

APR 2 1992

Docket No. STN 50-482  
License No. NPF-42

Wolf Creek Nuclear Operating Corporation  
ATTN: Bart D. Withers  
President and Chief Executive Officer  
P.O. Box 411  
Burlington, Kansas 66839

Gentlemen:

SUBJECT: NRC INSPECTION REPORT NO. 50-482/91-34

Thank you for your letter of March 20, 1992, in response to our letter and Notice of Deviation dated February 20, 1992. We have reviewed your reply and find it responsive to the concerns raised in our Notice of Deviation. We will review the implementation of your corrective actions during a future inspection to determine that full compliance has been achieved and will be maintained.

Sincerely,

Original Signed By:  
Thomas P. Gwynn

A. Bill Beach, Director  
Division of Reactor Projects

cc:  
Wolf Creek Nuclear Operating Corp.  
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CPaulk/cjg  
/ /92

C:PSS\*  
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D:DRS  
SJCollins  
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ABBeach  
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\*previously concurred

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Wolf Creek Nuclear Operating  
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Public Service Commission  
ATTN: Chris R. Rogers, P.E.  
Manager, Electric Department  
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U.S. Nuclear Regulatory Commission  
ATTN: Regional Administrator, Region III  
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Wolf Creek Nuclear Operating Corp.  
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Kansas Corporation Commission  
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State of Kansas  
Topeka, Kansas 66612

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Kansas Department of Health and Environment  
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# WOLF CREEK

NUCLEAR OPERATING CORPORATION

Bart D. Withers  
President and  
Chief Executive Officer

March 20, 1992

WM 92-0043

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

Reference: Letter dated February 20, 1992 to B. D. Withers,  
WCNOC from R. D. Martin, NRC  
Subject: Docket No. 50-482: Response to Notice of Deviation

Gentlemen:

The attachment to this letter provides Wolf Creek Nuclear Operating Corporation's (WCNOC) response to a Notice of Deviation concerning the failure to implement commitments associated to the provisions of Generic Letter 89-10, "Safety Related Motor-Operated Valve Testing and Surveillance."

Also documented in the reference was an associated Notice of Violation and proposed civil penalty. WCNOC's response to the Notice of Violation is provided in a separate submittal.

If you have any questions concerning this matter, please contact me or Mr. S. G. Wideman of my staff.



Very truly yours,

Bart D. Withers  
President and  
Chief Executive Officer

BDW/aem

Attachment

- cc: A. T. Howell (NRC), w/a
- R. D. Martin (NRC), w/a
- C. A. Pick (NRC), w/a
- W. D. Reckley (NRC), w/a

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## Reply to Notice of Deviation

### Background:

On February 20, 1992 the Regional Administrator of Region IV issued WCNOC a Notice of Deviation. This Notice of Deviation was a result of an inspection (50-482/91-34) conducted November 4-8, 1991. The inspection examined Wolf Creek Nuclear Operations Corporation (WCNOC) safety-related motor-operated valve (MOV) testing and surveillance program for implementing commitments to Generic Letter 89-10 "Safety Related Motor-Operated Valve Testing and Surveillance". By letter dated December 26, 1989, WCNOC committed to meet the schedule requirements of Generic Letter (GL) 89-10. Specifically, paragraph 'A' of GL 89-10 which established a schedule for the development of an MOV program to satisfy the requirements established in the generic letter and its supplements. WCNOC was ineffective in completing the commitment and the following deviations were cited in the Notice of Deviation:

As of November 8, 1991:

1. The licensee's GL 89-10 program failed to consider any design basis parameters other than differential pressure in its design basis reviews.
2. The licensee's GL 89-10 program failed to establish a method to properly size MOVs and select switch settings by not considering margins for rate of loading effects or torque switch repeatability; plate ratings vice stall ratings of the motors; diagnostic equipment inaccuracies; the performance of diagnostic tests at greater than 100 percent voltage; and, the performance of weak link analyses.
3. The licensee's GL 89-10 program failed to develop procedures for the performance of design basis testing (including design differential pressures and flows), acceptance criteria for the test, and feedback mechanisms.
4. The licensee's GL 89-10 program did not have provisions for periodic verification of MOV operability or post-maintenance testing.
5. The licensee's GL 89-10 program did not have adequate provisions for analyzing MOV failures, for justifying corrective action, and for trending those failures and corrective actions.

