

WOLF CREEK

NUCLEAR OPERATING CORPORATION

Bart D. Withers
President and
Chief Executive Officer

April 14, 1988

WM 88-0100

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555

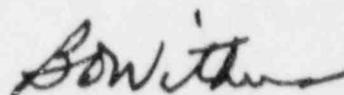
Reference: Letter from J. A. Calvo, NRC, to B. D. Withers, WCNO, dated January 15, 1988
Subject: Docket No. 50-482: Response to Inservice Testing Program SER

Gentlemen:

Attachment 1 is Wolf Creek Nuclear Operating Corporation's (WCNO) response to the Staff's SER for the Inservice Testing (IST) Program for Wolf Creek Generating Station. It describes changes to the IST Program based on the anomalies identified in Appendix C of the TER (attached to the Reference). The numbers of the items in Attachment 1 correspond to the numbers of the items identified in Appendix C of the TER. Also described are additions and changes to relief requests which were necessitated by the SER. These relief requests are contained in Attachment 2. As discussed with Mr. P. O'Connor and other members of your Staff, the relief requests contained in Attachment 2 provide supplemental information for the continuation of the Staff's review of WCNO's original IST Program submittal. Relief requests submitted for any subsequent changes to the IST Program will not be implemented without prior approval by the NRC.

A copy of this response is also being provided to Mr. H. C. Rockhold of EG&G Idaho, Inc. If you have any questions concerning this response, please contact me or Mr. O. L. Maynard of my staff.

Very truly yours,



Bart D. Withers
President and
Chief Executive Officer

Attachments

BDW/jad

cc: B. L. Bartlett (NRC), w/a
R. D. Martin (NRC), w/a
T. K. McLellan (NRC), w/a
P. W. O'Connor (NRC), 2 w/a
H. C. Rockhold (EG&G), w/a

A047
11

RESPONSE TO APPENDIX C OF THE TER FOR THE
WOLF CREEK GENERATING STATION
IST PROGRAM

1. Valves KJ-V711A, V711B, V712A, V712B, diesel generator to air receiver check valves, have been changed from passive to active in the IST Program. These valves will be tested quarterly in the closed direction in accordance with the requirements of the Code.
2. Valves BB HV-8026 and BB HV-8027, nitrogen supply valves to the pressurizer relief tank, have been changed to active valves and will be tested quarterly in accordance with the requirements of the Code.
3. Valves BM HV-19, HV-20, HV-21 and HV-22, steam generator sample isolation valves, have been changed from passive to active and will be tested quarterly.
4. Valve EM-V006, accumulator fill check valve, has been changed from passive to active in the IST Program. Since it is impractical to test this valve in accordance with the requirements of the Code, EM-V006 has been added to relief request VR-3. It will be tested in conjunction with the 10 CFR 50 Appendix J leak rate test. The revised VR-3 is included in Attachment 2.
5. Valve EP-V046, accumulator nitrogen supply check valve, has been changed from passive to active and was also added to relief request VR-3. It will be tested in conjunction with the 10 CFR 50 Appendix J leak rate test.
6. Valves KA-V648, V649, V650 and V651, atmospheric steam dump nitrogen accumulator supply check valves, have been changed from passive to active and have been added to VR-3. They will be tested in conjunction with the IWV-3420 leak rate test.
7. Valves BB HV-8000A and BB HV-8000B, PORV isolation valves, are active valves in Revision 6 of the WCGS IST program. They are being tested quarterly.
8. Valve relief request VR-22 was denied. Therefore valves which have degraded to the point that they exceed their previous stroke time by the specified amount will be repaired prior to returning to power or tested monthly as required by the Code. Denial of this relief request necessitates another relief request (VR-23) involving deletion of the trending requirement for valves that stroke in 2 seconds or less. VR-23 is included in Attachment 2.

