WOLF CREEK
NUCLEAR OPERATING CORPORATION

Bart D. Withers
President and
Chief Executive Officer

May 14, 1993

WM 93-0064

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Station P1-137
Washington, D. C. 20555

Reference: Letter dated April 16, 1993, from A. B. Beach, NRC to B. D. Withers, WCNOC
Subject: Docket No. 50-482: Reply to Notice of Violation 482/9303-01

Gentlemen:

Attached is Wolf Creek Nuclear Operating Corporation's (WCNOC) "Reply to Notice of Violation" 482/9303-01, which was documented in the Reference (NRC Inspection Report 50-482/93-03). Violation 482/9303-01 concerns two examples of failures to properly control and coordinate clearance order activities which could have resulted in personnel injury or damaged equipment.

The Reference also requested that, based on the results of an Incident Investigation Team formed by WCNOC Senior Management, all enhancements WCNOC has made to address communication deficiencies and program weaknesses be discussed in our response to the Notice of Violation. These items are discussed in the "Additional Information" section of the attached response.

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,

B D Withers

Bart D. Withers
President and
Chief Executive Officer

BDW/jan

Attachment

cc: W. D. Johnson (NRC), w/a
G. A. Pick (NRC), w/a
J. L. Milhoan (NRC), w/a
W. D. Reckley (NRC), w/a

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Reply to Notice of Violation 482/9303-01

Violation 482/9303-01: The violation includes two examples of WCNOC's failure to properly control and coordinate clearance order activities.

Finding:

"During an NRC inspection conducted on February 14 through March 27, 1993, a violation of NRC requirements was identified. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions," 10 CFR Part 2, Appendix C, the violation is listed below:

Clearance Order Issues

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 1.c, requires administrative procedures for equipment control (e.g., locking and tagging). This is accomplished, in part, by Procedure ADM 02-100, "Clearance Order Procedure," Revision 27.

Procedure ADM 02-100, Step 7.1.3.4 specified, in part, that, "After the clearance and tags have been prepared and approved, the shift supervisor/supervising operator shall review the tagging arrangement and verify that the clearance will not adversely affect the plant."

Contrary to the above, two examples of inadequate control and coordination occurred while implementing clearance orders:

(1) On March 11, 1993, without the cognizance of the shift supervisor/supervising operator, licensee personnel opened Valve BG V221, the excess letdown heat exchanger tube side combined drain valve listed under Clearance Order 93-0435-BG, prior to depressurizing the pressurizer relief tank. This released radioactive gas into the containment. When personnel implemented a clearance order change, the personnel inappropriately took both the clearance order and the clearance order change to the field. The tag for BG V221 was not intended to be placed and valve BG V221 was not intended to be opened until the pressurizer relief tank was depressurized and drained.

(2) On March 21, 1993, with the reactor defueled, because personnel did not place Clearance Orders 93-0618-EJ and 93-0651-EJ in the correct order, the reactor coolant system level decreased below the half-pipe level. Instructions on Clearance Order 93-0651-EJ specified opening listed valves if they are not in conflict with existing clearances to help drain systems. Prior to placing Clearance Order 93-0651-EJ personnel failed to assure that no adverse consequences would occur."

Reason for the Violation:

This violation had several underlying causes. To simplify the discussion of the underlying causes for this violation each example will be discussed separately.

Violation Example One:

The direct cause for the radioactive gas release in Containment was a communication break down. Poor communications were apparent in the shift turnover between the Control Room Crews and the Relief Crews as evidenced by the discussion below. Effective communications would have prevented the release of the radioactive gasses.

During refueling outages the Relief Crew Shift Supervisor (RCSS) is tasked with the responsibility of implementing management's directives in relation to the Clearance Order Program. However, on March 11, 1993, the day shift RCSS was on his normally scheduled day off and this responsibility was delegated to the day shift Relief Crew Supervising Operator (RCSO). This responsibility included implementing a change to Clearance Order 93-0435-BG to return the Reactor Coolant Drain Tank (RCDT) to service, in preparation for purging, venting, and draining the Pressurizer Relief Tank (PRT). As part of the directions for returning the RCDT to service the Manager Operations stressed the need to remove the fluid and radioactive gas from the PRT prior to completing the remaining portions of Clearance Order 93-0435-BG, which would drain and vent the Excess Letdown System. At 1830 hours CST when the shift turnover occurred between the day shift RCSO and the night shift RCSO, the change to Clearance Order 93-0435-BG had not yet been generated.

