U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-483/92006(DRSS)

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: April 6 - 10, 1992

Inspectors: A. W. Markley
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William Snell for
5/7/92
Date

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William Snell
5/7/92
Date

Inspection Summary

Inspection on April 6 through 10, 1992 (Report No. 50-483/92006(DRSS))
Areas Inspected: Routine unannounced inspection of the radiation protection and transportation programs and outage activities including: organization, management controls and training; audits and appraisals; external and internal exposure control; planning and scheduling; control of radioactive material; maintaining occupational exposures ALARA; transportation of radioactive materials; and, plant tours (IP 83750, 86750, 83729).
Results: A non-cited violation (NCV) was identified and reviewed during this inspection period (Section 9). Areas for which improvement appears to be warranted are: adequacy of qualification records (Section 3.a); procedures for receiving radioactive packages (Section 9); process for reviewing contract radiation protection technician training and experience (Section 3.b); facilitation of radiological work during changing conditions (Section 6); and housekeeping in the bioshield area and auxiliary building (Section 10).

A number of strengths were identified: surveillances were performance based and continued to be excellent (Section 4.a); the Suggestion Occurrence Solution program was excellent (Section 4.b); improvements were noted in the hot particle dose assessment methodology (Section 5); improvements were noted in outage planning (Section 6); and the former ALARA coordinator was added to the planning organization (Section 8).

DETAILS

1. Persons Contacted

* R. Bartz, Quality Assurance Engineer
* J. Blosser, Manager, Callaway Plant
  F. Eggers, Supervisor, Quality Assurance
  C. Graham, Supervisor, Health Physics Technical Services
* M. Greeno, Count Room Supervisor
* G. Hamilton, Supervisor, Radwaste
* P. Mills, Quality Assurance Engineer
* J. Neher, Quality Assurance Engineer
* S. Petzel, Engineer
* J. Polchow, Superintendent, Chemistry/Radwaste
* G. Randolph, Vice President, Nuclear Operations
* R. Roselius, Superintendent Health Physics
  M. Taylor, Assistant Manager - Work Control

* D. Calhoun, Resident Inspector

The inspectors also interviewed other licensee personnel during the course of the inspection.

* Denotes those present at the exit meeting on April 10, 1992.

2. General

This inspection was conducted to review aspects of the licensee's radiation protection and transportation programs and outage activities. The inspection included tours of radiation controlled areas, containment and bioshield areas, observations of licensee activities, review of representative records and discussions with licensee personnel.

3. Organization, Management Controls and Training (IP 83750 83729)

The inspector reviewed the licensee's organization and management controls for the radioactive waste management, effluent monitoring, and transportation programs, including: organizational structure, staffing, delineation of authority and management techniques used to implement the program and experience concerning self identification and correction of program implementation weaknesses.

a. Organization and Management Controls

The licensee's radiation protection and radioactive waste management organization remains essentially as described in previous inspection reports. Staffing within the chemistry department, radwaste department and the health physics (HP) department have remained very stable. Only two technicians have left within the last year. One chemistry technician left to attend graduate school and a health physics technician left after failing the plant's fitness-for-duty standards.

During normal operations, the HP technical staff is divided into three groups: senior staff technicians, apprentices and radiation/chemistry (RC) helpers. Senior RC technicians meet all the ANSI 3.1 requirements. Apprentices are enrolled in a three year training program. Following training, each apprentice gains journeyman technician status in two to three years and eventually gains senior technician status within the HP, chemistry or radwaste departments. Helpers are housekeepers and deconers. When apprenticeships open, helpers compete for the openings.

During outages, the health physics technical staff is reorganized. Senior HP technicians are temporarily elevated to supervisory status, apprentices perform junior technician functions and helpers are elevated to apprentice status. For each shift the elevated supervisor is assigned a crew composed of apprentices, helpers and contract technicians. The elevated supervisor provides technical support as well as direct in-the-field supervision. This would appear to be an excellent method for giving senior staff supervisory experience and broadening the work experiences of both the apprentices and the helpers.

