

ENCLOSURE 2

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Inspection Report: 50-483/95-16

License: NPF-30

Licensee: Union Electric Company
P.O. Box 149
St. Louis, Missouri

Facility Name: Callaway Nuclear Plant

Inspection At: Steedman, Missouri

Inspection Conducted: November 6-9, 1995

Inspector: Gilbert L. Guerra, Jr., Radiation Specialist
Plant Support Branch

Approved:

J. Blaine Nicholas
for Blaine Murray, Chief, Plant Support Branch
Division of Reactor Safety

12/7/95
Date

Inspection Summary

Areas Inspected: Routine, announced inspection of the radiological environmental monitoring program including: organization and management controls, training and qualifications, quality assurance program, radiological environmental monitoring program, meteorological monitoring program, and reports of environmental monitoring operations.

Results:

Plant Support

- The organizational structure and staffing of the health physics technical support group met Technical Specification requirements. Management controls of the radiological environmental monitoring program were properly implemented. The health physics technical support group maintained an appropriately sized staff to perform the duties required by the radiological environmental monitoring program (Section 1).
- The licensee maintained a trained and qualified staff to conduct the radiological environmental monitoring program. The health physics technical support group had experienced a low turnover of technical personnel (Section 2).
- Comprehensive quality assurance audits of the radiological environmental and meteorological monitoring programs were performed. Quality

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assurance surveillances of radiological environmental and meteorological monitoring program activities were comprehensive and satisfactory to evaluate the licensee's performance (Section 3).

- Environmental media sampling and environmental thermoluminescent dosimeter locations were at locations as described in the Offsite Dose Calculation Manual, with one exception. A violation was identified regarding the location of the control station for the airborne exposure pathway (Section 4).
- Problems were identified with two river water composite sampling stations. An inspection followup item was opened to track progress in composite sampler operability. A weakness was identified in the environmental air sampling program regarding air sample head O-rings and gaskets (Section 4).
- The licensee responded well to an event regarding a break in the discharge line to the Missouri river (Section 4).
- An excellent meteorological monitoring program was implemented. Meteorological monitoring instrumentation channels were operating properly and calibrated at the proper frequencies. The performance of the meteorological monitoring program satisfied the requirements of the Technical Specifications and agreed with the guidance contained in applicable Regulatory Guides and American National Standards Institute (ANSI) Standards (Section 5).
- Annual radiological environmental monitoring reports were submitted in a timely manner and contained the required information (Section 6).

Summary of Inspection Findings:

- Violation 483/9516-01 was opened (Section 4).
- Inspection Followup Item 483/9516-02 was opened (Section 4).
- Inspection Followup Item 483/9408-01 was closed (Section 7).

Attachments:

- Attachment 1 - Persons Contacted and Exit Meeting
- Attachment 2 - Documents Reviewed

DETAILS

1 ORGANIZATION AND MANAGEMENT CONTROLS (84750)

The organization, staffing, management controls, and assignment of the radiological environmental monitoring program responsibilities were reviewed to determine agreement with the requirements in Technical Specification 6.2.

Through discussions with the licensee's staff, the inspector determined that no major changes had occurred in the organizational structure and that an adequate staff existed to conduct the radiological environmental and meteorological monitoring programs. The radiological environmental monitoring program was conducted by health physics technical support staff under the supervision of the health physics department. The inspector determined that the present organization met the requirements of the Technical Specifications.

Procedures for the implementation of the radiological environmental monitoring program were reviewed. (Attachment 2 contains a list of procedures reviewed.) Specifically, Procedures APA-ZZ-01022, "Radiological Environmental Monitoring," Revision 0, March 1, 1994, and FDP-ZZ-03001, "Radiological Environmental Monitoring Program," Revision 5, June 20, 1995, were reviewed for the assignment of responsibilities for the management and implementation of the radiological environmental monitoring program. These procedures described the responsibilities for collection, documentation, and shipment of environmental media samples collected around the Callaway Nuclear Plant site. The inspector determined that the duties and responsibilities specified in the procedures regarding the implementation of the radiological environmental monitoring program were being performed. Through technical discussions with the licensee's staff, who were trained and qualified to perform the environmental sampling responsibilities, the inspector determined that they were familiar with the requirements of the radiological environmental monitoring program. The inspector verified that the assignment of management control responsibilities for the implementation of the radiological environmental monitoring program were as identified in the Technical Specifications.