Interviews with the day shift RCSO and the night shift RCSO, identified that inadequate turnover and poor communications were the direct cause of the event. The day shift RCSO did not adequately stress the need to remove the fluid and gas from the PRT prior to completing Clearance Order 93-0435-BG. However, the day shift RCSO did turnover the need to generate the change to Clearance Order 93-0435-BG to the oncoming night shift RCSO.

The night shift RCSO generated the change to Clearance Order 93-0435-BG, but inadvertently gave the entire clearance order to the Nuclear Station Operator (NSO) for placement. The NSO completed the change to the clearance order to restore the RCDT and then commenced draining and venting the Excess Letdown System in accordance with the originally planned Clearance Order 93-0435-BG. During interviews the night shift RCSO stated that he "lost sight of the placement of that portion of the clearance order" that had resulted in the event. Additionally, some potential contributing factors to the oversight were identified:

- On the night of the event a heavy work load existed.
- The Relief Crew was at a reduced staffing level due to scheduled days off.
- To some degree, the RCSO felt schedule pressure.
- The management directives were not in the Night Orders.

Violation Example Two:

The cause of this event was inadequate communication and coordination between the Clearance Order Group and the On Shift Operations Crew. In this event, Clearance Order 93-0618-EJ was intended to be placed first in a sequence of three clearance orders. This information was not communicated properly by the Clearance Order Group to the On Shift Operations Crew. At the time of the event all fuel was removed from the reactor vessel and no Residual Heat Removal (RHR) system pumps were operating when the level went below mid-loop. Normally, the RHR system isolation valves would be tagged at the mid-loop boundaries, however, an effort to minimize the clearance order impact on motor-operated valve (MOV) testing required close coordination of clearances to be successful.

Upon discovering that the Reactor Coolant System (RCS) was draining below mid-loop, the "A" RHR suction isolation was closed and placement of Clearance Order 93-0651-EJ was suspended. RCS inventory was returned to the desired level. Placement of clearance orders was resumed after the proper sequencing was determined.

Corrective Steps That Have Been Taken and Results Achieved:

Violation Example One:

WCNOC developed and implemented the use of a Relief Turnover Summary form. This form provides a mechanism for assuring critical information (such as the need to assure the PRT is vented and drained prior to completing Clearance Order 93-0435-BG) is communicated to the relieving crew. The use of this form has resulted in more effective turnover of management directives and important activities which are in progress or planned. Proper use of this form will assure management's directives are correctly communicated to the relieving crew.

Violation Example Two:

The need for accurate clearance order communication was discussed with the Clearance Order Group. This discussion clarified the importance for accurately and completely conveying important information to the personnel implementing the clearance order. This discussion clarified management's expectations on the importance of clearly communicating clearance order requirements to the implementing organizations.

Interoffice Correspondence OP 93-0165 was issued by the Manager Operations on March 29, 1993, to direct Operating Crews and the Clearance Order Group to use the "Clearance Order Summary Sheet" anytime there are special instructions, conditions or concerns to consider when hanging clearance orders and when changes to a clearance order are not straight forward or whenever information is identified that needs to be passed on. Use of this sheet has resulted in personnel assigned to perform clearance order tagging activities having a clearer understanding of special instructions, conditions and/or concerns which must be considered during the clearance order process.

Corrective Steps That Will Be Taken To Avoid Further Violations:

The actions already taken should avoid further violations. Also, the "Additional Information" section of this response addresses programmatic issues, lessons learned and corrective actions.

Actual or Potential Consequences of this Violation:

Violation Example One:

Increased airborne activity in Containment was observed. Based on grab samples obtained, the whole body and skin exposure were determined to be at most 3 mR/hr. The Thermal Luminescent Dosimeters used at WCNOC are able to monitor the exposure from the noble gases, thus additional manual calculations were not performed or required.

Violation Example Two:

This event led to the transfer of excess water to the Radwaste System for processing. Additionally, this event clearly indicated that the Operators were not aware of the clearance order boundaries. This lack of awareness on the part of Operators could have led to the movement of water to a location other than desired and the potential for personnel injury or equipment damage.

