U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-483/91004

Docket No. 50-483 License No. NPF-30

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

Facility Name: Callaway County Nuclear Station

Inspection At: Callaway Site, Callaway County, Missouri

Inspection Conducted: January 28 - February 1, 1991

WB Grant

Inspector: W. B. Grant

2/20/91
Date

James E. Foster, for

Approved By: William Snell, Chief
Radiological Controls and Emergency
Preparedness Section

2/20/91
Date

Inspection Summary

Inspection on January 28 - February 1, 1991 (Report No. 50-483/91004(DRSS))
Areas Inspected: Routine inspection of radiological protection program (IP 83750); radioactive waste treatment and effluent program (IP 84750) and solid radioactive waste management and transportation of radioactive materials (IP 86750), including: changes; audits and surveillances; plans and preparation; exposure control; control of radioactive material; training and qualification of personnel; process and effluent radiation monitors; solid radwaste storage; engineered-safety feature and control room habitability systems; implementation of the solid radioactive waste program; shipping of low-level wastes for disposal, and transportation.
Results: The licensee's radiation protection, radioactive waste treatment, effluent, solid radioactive waste management and transportation programs are good and continue to be effective in protecting the health and safety of workers and the public. No violations or deviations were identified. Strengths observed during the inspection were the continued strong management support of the Health Physics and the Radioactive Waste programs and the strong radiation/chemistry technician apprenticeship program.

DETAILS

1. Persons Contacted

D. Anderson, Training Supervisor
L. Beaty, System Engineer, Instruments and Controls
*J. Blosser, Manager, Callaway Plant
*D. Brownawell, Quality Assurance Engineer
*F. Eggers, Supervising Engineer, QAOS
*J. Gearhart, Superintendent, Quality Assurance
G. Hamilton, Supervisor, Radwaste
*J. Laux, Manager, Quality Assurance
S. Meyer, System Engineer
*J. Neudecker, Supervisor, Health Physics Operations
*J. Polchow, Superintendent, Chemistry/Radwaste
J. Peevy, Assistant Manager, Operations and Maintenance
*G. Randolph, General Manager, Nuclear Operations
*R. Roselius, Superintendent, Health Physics

The inspector also contacted other licensee representatives.

* Present at the February 1, 1991 exit meeting.

2. General

The inspection was conducted to review routine aspects of the radiation protection, radwaste and transportation programs during power operations. The inspection included tours of the control building, auxiliary building, fuel building and the low-level radwaste process and storage facility; observation of work in progress; review of licensee records and reports; and discussions with licensee and contractor personnel.

3. Changes (IP 83750, 84750, 86750)

The inspector reviewed changes in personnel, facilities, equipment, program and procedures that could affect the occupational radiation protection program.

A Health Physicist (HP) has been hired in the corporate engineering group.

A major TLD system upgrade has been completed. The TLD chip population has been replaced, a new TLD reader has been purchased, is undergoing testing and calibration, and the 0-200 mrem Victoreen self reading dosimeters (SRD) have been replaced by new 0-500 mrem Dosimeter Corporation of America SRDs.

In response to Generic Letter 89-01, the licensee's Process Control Program (PCP) was converted to Administrative Procedure APA-ZZ-01011 and the Radiological Environmental Technical Specifications (RETS) were relocated to the Offsite Dose Calculation Manual (ODCM).

The Health Physics Foremens' title has been changed to Health Physics Shift Supervisor.

No violations or deviations were identified.

4. Audits and Surveillances (IP 83750, 84750, 86750)

The inspector selectively reviewed the results of Quality Assurance (QA) audits and surveillances conducted by the licensee since the last inspection. Also reviewed were the extent of the audits and surveillances, their thoroughness, and the qualifications of the auditors.

An audit of radiation protection was conducted during August 1-10, 1990. The audit included: internal dosimetry; radioactive material control; control of airborne contamination; access control; count room quality control and NVLAP requirements. The audit report contained five minor findings. Corrective action had been completed on these items.