### Introduction:

The deviations listed above identify five examples of a failure to establish a program to ensure that MOVs will perform their intended safety-related functions, as required by WCNOC's commitments to Generic Letter 89-10. As discussed with the NRC during an enforcement conference on December 6, 1991, all five deviations have been determined to be a result of insufficient management oversight of the MOV program. Therefore, section I of this response addresses management oversight issues. Section II addresses the five specific deviations described in the Notice of Deviation. Where numbers have been used, the numbers correlate directly with the deviations identified above.



## I. Management Oversight Issues

### Reasons For The Deviations:

The five deviations identified are a result of one or more of the following three management factors:

- a. Insufficient recognition of the program complexity and emergent industry issues associated with Generic Letter 89-10.

The provisions of Generic Letter 89-10 were treated as an extension of the program developed to address Bulletin 85-03, "Motor Operated Valve Common Mode Failures During Plant Transients Due to Improper Switch Settings". Since the MOV program was viewed as an extension of the earlier, less detailed program, management did not recognize the dynamic nature of emerging industry issues associated with MOV design, maintenance, and testing, and therefore did not ensure the program was upgraded to meet the new and additional requirements.

- b. Insufficient definition of organizational responsibilities and interfaces.

WCNOC management inappropriately assumed that the existing organizational structure (2 Maintenance Engineers and 2 Nuclear Plant Engineers) could implement the provisions of Generic Letter 89-10. As a result, no single organization or position perceived ownership of the overall program. In addition, given the long time frame for implementation of the provisions of Generic Letter 89-10, management failed to focus on resource needs or program impact.

- c. Inappropriate interface between the MOV program and other established programs.

WCNOC management failed to recognize that emerging MOV issues identified by personnel were not being addressed or resolved in accordance with appropriate upper tier WCNOC programs such as design/configuration, reportability, and corrective action. Without proper management guidance and input, appropriate interface between the MOV program and other programs was not developed.

### Corrective Steps Which Have Been Taken and Results Achieved:

WCNOC has restructured oversight of the MOV program. This restructuring addressed each of the management issues identified as reasons for the deviation.

- a. Insufficient recognition of the program complexity and emergent industry issues associated with Generic Letter 89-10:

On November 8, 1991, executive management initiated an immediate stop work to all MOV design, maintenance and testing activities. Prior to re-commencing MOV work, associated procedures were reviewed, revised or written to ensure that short term activities necessary to demonstrate operability of safety-related MOVs were in full compliance with the provisions of Generic Letter 89-10. Design procedures were developed

to address design basis issues, configuration, sizing, margin, weak link and switch setting issues. In addition, the procedures specify conservative inputs so that analytical methods would conservatively envelope the credible system and field conditions which may be encountered by the MOVs under design basis conditions.

To ensure that industry issues and feedback were incorporated into the MOV program, the MOV team established contact with a broad cross-section of MOV talent in the industry. The MOV Team also employed four different consultant organizations who were actively involved in the implementation of Generic Letter 89-10. The MOV Team established working contacts with other licensees who have similar plant design and plant vintage. These contacts were used to compare design basis parameters and analytical methods. Dialogue with members of the NRC staff was also beneficial in focusing attention on industry MOV issues and methods. Feedback from all of these sources was incorporated into the MOV Program procedures.

Using the new and revised procedures, the MOV Team re-evaluated the qualification of all safety related MOVs which may have been affected by previous MOV program activities. Torque/thrust requirements were determined for each identified MOV as well as torque/thrust capabilities of the as-installed MOV configuration. Tests were also performed to ensure that the as-left switch settings allow the MOV to develop the required thrust under static conditions. Discrepancies between the required thrust and the MOV capability, as well as test deficiencies were resolved prior to restart from the fifth refueling outage. Resolution involved any combination of physical modification of the MOV, revisions to operating procedures and/or adjustment of switch settings. In all, 120 MOVs were evaluated to ensure compliance with the revised MOV program requirements.