2 TRAINING AND QUALIFICATIONS (84750)

The training and qualification programs for the health physics technical support staff responsible for implementing the radiological environmental monitoring program were reviewed to determine agreement with the requirements in Technical Specifications 6.3 and 6.4.

The inspector reviewed Procedure HDP-ZZ-06017, "Rad/Chem Technician Health Physics Technical Support Qualification/OJT Program," Revision 17, February 1, 1995, which described the training program for the radiation/chemistry technicians. Through discussions with licensee personnel and review of training records, the inspector determined that the technical staff were trained in accordance with the above procedure. The inspector noted that only

3 of 11 radiation/chemistry technicians in the health physics technical support group were not fully qualified to perform all duties unsupervised. The training program described in the above procedure allowed for the performance of certain duties if the individual had completed the task performance evaluation successfully, even though the qualification card itself was not fully completed. The inspector determined that the experience, training, and working knowledge of personnel in the health physics technical support group, in which some personnel had been in their positions a number of years, met or exceeded the minimum training and qualification requirements outlined by the above procedure.

3 QUALITY ASSURANCE PROGRAM (84750)

The quality assurance audit program regarding the radiological environmental monitoring program activities was reviewed to determine agreement with the requirements in Technical Specification 6.5.2.9.

Quality Assurance Department Audit Reports AP93-013, AP94-006, and AP95-010 concerning the radiological environmental monitoring program, were reviewed for scope, thoroughness of program evaluation, and timely followup of identified deficiencies. (Attachment 2 contains a list of audits and surveillances reviewed.) The licensee used their Suggestion, Occurrence, Solution program for tracking corrective actions. The auditors wrote Suggestion, Occurrence, Solution reports both to report any deficiencies in the program and to offer improvement suggestions. The inspector also reviewed audit schedules, plans, and checklists. The audits were performed at the frequencies required by Technical Specifications and were conducted in accordance with quality assurance procedures by qualified auditors, with assistance from technical specialists from other nuclear power facilities. The inspector noted that the quality assurance audits were designed to assess the adequacy and effectiveness of the radiological environmental and meteorological monitoring programs, including implementation and compliance with regulations, procedures, and industry standards. The inspector found the quality assurance audits to be comprehensive and able to effectively evaluate the licensee's performance in implementing the radiological environmental monitoring program.

The inspector also reviewed quality assurance surveillance reports conducted for the radiological and meteorological monitoring programs. The performance of a surveillance was often triggered by an event or report (Suggestion, Occurrence, Solution) of a problem in a specific area or a declining trend in performance. These performance evaluations adequately evaluated the performance of personnel and the implementation of station procedures for both the radiological environmental and the meteorological monitoring programs.

The licensee used a contractor laboratory to perform radiochemistry analyses on environmental media samples. The inspector reviewed Nuclear Procurement Issues Committee Audit Report 92-11, issued October 20, 1992, and Union Electric Corporation Audit Report SQL94-127, issued October 31, 1995, of the contractor laboratory. These audits verified the implementation of relevant

procedures for providing the radiological analyses of environmental monitoring samples in accordance with NRC Regulatory Guide 4.15. The audit team found that, overall, the program was adequate to ensure that the laboratory was performing the radiological analyses in accordance with laboratory procedures and NRC Regulatory Guide 4.15 recommendations. Also, the contractor laboratory participated in the Environmental Protection Agency interlaboratory comparison program.

