specifications. Therefore, deferring testing to cold shutdowns is acceptable.
Note 29	Accumulator Safety Injection EP-HV-8808A/B/C/D	These valves are locked open with power removed during normal operation with reactor coolant system pressure above 1000 psig as required by technical specifications. Valve testing will be performed during cold shutdown.	These valves are locked open so that inadvertent closure will not occur. Closing any one of these valves would defeat the capability of injection from the associated accumulator and is prohibited by plant technical specifications and safety analysis.

Note Number	Applicable Valves	Justification	NRC Comments
Note 30	High Pressure Coolant Injection EM-HV-8835	Failure of this valve in the closed position during normal operation could inhibit a portion of the emergency core cooling system. Closing EM HV-8835 would render both safety injection trains inoperable. This valve is required to remain open, with power removed from the valve operator, per plant technical specifications. Exercising the valve would violate technical specifications. Valve testing will be performed during cold shutdowns.	This valve is the isolation valve for safety injection flow to the reactor coolant system cold legs. Power to the valve actuator is removed during plant operations and closing this valve is prohibited by technical specifications. Therefore, testing during cold shutdown conditions is acceptable.
Note 31	Reactor Coolant System BB-V-443/444/445 BB-V-446/447/448 BB-V-449/550	Exercising of these valves during normal operation would result in interruption of component cooling water flow to the reactor coolant pumps thermal barrier cooling coil. Valve testing will be performed during cold shutdown.	Due to the sensitivity of reactor coolant pump thermal barriers to temperature transients when cooling is interrupted, the justification for deferring testing is adequate.
Note 33	Residual Heat Removal EJ-8730A/B	A full-stroke exercise of these valves during normal operations is not possible since these valves cannot open against reactor coolant system pressure. The flow path back to the refueling water storage tank would require opening BN-8717. Opening this valve and throttling a residual heat removal (RHR) pump discharge valve would make both trains of the RHR system inoperable since the RHR system could no longer provide adequate emergency core cooling flow upon initiation of a safety injection signal. Valves will be partial stroked quarterly and full stroked during cold shutdowns.	The test deferral is consistent with NRC guidance that valves should not be tested if the testing causes loss of a total system function.

Note Number	Applicable Valves	Justification	NRC Comments
Note 34	Residual Heat Removal EJ-HV-8811A/B	Testing of these valves during normal operation is impractical. Opening the valves during normal operation would drain the RHR suction header into the containment sump rendering the associated RHR train inoperable. Failure of either EJ HV-8811A or B in the open position would violate technical specifications which would require initiation of plant shutdown. Furthermore, access to these valves is limited due to the valves being located inside an encapsulation tank. Maintenance on these valves would require the plant to be shutdown. The additional risks encountered to perform testing do not justify the small amount of added assurance gained by the testing. Valve testing will be performed during cold shutdown.	Opening the valves during power operations could drain the contents of the RHR suction header into the containment sump and result in an inoperable train of RHR. The valves are essentially inaccessible, and a failure of one of the valves during testing could result in a plant shutdown to make repairs. Therefore, it is acceptable to defer testing.
Note 35	Containment Spray System EN-HV-0001/0007	Testing of these valves during normal operation is impractical. Opening valve during operation would run the risk of draining the containment spray pumps suction headers into the containment sump which could cause severe damage to the pumps and render them inoperable. The RWST must be isolated to prevent flooding containment should the single check valve not hold when these valves are stroked open. The additional risks encountered to perform testing do not justify the small amount of added assurance gained by the testing.	It is acceptable to defer testing to preclude draining the suction of the containment spray pumps and possible flooding of the containment.
Note 39	Accumulator Safety Injection EP-HV-8950A/B/C/D/E/F	Valve testing during normal operation is impractical. Failure of these valves in the open position would represent a major loss of safety equipment which would force the plant into shutdown. There is no manual backup valve for these valves and if one of the valves failed open it would render the associated accumulator inoperable which would put the plant into a one-hour action statement. The technical specification may not allow adequate time to test and restore an accumulator. Testing will be performed during cold shutdown.	The test deferral is acceptable to preclude loss of the accumulator function if a valve fails to reclose when tested during power operation. Opening of any one of these valves vents the associated accumulator directly to containment atmosphere.