Since restart, representatives from the MOV Team have attended industry meetings and seminars to gain further insight into emerging MOV issues. This feedback has also been incorporated into the scope of the MOV program. WCNOG remains active in the MOV user groups.

WCNOG management has clearly established the mission of the MOV program to focus on the ability of the MOV to perform its safety-related functions under design basis conditions. WCNOG design and static testing procedures are in full compliance with the design basis confirmation provisions of Generic Letter 89-10. Feedback from emerging industry issues and lessons learned have been incorporated into those procedures. Provisions are also in place to ensure that WCNOG remains cognizant of and incorporates the latest industry developments regarding MOV design, maintenance and testing.

- b. Insufficient definition of organizational responsibilities and interfaces:

On November 8, 1991 the MOV Team was formed. A division level manager was assigned overall responsibility for all aspects of the MOV program. The MOV Team was comprised of engineering, operations and maintenance personnel.



The Director Plant Operations issued a directive requiring that all design, maintenance, and testing activities associated with safety related MOVs be coordinated with the MOV Team. This directive was discussed at the morning management meeting and was reinforced at the outage shift turnover meetings. Procedures were revised to define organizational responsibilities and specify interface expectations.

- c. Inappropriate interface between the MOV program and other upper tier programs:

Specific actions were taken to ensure that the MOV activities appropriately interface with higher tier programs at WCNOC, including corrective action, operability, reportability and design/configuration control.

Procedures were revised or rewritten to include steps to ensure that MOV work appropriately interfaced with the WCNOC programs for corrective action, operability, reportability and design/configuration control. In addition to the procedures, management representatives frequently stressed the expectation that upper tier programs be used during regular morning meetings with the MOV Team members. During the meetings, management representatives also solicited input on emerging issues which could effect operability, reportability and/or require corrective actions. The meetings were used as a forum to define issues and resource requirements, and direct resolution through the appropriate program.

The following paragraphs describe actions taken to remediate past weaknesses in MOV program compliance with the WCNOC design/configuration control program.

Previous program documents and procedures which deviated from the requirements of the design/configuration control program were either superseded or revised to require interface with the appropriate existing procedures.

Procedures required new design work under the MOV program to use existing design and configuration control procedures. These procedures also required use of design basis records as the source of design inputs. Needed design record information was obtained from the original equipment manufacturer.

All accessible, safety related MOVs were walked down to establish the as-left configuration of critical MOV characteristics, including actuator size, motor nameplate, spring pack size, and torque switch setting.

The as-left MOV configuration was compared to the original design configuration, and to the configuration required by the new requirements of the MOV program. Any discrepancies were documented in the appropriate corrective action document.

The enhanced program invoked the WCNOC corrective action program to ensure that all issues which could affect operability were identified, documented and tracked through resolution before restart from the fifth refueling outage. Specific actions included:

Discrepancies identified during the design/configuration reviews were documented in Corrective Work Requests (CWR). The discrepancy evaluations were documented in design dispositions to the CWR, along with required repair/rework requirements in accordance with station procedures. In addition, the Manager of the MOV Team issued a guideline document for the standard format and content for the MOV evaluation dispositions. This guideline required that the root cause for each identified discrepancy be identified in the disposition with a reference to the document which evaluates the root cause for further corrective action.

Programmatic concerns which could affect other MOVs were documented in Performance Improvement Requests (PIR) in accordance with KGP-1210, "Performance Improvement Requests". Each PIR was evaluated for the affect the problem could have on MOV operability. Those PIRs which could affect operability were resolved through the remedial corrective action stage prior to restart from the refueling outage. Each of these PIRs was evaluated for root cause. Given the root cause, an evaluation was performed to determine other MOVs which could be adversely affected by the same root cause. These other MOVs were then added to the scope of the MOV restart program. Remedial corrective action work was completed prior to restart from the outage. In all, 120 safety related MOVs were evaluated prior to restart.

