

Ornaha Public Power District 444 South 16th Street Mall Ornaha NE 68102-2247

September 10, 1997 LIC-97-0145

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

1.

References:

Docket No. 50-285

- Letter from NRC (E. W. Merschoff) to OPPD (S. K. Gambhir) dated August 11, 1997
- Letter from NRC (A. T. Howell) to OPPD (S. K. Gambhir) dated June 17, 1997
- Letter from OPPD (S. K. Gambhir) to NRC (Document Control Desk), dated June 4, 1997 (LIC-97-0087)

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- Letter from OPPD (S. K. Gambhir) to NRC (Document Control Desk), dated August 12, 1997 (LIC-97-0116)
- Letter from OPPD (S. K. Gambhir) to NRC (Document Control Desk), dated May 21, 1997 (LIC-97-0079)

SUBJECT: Reply to a Notice of Violation, NRC Inspection Report No. 50-285/97-09

Your letter of August 11, 1997, (Reference 2) transmitted a Notice of Violation (NOV) resulting from an NRC inspection conducted April 23, 1997, through June 10, 1997, at the Fort Calhoun Station (FCS). Attached is the Omaha Public Power District (OPPD) response to this NOV.

If you should have any questions, please contact me.

Sincerely,

WY ans

S. K. Gambhir Division Manager Engineering & Operations Support

EPM/epm

Attachment

c: Winston and Strawn

- E. W. Merschoff, NRC Regional Administrator, Region IV
- L. R. Wharton, NRC Project Manager
- W. C. Walker, NPC Senior Resident Inspector

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NOTICE OF VIOLATION

Omaha Public Power District Fort Calhoun Station

Docket No. 50-285 License No. DPR-40 EA 97-280

During an NRC inspection conducted on April 23 through June 10, 1997, a violation of NRC requirements was identified. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions," NUREG-1600, the violation is listed below:

10 CFR 50.65(a)(1) states. in part, that each holder of a license to operate a nuclear plant shall monitor the performance of structures. systems, or components, against licensee-established goals, in a manner sufficient to provide reasonable assurance that such structures, systems and components, as defined in paragraph (b), are capable of fulfilling their intended functions. Such goals shall be established commensurate with safety and, where practical, take into account industry-wide operating experience.

10 CFR 50.65(b) states, in part, that the scope of the monitoring program specified in paragraph (a)(1) shall include safety related and nonsafety related structures, systems, and components as follows: (2) Nonsafety related structures, systems, or components: (iii) Whose failure could cause a reactor scram or actuation of a safety-related system.

10 CFR 50.65(a)(2) states, in part, that monitoring as specified in paragraph (a)(1) is not required where it has been demonstrated the performance or condition of a structure, system or component is being effectively controlled through the performance of appropriate preventive maintenance, such that the structure, system or component remains capable of performing its intended function.

Contrary to the above, as of July 10, 1996, the time when the licensee elected to not monitor the performance or condition of the turbine extraction steam system against licensee-established goals pursuant to the requirements of section (a)(1), the licensee had failed to demonstrate that the condition of this system was being effectively controlled through the performance of appropriate preventive maintenance, such that the system remained capable of performing its intended function. Specifically, the licensee's method of demonstrating the condition of the system, monitoring pipe wall thicknesses using a predictive methodology to ensure that minimum wall thicknesses were not exceeded, was inadequate. The method was inadequate because errors and omissions in the licensee's approach created erroneous predictions in wall thicknesses. These erroneous predictions allowed significant degradation to go undetected in certain piping sections within the fourth stage extraction steam system without appropriate maintenance being performed. As a result, a catastrophic failure of the second downstream large radius piping sweep in the fourth stage extraction steam system occurred on April 21, 1997, which resulted in a plant transient.

This is a Severity Level IV violation (Supplement 1).

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OPPD Response

A. Reason for the Violation

The reason the violation occurred was that the methods used to monitor wall thickness of extraction steam piping as part of the Erosion/Corrosion (EC) program were inadequate. The root cause of this inadequacy was an incomplete utilization of plant history data as detailed in Reference 5. Contributing causes were discussed in References 4 and 5 and included:

- over-reliance on one factor, i.e., that typical wear rates for large radius sweeps in extraction steam piping are low, with the result that OPPD omitted the failed site from previous inspections,
- a lack of detailed, proceduralized methodology for selecting inspection sites.

OPPD recognizes the inadequacies of the EC program and while we are not contesting the violation, it is our position that our compliance with the maintenance rule, 10 CFR 50.65, was adequate. The nonsafety-related extraction steam piping was included within the scope of the maintenance rule program per 10 CFR 50.65(b)(2)(iii) since failure of the SSCs could cause a reactor scram. The extraction steam piping was classified as non-risk dignificant and plant-level performance criteria were established in accordance with NUMARC 93-01, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Plants," Rev. 2, § 9.3.2.

As part of the initial implementation of the maintenance rule, extraction steam SSCs were evaluated against the plant-level performance criteria using historical data. Per NUMARC 93-01, § 9.3.3, a review of SSC failures and maintenance history was performed from July 1, 1992, through June 30, 1995, using NPRDS and other plant data. The FCS Maintenance Rule Program adopted NPRDS failure monitoring for all SSCs within the scope of the rule. SSCs have been monitored for failure (e.g., thru wall leakage) by the NPRDS since 1991. During the period covered by the historical review, no prior failures of extraction steam piping were identified that would have caused the established performance criteria to be exceeded. Accordingly, consistent with 10 CFR 50.65 and NUMARC 93-01, the extraction steam SSCs were placed in Paragraph (a)(2) of the rule and addressed as part of the preventive maintenance program.