4 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM (84750)

The radiological environmental monitoring program was reviewed to determine compliance with the requirements in Technical Specification 6.8.4.g and the Offsite Dose Calculation Manual.

The health physics technical support staff was responsible for the collection and documentation of radiological environmental samples, including the reading and annealing of environmental and personnel thermoluminescent dosimeters. Analyses of environmental samples were conducted by a contractor laboratory. The inspector reviewed procedures for the administration and implementation of the radiological environmental monitoring program. These procedures provided for the sampling, preparing, and shipping of environmental media samples and evaluating and reporting the radiological analytical results. The procedures were written with sufficient detail to ensure Technical Specification compliance. (Attachment 2 contains a list of procedures reviewed.)

The inspector accompanied and observed a radiation/chemistry technician collect and prepare air particulate and charcoal cartridge samples for shipment and analysis. All aspects of the sampling process and sample preparation for shipment and analysis were performed in accordance with approved procedures. Airborne sampling sites were inspected, and the air sampling equipment was operational and currently calibrated. The health physics technical support staff was supported by the health physics operations staff for maintenance and calibration of air samplers. The inspector verified that the licensee had a sufficient supply of environmental sampling equipment including additional air sample pumps.

The inspector visited and examined selected environmental media sampling locations of the following types: airborne, surface water, bottom sediment, broadleaf vegetation, and thermoluminescent dosimeters. During the inspection, the inspector verified that the sampling locations were as described in Table 9.11-A of the Offsite Dose Calculation Manual with one exception. The description of the control location for the airborne exposure pathway in the Offsite Dose Calculation Manual states, that it be 15 to 30 kilometers (10 to 20 miles) distant and in the least prevalent wind direction. However, the inspector found that the control airborne sampling station was 9.5 miles distant from the plant and in the north west sector, one of the most prevalent wind directions. Although, not defined in the Offsite Dose Calculation Manual, the inspector also noted that the control thermoluminescent dosimeters were located in the same general area. The purpose of the control locations according to the Offsite Dose Calculation

Manual, is to obtain background information. In general, it was determined that the collection, processing, and analyses of radiological environmental media samples were conducted in accordance with the Offsite Dose Calculation Manual. Because the control air sample location did not meet the description in the Offsite Dose Calculation Manual, this item is identified as a violation (483/9516-01).

The inspector observed the facilities used by the licensee including the environmental media sample storage and preparation areas and the radiochemistry counting room. The laboratory areas were equipped with the necessary chemicals, labware, and analytical instrumentation to perform the required radiological analyses and shipment preparation.

During a tour of the air sampler stations for the change out of collection media (e.g., the particulate filter and iodine charcoal cartridge), the inspector asked the radiation/chemistry technician collecting the samples to verify the sample-line integrity, prior to installing the new head with fresh collection media, by sealing off flow to the inlet of the sample head and verifying that the flow gage indicated approximately zero flow. It was found that the flow through the sample pump did not drop to approximately zero flow. Procedure HTP-ZZ-07001, "Collection and Shipping of Environmental Samples," Revision 22, September 1, 1994, required the technician to verify sample-line integrity (using the new sample head) by sealing off flow to the inlet of the filter sample head by using the palm of the hand and verifying that the flow gage indicated approximately zero flow. Upon inspection of the sample head after removal from the air sample station and securing of the sampling media, it was discovered by the inspector that an internal gasket, which sealed in place the charcoal canister, was missing from the sample head. This missing gasket may have caused air flow to bypass the sampling media. Hence, an improper environmental monitoring sample as required by the Offsite Dose Calculation Manual, would be collected. The licensee had already identified worn and cracked O-rings (ensures a tight seal for the all metal sample heads) on the exterior of the sample heads and had initiated the process of O-ring replacement with the issuance of Suggestion, Occurrence, Solution 95-2082. The licensee had not identified the condition of the internal gaskets nor implemented an inspection and replacement program. However, Suggestion, Occurrence, Solution 95-2097, issued at the end of the inspection, reviewed this occurrence for corrective action. Through discussions with the licensee, the inspector was informed that procedures would be reviewed and that this would be addressed at the next requalification training session. Also, the inspector noted that the licensee did not dedicate air sample heads to specific air samplers (which would reduce the possibility for cross contamination between subsequent sampling periods), although the licensee had enough sample heads to dedicate two per air sample station. Because the condition of the air sample head O-rings and gaskets were not in optimum condition and sample heads were distributed randomly between the five air sampling stations, these items were identified as weakness in the licensee's environmental air sampling program.

