



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W.
ATLANTA, GEORGIA 30323

AUG 10 1987

Report No.: 50-261/87-24

Licensee: Carolina Power and Light Company
P. O. Box 1551
Raleigh, NC 27602

Docket No.: 50-261

License No.: DPR-23

Facility Name: H. B. Robinson

Inspection Conducted: July 14-17, 1987

Inspector: *Roy E. Waddington* 8/5/87
C. H. Bassett Date Signed

Accompanying Personnel: H. Bermudez
R. B. Shortridge

Approved by: *Roy E. Waddington* 8/5/87
C. M. Hosey, Section Chief Date Signed
Division of Radiation Safety and Safeguards

SUMMARY

Scope: This was a routine, unannounced inspection in the area of radiation protection including: organization and management controls; training and qualifications; external exposure control; internal exposure control; control of radioactive material and contamination, surveys and monitoring; the program for maintaining exposures as low as reasonably achievable (ALARA); the solid waste program, transportation and inspector followup items.

Results: Two violations were identified - (1) failure to comply with radiological control procedures for protective clothing and personnel frisking, (2) failure to control one individual's radiation exposure to within the allowable limits of 10 CFR 20.101(a) (no Notice of Violation issued - licensee identified).

REPORT DETAILS

1. Persons Contacted

Licensee Employees

- *R. E. Morgan, General Manager
- *R. M. Smith, Manager, Environmental and Radiation Control
- *D. Sayre, Acting Director, Regulatory Compliance
- *D. A. Baur, Acting Director, Quality Assurance
- *A. M. McCauley, Acting Director, Onsite Nuclear Safety
- *P. C. Harding, Senior Specialist, Radiation Control
- R. A. Hammond, Senior ALARA Specialist
- M. R. Burch, Foreman, Radiation Control
- D. L. Weaver, Foreman, Radiation Control
- M. D. Crabtree, Foreman, Radiation Control
- S. A. Brown, Principal Specialist, Corporate Health Physics

Other licensee employees contacted included technicians, operators, security force members, and office personnel.

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- H. P. Krug, Senior Resident Inspector
- *R. M. Latta, Resident Inspector

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on July 17, 1987, with those persons indicated in Paragraph 1 above. The inspector described the areas inspected and discussed in detail an apparent violation with two examples for failure to follow radiation control procedure for personnel protective clothing (Paragraph 6) and frisking (Paragraph 8) and a licensee identified violation concerning an exposure in excess of 10 CFR 20.101(a) limits (Paragraph 6). The licensee acknowledged the inspection findings and took no exceptions. The licensee did not identify as proprietary any of the materials provided to or reviewed by the inspector during this inspection.

3. Licensee Action on Previous Enforcement Matters

This subject was not addressed in the inspection.

4. Organization and Management Controls (83722)

a. Organization

The licensee is required by Technical Specification (TS) 6.2.3 to implement the facility organization specified in TS figure 6.2.2.

The responsibilities, authority and other management controls necessary for establishing and maintaining a health physics program for the facility are outlined in Chapters 12 and 13 of the Final Safety Analysis Report (FSAR).

The inspector reviewed the plant organization with the Radiation Protection Manager (RPM) and discussed recent changes in personnel. The changes did not affect the RPM's line of authority or communication and it appeared that support for the radiation protection program would continue as a high priority for licensee management personnel.

b. Staffing

Technical Specification 6.2.3 specifies the minimum staffing for the plant. FSAR Chapters 12 and 13 further outline details on staffing. The inspector reviewed the health physics organization staffing levels with the RPM. The subjects of the attrition rate, use of contractor health physics technicians, personnel qualifications and actual versus authorized manning were also discussed.

At the time of the inspection, 38 health physics technical positions were authorized including technicians, specialists and senior specialists while 2 positions were not filled. In addition, 7 positions were authorized for supervisory/foreman personnel. The licensee was also utilizing 6 contract personnel, 1 foreman and 5 decontamination personnel, in an effort to further reduce the size of the total area maintained under contamination controls.

c. Controls

The inspector reviewed the licensee's reports dealing with radiological problems including Plant Operating Experience Reports (POER), Radiation Safety Violation (RSV) reports and Nonconformance Reports (NCR). The system of identifying radiological deficiencies appeared to be functioning as intended and problems were being identified, investigated and corrected. It was noted that some of the corrective actions taken in response to the problems noted in certain reports addressed the symptoms but not the root causes of the problems. The licensee acknowledged this and indicated that efforts were being made to correct this situation.

