WOLF CREEK
NUCLEAR OPERATING CORPORATION

Bart D. Withers
President and
Chief Executive Officer

July 2, 1993
WM 93-0084

U. S. Nuclear Regulatory Commission
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Reference: Letter dated June 4, 1993 from A. B. Beach, NRC to B. D. Withers, WCNOC
Subject: Docket No. 50-482: Reply to Notice of Violations 482/9308-03 and 9308-04

Gentlemen:

Attached is Wolf Creek Nuclear Operating Corporation's (WCNOC) "Reply to Notice of Violations 482/9308-03 and 482/9308-04" that were documented in the Reference (NRC Inspection Report 50-482/93-08). Violation 482/9308-03 concerns a late Surveillance Test which caused Residual Heat Removal Pump "B" to be inoperable. Violation 482/93-04 concerns inadequate work instructions for installation of Pressurizer Safety Valve BB 8010C which allowed over stressing of associated Class 1 piping. The NRC identified both incidents as Severity Level IV violations.

If you have any questions concerning this matter, please contact me at (316) 364-8831 ext. 4000 or Mr. K. J. Moles of my staff at ext. 4565.

Very truly yours,

Bart D. Withers
President and
Chief Executive Officer

cc: W. D. Johnson (NRC), w/a
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Reply to Notice of Violations 482/9308-03 and 482/9308-04

Violation 482/9308-03: Failure to Perform a Timely Surveillance: Missed Surveillance Test resulted in Residual Heat Removal (RHR) Pump "B" becoming inoperable.

Findings:

"Technical Specification 4.0.5 specifies requirements for inservice testing of ASME Class 1, 2, and 3 pumps. The specification also states that a 25 percent extension is allowed for a surveillance requirement before it is overdue and a limiting condition for operation exceeded. Program Guidance WCOP-02, "Inservice Testing Program For Pumps And Valves," Revision 9, Step 2.1.2, specifies that the table in Appendix A lists all pumps in the inservice testing program. Note 2 of the Inservice Testing Program Pump table specifies that the required test frequency for all pumps is every 3 months during normal operation.

Procedure STS EJ-100B, "RHR System Inservice Pump B Test," Revision 8, provides guidance for conduct of the quarterly inservice pump test to ensure pump OPERABILITY.

Contrary to the above, on April 13, 1993, the licensee determined that the surveillance test for Residual Heat Removal Pump B was late on April 10, 1993, which made the pump inoperable. The plant was in Mode 6 with the vessel level less than 23 feet below the flange. Consequently, the licensee failed to meet all limiting conditions for operation requirements."

Reason for Violation:

In accordance with the requirements of Technical Specification 4.0.5, surveillance test procedure STS EJ-100B, "Residual Heat Removal System Inservice Pump B Test," had an assigned due date of March 18, 1993, at 1510 CST, with a late date of April 10, 1993, at 1510 CDT. On March 13, 1993, RHR Pump "B" was declared inoperable in order to perform required non-pump related maintenance during the Sixth Refueling Outage. Since the pump was out-of-service, the performance of the surveillance test procedure was not scheduled on the Control Room R1 Status Chart. The R1 Status Chart is used by Control Room personnel to track required surveillance's that are performed on a monthly or longer frequency. Surveillances that are scheduled for equipment that is out-of-service were removed from the Control Room R1 Status Chart for this refueling outage to prevent confusion with surveillances that are required to be performed on operable equipment.

On April 6, 1993, during a routine review of the R1 schedule, which is maintained by the Surveillance Group, the Surveillance Coordinator noted

that surveillance test procedure STS EJ-100B had the potential for not being accomplished by the required date. Step 6.6.2.5.1.2 of Administrative Procedure ADM 02-300, "Surveillance Testing," Revision 18, requires the Surveillance Group to routinely review the R1 schedule to identify any scheduled R1 surveillances which have the potential for being missed. It also requires an investigation to be performed to determine the status of any R1 surveillances meeting this criterion, and if the deficiencies cannot be readily resolved it shall be brought to the attention of Plant Management for resolution. Following discovery of the condition on April 6, 1993, the Surveillance Coordinator verbally discussed the potential for STS EJ-100B becoming late with Operations Supervision. Also, on April 8, 1993, Operations Supervision was verbally informed of the condition. The requirement for the performance of the surveillance was placed on a maintenance work schedule (P-2) following the discussion, but this schedule is not used by the Control Room for surveillance activities. However, Operations Management did not follow-up on the concern with the Control Room because it was believed that the situation was being addressed by the Surveillance Group and the requirement to perform the surveillance test would be put on the Control Room R1 Status Chart for completion. On April 8, 1993, RHR Pump "B" was returned to operable status following repairs to RHR Pump Room Cooler SGL10B.