Date When Full Compliance Will Be Achieved:

Violation Example One:

Full compliance was achieved on April 19, 1993, with the implementation of the Relief Turnover Summary Form.

Violation Example Two:

Full compliance was achieved on March 29, 1993, with the implementation of the Clearance Order Summary Sheet.

Additional Information:

WCNOC formed an Incident Investigation Team (IIT 93-02) to investigate and resolve several incidents that were associated with clearance orders. The investigation team evaluated ten incidents which were documented in accordance with WCNOC's Performance Improvement Request (PIR) Corrective Action Program between the dates of March 4, 1993, and March 26, 1993. The IIT was chartered to evaluate each of the ten incidents, the human performance factors associated with each incident, collectively evaluate all causes to find any programmatic similarities that may exist and to provide lessons learned and corrective actions.

It is important to note this information is taken from IIT Report 93-02 and that some of the enhancements discussed are unique to specific activities which require clearance orders and not broad programmatic actions.

The following is a discussion of the human performance and programmatic issues which were identified during the IIT investigation:

Human Performance:

1) In four cases during the clearance order preparation process, the review performed by the Tagging Authority was intended to be independent and to identify any errors in the clearance order itself prior to the clearance being issued. However, these events indicate this review was not sufficiently performed.

2) In two cases the clearance order preparer used incorrect information. These errors were not caught by the Tagging Authority review (an independent review performed after the Clearance Order Preparer's review). However, these errors were identified and corrected by the Authorized Tagger prior to or during implementation of the clearance orders.

3) In one case the clearance order preparer had used an incorrect clearance order number on the Do Not Operate Tag. This error was not identified during the reviews performed by the Clearance Order Preparer, the Tagging Authority, the Authorized Tagger or the Authorized Tagger who verified the tags placement. In this case four barriers were insufficient to detect the tagging development error.

4) In one case a Human Do Not Operate (HDO) clearance order was issued for a breaker which had an active clearance order against it. This error eventually led to the breaker being incorrectly closed.

5) In one case an operator had been assigned to perform two clearance order tasks. The operator misunderstood the instructions and incorrectly assumed that both of the tasks involved HDO Tagging restoration activities. The operator did not fully understand the assignment thereby developing a mind set about what tasks had been assigned to him and did not apply a sufficient degree of attention to the clearance orders that had been provided to him for completion. Therefore, he did not remove the Do Not Operate tag from the breaker. Upon the removal of a clearance order the tags are returned to the Shift Supervisor for the performance of a tag inventory. This inventory serves as a barrier to human performance errors such as not pulling all of the tags in a particular clearance order or pulling the wrong clearance order tag from a component, etc. In this case this activity was not adequately performed.

6) Poor communications, both verbal and written were evident.

7) The "NOTE" section of the clearance order (which often contains important information) is often overlooked.

Programmatic:

1) The use of WCNOC personnel, who are not normally assigned to field duties, to supervise field activities during refueling outages contributed to one clearance order event. These individual's familiarity with the Clearance Order Program is not as heightened as personnel who are normally assigned to field activities. This allows errors that would normally be recognized by more experienced field personnel to go unnoticed.

2) The General Employee Training (GET) Class is used as the only exposure to WCNOC's Clearance Order Program for most of the temporary contract workers and supervisors. General Employee Training (GET) only provides a brief overview of the Clearance Order Program. The level of detail provided in the class may not be sufficient for workers who are expected to work with the Clearance Order Program.

3) In one case a contract worker became confused in the use of a HDO tag and closed a breaker which was under an active clearance order. The two factors that contributed to the event were that the contract worker had just recently been allowed to cycle a breaker with a Do Not Operate tag during a bus outage and that he had come from a plant that used "System-In-Test Tags". Cycling breakers with Do Not Operate tags in conjunction with a bus outage is an exception allowed by ADM 02-100, "Clearance Order Procedure". If contract personnel are going to be used to perform these types of authorized exceptions to the program then added supervisor attention must be provided in addition to training.

4) Some workers were taking abbreviated steps that were improper and contrary to the Clearance Order Program. These appear to be human performance in nature since these requirements are stated in procedure ADM 02-100. However, IIT 93-02 determined them to be programmatic issues.