The inspector noted that the licensee had experienced continued operability problems with the composite water samplers for several years. Through discussions with licensee personnel and review of Surveillance Reports SP93-088 and SP95-011 (see Attachment 2), the inspector learned that problems with the composite samplers went as far back as 1989, when a surveillance report noted that both samplers were inoperable nearly half of the time. Surveillance Report SP95-011 states that past corrective actions had not been effective, but much effort had been expended and that management had recently placed significant priority in having operational composite samplers. Problems, which have been plaguing the licensee, were due to planning delays, obtaining parts, harsh environment, design changes, silt buildup, and river flooding. Surveillance Report SP93-088 states that since 1991, more than \$50,000 had been spent on maintenance and repairs to the down stream sampler and, in addition, six pumps had been purchased over the last 3 years at a cost of \$550 per pump. These expenditures have yielded an operational sampler with an availability of approximately 45 percent of the time for the last 3 years. Notation (1) of Table 9.11-A of the Callaway Offsite Dose Calculation Manual, states, that if specimens are unobtainable due to sampling equipment malfunction, every effort shall be made to complete corrective action prior to the end of the of the next sampling period. Both composite water samplers were inoperable for periods of time exceeding the 1 month sampling period, sometimes for periods greater than 5 months. Because past corrective actions for maintaining the operability of the composite samplers had not been successful, and, at the time of this inspection, the samplers were not in use for their stated purpose, this issue is identified as an Inspection Followup Item (483/9516-02).

On October 9, 1995, the licensee discovered that their discharge line to the Missouri river had broken and had been leaking into Logan Creek (which subsequently flows into the Missouri river). The licensee estimated that the leak occurred on August 1, 1995, because this area had been flooded prior to the discovery. The site boundary for liquid effluents is the point at which the plant discharge line discharges into the Missouri river. This leak caused a deviation from the normal release path for liquid effluents, so any dose calculations due to liquid effluents were nonconservative since the dilution at the Missouri river could not be used for discharges at Logan Creek. Although all releases into the discharge line were in accordance with the Offsite Dose Calculation Manual, this event will be reported in the next Annual Radioactive Effluent Release Report as an unplanned release. The licensee recalculated the doses for all effluent releases made during this time period assuming that all of the plant effluent discharged into Logan Creek and that no dilution occurred in the creek. Doses were calculated to be up to 1 percent on the average higher than the doses calculated for releases at the Missouri river. These doses remained well below the 10 CFR Part 50, Appendix I limits for maintaining offsite dose as low as is reasonably achievable. Reports were made to the state of Missouri as required. It was determined that the licensee responded well to this event by sampling the break area for radionuclides and recalculating doses based on the specifics of the release.

5 METEOROLOGICAL MONITORING PROGRAM (84750)

The inspector reviewed the meteorological monitoring program to determine compliance with the requirements in Technical Specification 3/4.3.3.4 and the recommendations of NRC Regulatory Guides 1.23 and 1.97, and the American National Standards Institute-American Nuclear Society (ANSI-ANS) Standard 2.5-1984.

The inspector visited and inspected the primary and secondary meteorological towers and associated monitoring instrumentation. All instrumentation was found operational and calibrated. The required daily surveillance channel checks and monthly surveillance checks of the meteorological monitoring instrumentation were reviewed and found to have been satisfactorily completed by operations personnel and instrument and controls technicians, respectively.

