

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-483/88016

Docket No. 50-483

License No. NFP-30

Licensee: The Union Electric Company
Post Office Box 149
St. Louis, MO 63166

Facility Name: Callaway, Unit 1

Inspection At: Callaway Site, Callaway County, Missouri

Inspection Conducted: August 15-19, 1988

Inspectors: *S. Reynolds for*
S. D. Eick

9/16/88
Date

S. Reynolds for
T. H. Carter

9/16/88
Date

S. Reynolds
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9/16/88
Date

Approved By: *Frank J. Jablonski*
Frank J. Jablonski, Chief
Maintenance and Outages Section

9/16/88
Date

Inspection Summary

Inspection on August 15-19, 1988 (Report No. 50-483/88016(DRS))

Areas Inspected: Routine, announced inspection of maintenance activities using selected portions of Inspection Modules 62700, 62702, 62705, and 62720.

Results: Based on the inspection, the inspectors reached the following conclusions:

- Maintenance was accomplished, effective, and self-assessed; however, improvement is needed to assure that documentation is adequate and appropriate to assess the completion of post-maintenance testing.
- Weaknesses were identified in the amount of detail in corrective maintenance work instructions.

- Management attention is needed to assure maintenance controls on non-safety equipment is commensurate with those controls on safety-related equipment.
- Potential weakness exists in the tracking of technical issues identified during maintenance activities in that the resolution of these issues were not documented or referenced on the work request.
- The PM program was established using vendor recommendations, plant history and performance indicators. Implementation of the Reliability - Centered Maintenance (RCM) process should significantly improve the PM program to increase the reliability and operability of plant components and systems.
- The material condition of the plant was considered acceptable. A positive management attitude towards housekeeping was evident through the initiation of painting and housekeeping programs.
- "QA Planning Guide for Functional Area Maintenance," appeared thorough and had the potential to provide an effective evaluation of the overall maintenance process.
- Surveillances were considered to be effective performance-based assessments; however, audits were compliance oriented.
- One unresolved item was identified and discussed in Paragraph 2.2.3.2.

DETAILS

1. Persons Contacted

Union Electric Company

- *G. Randolph, General Manager, Nuclear Operations
- *J. Blosser, Manager, Callaway Plant
- *R. Butler, Senior Engineer, Quality Assurance (QA)
- *W. Campbell, Manager, Nuclear Engineering
- *G. Czeschin, Superintendent, Planning and Scheduling
- *J. Gearhart, Superintendent, QA Operations Support
- *A. Neuhalfen, Manager, QA
- *W. Robinson, Assistant Manager, Operations and Maintenance
- *S. Schoolcraft, Engineer, QA
- *D. Young, Superintendent, Maintenance

*Denotes those present at the exit meeting on August 19, 1988.

Other licensee personnel were contacted as a matter of routine during the inspection.

2. Evaluation and Assessment of Maintenance

The purpose of this inspection was to evaluate and assess the accomplishment and effectiveness of maintenance activities at Callaway. The evaluation and assessment were accomplished by:

- Review of selected portions of the Preventive Maintenance Program
- Review of Motor Operated Valve Maintenance Program
- Evaluation of maintenance backlog
- Review of completed work request
- Observation of maintenance activities
- Walkdown of plant systems
- Review of training records

This inspection also assessed the quality verification process related to maintenance, which was accomplished by:

- Review of audit and surveillance reports
- Review of the licensee's self assessment reports

2.1 Preventive Maintenance (PM)

The administration of the PM program was computerized. The PM program was periodically reviewed for possible additions or deletions. PM program requirements were compared with vendor recommendations, with frequency established based on plant history and performance indicators. PMs were classified and scheduled by priority; Environmental Qualifications (EQ) and FSAR Commitments.

The inspectors reviewed documentation and interviewed personnel to ensure PMs were performed on electrical breakers for selected components in the Safety Injection (SI) System. PMs for 4160 volt breakers (SI pumps A and B) and 600 volt breakers (valves 8813, 8814A, 8814B, 8806A, and 8806B) were reviewed and found to be scheduled and performed.