5) Work Packages were not always provided to the Clearance Order Group for the preparation of clearance orders in a timely manner. Additionally, changes in the outage schedule were not performed in such a manner as to allow adequate time for the necessary clearance orders to be written or modified. These two issues are directly linked. Better pre-outage planning would allow the Clearance Order Group to provide better support for emergent work activities.

6) Outage planning and sequencing of work activities was a contributing factor. In one event, a work activity was expected to immediately follow a Local Leak Rate Test (LLRT). However, the work activity was not performed until eleven days after the completion of the LLRT. Although this activity had been planned and coordinated prior to the outage, LLRTs are not specifically scheduled. Increased awareness and coordination between work groups is mandated because LLRTs are relied upon for system configuration necessary for subsequent work activities, but are not specifically scheduled.

Increased information on the outage schedule would have prevented the eleven day time gap from the LLRT completion to the clearance order placement.

The following is a discussion of the enhancements that have been completed or have been recommended and are under evaluation for implementation to address communication deficiencies and program weaknesses based on the results of the IIT:

Enhancements Completed:

1) ADM 02-100, "Clearance Order Procedure", was revised on March 31, 1993. The revision incorporated a summary sheet (Attachment IX) which collects and summarizes the function of the "HUMAN Do Not Operate (HDO) Tag".

2) Interoffice Correspondence OP 93-0165 was issued to direct Operating Crews and the Clearance Order Group to use the "Clearance Order Summary Sheet" anytime there are special instructions, conditions or concerns to consider when hanging clearance orders and when changes to a clearance order are not straight forward or whenever information is identified that needs to be passed on.

3) Interoffice Correspondence OP 93-0175 was issued to instruct all Operations Personnel to use the M-03 ELEVATIONS PRINTS (ISOMETRIC DRAWINGS) when developing a clearance order or authorizing work to ensure drain valves specified on the clearance order will ensure the component is drained. If there is doubt, brief the responsible maintenance personnel on what the M-03 drawing shows and urge them to take precautions.

Enhancements Under Evaluation:

1) Assess the controls used to ensure the pre-outage tasks are efficiently completed. Also, evaluate the process that is required to make changes to the outage schedule for enhancements.

   This activity will be completed by December 1, 1993.

2) Evaluate a method that will ensure management's expectations and the responsibilities of their people are clearly stated and uniformly complied with and support this with training as required. Consideration should be given to:

   - Determine whether or not contract employees should be treated as WCNOC employees in the Clearance Order Program.

   - Determine the necessity to include in procedure ADM 02-100, "Clearance Order Procedure", a requirement that workers sufficiently walkdown the clearance order prior to initiating work to ensure their own personal safety.

   - Ensure all personnel are knowledgeable of management's expectations.

   This activity will be completed by September 1, 1993.

3) Evaluate procedure, ADM 02-100, for human factor considerations, such as:

- Organize and clearly define the responsibilities of employees.
- Clearly define the function of "HDO".
- Methods to enhance notes and special instructions.
- A system that will aid the Control Room to more easily determine what components are tagged and to effectively manage clearance orders changes.
- Address the controls for tagged equipment being removed or replaced.
- Evaluate the exceptions in the procedure to ensure they are necessary and easy to understand to avoid human performance problems (i.e., steps 6.11 and 6.11.1 of ADM 02-100).
- Methods to identify unique conditions associated with a system (i.e., sections of pipes that will not drain).

This activity will be completed by December 31, 1993.

4) Evaluate the training program for enhancements in the following areas:

- Training to emphasize the required areas of the program.
- Determine the training requirements for temporary contract personnel, both craft and supervisory.
- Work group specific training to ensure that WCNOC employees and contract employees are familiar with their responsibilities within the clearance order process.

This activity will be completed by June 30, 1994.

5) Re-evaluate the use of clearance orders to establish system boundaries prior to conducting Local Leak Rate Test (LLRT). Also, evaluate the need to include LLRTs in the outage schedule to allow better coordination of subsequent work activities.

This activity will be completed by December 31, 1993.

6) Ensure the "Stop, Think, Act, Review" (STAR) Program (Self-Checking Program) is implemented within the Clearance Order Program to decrease the human performance errors in the verification process.

This activity will be completed by June 30, 1994.

WCNOC will complete all actions associated with this IIT by June 30, 1994.