Note Number	Applicable Valves	Justification	NRC Comments
Note 40	Compressed Air KA-FV-0029, KAV-0204	Failure of either valve in the closed position, or exercising of either valve, during normal plant operation, would interrupt the supply of instrument air to valves and equipment necessary for system control and operation. Interruption of air supply would cause loss of normal letdown capability, loss of pressurizer pressure and level control, loss of spray control capability and normal charging capability, which could result in reactor trip, safety injection initiation, overpressurization of the reactor coolant system (RCS), thermal shock of RCS piping, plant transients and consequently plant shutdown. Testing will be performed during cold shutdown.	Stroking the valve would isolate the air supply to various pneumatically-operated components, many of which are valves maintained in an open or closed position by air but fail on loss of air to the "fail-safe" position. The change of position for certain of these valves would result in various system transients, ultimately causing a plant trip. Deferral of testing to cold shutdowns is acceptable to preclude such a transient.
Note 50	Reactor Coolant System BB-8378A/B BB-8379A/B	Exercising these valves during power operation is impractical due to thermal transients induced on the auxiliary charging nozzle and on the auxiliary charging piping during switchover from normal to alternate charging. Valve testing will be performed during cold shutdown.	Subjecting nozzles and piping to thermal cycling can cause damage; therefore, it is acceptable to defer testing of these valves to cold shutdown.
Note 54	Chemical and Volume Control System BG-8481A/B	These valves will be partial-stroke exercised quarterly and full-stroke exercised during refueling outages. Full stroke exercising during normal operation would require injecting borated water into the RCS which could cause a power decrease. Furthermore, full-flow exercising of these valves cannot be performed during power operations or cold shutdown due to the existence of insufficient volume expansion to accommodate the flow required for testing. Full-stroke exercising during cold shutdown could also cause cold overpressurization of the RCS. Full-flow testing of these valves requires reactor head removal.	Deferral of full-stroke exercising is necessary due to the design of the system, with partial-stroke exercising quarterly at less than full flow.

Note Number	Applicable Valves	Justification	NRC Comments
Note 55	Chemical and Volume Control System BG-8481A/B	These valves will be tested closed during cold shutdowns. Testing of these valves required cross connecting both trains of charging which is not allowed per Technical Specification 3.5.2 in modes 1, 2, and 3, since it requires voluntarily entering Technical Specification 3.0.3.	Technical Specification 3.0.3 requires plant shutdown to proceed in one hour. Testing these valves would place the plant in such a condition which is not allowed by the technical specifications during power operations; therefore, deferral of testing is necessary.
Note 56	Reactor Coolant System BB-V118, BB-V148, BB-V178, BB-V208	These valves will be tested closed during cold shutdowns. Testing these valves quarterly would be burdensome since this would require securing reactor coolant pump seal water flow which would increase the probability of a loss-of-coolant accident.	Due to the sensitivity of reactor coolant pump seals to temperature transients when cooling is interrupted, the justification for deferring testing is adequate.
Note 58	Chemical and Volume Control System BG-8381	This valve will be tested closed during cold shutdowns. Testing during power operation would require securing normal charging which would cause a plant trip.	Switching to alternate charging could create a plant transient, and possibly a plant trip. Test deferral is appropriate to preclude such an upset condition.
Note 59	Component Cooling Water System EG-V204	This valve will be tested closed during cold shutdowns. Testing during power operation could damage the reactor coolant pumps and would increase the probability of a loss-of-coolant accident.	Due to the sensitivity of reactor coolant pump seals to temperature transients when cooling is interrupted, the justification for deferring testing is adequate.