No violations or deviations were identified.

5. Training and Qualifications (83723)

a. General Employee Training (GET)

The licensee is required by 10 CFR 19.12 to provide basic radiation safety training for workers. Regulatory Guides 8.13, 8.27 and 8.29 provide an outline of the topics that should be included in such

training. The inspector reviewed selected records of radiation workers and verified that their GET training was current.

In a previous inspection report (50-261/87-12) it had been noted that some new employees who received marginal grades were involved in contamination events or radiation safety violations shortly thereafter. Licensee representatives indicated that they had developed a method for correlating marginal GET performance with radiation safety violations and contamination events in order to spot potential problems which could be solved by special training. A retraining program was being developed for this purpose.

b. Qualifications

Technical Specification 6.3.1 requires the radiation protection staff to meet or exceed the requirements and recommendations of ANSI N18.1-1971 with regard to the minimum qualifications for comparable positions. The inspector reviewed the qualifications of selected members of the licensee's health physics organization and determined that the records reviewed met the ANSI N18.1-1971 criteria.

No violations or deviations were identified.

6. External Occupational Exposure Control and Dosimetry (83724)

a. Personnel Monitoring

10 CFR 20.202 requires each licensee to supply appropriate monitoring equipment to specific individuals and requires the use of such equipment.

During plant tours, the inspector observed workers wearing appropriate personnel monitoring devices.

b. Control of Radiation Areas

10 CFR 20.203 specifies the posting, labeling and control requirements for radiation area, high radiation areas, airborne radioactivity areas and radioactive material. Additional requirements for control of high radiation areas are contained in Technical Specification 6.13 and in Plant Procedure AP-031, Rev. 6, Administrative Control for Locked High Radiation Areas, dated September 24, 1986.

During tours of the plant, the inspector reviewed the licensee's posting and control of radiation areas, high radiation areas, airborne radioactivity areas, contamination areas, radioactive material areas and the labeling of radioactive material. The inspector also reviewed and discussed with licensee representatives the aforementioned procedure, AP-031, relative to personnel access to

the fuel transfer canal area during fuel movement and access to the containment sump when the thimbles are withdrawn. The inspector determined that the licensee apparently provides adequate access control to such special hazards areas.

c. Personnel Exposure Control

The licensee is required by 10 CFR 19.13, 20.101, 20.102, 20.201(b), 20.202, 20.401, 20.403, 20.405, 20.407, and 20.408 to maintain workers' doses below specified levels and keep records of and make reports of exposures.

The inspector reviewed the NRC Form 5 equivalent computer printouts for the months of May and June 1987, and verified that the radiation doses recorded for plant personnel were within the quarterly limits of 10 CFR 20.101(a), with the exception of one individual. An exposure in excess of 20.101(a) limits without NRC Form 4 documentation occurred on May 12, 1987, as the result of an individual failing to report to the licensee an occupational exposure received during the same quarter at another location.

The individual arrived onsite on the evening of May 11, 1987, to support the removal of a steam generator manway. The individual stated and signed documentation that he had not received any dose in the second quarter, 1987. Therefore, per the licensee's policy, a limit of 500 millirem (mrem) allowable exposure was applied until documentation from the individual's employer was received verifying his exposure history. That night the worker received an exposure of 94 mrem. The next day his radiation exposure documentation arrived, indicating an exposure of 1,201 mrem for the second quarter at another licensee's facility. Shortly thereafter, the licensee realized that the individual had accumulated a total dose for the quarter of 1,295 mrem without NRC Form 4 documentation on site.

The licensee removed the individual from the site, issued a Radiation Safety Violation of Severity Level I and sent a letter to the individual's employer explaining the overexposure and apparent cause. The licensee also initiated the practice of reviewing all available present quarter exposure documentation prior to TLD issuance and as paperwork arrives. A Licensee Event Report (LER) was also issued.