During a review of the qualifications of the licensee's outage health physics management and technical staff, the inspectors noted, however, that the licensee had not considered the application of ANSI 3.1-1978 criteria for the upgraded supervisors. While this appears to be an excellent use of available resources, the licensee did not consider the application of ANSI 3.1-1978 criteria for the upgraded supervisors. With respect to the upgraded supervisors, it was possible to determine that these individuals were qualified for supervisory status by the review of a 1988 organization chart. However, it was not possible to determine whether all of the chemistry and radwaste technicians were qualified to perform radiation protection duties and functions. Their documentation consisted of training records and personnel status sheets from the corporate personnel office. The personnel status sheets were of limited value since health physics, chemistry and radioactive waste technicians have the same job title of rad/chem technician, and no description of duties and functions were identified. No documentation or records were presented by the licensee that described the duties, responsibilities and periods in which these activities were performed. This lack of documentation was also noted for health physics and radwaste management personnel during previous inspections. While records of training appeared to be in order, records of experience were inadequate to determine whether some of these individuals were qualified. The licensee acknowledged the inspectors' concerns and indicated that qualification records would be upgraded. This will be followed up in a future inspection. (Open Item No. 483/92006-01)

b. Contract Radiation Protection Technician (CRPT) Qualification and Training

The inspectors also reviewed the qualifications of CRPTs whose services were acquired for the refueling outage. In general, the

individuals reviewed were found to have the requisite levels of experience to meet the requirements of ANSI 3.1-1978. During this review, three CRPTs were identified whose experience did not appear to meet the ANS qualification requirements.

Additional information provided by the licensee resolved most of the concerns; however, one of the individuals was subsequently placed on restricted duties. The licensee indicated that this individual would not be allowed to post/depost areas, perform unconditional release surveys, or perform unsupervised job coverage. The licensee indicated that the review and screening process for vendor personnel would be formalized, experience applicabilities would be defined, and resumes would receive multiple reviews for approval.

The inspectors also reviewed the qualification examinations for both senior and junior CRPTs. The questions on these exams were very basic in nature and did not appear to be comprehensive. The licensee acknowledged that the examinations were basic and indicated that the tests would be upgraded to more reasonably evaluate the CRPT knowledge level.

The upgrade of the verification of CRPT experience and qualifications and knowledge level examinations will be reviewed during a future inspection. (Open Item No. 483/92006-02)

No violations or deviations were identified. Two open items were identified.

4. Audits, Surveillances and Self Assessments (IP 83750)

The inspectors reviewed the results of Quality Assurance (QA) audits and surveillances conducted by the licensee since the last inspection. Also reviewed were the extent and thoroughness of the audits and surveillances.

a. Audits and Surveillances

The inspector reviewed seven surveillances ranging in subject matter from assessing the effectiveness of the Corporate Radiation Protection committee to reporting on the processing, packaging and shipment of one cask of spent resin. Each surveillance was thorough and substantive in nature, two were especially informative. One surveillance tracked and documented the efforts of the plant to dispose of its sewage sludge. The surveillance took eight months to complete and could serve as a primer for any individual interested in the problems associated with disposing of wet dispersible solids. Another surveill[illegible] assessed the effectiveness of the Plant ALARA Committee (PAC) to implement the plant's ALARA program. Suggestion Occupance Solutions (SOS), the plant's system for reporting deficiencies, were reviewed, meetings were held with members of the PAC, and historical data pertaining

to the effectiveness of the PAC was researched. As a result of deficiencies found by the surveillance the PAC was terminated and its responsibilities reassigned to the new Outage Review Board (ORB). The surveillance also examined aspects of the ORB which would minimize problems experienced by the PAC.

The inspector reviewed one audit performed on the radiation protection program and noted that it relied heavily on observing activities for procedural adherence. Several of the surveillances, on the other hand, were performance based and had examined programs for effectiveness and quality. The plant appears to have used audits and surveillances interchangeably. QA management confirmed this observation. The licensee indicated that audits, unlike surveillances, must be planned and completed within specific time constraints and if QA determines that the scope of an assessment is too broad or time will be a factor they will conduct a performance based surveillance. In addition, QA was committed to conducting audits to examine programs for quality and effectiveness, and even though this audit had not met that standard; future audits would.

b. Event Identification and Corrective Action

The inspector reviewed the plant's Suggestion Occurrence Solution (SOS) system for identifying and reporting deficiencies as well as tracking implementation of corrective actions. The tracking capability of the system is excellent. All SOSs are numbered and entered into a computer database. Any employee with access to a computer can call up the SOS number and get the following information: who had written the SOS, a description of the deficiency or incident, what departments had been assigned to investigate the incident, the result of the investigation or investigations, the current status of the SOS and what corrective actions were taken. The database can categorize SOSs (radiological occurrences, contamination events or ALARA suggestions), analyze the data for trends and generate reports. With this system the inspector was able to review a majority of the approximately 100 SOSs generated in 1992.