An audit of chemistry and radwaste was conducted during May 5-21, 1990. The audit included: low-level radwaste solidification; radwaste personnel radiation control; radioactive gas storage tank surveillance; waste classification (RADMAN); sampling, packaging and storage of low-level radioactive waste; control of vendor/contractor activities and radwaste shipment documentation. The audit identified three findings. Corrective action on the audit findings had been completed.

Surveillances of radiation protection and radwaste activities were selectively reviewed. Corrective actions that were required appeared to have been completed in a timely manner and to have been technically sound.

5. External Exposure Controls (IP 83750)

The licensee's external exposure control program was reviewed, including: changes in facilities, equipment, personnel, and procedures; adequacy of dosimetry program to meet routine and emergency needs; dose tracking capabilities; required records, reports and notifications; effectiveness of management techniques used to implement these programs; and experience concerning self identification and correction of program implementation weaknesses.

The inspector verified that there were no changes in the licensee exposure evaluation, badge spiking, QA/QC, extremity, neutron or multiple badge monitoring programs. No problems were noted.

The licensee's vendor supplied exposure reports for 1990 were reviewed; no exposures greater than 10 CFR 20.101 limits were noted. Requests for increased administrative exposure limits were reviewed for approval status and control; no problems were noted.

The inspector selectively reviewed Radiation Work Permits (RWPs) and associated radiation surveys and observed work being performed under selected RWPs; no problems were noted.

The licensee recently purchased and was using a J. L. Shepherd Model 81-8 Irradiator with a beamport for calibration of TLD chips. The use of a beamport irradiator is in accordance with the American National Standards Institute (ANSI) guidance and format.

No violations or deviations were identified.

6. Internal Exposure Control (IP 83750)

The licensee's internal exposure control and assessment program was reviewed including: changes in facilities, equipment, personnel; respiratory protection training and procedures affecting internal exposure control and personal assessment; determination whether engineering controls, respiratory equipment, and assessment of individual intakes meet regulatory requirements; planning and preparation for maintenance and refueling tasks including ALARA considerations; required records, reports and notifications; effectiveness of management techniques used to implement these programs; and experience concerning self-identification and correction of program implementation weaknesses.

The licensee's control program for internal exposure includes use of engineering controls, surface and airborne survey data, respiratory protection equipment, and direct surveillance of selected work activities. A selected review of air sample data and smear survey results was made; no problems were noted.

A review of the licensee's whole body count records indicated that no exposures in excess of the 40 MPC-hour control measure occurred during 1990. MPC-hour determinations were being tracked. No problems were noted.

The inspector reviewed the calibration results of the chair type whole body counter (WBC) located in the dosimetry office in the Service Building. The WBC was tested in August 1990 to evaluate counting system performance. Test counts were performed to evaluate WBC measurement accuracy, precision and sensitivity. Special radioactive sources and reference phantoms were used for measurements of test nuclide activity in the thyroid, lung and lower torso distributions. No problems were noted.

On September 23, 1990, a contract worker from Decon Technology, Inc, (DTI) was hydrolancing Resistance Thermal Detector (RTD) piping when water and crud splashed back contaminating his facial area including his mouth, facial hair and nose. Initial surveys found the contractor's mouth, nose, forehead, hair and both nostrils were contaminated to about 2000 cpm and about 3000 cpm was detected on his teeth and jaw. Washing and a nose blow reduced the contamination to less than 100 cpm. By licensee procedure a WBC was required because the worker's nasal smears were greater than 400 dpm. The final assessment of intake was performed utilizing the results of the lung counts performed on four separate occasions including one requested by the licensee and done at Salem Nuclear Generating Station where the contractor was currently working. Standard ICRP 30 lung modeling techniques were employed to calculate the maximum intake, including:

Committed Dose Equivalent, Committed Effective Dose Equivalent, % ALI, and MPC-hours. The lung data assessment was confirmed by the results of the lapel air sample worn by the worker during the event. The results of the assessment were:

Maximum MPC - hours: 23.1
Maximum % ALI: 0.46%
Maximum Committed Effective Dose Equivalent: 30 mrem
Maximum Committed Dose Equivalent: 165 mrem Organ: Lungs

Hydrolancing of the RTD bypass piping was intended to reduce dose rates from the piping prior to its removal. The RTD hydrolancing operation was not successful because of an insufficient decontamination factor on the pipe following hydrolancing and the fact that the job was cancelled prior to completion. The hydrolancing was a "critical path" job, so when the decontamination factor was found to be small the job was cancelled.