10 CFR 2, Appendix C, Section V. A states that licensees are not ordinarily cited for violations resulting from matters not within their control. Since the licensee had no reason to believe that the information provided by the worker was not factual, a Notice of Violation will not be issued in this instance (50-261/87-24-02).

d. Radiation Work Permits (RWPs)

The inspector reviewed general and special RWPs posted at the entrance to the radiation control area (RCA) to verify they complied

with regulatory requirements. One Special RWP, No. 87-0188, Revision 01, dated June 25, 1987, covered work associated with movement of spent fuel to the new dry storage facility to include equipment modification and set-up, loading and testing, and all associated items for dry run of the transfer system.

On July 16, 1987, the inspector observed one aspect of the work governed by Special RWP 87-0188 which was an operational checkout of the spent fuel cask transfer skid. A contamination area had been established around the transfer skid and several individuals were performing the checkout of the equipment. The posting on the contamination area indicated that the minimum protective clothing required for entrance into the area was shoe covers and rubber gloves. It was noted that, after the workers completed the checkout, three individuals began covering the transfer skid with a tarp. One worker, wearing only rubber gloves, entered the contamination area in order to pull the tarp over the skid. After the tarp was fastened over the skid, the three individuals doffed the gloves they had been wearing and proceeded past two friskers in the area to the personnel portal monitors at the entrance to the RCA. There they were monitored and exited the RCA. The frisking issue is discussed further in Paragraph 8.b below.

Technical Specification 6.5.1.1.1.a requires written procedures to be established, implemented and maintained for the applicable procedures recommended in Appendix A of Regulatory Guide 1.33, Revision 2, February 1978. Appendix A of Regulatory Guide 1.33-1978, Section 7.e(1) specifies access control to radiation areas including a Radiation Works Permit system as a typical safety-related activity that should be covered by written procedures.

The licensee's procedure, PLP-016, Revision 4, Radiation Work Permit Program, dated January 1, 1987, describes the RWP program including the use of an RWP. Section 5.2.2 specifies that all personnel shall read, understand and follow the provisions set forth on their RWP. Special RWP 87-0188, Revision 2, dated June 25, 1987, requires personnel to dress in protective clothing as indicated on area posting. Failure to wear protective clothing as prescribed by area posting and required by the RWP was identified as an apparent violation of Technical Specification 6.5.1.1.1.a (50-261/87-24-01).

7. Internal Exposure Control and Assessment (83725)

a. Intake Assessment

10 CFR 20.103(a) establishes the limits for exposure of individuals to concentrations of radioactive materials in air in restricted areas. This section also requires that suitable measurements of concentrations of radioactive materials in air be performed to detect and evaluate the airborne radioactivity in restricted areas and that

appropriate bioassays be performed to detect and assess intakes of radioactivity.

The inspector reviewed selected results of general in-plant air samples taken during the period May - July 1987, and the results of air samples taken to support work authorized by specific radiation work permits. The inspector also reviewed selected results of whole body counts.

b. Respiratory Protection Program

10 CFR 20.103(b) requires that, when it was impracticable to apply process or engineering controls to limit concentrations of radioactive materials in air below 25 percent of the concentrations specified in Appendix B, Table 1, Column 1, other precautionary measures should be used to maintain the intake of radioactive material by any individual within seven consecutive days as far below 40 maximum permissible concentration-hours (MPC-hrs) as is reasonably achievable.

By review of records, observations and discussions with licensee representatives, the inspector evaluated the respiratory protection program, including training, MPC-hr controls, quality of breathing air and the issue, use, decontamination, repair and storage of respirators.

No violations or deviations were identified.

8. Control of Radioactive Materials and Contamination, Surveys and Monitoring (83726)

a. Surveys

The licensee is required by 10 CFR 20.201(b) and 20.401 to perform surveys and to maintain records of such surveys necessary to show compliance with regulatory limits. Survey methods and instrumentation are outlined in FSAR Chapter 12, while TS 6.5 and 6.11 provide requirements for adherence to written procedure.

During plant tours, the inspector examined radiation levels and contamination survey results posted outside selected rooms and cubicles. The inspector performed independent radiation level surveys of selected areas and compared them with licensee survey results.

b. Frisking

During tours of the plant, the inspector observed the exit of workers and movement of materials from the RCA to the clean areas of the plant to determine if proper frisking was being performed by workers and proper fixed and transferable contamination surveys were being

performed on materials. No problems were noted with material surveys; however, personnel frisking deficiencies were noted.