On April 13, 1993, questions were raised by an Outage Management representative concerning when surveillance test procedure STS EJ-100B would be accomplished. Following an investigation, the manual surveillance testing tracking log, which is maintained by the Surveillance Group, was consulted and it was determined that STS EJ-100B had not been accomplished by April 10, 1993, as required by Technical Specification 4.0.5.

The root cause of this event was a lack of oversight of the Surveillance Program. After it was identified that STS EJ-100B had the potential for becoming late, an attempt to resolve the deficiency was not performed in accordance with step 6.6.2.5.1.2 of Administrative Procedure ADM 02-300. Operations Management was informed of the potential for STS EJ-100B to be late; however, believing that the Surveillance Group had control of the situation, Operations Management did not follow-up on this concern with the Control Room. The Surveillance Group did not follow-up with the Control Room to ensure that STS EJ-100B would be accomplished within the time requirements of Technical Specification 4.0.5.

Contributing factors include:

1. Failure to have surveillance test procedure STS EJ-100B on Control Room R1 Status Chart.

2. Use of multiple schedules for tracking the accomplishment of surveillance test procedures.

3. Lack of adequate procedural guidance on the performance of investigation and follow-up required to correct deficiencies

identified for potential late surveillances. WCNOC recognizes that this was ineffective implementation of a corrective action developed in response to the event described in Licensee Event Report 482/91-011-01.

Corrective Steps That Have Been Taken and Results Achieved:

On April 13, 1993, 1715 CDT, the Shift Supervisor was notified of the necessity to perform surveillance test procedure STS EJ-100B. Upon being notified that the surveillance had been missed, the Shift Supervisor declared RHR Pump "B" inoperable and entered Technical Specification 3.9.8.2. Technical Specification 3.9.8.2 requires, in part, that with less than two independent residual heat removal loops operable while in Mode 6 with the water level less than 23 feet above the top of the reactor vessel flange, immediate corrective actions must be initiated to return the required RHR loop to operable status, or establish greater than or equal to 23 feet of water above the reactor vessel flange, as soon as possible. At 1740 CDT, performance of surveillance test procedure STS EJ-100B was commenced to verify operability of RHR Pump B. On April 14, 1993, at 0010 CDT, RHR Pump "B" was declared operable following the successful performance of surveillance test procedure STS EJ-100B and Technical Specification 3.9.8.2 was exited.

In response to this event and previous events involving late performances of surveillance test procedures, Administrative Procedure ADM 02-300 was superseded by procedure ADM 01-300, "Surveillance Testing", Revision 0 (issued 5/26/93). The rewrite of the procedure was based on input from other plants and knowledge gained from late performances of surveillance test procedures in the past. This rewrite proceduralizes the use of a Past Due Notification Sheet, which will be hand carried to the Control Room when a surveillance test procedure has not been completed at least two days prior to its late date. This will eliminate the reliance on verbal communications to relay information regarding surveillances becoming late and will place the Control Room in the information loop.

The investigation of surveillances about to go past due described in Step 5.6.2.2 of ADM 01-300, Revision 0 (previously ADM 02-300 Revision 18, Step 6.6.2.5.1.2) was found to be ineffective. Therefore, another procedure enhancement has been made. Change MA 93-0102 to ADM 01-300 requires that a PIR be considered based on guidance in KGP-1210 "Performance Improvement Request," by the responsible group whenever a Past Due Notification Sheet is used. This will ensure the appropriate personnel are responsible for the investigation and remain involved until resolution of the problem.

Corrective Steps That Will Be Taken to Avoid Further Violations:

The methodology to be used when removing surveillances from the R-1 schedule is also being evaluated. This evaluation will include restoration of items to the schedule.

The use of multiple schedules to track surveillance test procedures is being evaluated to determine if the use of one schedule would be appropriate to eliminate confusion.

Date When Full Compliance Will Be Achieved:

With the actions already taken, as discussed above, Wolf Creek Generating Station (WCGS) is currently in full compliance with the requirements of Technical Specification 4.0.5, and the corresponding RHR pump surveillances are current. The method of scheduling surveillances determined to be most effective will be proceduralized by December 6, 1993.