Prior to starting the hydrolancing, personnel involved attended an RTD seminar and a hydrolance ALARA briefing. Lack of coordination, communication and misunderstandings, principally among Operations and Health Physics personnel, delayed the start of the hydrolance job and thus contributed to the fatigue of the DTI personnel which, along with the unavailability of the proper hydrolance equipment, contributed to the failure of the task. The licensee has addressed these weaknesses and their corrective actions in two Suggestion Occurrence Solution System (SOSs) reports. The incident and the licensee's corrective actions were reviewed. No problems were noted.

No violations or deviations were identified.

7. Control of Radioactive Material and Contamination, Surveys and Monitoring (IP 83750)

The inspector reviewed the licensee's program for control of radioactive materials and contamination, surveys and monitoring, including: adequacy of supply, maintenance and calibration of contamination survey and monitoring equipment; effectiveness of survey methods, practices, equipment, and procedures; adequacy of review and dissemination of survey data; effectiveness of methods of control of radioactive and contaminated materials.

There were 397 personnel contamination incidents (PCI) recorded in 1990. Of these, 303 were attributed to the outage which ran from September 20 through November 15, 1990. Of the 397 PCIs about 50% were less than 800 cpm and about 80% were less than 2500 cpm. Hot particles contributed 85 PCIs. The licensee tracks personnel contaminations to determine problem areas and repeat offenders. No specific cause has been determined for the increase in PCIs in 1990; however, a task force has been established to investigate possible causes.

No violations or deviations were identified.

8. Maintaining Occupational Exposures ALARA (IP 83750)

The inspector reviewed the licensee's program for maintaining occupational exposure As-Low-As-Reasonably-Achieveable (ALARA), including: ALARA group staffing and qualifications; changes in ALARA policy and procedures, and their implementation; ALARA considerations for maintenance and refueling outages; worker awareness and involvement in the ALARA program; establishment of goals and objectives and effectiveness in meeting them.

During the Refueling Outage (RFO-4), ALARA reviews were completed on 72 RWPs and pre-job briefings were given on 77 RWPs. Video tapes of RFO-3 activities were used to better inform the workers of what to expect and to allow workers to see the task in progress prior to radiation control area (RCA) entry. A fax machine was located in the HP office and at two locations in the reactor building. The Fax was used to transmit surveys, ALARA briefings and RWPs to and from the reactor building. Video cameras, temporary shielding and flushing techniques were used to control exposure to ALARA levels. A shielded wait area was erected inside the bioshield for the steam generator eddy current workers. Flushing was used to remove or reduce hot spots from various lines and valves. Over 11 tons of shielding was installed during the outage with an estimated net savings of 190 person-rem.

The total dose for 1990 was 442 person-rem, of which about 416 person-rem was attributed to refueling/maintenance outage RFO-4.

No violations or deviations were identified.

9. Plans and Preparations (IP 83750)

The inspector reviewed the licensee's planning and preparation for the refueling/maintenance outage which was completed November 15, 1990.

An HP foreman was assigned to the Planning Department about four months prior to the outage to evaluate RWP requests and prepare reports to use for access control to the RCA. Approximately 2700 work documents were reviewed and categorized by work type and location. The work activities were then assigned to the appropriate RWP. Two HP foremen were assigned to supervise the RWP program and provide backup to the ALARA program. Two senior HP technicians were assigned to the ALARA group for the entire outage and two additional HP technicians per shift were rotated into the group on a 3-week cycle.

No violations or deviations were identified.