9. Valve relief request VR-9 has been revised to full stroke the check valves each refueling. As explained in VR-9, the method for verifying full stroke is the same as that used in the pre-operational testing of this valve. VR-9 is included in Attachment 2.
10. Valve relief request VR-17 has been revised to full stroke these valves using the sample disassembly/inspection method as recommended in the TER. VR-17 is included in Attachment 2.
11. Valve relief request VR-14 has been revised to full stroke the check valves each refueling. The method for verifying full stroke is the same as that used in the preoperational test. VR-14 is included in Attachment 2.
12. Valve relief request VR-16 has been revised to full stroke these valves using the sample disassembly/inspection method as recommended in the TER. VR-16 is included in Attachment 2.
13. Valve relief request VR-1 has been deleted as recommended by the TER.
14. Valve relief request VR-5 requests relief from IWV-3421 through IWV-3425. The writeup in the TER for VR-5 is acceptable. The IST program complies with the requirements in IWA-3426 and 3427.
15. The justification for cold shutdown testing for EN HV-1 and EN HV-7 has been revised. The revised justification, which is now "Note 35" of Appendix B of the IST Program, reads as follows:

"Testing of these valves during normal operation is impractical. Opening the valves 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."
16. The design effort to add instruments to measure flow for the boric acid transfer and emergency fuel oil transfer pumps is progressing. The interim relief provided in the SER (page 3) until November 30, 1988 should provide adequate time to complete installation of the instruments.
17. Pump relief request PR-5 has been deleted as recommended in the TER.

18. Performance data for the pumps listed on pump relief request PR-11 was analyzed to determine the amount of data scatter associated with each pump and to look for signs of degradation. Twelve of the sixteen pumps listed have shown relatively consistent data (variations of 3% or less). There is no reason to believe that any of these pumps have degraded or are currently degrading, in fact most of these twelve are reading consistently higher than the reference value. When the reference values are adjusted, there should not be a problem meeting the code acceptance criteria. These twelve pumps have been deleted from PR-11. Relief request PR-13 has been submitted for the Emergency Fuel Oil Pumps PJE01A, and PJE01B. The relief request asks for an acceptance criteria of ± 1.5 psig from the reference value, based on the very low differential pressure output for these pumps.

The two pumps that remain on the relief request PR-11 are the Fuel Pool Cooling Pumps, PEC01A and PEC01B. Both of these pumps have experienced random variations in their data of 5% over the past two years. These pumps are high flow (3200 gpm) and low head (58 psid). A review of the data revealed no reasonable explanation for the variations. There is no reason to believe that these pumps have degraded or are currently degrading. PR-11 has been revised to add a required action level of 8% above the reference value. This relief request is included in Attachment 2.

19. All of the pumps listed in pump relief request PR-1 were reviewed to determine which pump bearings have permanently installed temperature monitoring devices and/or are accessible for measurement with a portable temperature measuring device. As a result of this review the outboard bearings for the centrifugal charging pumps and the safety injection pumps were deleted from the relief request and the IST program has been revised accordingly. For the other pump bearings it is impractical to measure temperature.

ATTACHMENT 2

TO WM 88-0100

SUPPLEMENTAL INFORMATION ON
RELIEF REQUESTS ASSOCIATED WITH
WOLF CREEK GENERATING STATION
IST PROGRAM

April 14, 1988

April 14, 1988

RELIEF REQUEST NO. PR-1

PUMPS:

PAL01 A and B, Motor Driven Aux. Feedwater Pumps;
PAL02, Turbine Driven Aux. Feedwater Pump; PBG02 A and
B, Boric Acid Transfer Pumps (inboard bearing only);
PBG05 A and B, Centrifugal Charging Pumps; PEC01 A and
B, Fuel Pool Cooling Pumps PEF01 A and B, Essential
Service Water Pumps; PEG01 A, B, C and D, Component
Cooling Water Pumps; PEJ01 A and B, Residual Heat
Removal Pumps; PEM01 A and B, Safety Injection Pumps
(inboard bearing only); PEN01 A and B, Containment
Spray Pumps; PJE01 A and B, Emergency Fuel Oil Transfer
Pumps.