Actual or Potential Consequences of This Violation:

During the time that RHR Pump "B" was considered to be inoperable due to the failure to perform STS EJ-100B [April 10, 1993, at 1510 to April 14, 1993, at 0010 CDT] the pump was fully functional. Also, the satisfactory completion of the surveillance test procedure on April 14, 1993, indicates that the pump would have performed its required safety function had it been needed. The "A" RHR Pump was providing decay heat removal during this period and was fully operable and capable of performing its safety function. Therefore, the health and safety of the public and plant safety were assured during this condition.

Violation 482/9308-04: Inadequate Work Instructions: Instructions did not prevent excessive cold springing of Class 1 piping at Pressurizer Code Safety Valve BB 8010C.

Findings:

"Technical Specification 6.8.1.a states that written procedures shall be established, implemented, and maintained covering the applicable procedures recommended in Appendix A of Regulatory Guide 1.33, Revision 2, dated February 1978. Regulatory Guide 1.33, Appendix A, Item 9.a, requires that maintenance that affects the performance of safety-related equipment should be properly pre-planned and performed in accordance with written procedures, documented instructions, or drawings appropriate to the circumstances.

10 CFR Part 50, Appendix B, Criterion III, "Design Control," specifies, in part, that the design basis for those structures, systems, and components to which this appendix applies are correctly translated into specifications, drawings, procedures, and instructions. This is accomplished, in part, by Procedure ADM 01-057, "Work Request," Revision 26. Step 7.16 of Procedure ADM 01-057 specifies, "Develop Work Instructions in sufficient detail necessary to perform safe and effective work."

Contrary to the above, in November 1991, licensee personnel implemented Work Request 60097-91, Section 6.0, for installation of Pressurizer Safety Valve BB 8010C. The instructions failed to specify a maximum allowable deflection of 1/2 inch. Consequently, licensee personnel moved the safety-related piping 1 1/2 inch vertically in order to join the flanges creating excessive stresses in the piping."

Reason for Violation:

On April 10, 1993, maintenance personnel identified a 1 1/2-inch vertical and 2 3/4-inch horizontal misalignment between the Pressurizer Code Safety Valve BB 8010C flange and the discharge pipe flange. The pressurizer safety valve is ASME Class 1 and the discharge piping was fabricated and installed in accordance with the B31.1 power piping code. The flanges had been disassembled and the safety valve bench tested in accordance with preventive maintenance Work Request 60265-92. A maintenance engineer initiated Work Request 02447-93 that requested design engineering to approve reworking the discharge piping to allow alignment of the piping, to evaluate the existing condition to determine the effects on the piping service life, and to review the potential for additional cold springing of the piping. Performance Improvement Request (PIR) MA 93-0374 was written to investigate the circumstances. All work requests relating to BB 8010C were reviewed, and several mechanics and engineers were interviewed.

During Refuel II, the Constant Support BB02-H004 strut paddle was found to be bent. This was documented in Work Request 70747-87. Investigation revealed that an installed load pin prevented free movement of the pressurizer safety line, resulting in plastic deformation of the piping during heatup of the pressurizer. A liquid penetrant examination was performed of all piping and elbows between the pipe support and the first upstream field weld. Radiography, visual examinations, hardness tests, and metallographic examinations were also performed. Other constant supports were inspected to verify no other load pins remained installed. Engineering determined from the above tests that the piping had not exceeded its tensile strength and that the plastic deformation experienced would not prevent the piping from performing its design function. Plant Modification Request (PMR) #2349 was issued to accept the affected piping as is. An as-built survey was provided to Nuclear Plant Engineering (NPE) identifying the piping to be off location in the vertical direction. The significance of the misalignment was not apparent because with the flange made up, both sections of the line were off location. Additionally, the offset with the flange broken was not called to their attention. Consequently, instructions were issued to rework the existing pipe support and return the system to service without addressing the piping deformation.

Personnel involved in removing, testing, and replacing the safety valve assumed that NPE was aware of the piping anomaly and had dispositioned it acceptable as installed. They therefore assumed the cold springing of the discharge piping necessary for re-assembly was also acceptable. There were three more incidents of cold springing the piping between 1987 and 1993, with the same personnel performing the work each time. They continued to believe the required cold springing was acceptable until recent plant emphasis on performance enhancement caused them to question this practice.