The inspector reviewed meteorological instrumentation calibration procedures, surveillance procedures, and associated records. The inspector determined that meteorological sensing and recording equipment had been calibrated semiannually by the licensee's instrument and controls technicians. The calibrations were conducted in accordance with approved procedures for wind speed, wind direction, and air temperature difference. The licensee maintained primary and secondary towers. The primary tower was equipped with wind speed, wind direction, and temperature sensing instrumentation at the 10, 60, and 90 meter elevations, and the secondary tower at the 10 meter elevation. The meteorological monitoring instrumentation calibration procedures and the calibration records for the last four calibrations, conducted between February 16, 1994, and September 1, 1995, were reviewed. The inspector verified that the meteorological tower instrumentation had been calibrated semiannually in accordance with Technical Specification requirements. All records reviewed indicated that the meteorological monitoring instruments were being properly maintained, tested, and calibrated in compliance with Technical Specification requirements.

The inspector noted that backup recording equipment such as strip chart recorders were available at the meteorological towers and in the control building near the control room for use if the plant computer were down. The licensee obtained a greater than 90 percent data recovery rate for 1994.

6 REPORTS OF ENVIRONMENTAL MONITORING OPERATIONS (84750)

The annual radiological environmental operating reports and annual radioactive effluent release reports were reviewed to determine compliance with the reporting requirements in Technical Specifications 6.9.1.6 and 6.9.1.7.

The inspector reviewed the annual radiological environmental monitoring reports and annual radioactive effluent release reports for 1992, 1993, and 1994. The reports were submitted in a timely manner and contained the required information. Any discrepancies or missed samples were reported. The

inspector determined that the Technical Specification sampling, analyses, and reporting requirements were met. The inspector determined that the annual land use censuses were conducted as required by the Technical Specifications, and the results were included in the respective annual radiological environmental monitoring reports

7 FOLLOWUP - PLANT SUPPORT (92904)

(Closed) Inspection Followup Item 483/9408-01 - Unplanned Spreads of Contamination in the Radwaste Facility

Leaks from the Primary Evaporator Bottoms Tank, which caused contamination events in the radwaste facility, had occurred in the past. These events were caused by a combination of worn packing, a warped mixer shaft, and overflow events. Work orders were initiated which eventually led to the replacement of the mixer shaft, replacement of the packing material, and recalibration of level transmitters to properly respond to the density of the contents of the tank. Also, procedural controls were established to avoid overflowing the tank and challenging the mixer packing. After final repairs and testing, evaporator bottoms were processed into the tank on three occasions, January 30, May 3, and October 31, 1995, without a recurrence of the leakage problem previously encountered.

ATTACHMENT 1

1 PERSONS CONTACTED

1.1 Licensee Personnel

- *M. Evans, Superintendent, Health Physics
- *J. Barbour, Engineer
- L. Godley, Radiation/Chemistry Technician
- *G. Hamilton, Supervisor, Quality Assurance
- B. Holderness, Safety Analyst and Radiological Engineer
- *G. Huges, Supervisor, Independent Safety Engineering Group
- *J. Kerrigan, Supervisor, Health Physics Counting Room
- *J. Kovar, Engineer, Quality Assurance
- *T. Lowry, Engineer
- *B. Miller, Dosimetry Supervisor
- *R. Roselius, Superintendent, Chemistry/Radwaste
- *M. Reidmeyer, Engineer, Quality Assurance
- *M. Taylor, Assistant Manager, Work Control

1.2 NRC Personnel

- *D. Passehl, Senior Resident Inspector
- F. Brush, Resident Inspector

In addition to the personnel listed above, the inspector contacted other personnel during this inspection period.

*Denotes those present at the exit meeting.