CLASS:

ISI Class 2 and 3

TEST REQUIREMENT:

The temperature of all centrifugal pump bearings
outside the main flowpath shall be measured at points
selected to be responsive to changes in the temperature
of the bearing. (IWP-4310)

BASIS FOR RELIEF:

- a) Bearings of certain pumps addressed in this Relief Request are cooled by their respective process fluid. Thus, bearing temperature measurements would be highly dependent on the temperature of the cooling medium.
- b) Bearing temperature taken at one-year intervals provide little data toward determining the incremental degradation of a bearing or providing any meaningfully trend information.
- c) All pumps addressed by this Relief Request, except for the Emergency Fuel Oil Transfer Pumps, are subjected to vibration measurements on a quarterly basis in accordance with Subsection IWP-4500. Vibration measurements are a significantly more reliable indication of pump bearing degradation than are temperature measurements.

April 14, 1988

RELIEF REQUEST NO. PR-1

- d) All pumps addressed by this Relief Request have no permanently installed temperature monitoring devices or access for measurement with a portable temperature measuring device. The only exceptions are the outboard bearing of the CCPs and SI Pumps which have installed local temperature measuring devices in the oil return line from the bearing.

In summary, other measurable Parameters are more indicative of pump performance and in some instances the measured temperature does not represent the actual bearing temperature. Therefore, pump bearing temperature will not be measured with the exceptions noted in (d) above.

ALTERNATE TESTING:

None

RELIEF REQUEST NO. PR-5

(NOT USED)

RELIEF REQUEST NO. PR-11

PUMPS:

PEC01A and B, Fuel Pool Coolant Pumps.

CLASS:

ISI Class 3

TEST REQUIREMENT:

The allowable ranges of inservice test quantities in relation to the reference values are tabulated in Table IWP-3100-2. This table limits the acceptable performance of each pump dependent variable (flowrate or differential pressure) to a maximum of 103 percent of the respective reference value. If the Test Parameter should exceed this limit, it shall be declared inoperative and removed from service.
(IWP-3200)

BASIS FOR RELIEF:

The requirement to declare a pump inoperative when a Test Parameter exceeds the reference value by 3 percent is not technically justified, sound engineering judgement, nor acceptable plant operating practice for the following reasons:

- Indiscriminately declaring Safety System Pumps inoperative results in excessive and unneeded testing of other plant Safeguard Systems and Components. Such testing could ultimately detract from the overall reliability of the Plant Safety Systems. In addition, unwarranted testing unnecessarily adds to the burden of the Operations Force and dilutes efforts focused on the performance of their primary duties. Also, Operators are subjected to additional, and unnecessary radiation exposure.
- The case where a Test Parameter exceeds the reference value is not necessarily indicative of pump degradation. It may merely signify that the reference value is probably at the lower side of the statistical scatter of the test data and the specific test in question is on the upper side. Note that the reference values are subject to the same elements of statistical error associated with any other individual test.

RELIEF REQUEST NO. PR-11
(continued)

- The 3-percent limitation is overly restrictive when compared to the accuracy of the instrumentation used to gather the test data. Analysis has shown that, in order to consistently remain below the 3-percent limit, Instrument Loop accuracies in the range 0.5 to 0.75 percent would be required. This presents a significantly more restrictive requirement than that established by Paragraph IWP-4110 (±2 percent).
- Power Plant Operating Systems are not configured in a manner that provides the laboratory-type conditions demanded to meet the repeatability implied by the 3-percent restriction. Several of the tests require throttling with large Gate or Butterfly Valves using remote manual control. Thus, non-quantifiable System Flow conditions are created that are certain to affect measured test quantities.
- To ensure the reference values do not reflect operations at the lower end of the performance spectrum and, thus, ultimately be reflected in frequently exceeding the upper performance limits as a result of instrument drift, all related instrumentation is calibrated on a frequent basis.
- This requirement provides no additional measure of reliability to the equipment.
- When the upper limits are exceeded, the only reasonable way of correcting the inoperative condition is to conduct an analysis to ensure that the pump is indeed operable and capable of meeting its intended function. When this is done, in accordance with Subarticle IWP-3230(c), a new reference value must be established. Due to the test conditions and methods of testing at WCGS, any change in the reference point eliminates the correlation of future test results with past pump performance. Because, the usefulness of any past data in determining a trend for pump performance is essentially eliminated a primary goal and basis for the Inservice Testing Program could be jeopardized.