Note Number	Applicable Valves	Justification	NRC Comments
Note 60	Reactor Coolant System BB-V001, BB-V022, BB-V040, BB-V059 High Pressure Coolant Injection EM8815 Chemical and Volume Control System BG-8546A/B	These valves will be full-stroke open tested during refueling outages. Full-stroke exercising during normal operation would require injecting borated water into the RCS which could cause a power decrease. Furthermore, partial- or full-flow exercising of these valves cannot be performed during power operations or cold shutdowns due to the existence of insufficient volume expansion to accommodate the flow required for testing. Full-stroke exercising during cold shutdowns could also cause cold overpressurization of the RCS. Full-flow testing of these valves requires reactor head removal.	The only plant condition that allows flow testing of these valves is with the reactor vessel head removed during refueling outages. Therefore, test deferral is appropriate.
Note 61	Reactor Coolant System BB-V001, BB-V022, BB-V040, BB-V059 High Pressure Coolant Injection EM8815 Chemical and Volume Control System BG-8546A/B	These valves will be full-stroke open tested during refueling outages. Full-stroke exercising during normal operation would require injecting borated water into the RCS which could cause a power decrease. Furthermore, partial- or full-flow exercising of these valves cannot be performed during power operations or cold shutdown due to the existence of insufficient volume expansion to accommodate the flow required for testing. Full-stroke exercising during cold shutdown could also cause cold overpressurization of the RCS. Full-flow testing of these valves requires reactor head removal.	Testing these valves is only practical in a plant condition when the reactor vessel head is removed. Therefore, test deferral is necessary.
Note 62	Residual Heat Removal System - EJ-8841A/B Reactor Coolant System BB-8949B/C Accumulator Safety Injection EP-8818A/B/C/D	These valves will full-stroke open tested during cold shutdowns. These valves cannot be exercised open during power operation due to system pressure not being able to overcome RCS pressure.	These valves cannot be tested at power conditions because there is no flow path available for testing.

Note Number	Applicable Valves	Justification	NRC Comments
Note 63	Residual Heat Removal System - EJ-8841A/B Reactor Coolant System BB-894[a]B/C Accumulator Safety Injection EP-8818A/B/C/D	These valves will be close tested during cold shutdowns. Per OM-10, Section 4.3.2, it is not practical to exercise these valves from the open to the closed position due to the reasons stated in Note 62. Assurance of valve closure is provided by monitoring of RCS leakage in accordance with Technical Specification 3/4.4.6.2. Additionally, these valves are close tested in accordance with the guidelines of Technical Specification 4.4.6.2.2.	The test deferral is necessary to perform a closed test which verifies that the obturator travels from the open position to the closed position. The valves are normally closed and the closure during power operations is monitored through RCS leakage rate monitoring.
Note 64	Reactor Coolant System BB-8948A/B/C/D BB8949A/D High Pressure Coolant Injection System EMV001/2/3/4 Accumulator Safety Injection EPV010/020/030/040	These valves will be full-stroke open tested during refueling outages. These valves cannot be exercised open during power operation due to system pressure not being able to overcome RCS pressure. In cold shutdown, Technical Specification 3.5.4 requires both safety injection pumps to be isolated from the RCS; therefore, there is no practical method for testing these valves during cold shutdowns.	For quarterly testing, the test deferral is necessary due to the unavailability of a full-flow path during power operating conditions. During cold shutdown, low-temperature, overpressure protection concerns preclude operation of the high pressure injection pumps. Test deferral is justified.
Note 65	Reactor Coolant System BB-8948A/B/C/D BB8949A/D High Pressure Coolant Injection System EMV001/2/3/4 Accumulator Safety Injection EPV010/020/030/040	These valves will be close tested during cold shutdowns. Per OM-10, Section 4.3.2, it is not practical to exercise these valves from the open to the closed position due to the reasons stated in Note 62. Assurance of valve closure is provided by monitoring of RCS leakage in accordance with Technical Specification 3/4.4.6.2. Additionally, these valves are close tested in accordance with the guidelines of Technical Specification 4.4.6.2.2.	The test deferral is necessary to perform a closed test which verifies that the obturator travels from the open position to the closed position. The valves are normally closed and the closure during power operations is monitored through RCS leakage rate monitoring.