The licensee had implemented the Reliability - Centered Maintenance (RCM) process on three plant systems. These systems were Essential Service Water, Essential Service Water Pumphouse HVAC, and Gaseous Radwaste. This process should significantly increase the reliability and operability of these systems. As a result of RCM on these three systems, several PMs were identified that provided little if any increased reliability, operability, or safety and were subsequently deleted. Application of the RCM process on all plant systems should significantly increase overall plant reliability and operability; however, the licensee had not determined if RCM would be applied to all other plant systems.

2.2 Accomplishment of Maintenance

2.2.1 Corrective Maintenance Work Request Backlog

The backlog of corrective maintenance (CM) Work Requests (WRs) on "plant" equipment, equipment important to safe operation of the plant, plant fire protection, security, power generation, power distribution, and necessary for Radiological Emergency Response Plan, was approximately 920, which was approximately a two to three month work backlog. WRs greater than 90 days old appeared to have no impact on safety. High priority WRs were generally completed first with the majority of the backlog comprised of low priority WRs. The licensee's backlog goal of 900 or less appeared adequate and manageable with the present work force and limited amount of overtime.

2.2.2 Preventive Maintenance Backlog

Scheduling, control, and management of preventive maintenance (PM) activities appeared adequate. However, the licensee did not have a method established to count and track PM backlog on a continuous basis. PM activities were scheduled on a monthly basis and only past due PM activities for the particular month were tracked.

Generally any late or past due PMs were rescheduled and completed within the next month. A monthly report was issued to upper management that identified past due and deferred PMs and the relative safety significance of the activities. A review of several PM activities for due dates, frequency, and last completed dates did not identify any PM activities that should have been performed, but had not. A review of several deferred PMs identified that thorough technical evaluations were not documented. However, the deferred PMs reviewed did not indicate a potential operability, reliability, or safety problem. Instructions for performing a technical evaluation on deferred PMs was lacking in that the instructions did not require consideration of operability, reliability, failure modes, or safety significance.

2.2.3 Review of Completed Work Requests

Review of 21 corrective maintenance, 5 preventive maintenance, and 4 generic WRs on the High Pressure Coolant Injection System (EM) performed in 1987 and 1988 indicated that work was generally performed effectively and within the bounds of the work control system and QA program. However, some potential weaknesses were identified as discussed below.

2.2.3.1 Work Instructions

The WR form appeared cumbersome and cluttered; it was often difficult for the licensee and the inspectors to identify all the various information included on the WR and the WR Completion Form. Work instructions for corrective maintenance were not as detailed as the PM work instructions. The PM work instructions detailed work to be performed, parts/tools/equipment needed, and the task description described with step by step instructions. However, no examples were identified for CMs where lack of maintenance task instructions resulted in rework.

2.2.3.2 Post-Maintenance Testing

Three of the WRs and four of the Generic WRs reviewed, did not either indicate what post-maintenance testing was required or if post-maintenance testing was performed. The four Generic WRs concerned valve adjustments, including limit switch adjustments on air operated valves, and/or troubleshooting. The Multiple Use Completion Form was the only documentation given to maintenance to perform the work and no post-maintenance testing was specified on the form. Two of the four valves were Containment Isolation valves that required stroke time testing after maintenance. The licensee did provide the inspector with the results of the post-maintenance stroke timing; however, it required a tedious search of the computer files using the equipment number and expected date of testing. The licensee's QA staff had earlier identified a similar problem with 7 out of 20 WRs that appeared to

have ineffective or inadequate post-maintenance testing. The concern about inadequate or missing post-maintenance testing is considered an unresolved item (483/88016-01) and will be reviewed in the future.

2.2.3.3 Resolution of Concerns

Generic WR G412585-52 was written to replace a blown fuse for Auxiliary Feedwater Steam Supply Valve, FCHV-312. One of the electrical skills allowed under a Generic WR was replacing blown fuses with the same type and current rating. Maintenance personnel replaced a blown 6 amp fuse with one of the same type and current rating; however, the electrical print required a 7 amp fuse. No followup action was documented on the Completion Form concerning the fuse discrepancy. A computer search revealed that an engineering evaluation of the discrepancy was completed, including a 10 CFR 50.59 review. More attention is needed in the area of documentation and resolution of concerns identified during the performance of maintenance.

