

WOLF CREEK

NUCLEAR OPERATING CORPORATION

Richard A. Muench
President and Chief Executive Officer

June 12, 2009

WM 09-0040

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

Reference: Letter dated May 13, 2009, from V. G. Gaddy, USNRC, to R. A. Muench, WCNOG

Subject: Docket No. 50-482: Reply to Notice of Violation EA-09-110

Gentlemen:

The attachment to this letter provides Wolf Creek Nuclear Operating Corporation's (WCNOG) reply to Notice of Violation (NOV) EA-09-110, contained in the reference, concerning events discussed in Inspection Report 05000482/2009002.

This letter contains two new commitments. If you have any questions concerning this matter, please contact me at (620) 364-4000, or Mr. Richard D. Flannigan at (620) 364-4117.

Sincerely,



Richard A. Muench

RAM/rit

Attachment I - Reply to Notice of Violation EA-09-110
Attachment II - List of commitments

cc: E. E. Collins (NRC), w/a
V. G. Gaddy (NRC), w/a
B. K. Singal (NRC), w/a
Senior Resident Inspector (NRC), w/a

JEH
MRB

Reply to Notice of Violation EA-09-110

Violation EA-09-110 (from reference 1)

Title 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requires, in part, that "measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly identified and corrected."

Contrary to the above, from 2001 through March 31, 2009, the licensee failed to establish measures to assure that conditions adverse to quality are promptly identified and corrected. Specifically, the licensee failed to identify the adverse condition of and to take corrective action for the repetitive, inappropriate closure of the reactor coolant pump thermal barrier heat exchanger valves, inappropriate closure of the downstream component cooling water containment isolation valves, and inappropriate circuit breakers opening associated with the above thermal barrier valves.

Reason for the Violation

This violation occurred because Wolf Creek Nuclear Operating Corporation (WCNOC) failed to adequately evaluate corrective action documents associated with occurrences of this event. During the period from 2001 to March 31, 2009, multiple corrective action documents were written concerning the inappropriate closure of the thermal barrier isolation valves. None of the evaluations prior to Condition Report (CR) 2007-2064 (CR that evaluated the violation) were performed at the level necessary to determine a cause and take corrective actions. The other CRs were closed to trending, closed as troubleshooting, or resulted in procedure changes to minimize flow perturbations, but none determined an actual cause or developed corrective actions that corrected the problem. The evaluation of this violation determined that the failure to adequately evaluate these events resulted from 1) Complacency/Overconfidence, the condition was believed to have little or no safety significance and until recently as this was a rarely occurring condition that required a simple evolution to restore; 2) Flawed Defenses-Corrective Action, the condition occurred because of inadequate condition action assignment, evaluation of the condition, lack of corrective actions, and the failure by multiple levels of the organization to recognize the significance of the issue; and 3) Flawed Assessment, a lack of rigor on the part of the evaluator, screener, and evaluation approver was apparent, in addition, corrective action oversight personnel (trending) failed to identify that this was a recurring condition.

The specific result of the failures described above was the repetitive, inappropriate closure of the reactor coolant pump thermal barrier heat exchanger valves, inappropriate closure of the downstream component cooling water containment isolation valves, and inappropriate circuit breakers opening associated with the above thermal barrier valves.

The cause of these equipment conditions was found to be a design deficiency. It has been a common occurrence at Wolf Creek that the thermal barrier isolation valves will close during the periodic swapping of the Component Cooling Water (CCW) trains. The valve receives a high-flow alarm due to the flow perturbations experienced while switching trains. In the event that one or more thermal isolation valves close, a note within procedure SYS EG-201, "Transferring Supply of CCW Service Loop and CCW Train Shutdown," states the following: "Flow oscillations experienced during the performance of this procedure can cause an isolation of CCW flow to Radwaste and/or RCP thermal barriers. If the RCP thermal barriers isolate and Seal Injection is available, thermal barrier cooling should be established after the trains have