No violations or deviations were identified.

5. External and Internal Exposure Control (IP 83750, 83729)

The inspector reviewed the licensee's external exposure control and personal dosimetry program, including: changes in the program, use of dosimetry to determine whether requirements were met, assessment

of whether individual intakes met regulatory requirements; planning and preparation for maintenance and refueling outage tasks including ALARA considerations and required records, reports and notifications.

The inspectors reviewed the licensee's use of electronic dosimetry and instructions for its use. The licensee utilizes the Merlin-Gerin electronic dosimeters for work in high radiation areas. These are obtained from health physics (HP) personnel either near the Access Control station or at specific check points located in containment. The licensee provides instruction for the use of these instruments during General Employee Training, but does not demonstrate the respective alarms. Currently, HP personnel do not provide any in-the-field instruction regarding the use of electronic dosimetry or demonstration of the high dose accumulation and high dose rate alarms.

The inspectors questioned numerous workers, HP technicians, and HP supervision regarding the use of these instruments. A large majority of those questioned had heard the alarms before, but many were unaware that the high dose rate alarm, a continuous tone, could potentially mask the high dose accumulation alarm, an intermittent tone. However, all personnel questioned indicated that if any alarm were received, their instructions were to leave the area immediately and report to HP.

The inspectors reviewed the results of whole body counting and several problems experienced early in the outage. As noted in the previous inspection report, the licensee has experienced some problems with fuel integrity. This resulted in airborne radioiodine problems at the start of the outage and during a spill of radioactive water from the volume control tank to the floor of the A residual heat removal (RHR) pump room. The maximum uptake of radioiodine was in the range of two to five nanocuries, which was less than one percent of the maximum permissible organ burden. No other problems were noted.

The inspectors also reviewed the licensee's methods for and results of hot particle dose assessment. The licensee's methods for performing hot particle dose assessment have improved since the previous inspection and will now account for the gamma component of exposure for exposures that exceed one microcurie-hour. The results of skin dose assessments indicated that no regulatory overexposures of the skin or extremities occurred.

No violations or deviations were identified.

6. Planning and Scheduling (IP 83750, 83729)

The inspectors reviewed the management controls utilized to schedule and coordinate work activities for the ongoing refueling outage. As noted in previous inspections, the licensee did not effectively plan work activities in radiological areas, in particular, the containment. During this inspection, the inspector noted that the licensee had made significant progress in addressing previously identified concerns and performance problems, which included the implementatiaon of area based outage planning.

The licensee began the implementation of area based planning by revising their polar coordinate system to a grid coordinate system. A computer software program was developed to translate polar coordinates into grid coordinates. Equipment location indexes are being revised to reflect the new system. This system appears to have numerous advantages. These include: preplanning capabilities that can identify schedule conflicts, streamline scaffold erection and minimize the number of trips into the containment; quantifying total scaffolding needed in containment and grouping scaffold jobs by work location, need date, and facilitating leave or remove decisions; and structuring valve line-up sheets to reflect valve locations to minimize waste transfers. Since the grid maps are essentially identical to the health physics survey maps, up to date ALARA information, radiological status and work locations can be more easily communicated.

Other scheduling improvements were noted during this outage. Quality control activities were added to the schedule for the first time. While some learning experiences were encountered, there were no situations identified regarding quality control holdups. Second, inservice inspection activities inside the bioshield area were completed prior to drain down for mid-loop operations thereby minimizing dose for this work.

While the licensee's efforts to improve radiological planning appear to be much improved, further improvements appear to be achievable. The grid system appears to do a good job of identifying work activities in specific areas and produces a listing of work activities and support needs at given locations. A link between the planning software and the grid system that can produce a graphical depiction of work activities and work locations has yet to be developed. This product would facilitate overall coordination of activities, as work group understanding of outage priorities and work locations, and radiological work control.