Note Number	Applicable Valves	Justification	NRC Comments
Note 66	Accumulator Safety Injection EP-8956A/B/C/D	These valves will be full-stroke open tested during refueling outages. These valves cannot be exercised open during power operation due to system pressure not being able to overcome RCS pressure. These valves cannot be partial- or full-stroke open exercised during cold shutdown due to cold overpressurization concerns.	There is no flow path available to exercise these check valves at plant conditions other than refueling outages. During power operations, flow cannot be injected into the RCS. During cold shutdowns, a flow path is unavailable due to low-temperature, overpressurization concerns. Test deferral is justified.
Note 67	Accumulator Safety Injection EP-8956A/B/C/D	These valves will be close tested during cold shutdowns. Per OM-10, Section 4.3.2, it is not practical to exercise these valves from the open to the closed position due to the reasons stated in Note 62. Assurance of valve closure is provided by monitoring of RCS leakage in accordance with Technical Specification 3/4.4.6.2. Additionally, these valves are close tested in accordance with the guidelines of Technical Specification 4.4.6.2.2.	The test deferral is necessary to perform a closed test which verifies that the obturator travels from the open position to the closed position. The valves are normally closed and the closure during power operations is monitored through RCS leakage rate monitoring.
Note 68	High Pressure Coolant Injection EM-8922A/B, EM-8926A/B	These valves will be partial-stroke open exercised quarterly and full-stroke exercised during refueling outages. These valves cannot be exercised open during power operation due to system pressure not being able to overcome RCS pressure. In cold shutdown, Technical Specification 3.5.4 requires both safety injection pumps to be isolated from the RCS; therefore, there is no practical method for testing these valves during cold shutdowns.	There is no flow path available to exercise these check valves at plant conditions other than refueling outages. During power operations, flow cannot be injected into the RCS. During cold shutdowns, the high pressure injection pumps cannot be operated to provide a flow of water due to low-temperature, overpressurization concerns.

Note Number	Applicable Valves	Justification	NRC Comments
Note 69	High Pressure Coolant Injection EM-8926A/B	These valves will be tested closed during cold shutdowns. Testing these valves closed requires isolating the RWST which during power operation would require voluntarily entering Technical Specification 3.0.3.	Because the refueling water storage tank must be available during power operations as a supply of borated water in the event of a loss-of-coolant accident, testing these valves cannot be performed quarterly. Test deferral is necessary.
Note 70	Containment Spray System EN-V002/8	These valves will be open tested during refueling outages by disassembly. A different valve will be disassembled, inspected, and manually full-stroked during each refueling. If the full-stroke capability of the disassembled valve is in question, the other valve will be disassembled, inspected, and manually full-stroked during the same outage in accordance with the 1994 Addenda of the OM Code, Subsection ISTC 4.5.4 (see Relief Request 2VR-6). Stroke-open testing of these valves would require installing temporary piping and flooding the containment recirculation sump with contaminated water. It is not practical to test these valves except during refueling outages, because of the radiation exposure and limited time (due to Technical Specification 3.5.2).	See the evaluation for Relief Request 2VR-6, Section 3.6, above.
Note 71	Residual Heat Removal System EJ-8969A/B	These valves will be full-stroke open tested during refueling outages. Full- or partial-stroke opening of these valves during normal operations would require stroking of EJ HV-8804A/B. Valves EJ HV-8804A/B controls are interlocked with BN-8813 which is required by plant technical specifications to remain open during power operations. Closing BN-8813 would require voluntarily entering Technical Specification 3.0.3, which would require plant shutdown to proceed within 1 hour. Partial-stroke testing these valves during cold shutdowns is impractical because it requires reactor head removal.	These check valves cannot be exercised without stroking valves HV-8804A/B which cannot be closed during power operations (see Note 27 above). During cold shutdowns, testing is impractical. Only during refueling outages when the reactor vessel head is removed can these valves be flow tested. Test deferral is necessary.