Engineering evaluations confirmed that the safety valve flange was below the discharge pipe mating flange by 1 1/2 inches. The Class 1 pipe, designed to be horizontal, was found to slope downward, away from the pressurizer at 3/8 inch per foot. The deflection required to cold spring the piping was less than 60 percent of that required to accommodate thermal expansion of the pressurizer with the constant support pinned. In addition, the motion of the safety nozzle during heatup relieved the stresses created by the cold springing. Liquid penetrant testing was performed to look for defects, and a fatigue analysis was performed in accordance with the ASME Code on this line. The total fatigue usage from design cycles, constrained thermal expansion, and cold springing was calculated to be 0.163, with the fatigue usage from cold springing contributing 0.003. Since the calculated fatigue usage remained less than the ASME allowable of 1.0, it was concluded that the pipe was acceptable for use-as-is. The most highly stressed component in the line is an elbow above the pressurizer nozzle. Because the fatigue usage exceeded 0.1, a high energy pipe break was required to be postulated at this elbow. The previous Effects Analysis was found to bound this postulated break, but the affected

elbow was not listed in Updated Safety Analysis Report (USAR) Table 3.6-4, Sheet 47. Consequently, the USAR is being revised.

Specification M-204(Q), Appendix D, "Compensation Allowances For Piping Misalignment," Revision 40, provided guidance to be observed in the field for aligning safety-related piping. The maximum allowed pipe movement for alignment was 1/2 inch, but the pipe had been moved greater distances during past refueling outages. Work Request 60097-91 instructions failed to specify the design specification limits or any precautions to prevent excessive cold springing. Further, the amount of actual deflection was not documented. The failure to provide adequate work instructions was a violation of Technical Specification 6.8.1.a.

The root cause for pipe misalignment was the failure to remove the pin from constant support BB02-H004 prior to heatup. The reason the pin was not removed could not be determined from available information. Thus, no direct programmatic failure could be established. Additionally, the work instructions were reviewed and found to be adequate for the scope as originally defined. However, several programs were identified which could have resulted in correction of the problems which resulted in this violation, had they worked successfully.

- The original evaluation by NPE did not direct breaking the flange to check for misalignment.

- Mechanical Maintenance personnel removing and replacing the safety valve did not adequately pursue the acceptability of the misalignment.

- Mechanical Maintenance Engineering failed to recognize that there are cold spring allowances provided by M-204 and M-205 piping specifications. It should be noted that the personnel involved do not typically work with these specifications.

Corrective Steps That Have Been Taken and Results Achieved:

In response to Work Request 2447-93, the Shift Supervisor initiated Reportability Evaluation Request (RER) 93-024 to investigate Operability and Reportability of the piping deformation. Though the system was always operable and the incident not reportable, Plant Modification Request #4629 (Revisions 0 to 3) was issued to correct the misalignment and evaluate the existing condition of the piping. This initiated the review of Work Requests relating to BB 8010C and the interviews with personnel involved.

Performance Improvement Request (PIR) MA 93-0374 was written to review the circumstances related to previous cold springing of the piping and to determine corrective actions.

PIR 93-0517 was written for NPE to determine why the piping deformation identified by the as-built drawing furnished per WR 70763-87 was not addressed in later work instructions.

A USAR Change Request was initiated with PMR #4629 to include the affected piping elbow in Figure 3.6-1, Table 3.6-3, and Table 3.6-4.

Corrective Steps That Will Be Taken to Avoid Further Violations:

M-204 and M-205 piping specifications will be reviewed with all Mechanical Maintenance Engineering and Craft personnel. This will be accomplished by December 1, 1993.

STS MT-005, "Pressurizer Code Safety Valve Operability," will be revised to add the use of temporary support when removing valves for testing and to include match marking the flanges prior to valve removal. This revision will be made by Refuel VII or before next use of the procedure.

Date When Full Compliance Will Be Achieved:

The evaluations conducted and actions taken to date ensure that WCGS is currently in compliance with Technical Specification 6.8.1.a, as it relates to Reg. Guide 1.33, and 10 CFR 50, Part B, Criterion III. All corrective actions will be completed before Refueling Outage VII.

Actual or Potential Consequences of This Violation:

Engineering concluded that with the excess loads applied to the piping, the stresses in the valve body of BB 8010C continued to meet all applicable stress limits and therefore the valve remained operable. Also, the elastic-plastic deformation evaluation of the pipe stresses and fatigue usage concluded that the Class 1 piping continues to meet the requirements of the ASME Boiler and Pressure Vessel Code, Section III, Part NB. Therefore, based on the results of the engineering evaluation, public health and safety and plant were assured for this condition.