10. Training and Qualifications of Health Physics/Radwaste Personnel (IP 83750, 84750, 86750)

Selected training records were reviewed which indicated that Health Physics and Radwaste/Chemistry personnel were being trained in accordance with established training program requirements. The training program for

apprentice Rad/Chem - HP technicians is a 3-year program including formal classroom courses in general employee training (NGET), Rad/Chem Theory, Operational Health Physics and Emergency Response with each course module followed by a period of on-the-job training (OJT). After successfully completing classroom and OJT modules A, B and C, candidates are given a job performance examination to measure competency and mastery of required knowledge and skills. Successful completion of this part of the apprenticeship program takes about two years and gives the candidate the title of Assistant Technician. After approximately one additional year of experience and similar multiphase training is completed, the candidate is certified as a Health Physics Technician. The licensee was starting its second apprenticeship class of four candidates on February 4, 1991.

Lesson plans for annual requalification training for radwaste technicians were reviewed and verified to be in accordance with training requirements. Annual requalification training consists of two sessions of about forty hours each and include topics such as specific reactor systems, 10 CFR 20 and 71, 49 CFR, RADMAN, packaging requirements and shipping regulations and recent operational events at the the site or in the industry.

Interviews were conducted with 42 percent of the onshift radwaste technicians. Individuals were randomly selected. Those personnel interviewed all conveyed a positive image of competent professionals who were well trained and motivated to perform their assigned responsibilities. Information was conveyed to the inspector that some minor problems exist in the Suggestion Occurrence Solution System (SOS), in that some problems could be solved at a lower level of management, i.e. first line supervisors, but instead the problems are escalated to upper management. It was not perceived by the inspector that this feeling was true a. ut the majority of SOSs but was limited to only a few isolated cases. The licensee should continue to encourage solving of problems at the lowest management level possible.

No violations or deviations were identified.

11. Solid Radioactive Waste (IP 86750)

The licensee's solid radioactive waste program was reviewed, including: determination of whether changes to equipment and procedures were in accordance with 10 CFR 50.59; adequacy of implementing procedures to properly classify and characterize waste, prepare manifests and mark packages; overall performance of process control and quality assurance programs; adequacy of required records, reports and notifications; and experience concerning identification and correction of programmatic weaknesses.

According to licensee representatives and records, there were 17 shipments of dry active waste (DAW), filters and solidified resins during 1990. Eight shipments went directly to the burial sites and 9 were to the licensee's vendor for processing and future shipment to a burial site. Licensee QA/QC personnel verified that the shipments meet NRC, DOT and burial site requirements.

The inspector verified that classification, characterization and shipping of solid radwaste were performed in accordance with regulatory requirements and licensee procedures.

No violations or deviations were identified.

12. Process Radiation Area Radiation and Effluent Radiation Monitors (IP 84750)

Calibration (surveillance) records and procedures for area, process and effluent monitors were selectively reviewed. The inspector verified that the radwaste building discharge line radiation monitor, the fuel pool bridge crane radiation monitor, the manipulator crane monitor, and the monitors on the filter units of the auxiliary building and the containment purge had been checked, calibrated and maintained as required. Alarm/trip set points were verified as properly set to meet design objectives.

No violations or deviations were identified.

13. Engineered-Safety-Feature (ESF) Filtration and Control Room Habitability Systems (IP 84750)

Technical Specifications require filter testing of the control room emergency exhaust system and the emergency exhaust systems for the fuel and auxiliary buildings. The inspector reviewed records of recent tests performed on these systems and discussed testing procedures with the system engineer responsible for the tests. The review included both in-place tests of HEPA filters and iodine absorber units as well as laboratory tests of activated carbon samples. Surveillance testing has been timely and test results have met acceptance criteria. No problems were noted.

The licensee tracks the operation of the ESF ventilation units to ensure the 720 hour testing requirement is complied with. ESF ventilation unit test records were reviewed; no problems were noted.

The inspector performed a visual inspection of the ESF systems for observable deficiencies; no deficiencies were noted.

No violations or deviations were identified.

14. Exit Meeting (IP 30703)

The inspector met with licensee representatives (denoted in Section 1) at the conclusion of the inspection on February 1, 1991, to discuss the scope and findings of the inspection. The inspector also discussed the likely informational content of the inspection report with regard to documents or processes reviewed by the inspector during the inspection. The licensee did not identify any such documents/processes as proprietary. The following matters were discussed specifically by the inspector.

a. The apparent improvements that could be made in the SOS program. (Section 10)

b. The very good assessment made on the DTI worker uptake. (Section 6)