RELIEF REQUEST NO. PR-11
(Continued)

ALTERNATE TESTING:

Pumps will be tested in accordance with Subsection IWP with the following exceptions:

- a) The required action range (HIGH) will be above a value equal to 108 percent of the reference value for test quantities flowrate and differential pressure; and
- b) The Alert-range (HIGH) will be above a value equal to 105 percent of the reference value for test quantities of Flow Rate and differential pressure.

RELIEF REQUEST NO. PR-13

PUMPS:

PJE01A and B Emergency Fuel Oil Transfer Pumps

CLASS:

ISI Class 3

TEST REQUIREMENT:

The allowable ranges of inservice test quantities in relation to the reference values are tabulated in Table IWP-3100-2.

BASIS FOR RELIEF:

The Emergency Fuel Oil Transfer Pumps are small submersible pumps. Their nominal differential pressure is only 12 to 13 psid. Which means the maximum allowable high range is less than 0.4 psi above the reference value.

By using a more accurate discharge pressure gauge the maximum Instrument error is limited to 0.09 psi.

The data scatter over the last two years of testing has been greater than 8% (1.0 psi). This variation is probably related to the short run time (about 2 mins.) during the test. (See PR-10). Installation of flow instrumentation, scheduled for Nov. 88, should help explain the variation.

ALTERNATE TESTING:

The Emergency Fuel Oil Transfer Pumps will be tested quarterly and use an Acceptance Criteria of ± 1.5 psig from the reference value.

Attachment 2 to WM 88-0100
Page 8 of 15
April 14, 1988

RELIEF REQUEST NO. VR-1

(NOT USED)

RELIEF REQUEST NO. VR-3

VALVE(S):

BB-V118, BB-V148, BB-V178, BB-V208, BG-8381, EG-V204,
KA-V204, EM-V006, EP-V046, KA-V648, KA-V649, KA-V650,
KA-V651

CATEGORY:

A/C

FUNCTION:

Various depending on Component and System function.

TEST REQUIREMENT:

Check Valves shall be exercised at least once every 3 months, except as provided by IWV-3522. (IWV-3521)

BASIS FOR RELIEF:

When these valves are in operation there is no practical means to test valve closure. Valve closure cannot be verified due to System Design. To perform a closure verification constitutes a Leak Test which presents a significant hardship during Cold Shutdown. Leak Testing requires an extended period of time which causes extended outages of securing Seal Water Injection to RCP Seals, NORMAL Charging, Component Cooling Water, Instrument Air to Containment, water and nitrogen to the Emergency Accumulators, and nitrogen to the entire Power Block.

ALTERNATE TESTING:

Verification of valve closure will be done either in conjunction with the 10 CFR 50 Appendix J Type C Leak Tests (AT-1) conducted at least once per 2 years or in conjunction with IWV3420 Leak Test (AT-3) conducted at least once per 2 years.

RELIEF REQUEST NO. VR-9

VALVE(S):

BB-8948A, B, C and D

CATEGORY:

A/C

FUNCTION:

Provides Flowpath from the Accumulators, Safety Injection Pumps or Residual Heat Removal Pumps to the RCS Cold Legs.

TEST REQUIREMENT:

Check Valves shall be exercised at least once every 3 months, except as provided by IWV-3522. (IWV-3521)

BASIS FOR RELIEF:

Full Stroke or Partial Stroke Exercising during NORMAL Operations cannot be accomplished since System Pressure required to perform the test is not enough to overcome RCS Pressure. Full Stroke Exercising during Cold Shutdowns cannot be accomplished since the Flow Rate required to Full Stroke the valves would require injection into the RCS, which could cause cold over-pressurization of the RCS.

ALTERNATE TESTING:

These valves will be Full Stroke Exercised during Refueling Outages. Verification of Check Valve operability will be demonstrated in accordance with the methodology used in the Pre-Operational Testing Program. The differential pressure across the entire System (between Accumulator and the RCS) will be approximately the same as that used in the Pre-Operational Test. Accumulator Pressure vs. time and Accumulator Level vs. time will be measured to calculate System resistance. Demonstrating acceptable System resistance verifies the Accumulators are capable of operating adequately and indicates that the Check Valves are not CLOSED or partially CLOSED.

RELIEF REQUEST NO. VR-14

VALVE(S):

EP-8956A, B, C and D

CATEGORY:

A/C

FUNCTION:

Provide flow from the Accumulator Safety Injection Tanks to the RCS Cold Legs.