For initial maintenance rule implementation, extraction steam piping was considered effectively controlled by the EC program so that the Paragraph (a)(2) classification was appropriate. OPPD's review indicated a well-developed EC inspection program that was pro-actively replacing EC-susceptible piping prior to reaching minimum wall thickness. From a maintenance rule standpoint, no functional failures or MPFFs were identified during the previous two operating cycles that would suggest that preventive maintenance was ineffective.

OPPD continues to believe that the implementation of the maintenance rule was correct. The extraction steam piping, prior to the April 21, 1997, event, had met its performance criteria and had not experienced a Maintenance Preventable Functional Failure (MPFF) during the period relevant to the maintenance rule implementation. OPPD therefore determined that the piping was being effectively controlled through preventive maintenance. This view is consistent with NRC guidance. In SECY-97-055, "Maintenance Rule Status, Results, and Lessons Learned," dated March 4, 1997, (page 5) the NRC stated its position as follows: "Frovided that an SSC meets its performance criteria or does not experience a repetitive maintenance preventable functional failure (MPFF), the preventive maintenance

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for that SSC is considered to be effective, and monitoring can continue under Paragraph (a)(2). When the SSC does not meet a performance criterion or experiences a repetitive MPFF, the licensee must determine whether the SSC should be monitored under Paragraph (a)(1)." Since the extraction steam piping had met the performance criteria and had not experienced a MPFF until the April 21 event, OPPD maintains that monitoring under Paragraph (a)(2) was adequate.

OPPD's reliance on its existing EC program was also consistent with the regulatory guidance. Regulatory Guide 1.160, Rev. 2, " Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," issued March 1997, encourages the use of existing licensee programs in meeting the maintenance rule. Specifically, Regulatory Guide 1.160 states (page 3) that the "NRC staff encourages licensees to use, to the maximum extent practicable, activities currently being conducted, such as technical specification surveillance testing, to satisfy monitoring requirements." In implementing the maintenance rule, OPPD's review indicated that the EC Program was generally effective and that therefore it was appropriate to utilize this existing program for monitoring purposes.

OPPD agrees that one purpose of the maintenance rule is to minimize failures and events caused by the lack of effective maintenance. Nevertheless, the maintenance rule cannot and does not preclude failures from occurring. In fact, the rule and associated guidance contemplate that failures may occur, and specify that when they do, a cause determination must be performed and corrective action taken. As stated in SECY-97-055 (page 9), "From a regulatory standpoint, the occurrence of an MFFF is not a violation. Rather, an MPFF indicates a potential problem; what is important is that the licensee take effective corrective actions." In essence, then, the maintenance rule has a built-in self-improvement mechanism by which licensee programs are enhanced if a MPFF er unacceptable performance occurs. In the case of the April 21 event, this failure was identified as the tirst MPFF of the extraction steam piping, and, as contemplated by maintenance rule, a cause determination was performed and the appropriate SSCs were dispositioned to Paragraph (a)(1) with monitoring against established goals. In this manner, OPPD complied with 10 CFR 50.65.

B. Corrective Steps Which Have Been Taken and the Results Achieved

The corrective actions and results achieved prior to returning Fort Calhoun to power operation are discussed in our previous submittal, Reference 3, documenting the information requested from the public meeting of May 5, 1997, and in Licensee Event Report 97-003, Reference 6. The status of additional corrective actions were discussed during the predecisional enforcement conference on July 21, 1997.

Specifically, the CHECWORKS[®] model has been revised and verified. The results of the updated CHECWORKS[®] model are being used as one of the tools to select inspection sites for the 1998 refueling outage.

Based on the extraction steam line failure, the following actions were taken in accordance with 10 CFR 50.65:

- A cause determination was performed based on the Root Cause Analysis and Failure Analysis on the extraction steam pipe.
- The failure was identified as an MPFF.

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OPPD determined that all FAC-susceptible piping should be placed in Paragraph (a)(1) with monitoring against established goals. This resulted in the extraction steam piping being dispositioned to Paragraph (a)(1).

In addition, comprehensive corrective actions were also taken under the Maintenance Rule to provide assurance that other piping was being effectively controlled by adequate preventive maintenance. Specifically, OPPD conducted a review of piping in other systems to determine whether the piping was being effectively monitored by the EC Program or other preventive maintenance activities. As a result of this review, piping in three additional systems were dispositioned to Paragraph (a)(1) of the maintenance rule.

C. Corrective Steps Which Will Be Taken

As discussed in Reference 6 the following additional corrective measures will be taken:

- Revise the Erosion/Corrosion Program Plan, controlling procedures and modules to be consistent with industry standards. This revision will include upgrade of the implementing procedures to be consistent with industry standards (e.g., NSAC 202L, Rev. 1), development of susceptibility documentation and requirements for use of current industry experience. This will be completed by the beginning of the 1998 Refueling Outage.
- Revise and verify that the Fort Calhoun CHECWORKS[®] models are consistent with industry standards by December 31, 1997.

Included in item 2 is a review of maintenance performed on the CHECWORKS[®] modeled systems to identify components replaced during the period 1988 to 1984, when the Fort Calhoun computerized maintenance order system was instituted. A review of the CHECWORKS[®] model data shows that components replaced after 1988 were incorporated into the model.

In addition, OPPD is pianning the following enhancements.

- 1. The sixth stage extraction steam piping is planned for replacement during the 1998 refueling outage. The other extraction steam piping will be evaluated and replaced as dictated by the improved EC program.
- A review of maintenance history prior to 1984 will be conducted to include any appropriate failure data into the CHECWORKS[®] models.

D. Date When Full Compliance Will Be Achieved

OPPD is currently in full compliance.