Note Number	Applicable Valves	Justification	NRC Comments
Note 72	Residual Heat Removal System EJ-8958A/B	These valves will be partial-stroke exercised quarterly and full-stroke exercised during refueling outages. These valves cannot be full-flow exercised open during power operation due to system pressure not being able to overcome RCS pressure. Furthermore, full-flow exercising of these valves cannot be performed during cold shutdown due to the existence of insufficient volume expansion to accommodate the flow required for testing.	Insufficient flow is available during power operations and cold shutdown to full-stroke exercise these check valves. Therefore, partial-stroke exercising quarterly and full-stroke exercising during refueling outages is acceptable.
Note 73	Residual Heat Removal System EJ-8958A/B	These valves will be tested closed during cold shutdowns. Testing these the valves closed during power operations requires isolating the refueling water storage tank which would require voluntarily entering Technical Specification 3.0.3 and a 1-hour action statement.	As noted in Note 72 above, these valves are exercised to verify the opening capability quarterly and during refueling outages. Closure capability is verified during cold shutdown conditions when the refueling water storage tank can be isolated. Test deferral is justified.
Note 74	Chemical and Volume Control System BG-V135	Testing valve BG-V-135 requires securing letdown. Because letdown normally operates during power operations, BG-V135 will be tested open during cold shutdown.	It is unclear which valve is covered in this note. It does not appear that the valve table references this note for any valve, and the two numbers in the note are not the same. Neither "BG-V-035" nor BG-V-305" are included in the valve table. This discrepancy should be resolved.
Note 76	Containment Spray EN-V004/10	These valves are partial stroked quarterly. A different valve will be full stroked during each refueling outage. If the full-stroke capability of the disassembled valve is in question, the other valve will be disassembled, inspected and manually full stroked during the same outage per the requirements of the 1994 Addenda of the OM Code, Subsection ISTC 4.5.4 (see Relief Request 2VR-6).	See the evaluation for Relief Request 2VR-6, Section 3.6, above.

Note Number	Applicable Valves	Justification	NRC Comments
Note 77	High Pressure Safety Injection System EM-8922A/B	These valves will be closed tested during cold shutdown. It is not practical to close test these valves at power.	When a test cannot be performed during power operations, it is acceptable to defer testing to cold shutdown conditions.
Note 78	Main Steam to Turbine Driver for Auxiliary Feedwater Pump FCV-0001/2/24/25	These valves are all part of one valve group which will be on a rotating schedule for disassembly and inspection each refueling outage. If a problem is identified during the sample disassembly of one of these valves, then all remaining check valves in the group shall be disassembled and inspected per the 1994 Addenda of the OM Code, Subsection ISTC 4.5.4 (see Relief Request 2VR-6).	See the evaluation for Relief Request 2VR-6, Section 3.6, above.
Note 81	Chemical Volume and Control System BG-LCV-0459/460	These valves will be tested during cold shutdowns. These valves isolate letdown flow through the regenerative heat exchanger. Closing these valves at power results in a significant thermal cycling of the normal charging line. Isolation of charging flow before testing would stop cooling of letdown flow and cause a steam environment resulting in water hammer. These valves are located behind the bioshield wall. Failure of either of these valves closed at power would result in plant shutdown to allow access for repairs. The degradation in plant equipment caused by testing and risks associated with valve failure at power do not justify the small amount of added assurance gained by the testing.	It is impractical to close these valves during power operations because the charging system piping would be subjected to thermal cycling. Also, isolation could result in a water hammer pressure surge which is highly undesirable. Deferring testing to cold shutdown conditions is necessary to prevent damage to the system.