PIRs which were judged to not affect MOV operability, as well as all PIR preventive corrective actions, were tracked and have been incorporated into the MOV scope document. The MOV scope document defines and outlines remaining activities and issues to be addressed in the WCNOG MOV program.

The above actions have resulted in the integration of MOV program elements with upper tier programs. The effects of the previous weak MOV program interface with the corrective action programs and design/configuration programs have been evaluated and appropriate remedial actions have been implemented. The above actions have ensured that MOVs will perform their intended safety-related functions.

#### Other Management Oversight Actions

In addition to the specific actions described above, WCNOG has implemented changes in the method used to oversee the definition and execution of issues which are not directly resulting from the day-to-day, normal operation of the plant.

The director level of management has formed the Issues Review Group (IRG). The IRG charter was issued on January 9, 1992. The IRG's mission is to ensure that responsibility and resources are appropriately assigned for significant generic regulatory and safety issues impacting operation. In addition, the IRG receives feedback on the resolution of various issues, and may direct additional independent reviews when deemed prudent.

The IRG is chaired by the Director Plant Operations and is comprised of the Director Plant Operations, Director Nuclear Plant Engineering, Director Nuclear Services and Director Quality and Safety.

For significant issues, the IRG assigns a Project Manager, responsible for defining the scope of the issue, documenting a plan for resolution of the issue; identifying resources and training required to complete the issue, and providing periodic updates on progress to the IRG.

The IRG has been functional since January 9, 1992, and has identified a list of issues that are reviewed by the IRG. The list of issues is drawn from regulatory correspondence, INPO Significant Operating Experience Reports, and the WCNOG Industry Technical Information Program.

The IRG has also reviewed the scope of work remaining under the MOV program, and has assigned a Project Manager for the remaining MOV work. Sufficient resources have been provided to ensure integrated resolution of the remaining MOV issues in accordance with the provisions of Generic Letter 89-10. The current MOV Team is comprised of a Supervisor Engineer reporting to the Project Manager, with the resources of four design engineers, one equipment engineer, one operator, one test engineer and one maintenance engineer. These resources are working from a single location inside the protected area, and are dedicated full time to the performance of WCNOG's MOV program. The team will remain in place until all issues have been resolved and integrated into normal operations, at which time the MOV program elements will return to the appropriate line organizations.

#### Corrective Steps Which Will Be Taken to Avoid Further Deviations:

The actions described above are sufficient to prevent recurrence of the management oversight weaknesses identified in the Notice of Deviation. Management oversight has been restructured so that significant issues affecting the safe operation of Wolf Creek Generating Station (WCGS) are recognized, adequately staffed and managed through resolution. Oversight of the MOV program has also been restructured. The scope of work associated with Generic Letter 89-10 has been developed and staffed, with methods in place to monitor performance. The actions taken have brought WCNOG into compliance with those provisions of Generic Letter 89-10 which were required to be completed by January 1, 1991. Specific remaining actions associated with each of the five items in the Notice of Deviations are addressed in section II.

#### II. Specific Deviation Issues

##### Corrective Steps Which Have Been Taken and Results Achieved:

1. The MOV program procedures were revised, rewritten or developed to define design basis parameters for safety-related MOVs. The design basis parameters included:

Degraded terminal voltage and methods to calculate design basis minimum available voltage at AC and DC motor operators.

A determination of safety-related and non safety-related functions for each MOV, including valve mispositioning as postulated in the current WCNOG Licensing Basis.

Maximum expected differential pressure across the MOV, for both the open and closed direction of the valve as well as the temperature range, flow rate range, direction of flow, and actuation stroke time for each direction of actuation.

In addition, MOVs were reviewed to determine MOVs which could have been adversely affected by previous MOV activities. The MOV team established design basis parameters for all MOVs identified as potentially affected in accordance with the new procedures.

2. A procedure to define the methodology to be used to determine design requirements for MOV torque/thrust and torque/thrust capabilities for a given MOV configuration was developed.

