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VICE PRESIDENT - NUCLEAR

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

Perry Nuclear Power Plant
Docket No. 50-440
Reply to Notice of Violation

Gentlemen:

This letter acknowledges receipt of the Notice of Violation contained within Inspection Report 50-440/92004 dated July 9, 1992. The report identifies areas examined by a Region III Inspector from March 26 through June 23, 1992. This letter also acknowledges and confirms agreements reached during a telephonic exit meeting held on June 23, 1992, involving potential local leak rate testing of the Main Steam Isolation Valves.

If you have any questions, please feel free to call.

Sincerely,

Steven F. Jenicke for

Michael D. Lyster

MDL:RWG:ss

Attachments

cc: NRC Project Manager
NRC Resident Inspector Office
NRC Region III

140044

Operating Companies
Cleveland Electric Illuminating
Toledo Edison

IE01

RESPONSE TO
NOTICE OF VIOLATION

50-440/92004-1
Restatement of the Violation

10 CFR Part 50, Appendix B, Criteria XVI requires in part, that in the case of significant conditions adverse to quality, measures shall be taken to assure that the cause of the condition is determined and corrective action taken to preclude repetition. 10 CFR Part 50, Appendix B, Criterion II requires, in part, that the licensee implement a quality assurance program through plant life. For the Perry Nuclear Power Plant, this program is specified in the USAR Chapter 17.2 Quality Assurance Program Description (QAPD). Section 17.2.2.2.f of the QAPD commits the licensee to comply with the Regulatory Guide 1.33 dated February 1978. This regulatory guide requires, in part, that the licensee comply with ANSI Standard 18.7-1976. Exceptions to ANSI 18.7-1976 are noted in Table 1.8-2 of the USAR. Paragraph 5.2.8 of this ANSI standard requires that a surveillance test program be prescribed to ensure that safety related components will operate to keep parameters within normal bounds or act to place the plant in safe condition. Paragraph 5.2.19(3) requires that the surveillance test program provide assurance that failures or substandard performance do not remain undetected and that the reliability of safety-related systems be maintained. Paragraph 5.2.7.1 requires that a maintenance program be developed to maintain safety-related components at the quality required for them to perform their intended function. It also requires that experience with malfunctioning equipment be reviewed and evaluated to determine whether a replacement component of the same type can be expected to perform its function reliably.

Contrary to the above, as of March 31, 1992, the licensee's corrective measures had not been adequate to assure that the causes of excessively leaking main steam line penetrations boundary valves had been determined and that corrective action had been taken to preclude repetition. In addition, the licensee's surveillance test and maintenance programs have not provided assurance throughout an entire fuel cycle that: (1) the MSL penetration valves will perform their safety function reliably by keeping leakage out of containment within the allowable limit, and, (2) the substandard performance of the MSL penetration valves does not remain undetected.

Reason For The Violation

Efforts to correct main steam line (MSL) penetration leakage in 1987, 1989, and 1990 included both relatively minor maintenance, such as seat lapping, and substantial maintenance activities, such as rebuilding and machining MSIV seats and guide ribs. Prior to each repair effort, as found inspections were performed and an evaluation conducted to determine the appropriate course of action for repair. Each inspection and repair effort became progressively more in-depth and/or complete than the previous one as further knowledge was gained on failure mechanisms by both onsite and industry personnel. Each maintenance activity performed was consistent with efforts employed by other utilities experiencing similar difficulties at that time. It was therefore believed that in each case the apparent problems had been corrected; that the valves were capable of performing their safety function throughout an entire

fuel cycle; and that repetition of the failures was precluded. These evaluations were based on the scope of the actions completed, and on successful post maintenance leak test results. After the first refueling outage, this justification was utilized to defer a previously proposed MSIV upgrade which had been recommended by the valve manufacturer.

In hindsight, it can be shown that these repair efforts were not successful in correcting all of the contributing causes for MSL Local Leak Rate Testing (LLRT) failures. Excessive MSL penetration leakage has been determined to be the result of the concurrent effects of the multiple causual factors. The use of recent technological advances in diagnostic equipment has improved the ability to detect and correct minor deviations in orientation and concentricity of critical components, thereby allowing the identification of causal factors which were not previously identified.

Corrective Actions Taken And Results Achieved

As a result of LLRT failures in RFO2, a decision was made to implement the previously deferred MSIV upgrade modification. The six MSIVs from the A, B, and D MSLs which failed leak rate testing during Refueling Outage (RFO)3 were modified with the new upgrade developed by the vendor. This upgrade incorporates several design improvements, such as a poppet nose cone to help the guide the poppet into the seat and prevent poppet cocking and an poppet anti-rotation improvement which ensures the poppet to seat contact areas remain consistent. These improvements allow the valve to overcome deficiencies such as out-of-tolerance components, oxide coating and lack of seat concentricity. This is the latest generation of this upgrade and has an excellent history of leakage improvement at other utilities. The MSIVs in the MSL "C" penetration, which successfully passed the leak test, were evaluated for modifications and it was judged that this was necessary. Difficulties experienced in obtaining acceptable poppets would have precluded implementation of the modification in any case.