Two concerns in outage planning and work control were identified. The licensee was performing shot peening and eddy current testing of the steam generators. This activity involved the staging of significant quantities of equipment, the construction of containment tents, provision of utilities, and the implementation of hot particle contamination controls for the bioshield area. This staging of equipment involved the transport of approximately 120 boxes of equipment and materials into containment with approximately three-fourths of this equipment taken in the bioshield area. When shot peening and eddy current testing of the steam generators is completed, this material will have to be removed from containment. In addition, there is a significant quantity work that is pending steam generator work completion. This was discussed with the licensee. No evidence was found or presented regarding demobilization planning for this work. The potential exists for RP personnel to lose contamination control when this work is completed and efforts begin to expeditiously remove this equipment and commence subsequent work activities. The licensee indicated that this concern would be addressed.

The second concern involved facilitating work during changing radiological conditions. The licensee did not have an established method for ensuring that work being performed in one area did not unknowingly impact other nearby workers. Licensee personnel indicated that there have been a number of instances in which personnel arrived at a job site where the workers did not have the appropriate protective equipment and had to be sent back to obtain it. This situation usually involved workers who had followed their radiation work permit (RWP) instructions which did not require respirators and reported to the check point to find another ongoing job in their job's immediate vicinity that involved potentially airborne conditions. Although no specific instances where inadvertent uptakes of airborne material or excess dose were noted related to this concern, the licensee indicated that this situation would be evaluated.

No violations or deviations were identified.

7. Control of Radioactive Material (IP 83750)

The inspector reviewed the licensee's program for control of radioactive materials and contamination, 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 radioactive and contaminated material controls.

During a review of the SOSs, the inspector noted an incident in which the plant may have lost control of a item containing special nuclear material such that workers may have been inadvertently exposed to a high dose-rate item. SOS 92-0313 reported that on March 20, 1992, while surveying the seal table area, health physics personnel found an incore flux mapping system detector on the floor. The cables had been cut off the detector as is normally done before transfer to radwaste. On March 21, the detector was surveyed (100 mRem on contact), bagged,

and transferred to the radwaste building. Security was notified of the incident and an investigation begun.

During the last refueling outage, 15 detectors had been removed, sent to the radwaste building and placed in a drum for storage. On March 21, radwaste opened the drum and found only 14 detectors. They compared the serial numbers on all of the detectors to those on the "Interim Storage Accountability Logsheet" and determined that the detector found near the seal table area was the missing detector. How or why the missing detector was left behind was not determined. Reviewing dose records from the last outage revealed little. The seal table area is not readily accessible and work in the area stopped right after the detectors were sent to radwaste. The detectors were removed just before the end of the outage and any subsequent dose to workers in the general area could have come from other sources. The investigation concluded: Engineering had originally sent only 14 detectors to the radwaste building; radwaste had not questioned the accuracy of the count; workers had not been inadvertently exposed; and that this was not a reportable event under 10 CFR 50.72. During the inspection, the plant was in the process of determining what corrective actions to undertake.

No violations or deviations were identified.

8. Maintaining Occupational Exposures ALARA (IP 83750)

The inspector reviewed the licensee's program for maintaining occupational exposures ALARA, including: ALARA group staffing and qualification; changes in ALARA policy and procedures, and their implementation; ALARA considerations for planned, maintenance and refueling outages; worker awareness and involvement in the ALARA program; establishment of goals and objectives, and effectiveness in meeting them. Also reviewed were management techniques, program experience and correction of self-identified program weaknesses.

Since the last inspection, the licensee has made several significant improvements in the ALARA program. The former ALARA supervisor was permanently assigned to the planning group as an HP Planner, design engineers were trained in ALARA principles and a grid system for outage work planning in containment was developed and implemented. The new HP planner is responsible for ensuring that ALARA principals are considered for proposed design changes, work requests are reviewed for ALARA concerns, certain high risk jobs receive a formal ALARA review and work is scheduled to prevent work done by one group from affecting another. In addition, the planner assists the operational ALARA supervisor by assigning low risk jobs to general RWPs. The grid system for work planning involves dividing containment into 3 foot square grids, translating the grids onto a map of containment and plotting jobs, by number, to their locations on the grid. In this way, workers can tell where in containment a job is located and how many jobs are scheduled for that area. The maps are periodically updated and when a job is completed its number is removed from the map. For the outage, the plant used the system to ensure that scaffolding in any one grid remained in place until all of the jobs in that grid had been completed. This addressed a concern raised in a previous inspection about workers receiving dose while repeatedly tearing down and reerecting scaffolding.