On July 16, 1987, an individual was noted exiting a posted contamination area adjacent to the spent fuel cask decontamination area. After removing the protective clothing he had been wearing, the individual proceeded past two frisker stations in the immediate area and into the Auxiliary Building. When questioned later, the individual indicated he had performed a hands and feet frisk at a control point which had been established inside the Auxiliary Building at the entrance/exit to the Reactor Containment Building.

Also on July 16, 1987, three individuals were working in a contamination area which had been established around the spent fuel cask transfer skid. After completing an operational checkout of the skid, making some adjustments and covering the skid with a tarp, the workers doffed their protective clothing and proceeded past the frisker stations in the immediate area to the portal monitors at the entrance to the RCA. There they did not perform a frisk but entered the portal monitors, were monitored and left the RCA.

Technical Specification 6.5.1.1.1.a requires written procedures to be established, implemented and maintained for the applicable procedures recommended in Appendix A of Regulatory Guide 1.33, Revision 2, February 1978. Appendix A of Regulatory Guide 1.33-1978, Section 7.e(4) specifies contamination control as a typical safety-related activity that should be covered by written procedures.

The inspector reviewed the licensee's procedure PLP-031, Revision 2, Personnel Contamination Program, January 1, 1986, which outlines the program requirements for monitoring, tracking and reducing personnel contamination. The procedure specifies that each person is responsible for performing a hands and feet frisk at the nearest frisking station immediately upon exiting a contamination area. Failure of the four individuals to perform a hands and feet frisk at the nearest frisker station after exiting a contamination area was identified as an additional example of an apparent violation of Technical Specification 6.5.1.1.1.a (50-261/87-24-01).

9. Maintaining Occupational Exposures As Low As Reasonably Achievable (ALARA) (83728)

a. The ALARA Program

10 CFR 20.1(c) states that licensees should make every reasonable effort to maintain radiation exposures as low as reasonably achievable, taking into account the state of technology, the economics of improvements in relation to benefits to the public health and safety and other societal and socioeconomic considerations.

The inspector reviewed the licensee's program for maintaining occupational exposures ALARA, including the station's ALARA goals and objectives, the effectiveness in setting and meeting ALARA goals, participation by different station groups in the ALARA program, the ALARA subcommittee's involvement in the ALARA program and the functions of the onsite ALARA group.

b. The ALARA Group and Subcommittee

The onsite ALARA group was composed of a senior ALARA specialist, an ALARA specialist and an ALARA technician. Their primary responsibility was to review procedures for upcoming operations and ensure that dose-reduction techniques were incorporated to the maximum extent possible. The group also formulated pre-job exposure estimates based on detailed ALARA reviews when jobs were expected to exceed 1 man-rem of collective dose, and provided management with options that would achieve dose reduction.

In addition to the ALARA group, the facility had a 13-member ALARA Subcommittee composed of members from various departments. The subcommittee reported to the Plant Nuclear Safety Committee. The subcommittee's function was to review the results of exposures and problems relating to major outage or maintenance work. The group also reviewed ALARA problem cards (or ALARA suggestions). The problem card system was initiated in March 1987, to aid in identifying potential problems and provide a vehicle for suggesting ways to improve the facility's exposure record. The system had generated an average of four suggestions per month since its inception.

c. ALARA Initiatives

Through discussions with licensee representatives, it was concluded that one of the root causes for collective doses at the facility being in excess of the national PWR average was inadequate preparation for and communications during maintenance activities. The inspector reviewed instances in which workers entered radiation areas after being briefed on the job to be performed and then found that they did not have the correct tools. Another example discussed involved workers transporting filters with a contact reading of 25 R/hr by hand to a movable shielded cask because the cask would not fit through the doorways to the Waste Holdup Tank Room.

The licensee indicated that steps were being taken to alleviate this problem including the formulation of a procedure to ensure proper communication and review of exposure expenditures. The licensee also stated that an incentive program was being developed to stimulate further ALARA improvements and suggestions.

d. Accumulated Exposure

In 1986, the facility's collective dose was 539 man-rem compared to a goal of 450 and the Pressurized Water Reactor (PWR) national average of 397 man-rem. Through July 15, 1987, the total accumulated exposure was 437 man-rem compared to a yearly goal of 450. The licensee indicated that, based on the projected workload, the 1987 goal would probably be exceeded. This was mainly attributed to completion of unplanned steam generator repair work during the recent refueling outage which caused the expenditure of approximately 50 man-rem.

No violations or deviations were identified.