TEST REQUIREMENT:

Check Valves shall be exercised at least once every 3 months except as provided by IWV-3522. (IWV-3521)

BASIS FOR RELIEF:

Full Stroke or Partial Stroke Exercising during NORMAL Operations cannot be accomplished since System Pressure required to perform the test is not enough to overcome RCS Pressure. Full Stroke Exercising during Cold Shutdowns requires injection into the RCS which could result in cold over-pressurization of the RCS.

ALTERNATE TESTING:

These valves will be Full Stroke Exercised during Refueling Outages. Verification of Check Valve operability will be demonstrated in accordance with the methodology used in the Pre-Operational Testing Program. The differential pressure across the entire System (between Accumulator and the RCS) will be approximately the same as that used in the Pre-Operational Test. Accumulator Pressure vs. time and Accumulator Level vs. time will be measured to calculate System resistance. Demonstrating acceptable System resistance verifies the Accumulators are capable of operating adequately and indicates that the Check Valves are not CLOSED or partially CLOSED.

RELIEF REQUEST NO. VR-16

VALVES(S):

FC-V001, FC-V024, FC-V002 and FC-V025

CATEGORY:

C

FUNCTION:

Function to maintain steam supply to the Aux. Feedwater Pump Turbine during a steamline break.

TEST REQUIREMENT:

Check Valves shall be exercised at least once every 3 months, except as provided by IWV-3522. (IWV-3521).

BASIS FOR RELIEF:

FC-V001 and FC-V024 are in series in one of the Main Steam Supply Lines to the AFWP Turbine. FC-V002 and FC-V025 are located in the opposite Main Steam Supply Line. A CLOSED Check Valve Test cannot be performed on each valve due to there not being Drain or Test Lines located between either pair of Check Valves.

ALTERNATE TESTING:

A different valve in this group will be disassembled, inspected, and manually Full Stroked at each Refueling. If the Full Stroke capability of the disassembled valve is in question, the remainder of the valves in this group will be disassembled also, inspected, and manually Full Stroked at the same Outage.

RELIEF REQUEST NO. VR-17

VALVE(S):

EN-V003, EN-V004, EN-V009, EN-V010

CATEGORY:

C

FUNCTION:

Provide FlowPath from Refueling Water Storage Tank to the Spray Headers.

TEST REQUIREMENT:

Check Valves shall be exercised at least once every 3 months, except as provided by IWV-3522. (IWV-3521)

BASIS FOR RELIEF:

The FlowPath that would provide sufficient flow to fully OPEN these valves cannot be utilized since it could result in spraying Containment.

ALTERNATE TESTING:

Valves will be Partial-Stroke Exercised OPEN every 3 months. And a different valve in each group * will be disassembled, inspected, and manually Full Stroked OPEN during each Refueling. If the Full Stroke capability of the disassembled valve is in question, the remaining valve in that group will be disassembled, inspected, and manually Full Stroked during the same Outage.

*Group I EN-V003, EN-V009
Group II EN-V004, EN-V010

RELIEF REQUEST NO. VR-22

(NOT USED)

RELIEF REQUEST NO. VR-23

VALVES:

Valves with Maximum Stroke Times of two seconds.

CATEGORY:

A and B

FUNCTION:

Various

TEST REQUIREMENT:

If, for Power Operated Valves, an increase in Stroke Time of 50% or more from the previous test for valves with Full-Stroke Times less than or equal to 10 sec. is observed, Test Frequency shall be increased to once each month. [IWV-3417(a)].

BASIS FOR RELIEF:

It is impractical to apply the strict requirements of Paragraph IWV-3417(a) in any meaningful way without installing sophisticated Timing Devices. Operator Reaction Time could easily vary by 0.5 seconds thereby adding considerable error to test results of Quick-Acting Valves. Therefore, the 50% Unincreased-Test-Frequency Criteria will not be applied when Maximum Valve Stroke Times are two seconds.

ALTERNATE TESTING:

A Limiting Stroke Time of two seconds will be assigned to these valves. Valves exceeding this limit will be corrected in accordance with IWV-3417(b).