No violations or deviations were identified.

9. Transportation of Radioactive Material (IP 86750)

During a review of selected SOSs, the inspector noted two incidents both of which involved a failure to implement the licensee's procedures for receiving radioactive materials. SOS 92-0232 reported that two packages had been received at the warehouse shipping dock and only one package had been surveyed per procedures HTP-ZZ-02004 and HTP-ZZ-02002. The other package was surveyed the following day. Plant procedures requires that incoming packages containing certain radioactive materials be surveyed within three hours of arrival. In addition, the plant had asked their vendors to affix a label on their packages declaring the contents to be radioactive and shipping dock personnel are required to notify HP immediately after receiving a package so labeled. The plant concluded that the reason the package had not been surveyed was that the vendor failed to affix the required label and so no corrective action was taken. The licensee was asked to reexamine this policy. Relying on vendors to ensure that procedural requirements are met is a poor practice. Employees responsible for receiving packages should be trained to recognize incoming radioactive packages.

In another incident (SOS 92-0092), a package was received at the dock and sent to stores before the required surveys were done. In this case, HP was immediately notified but two shifts passed before the packages were surveyed. The plant concluded that a breakdown in communication between HP shifts had caused the incident and ignored the fact that the package had been sent to stores before the required survey was performed. Implementing these procedures ensures that the spread of contamination from a contaminated or leaking package will be contained and workers are not unduly exposed to even low levels of radiation for extended periods of time. While neither of these incidents indicates a breakdown in the plant's program for receiving radioactive packages they do indicate that an examination of the process is warranted. This will be reviewed in a future inspection. (Open Item No. 483/92006-03) The licensee identified these two examples of procedural violations and they are not being cited because the criteria in Section VII.B.1 of the Enforcement Policy were satisfied.

One non-cited violation with two examples was identified.

10. Plant Tours (IP 83750, 83729)

The inspector performed several tours of radiologically controlled areas. These included walk downs of the auxiliary building, radwaste facilities and spent fuel pool facilities. The inspector observed the following:

Contamination monitoring, portable survey, area radiation monitoring instrumentation in use throughout the plant; instrumentation observed had been recently source checked and had current calibrations, as appropriate.

Posting and labeling for radiation, high radiation, contaminated and radioactive material storage areas; were in accordance with regulatory requirements and approved station procedures.

Housekeeping and material conditions in the bioshield area of containment and some areas in the auxiliary building were poor. Conditions in upper levels of containment were generally good. Housekeeping conditions were also a problem during the previous outage.

The inspectors questioned several work groups and HP personnel regarding housekeeping responsibilities. The licensee appears to require the workers to clean up their tools and equipment associated with their task. Trash and debris that are generated by the activities are left to a crew of helpers who are responsible for this cleanup. From the conditions observed, either this method of housekeeping is not effective or more oversight and/or resources are necessary to ensure that good performance is achieved.

No violations or deviations were identified.

11. Exit Interview (IP 83750)

The inspector met with licensee representatives (denoted in Section 1) at the conclusion of the inspection on April 10, 1992, to discuss the scope and findings of the inspection.

During the exit interview, the inspectors discussed the likely informational content of the inspection report with regard to documents or processes reviewed by the inspectors during the inspection. Licensee representatives did not identify any such documents or processes as proprietary. The following matters were specifically discussed.

a. Inspector concerns regarding the adequacy of qualification records and the verification of CRPT experience and qualifications. (Section 3)

b. Inspector concerns with outage planning regarding job demobilization and facilitating work during changing conditions. (Section 6)

c. Inspector concerns regarding the procedure for receipt of radioactive materials. (Section 9)

d. Inspector concerns regarding housekeeping in the bioshield and auxiliary building. (Section 10)