10. Solid Waste (84722)

a. Storage Areas

10 CFR 20.203(e) requires that each area or room in which licensed material is used or stored in amounts in excess of ten times the quantities listed in Appendix C be posted as a radioactive material area.

During plant tours, the inspector verified that radioactive materials storage areas were properly posted.

b. Waste Classification and Stability

The licensee is required by 10 CFR 20.311(d)(1) to prepare all waste so that the waste is classified in accordance with 10 CFR 61.55 and will meet the waste characteristic requirements specified in 10 CFR 61.56.

The inspector discussed the program for waste classification and characterization with licensee representatives. The licensee used a vendor supplied computer code for these tasks. The licensee indicated that waste solidification would be performed on an infrequent basis and that a vendor would be contacted to perform the operation. Such services had been used in the past but the vendor's equipment had been shipped offsite and no such processing was anticipated in the near future. Dewatering of resin was still performed on occasion but licensee personnel performed that task.

c. New Radwaste Building

The licensee had constructed a new facility to house the waste processing and storage equipment, but due to a change in operating philosophy and the shift away from solidification, this facility was not completed. It was anticipated that the facility would be redesigned to accommodate other operations including the sorting of

contaminated waste generated inside the RCA and frisking of potentially clean waste.

d. Waste Manifests

10 CFR 20.311(b) requires that each shipment of radioactive waste to a licensed disposal facility be accompanied by a shipment manifest and specifies required entries on the manifests. The inspector reviewed selected records of radioactive waste shipments performed during 1987, and verified that the manifests had been properly completed.

e. Radwaste Shipments

Through discussions with licensee representatives and records review, it was noted that the licensee had made 46 shipments containing a total of 16,000 cubic feet (ft³) of solid radioactive waste and 158.1 curies of activity during 1986. As of June 30, 1987, 11 shipments had been made to dispose of 310 ft³ of solid radioactive waste containing 101 curies of activity.

No violations or deviations were identified.

11. Transportation (86721)

a. Procedures

The inspector reviewed selected licensee procedures and verified that procedures were available for: selection of packaging; preparation of waste for shipment; marking, labeling and placarding; radiation and contamination monitoring and disposal site acceptance criteria.

The inspector discussed with licensee representatives the licensee's method for updating procedures when regulations change or additional guidance is provided in IE Information Notices. Licensee representatives stated that personnel at the Harris Energy and Environmental Center handle such matters and inform the affected groups onsite of the applicable changes. The licensee further indicated that the Document Control organization onsite was responsible for ensuring that the changes were entered into the affected procedures but that no organization performed surveillances to ensure compliance.

b. Shipment Manifests

10 CFR 71.5 required the licensee to prepare shipments of radioactive material in accordance with Department of Transportation (DOT) regulations in 49 CFR Parts 170 through 189.

The inspector reviewed the shipping paperwork for selected shipments made during 1987. The manifests and related documents were being completed and maintained as required.

No violations or deviations were identified.

12. Audits (83722, 83724, 83725, 83726, 83728, 84722, 86721)

The licensee is required by TS 6.5 to perform audits of radiological controls operations.

The inspector reviewed the following audits and surveillances performed by the licensee's Quality Assurance organization:

QAA/0020-86-04, dated June 4, 1986
 QAA/0020-87-04, dated June 5, 1987
 QASR No. 86-127, dated September 26, 1986
 QASR No. 86-138, dated October 24, 1986
 QASR No. 86-148, dated November 14, 1986
 QASR No. 87-054, dated June 29, 1987

The scope of these audits and surveillances included the following:

Environmental and Radiation Control (E&RC) Administration
 E&RC Calibration
 Environmental Monitoring
 Radiation and Respiratory Protection
 ALARA Program
 Radiological Surveillance
 Reportable Occurrences (Licensee Event Reports)
 Process Control Program
 Verification of Corrective Action from Previous Audits
 Plant Housekeeping.

The audits and appraisals appeared to be of adequate depth and were performed by personnel with technical backgrounds in the area of health physics.

No violations or deviations were identified.

13. Inspector Followup Items (IFI) (92701)

(Closed) IFI (50-261/86-20-03) Licensee actions to be taken following modifications to the radwaste system. The inspector reviewed the licensee's proposed changes to the FSAR to reflect previous changes to the radwaste system. The changes appeared adequate.