This procedure incorporated calculated margins for torque switch repeatability, rate of loading affects, and test equipment inaccuracies. The procedure requires the calculated available motor torque to be based upon the motor nameplate voltage under degraded voltage condition. It requires use of the reconciled design configuration of the MOV in determining calculation inputs, including the reconciled as installed motor rating. The procedure requires that developed thrust loads remain within the maximum allowables determined in the original design for the motor, actuator and valve. Any increase in thrust beyond original design allowables was formally reconciled with original design qualification in accordance with existing procedures.

This procedure was used to recalculate torque/thrust requirements and capabilities for those valves within the scope of item 1. Discrepancies were resolved prior to restart from the fifth refueling outage.

Static testing performed after formation of the MOV team used nominal available voltage. The test voltage was factored into the evaluation of static test results.

3. Previous differential pressure (DP) tests which had been performed on MOVs were evaluated in accordance with new procedures. DP tests which were not performed under the same fluid system and line-up conditions as defined in functional scenarios or within the bounding physical parameters defined in the maximum expected differential pressure calculation, were invalidated and revoked as a basis for confirming that a MOV would perform its intended safety-related functions under design basis conditions.
4. As an interim measure, the Director Plant Operations issued a directive that all design, maintenance, and testing activities associated with safety-related MOVs be coordinated with designated representatives of the MOV team, to ensure that activities comply with the revised MOV program requirements. This directive was discussed at the morning management meeting and was reinforced at the outage shift turnover meetings. Diagnostic testing was performed on all safety-related MOVs which had received maintenance or modifications during the fifth refueling outage.
5. The previous MOV procedures were evaluated against the provisions of Generic Letter 89-10 and its supplements to ensure that the provisions of Generic Letter 89-10 are addressed by the WCNOG MOV program implementing procedures. Where missing or weak program elements were identified which could affect the short term operability of MOVs, the discrepancies were resolved by revising or preparing new procedures. All procedures defined organizational responsibilities and

specified interface expectations. Program weaknesses, (such as inadequate failure analysis and corrective action) which could affect operability of a population of MOVs were also resolved through the remedial corrective action stage.

Missing or weak program elements, judged to not affect operability of MOVs, (such as trending, formal feedback procedures, dynamic testing), were logged into a tracking document. These open action items have been subsequently incorporated into a formal MOV scope document which will guide the preparation of the remaining program and procedural work.

The above actions have brought WCNOC into compliance with those provisions of Generic Letter 89-10 which were required to be complete by January 1, 1991, and are necessary to confirm operability of safety-related MOVs at WCGS. WCNOC management has clearly established the mission of the MOV program to focus on the ability of the MOV to perform its safety-related function under design basis conditions. WCNOC design basis confirmation and static testing procedures are in full compliance with the design basis confirmation provisions of Generic Letter 89-10.

Corrective Steps Which Will Be Taken To Avoid Further Deviations And The Date When Corrective Actions Will Be Completed:

1. A new program document defining implementation of the provisions of Generic Letter 89-10 will be issued. In addition, procedures will be revised to address other instances of credible mispositioning.
2. Procedures will be revised to incorporate methods to reconcile the diagnostic test voltage with the design basis voltage (during testing or test evaluation) so that diagnostic tests confirm the ability of the MOV to perform under design basis conditions. Procedures will also be revised to address the weak link analysis and criteria for when this analysis is required and methods used for the analysis.
3. A procedure for overall dynamic testing will be written to identify purpose, objectives, design basis input parameters to be monitored, acceptance criteria and feed back mechanisms.
4. The MOV program will be revised and procedures written to address post-maintenance testing (when testing is required, which testing is required for each type of valve function and interfacing of MOV diagnostic testing with other established test programs). These procedures will also identify criteria for when periodic testing is required to verify operability.
5. A tracking and trending program will be formalized within the overall MOV program to accommodate valve failures, corrective actions and provide data to enhance and provide for improved MOV preventative maintenance and periodic verification.

Necessary implementing procedures will be revised to require timely evaluation of calculation and test results and documentation of discrepancies on appropriate corrective action documents, and in accordance with existing WCNOC procedures.

The above corrective actions will be completed July 31, 1992.