Due to the recurring problems associated with the MSIVs, a special multidisciplinary task force (Main Steam Line Penetration Task Force) was formed on November 26, 1990, to develop and implement an overall strategy to improve the leakage problems of the main steam line penetrations. One of the major accomplishments of the task force was the completion of a special problem analysis. This study also generated several recommendations.

A high precision data acquisition system (DAS) was obtained and utilized during RFO3 to aid in the troubleshooting and repair of MSIVs requiring rework. Base-line data for all critical valve dimensions was retained for use in trending and future diagnostic efforts.

An additional task force recommendation involved correcting problems associated with the drain and leakage control valves. In the past, problems have been experienced with debris in some of these valves. During the recent rework effort, a special QC hold point inspection was utilized to verify cleanliness of the piping system after repairs had been completed.

The testing methodology has also been substantially improved. Prior to the testing in RFO3, the leakage through each boundary valve was grossly estimated in order to determine which valves required rework but the methods and results

of these estimates were not documented. During RF03 testing, such leakage was systematically derived by proceduralized methods for both as-found and as-left conditions to establish baseline data for future evaluations. It is anticipated that these values will be used to trend overall valve performance and correct degrading conditions prior to exceeding the acceptable penetration leakage rates.

Actions To Avoid Further Violations

Additional actions to improve the sealing performance of the main steam line penetration are being evaluated. The Main Steam Line Penetration Task Force continues to meet and develop recommendations for improvement. These actions include improving the maintenance methods as the remaining items in the report from the PWROG Main Steam Isolation Valve Maintenance Committee are revieved. These items as well as the knowledge gained from the recent outage will be incorporated when the maintenance instruction for these valves is revised. The involved personnel also are attempting to gather lessons learned from other plants. Contact has been initiated with personnel from other plants and outside vendors in the hope that this new information can also be used to improve our maintenance methods.

The LLRT instructions for the MSL penetrations will also be revised to clarify performance requirements and incorporate the lessons learned from this outage. Current plans are to remove boundary valve leakage quantification from the existing test instruction and develop new instructions which specifically addresses these actions. This will allow a greater control over the activity and provide a clearer focus.

Several design modification options are also being explored. These options should correct potential causes of leakage as well as improve the testability of the penetration. Examples of alternatives being explored include: altering the drain line on each Inboard MSIV Leakage Control System subsystem to catch potential debris prior to it being swept into the valve seats; adding flange connections so that the drain and leakage control valves may be isolated and tested independently; and adding flanges on the Outboard Leakage Control System so troubleshooting may be conducted on the steam lines while another valve is disassembled. In general, the design of the steam lines is being continually evaluated for additional enhancements. These enhancements will be evaluated for implementation commensurate with their respective merits.

Data When full Compliance Will Be Achieved

Full compliance with the applicable 10CFR50, Appendix B criteria cited in the Notice of Violation for Inspection Report 92004 was achieved upon obtaining satisfactory LLRT results for the respective MSL penetrations during RF03. All reasonable efforts were made to ensure that effective corrective measures were employed to restore the MSIVs to an optimal operating condition.

Supplemental Information

In addition to submitting the required response to Notice of Violation 50-440/92004, you requested that PNPP also confirm your understanding of commitments made during a June 23, 1992 exit meeting. Specifically, it was agreed that:

1. PNPP will local leak rate test (LLRT) the "C" MSL and one of the three other MSLs. The testing will be performed any time between January 1 and May 31, 1993, provided an outage expected to exceed 7 days occurs.

2. If the MSL with the modified MSIVs fails its LLRT, the other two MSLs, with modified MSIVs, will also be tested.

3. If the "C" MSL fails its LLRT as a result of MSIV failure, the failed MSIV(s) will be modified.

PNPP acknowledges and confirms the above understanding with the following clarification. If the "C" MSL fails its LLRT as a result of MSIV failure and the DAS diagnostic equipment cannot be readily obtained without unreasonable difficulty or delay, PNPP will restore the MSIV(s) using the existing design and implement the improved design modification during RF04. PNPP may not be able to obtain the DAS equipment on short notice due to limited availability. Installation of the MSIV modification without the use of the DAS equipment will diminish the ability to achieve the optional benefits from the improved design. Therefore, the ability to effectively implement the "C" MSIV modification will be dependent on the availability of the DAS equipment; but in any case, no later than RF04.