been swapped and flows are stable." After the thermal barrier isolation valves close, they are reopened by the operators "after the trains have been swapped and flows are stable." The turbulent flow experienced right after opening these valves has caused the flow variations to occur. When the valve starts to open, a high flow alarm is received, apparently due to the flow surge caused by re-establishing flow through the thermal barrier cooler. When the valve reaches the full open position, the high flow signal immediately causes the valve to try and re-close. This instantaneous reversal in valve direction (open to close) causes its feeder breaker to trip. The breaker trips due to very high in-rush current. This high in-rush current is a result of the motor coasting down from the open demand and then the high flow signal immediately trying to re-close the valve, which reverses the direction of the motor before it has coasted to a full stop. The breaker operates properly by providing the required protection. An additional concern arises in the event of a leak in the Reactor Coolant Pump (RCP) thermal barrier heat exchanger. This would result in a high-flow alarm and the closure of all four isolation valves. The response guidance in procedure ALR 00-074C, "RCP THRM BAR CCW FLOW," opens the valves to verify that the high-alarm is valid. In the event of an actual leak, the high-flow alarm would cause the breaker to trip when the valve reaches the full-open limit switch. This would prevent the operator from being able to isolate flow to the thermal barriers until the breakers could be closed. The thermal barrier isolation valves receive the high-flow alarm at 6.679 volts, which corresponds to 50 gpm flow. Troubleshooting performed under Work Order (WO) 08-311647-000 on 11/26/08 identified that the flow through the "D" thermal barrier was 6.65 volts, very close to the high flow alarm point. The turbulent flow right after opening these valves causes a high-flow alarm, which rapidly changes the direction of the motor when it reaches the full-open position. This instantaneous reversal in valve direction (open to close) causes its feeder breaker to trip due to very high inrush current.

Corrective steps that have been taken and results achieved

The corrective actions taken to address the inadequate evaluation and corrective action program deficiencies that contributed to this issue are being addressed by the actions being taken from the Problem Identification & Resolution (PI&R) Initiative that is addressing WCNO's PI&R substantive crosscutting issue (Reference 2).

Actions that have been taken to correct the design deficiency in the flow loop and motor control circuitry are 1) Procedure SYS EG-205, "CCW to RCP Flow Adjustment," has been revised to include optimization of component cooling water (CCW) flow to the thermal barriers and was performed initially on January 7, 2009 under WO 08-311647-000. This has been successful to date in preventing recurrence. This procedure revision will assist in avoiding operating near the high-end of our operating band in an effort to prevent the valves from closing during the CCW flow train swaps, and 2) configuration change package (CCP) 012956 has been issued to install an appropriate time delay relay on the control circuitry for the thermal barrier isolation valves to prevent the sudden reversal of motor actuator direction on sensed high flow. This will prevent the isolation valve breaker trips and allow more time for flow to stabilize, thus preventing the unnecessary valve closure due to false sensed high flow.

Corrective steps that will be taken to avoid further violations

Full implementation of the actions defined in reference 2 and CCP 012956 should prevent future further violations of the general problem, Criterion XVI, Corrective Action, and the specific example cited of the valve closures due to inappropriate breaker openings.

In addition WCNOG has undertaken an effort to further evaluate other potential flow conditions that could contribute to this condition. (Corrective Action document 00016243) This evaluation includes actions to obtain and analyze flow data during isolation of the radwaste loop to ensure the high flow alarm setpoint will not be reached. If there is not sufficient margin identified during this evaluation then further actions, modifications, or procedure changes will be identified.

Date when full compliance will be achieved

Full compliance will be achieved no later than the end of Refuel XVII in November, 2009, following implementation of CCP 12956.

The evaluation of CR 00016243 and its associated actions to evaluate flow with radwaste isolated is scheduled to be completed by October 1, 2009. This assumes that the data collected does not indicate that further modifications are required. If additional modifications are needed the schedule for implementation will be determined.

Date when additional Actions will be completed

Corrective actions in progress to address the Corrective Action portion of this violation will be completed as described in reference 2.

References

1. Letter dated May 13, 2009, from V. G. Gaddy, USNRC, to R. A Muench, WCNOG, Inspection Report 2009002
2. Letter WO 09-0013, dated May 26, from M. W. Sunseri, WCNOG to USNRC, Written Response to Substantive Cross-Cutting Issues in Problem Identification & Resolution and Human Performance at Wolf Creek Generating Station
3. Modification Document - Configuration Change Package 12956
4. Corrective Action Document (PIR) - 2007-2064
5. Corrective Action Document (CR) - 00016243
6. Work Order 08-311647-000

LIST OF REGULATORY COMMITMENTS

The following table identifies those actions committed to by WCNOG in this document. Any other statements in this submittal are provided for information purposes and are not considered to be regulatory commitments. Please direct questions regarding these commitments to Mr. Richard Flannigan at (620) 364-4117.

REGULATORY COMMITMENTS

<u>Regulatory commitment</u>	<u>Due</u>
Full implementation of CCP 012956 should prevent future valve closures due to inappropriate breaker openings.	No later than Refuel XVII, November, 2009
Evaluation of CR 00016243, will evaluate flow with radwaste isolated. (NOTE - This assumes that the data collected does not indicate that further modifications are required. If additional modifications are needed the schedule for implementation will be determined.)	October 1, 2009