2.2.4 Summary of Maintenance Accomplishment

- The licensee's backlog appeared adequate and manageable with the present work force.
- Potential weaknesses were identified with the WRs in the amount of detail in the work instructions and inadequate or missing post-maintenance testing.
- Potential weakness exist in the tracking of technical issues identified during maintenance activities in that the resolution of these issues were not documented or referenced on the work request.

One unresolved item was identified.

2.3. Effectiveness of Maintenance

2.3.1 Observation of Work Activities

The inspectors observed portions of approximately four mechanical maintenance activities to determine if those activities were performed in accordance with required administrative and technical requirements. The inspectors concluded that maintenance activities were generally accomplished effectively based on the following:

- Administrative approvals were obtained;
- Equipment was properly tagged;
- Replacement parts were acceptable and certified;
- Approved procedures were available and properly implemented;

- Work was accomplished by experienced and knowledgeable personnel;
- Radiological controls were established and implemented;
- Appropriate post-maintenance testing was identified.

In particular, the inspectors observed oil samples taken on Diesel Generator A engine according to PM No. P438178 and No. P440071. The system engineer briefed the maintenance personnel on the location of the sample points with a drawing. The maintenance personnel had not performed those PMs before and agreed that a similar drawing could be included in the PMs package to provide sample locations without assistance from the system engineer.

The lube oil reservoir sightglass was replaced on the CVCS Centrifugal-Charging Pump A according to WR No. W114949. No anomalies were noted and precautions were taken to prevent spillage of oil, with QC present to verify cleanliness.

The inspector monitored the work to replace the leaking inboard mechanical seal on the Condenser Drain Pump (nonsafety-related) according to WR No. W109791. Several concerns were identified as follows:

- The outboard mechanical seal was repositioned to adjust the amount of spring compression. Instructions and the vendor drawing that showed the dimensions required for proper compression were not included in the work packages.
- Clean, lint free cloths and suitable solvent for keeping the new mechanical seal free from any possible dirt, grease, or oil to ensure proper sealing were not used.
- The WR did not include instructions for proper installation and adjustment of the mechanical seal and work had to be stopped while the instructions were located. Even after the vendor drawing was obtained, the drawing was not taken to the work area and necessary numerical values (dimensions and torque values) and instructions had to be recalled from memory.
- The WR did not include instructions for removal and reinstallation of the pump casing including torque requirements. The removal of the pump casing was necessary to replace the defective mechanical seal.

Licensee management intimated that nonsafety-related work was performed with the same level of quality and effectiveness as safety-related work. However, the control of maintenance activities for nonsafety-related equipment appeared incommensurate with maintenance on safety-related equipment. Since post-maintenance testing was not performed by the end of this inspection, the adverse effects, if any, on the operability of the pump could not be ascertained.

2.3.2 Plant Observations and System Walkdowns

To assess the material condition of the plant, the inspectors made general observations of the plant and conducted walkdowns on the following elevations:

- E1. 1974' • A and B Diesel Generator Rooms
 - Atmospheric Steam Dump
 - 'B' Containment Spray Pump Room
 - Blowdown Isolation Valves
 - Boric Acid Tank Room
 - CCW Pump Room
 - Feedwater Isolation Valves
 - MSIVs
 - North and South Electrical Penetration Rooms
 - Remote Shutdown Panel
 - Safety Relief Valves

- E1. 2026' • Aux Bldg: Safety and Non Safety Switchgear

- E1. 2047' • Control Room
 - Personnel Access Hatch

- E1. 2065' • Turbine Deck

Work requests were written and condition tags were hung on components needing repair; however, 4 out of 14 condition tags identified were void or the work had been completed. More attention to detail concerning the removal of these tags was needed to give an accurate account of the operability and material condition of plant equipment.

During the walkdowns, the inspectors observed very little rust and corrosion on piping and components, no temporary "quick-fix" repairs, that leaks from flanges or packing were previously identified with condition tags attached, that valve stems appeared adequately lubricated, and no abnormal noises or vibrations on operating equipment. The inspectors also evaluated housekeeping and noted very little evidence of dirt and debris. A painting program had been implemented that labeled equipment and flow direction in piping and specific plant areas have been assigned to individuals for housekeeping responsibilities. The painting program should be beneficial in identifying leaks and reducing the number of "wrong train," "wrong component" type personnel errors. Both programs indicated a positive management attitude towards housekeeping.