2 EXIT MEETING

An exit meeting was conducted on November 9, 1995, at the Callaway Nuclear Plant. During this meeting, the inspector reviewed the scope and findings of the of the inspection as detailed in this report. The licensee did not express a position on the inspection findings documented in this report. The licensee did not identify as proprietary any information provided to, or reviewed by, the inspector.

ATTACHMENT 2

List of Documents Reviewed

Procedures:

- APA-ZZ-00006. "Licensing and Fuels Organization and Responsibility." Revision 5. December 7, 1994
- APA-ZZ-00014. "Conduct of Operations-Health Physics." Revision 6. February 9, 1995
- APA-ZZ-01022. "Radiological Environmental Monitoring." Revision 0. March 1, 1994
- FDP-ZZ-03001. "Radiological Environmental Monitoring Program." Revision 5. June 20, 1995
- FDP-ZZ-03002. "Sample Collection and Shipment for REMP." Revision 4. March 1, 1994
- FDP-ZZ-03003. "Evaluation and Reporting of REMP Data." Revision 4. February 11, 1994
- FDP-ZZ-03005. "Land Use Census Program." Revision 0. July 13, 1994
- FDP-ZZ-03006. "Meteorological Data Evaluation." Revision 0. July 3, 1995
- GDP-ZZ-00230. "Certification of Quality Assurance Personnel." Revision 12. September 9, 1994
- HTP-ZZ-04143. "Operation of the Collins Model 42 River Water Composite Sampler." Revision 4. September 6, 1995
- HTP-ZZ-04221. "Calibration of Miscellaneous Air Samplers." Revision 9. March 9, 1995
- HDP-ZZ-06017. "Rad/Chem Technician Health Physics Technical Support Qualification/OJT Program." Revision 17. February 1, 1995
- HTP-ZZ-07001. "Collection and Shipping of Environmental Samples." Revision 22. September 1, 1994
- ISL-RD-00S10. "Loop-Misc: 10 Meter Wind Speed-Pri." Revision 14. November 3, 1995
- ISL-RD-00Z10. "Loop-Misc: 10 Meter Wind Direction-Pri." Revision 12. August 11, 1995
- ITL-RD-000PR. "Loop-Misc: 1 Meter Precipitation." Revision 5. June 2, 1995
- ITL-RD-00DP10. "Loop-Misc: 10 Meter Dew Pt. -Pri." Revision 6. June 2, 1995
- ITL-RD-00T10. "Loop-Tmp: 10 Meter Temp-Pri." Revision 6. August 17, 1995

ITM-ZZ-00002. "Maintenance: Primary Met Tower Instrumentation." Revision 8.
July 19, 1994

TDP-ZZ-00059. "Quality Assurance Department Training Program." Revision 6.
December 13, 1994

Audits and Surveillances:

AP95-010 - Quality Assurance Audit of Radiological Environmental Monitoring
Plan, August 15, 1995

AP94-006 - Quality Assurance Audit of Radiological Environmental Monitoring,
August 12, 1994

AP93-013 - Quality Assurance Audit of Radiological Environmental Monitoring,
August 25, 1993

SP95-011 - Status of the Missouri River Composite Samplers, July 14, 1995

SP95-048 - Air Sample Flowrates, June 5, 1995

SP95-094 - Reportability of Plant Discharge Line Leakage, November 3, 1995

SP94-053 - Environmental Reporting Requirements for the Callaway Plant,
June 29, 1994

SP93-008 - Quality Assurance Program for Effluent and Environmental
Monitoring, February 22, 1993

SP93-011 - Quality Requirements for Calibration of Meteorological Instruments,
April 13, 1993

SP93-047 - Land Use Census, June 18, 1993

SP93-051 - Implementation of the Radiological Environmental Monitoring
Program, July 26, 1993

SP93-088 - Sampler Inoperability, March 3, 1994

Reports:

Annual Radioactive Effluent Release Reports - 1993 and 1994

Annual Environmental Operating Reports - 1992, 1993, and 1994

Other:

Offsite Dose Calculation Manual, Revision 5, February 1995