2.3.3 Valve Maintenance

All safety-related (SR) and non safety-related Limitorque valve operators (approximately 330) were included in the valve PM program. Fifteen month PMs included an inspection of the components in the actuator housing, lubricant sampling in the limit switch compartment and main gear case, motor current readings and motor

insulation resistance readings. These activities were accomplished under Procedure MPM-ZZ-QA001, "Limitorque Operator Inspection and Lubrication," Revision 11. The system walkdowns verified that valve stems and upper grease fittings were lubricated with no anomalies noted on any MOV inspected.

To date, baseline diagnostic testing had been completed on 34 SR valves. Baseline testing will be completed every fourth refueling and motor load testing will be completed every refueling. The diagnostic program will be expanded to include all 155 SR valves in the future.

2.3.4 Training

Training and qualification records were reviewed for seven maintenance personnel that participated in maintenance activities witnessed by the inspectors. Training files were readily available and documented all training received since the employees were hired by the licensee. The inspectors determined from review of the records that personnel were qualified to perform the assigned maintenance activities.

2.3.5 Summary of Maintenance Effectiveness

- Maintenance activities observed during the inspection were generally accomplished in an effective manner with knowledgeable and professional personnel. However, non safety-related maintenance appeared incommensurate with safety-related maintenance work.
- The material condition of the plant was considered acceptable.
- A positive management attitude towards housekeeping was evident through the initiation of painting and housekeeping programs.

2.4 Assessment of Maintenance

The licensee, through QA audits and surveillances and the recent INPO self-assessment, had generally performed a complete, effective assessment of maintenance. The QA Department had a newly revised "QA Planning Guide for the Functional Area of Maintenance" that appeared thorough and had the potential to provide a complete, effective evaluation of the entire maintenance process. Review of several QA surveillances that were performed within the past 12 months indicated that the surveillances were effective "performance-based" assessments of several facets of the maintenance process. Contrary to the surveillances, QA audits of the I&C Department and of Maintenance for 1987 and 1988 were compliance oriented and were not useful to determine that maintenance was or was not effectively accomplished. For example, the April 1988 audit of UENO Maintenance and the July 1988 audit of the I&C Department included verification that OJT tasks qualifications cards were signed by a qualified individual. Additionally, a finding during the December 1987 audit of the I&C Department was that reject stickers on three torque wrenches did not have the initials of the individual attaching the stickers.

2.4.1 Summary of Assessment of Maintenance

- "QA Planning Guide for Functional Area of Maintenance," appeared thorough and had the potential to provide an effective evaluation of the overall maintenance process.
- Surveillances were considered to be effective performance-based assessments.
- Audits were compliance oriented with indeterminate evidence that maintenance was effectively accomplished.

3. Conclusions

Based on inspection activities described in this report, the inspectors concluded that:

- Maintenance was accomplished, effective, and self-assessed; however, management involvement is needed to assure that documentation is adequate and appropriate to assess the completion of post-maintenance testing.
- Potential weaknesses were identified in the amount of detail in maintenance work instructions and the lack of documentation in resolution of concerns identified during maintenance.
- Management attention is needed to assure that non-safety work is given adequate attention to detail and quality.
- The PM program was established using vendor recommendations, plant history and performance indicators. Implementation of the Reliability-Centered Maintenance (RCM) process should significantly improve the PM program to increase the reliability and operability of plant components and systems.
- The material condition of the plant was considered acceptable. A positive management attitude towards housekeeping was evident through the initiation of painting and housekeeping programs.
- "QA Planning for Functional Area of Maintenance," appeared thorough and had the potential to provide an effective evaluation of the overall maintenance process.
- Surveillances were considered to be effective performance-based assessments; however, audits were compliance oriented.
- One unresolved item was identified.

4. Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, violations, or deviations. An unresolved item disclosed during this inspection is included in Paragraph 2.2.3.2.

5. Exit Interview

The inspectors met with licensee representatives (denoted in Paragraph 1) on August 19, 1988, and summarized the purpose and findings of the inspection. The inspector discussed the likely content of the inspection report with regard to documents or processes reviewed by the inspectors during the inspection. The licensee did not identify any such documents or processes as proprietary.