



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

SEP 8 0 1986

Report No.: 50-325/86-20, 50-324/86-21

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

Docket Nos.: 50-325, 50-324

License Nos.: DPR-71, DPR-62

Facility Name: Brunswick

Inspection Conducted: August 4-8, 1986

Inspector:

W. T. Cooper
W. T. Cooper

9-16-86

Date Signed

Accompanying Personnel: A. W. Grella

Approved by:

C. M. Hosey
C. M. Hosey, Section Chief
Division of Radiation Safety and Safeguards

9/18/86

Date Signed

SUMMARY

Scope: This routine, unannounced inspection involved a review of the licensee's solid waste processing and radioactive waste transportation programs. The inspector also reviewed one allegation made by a former licensee employee.

Results: One violation was identified: (1) failure to ensure that a waste shipment contained less than one percent free-standing liquid and no unabsorbed oil as required by NRC regulations and the burial site license conditions.

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REPORT DETAILS

1. Persons Contacted

Licensee Employees

- *C. R. Dietz, General Manager
- *J. W. Chase, Assistant to the General Manager
- *L. Sellars, Senior Specialist, Radwaste Operations
- *T. Haniker, Shift Foreman, Radwaste Operations
- *L. F. Tripp, Environmental and Radiation Control Supervisor, RC-1
- *J. D. Henderson, Environmental and Radiation Control Supervisor, RC-2
- *R. Sneed, Senior Engineer, Environmental and Radiation Control
- *W. J. Dorman, Supervisor, Quality Assurance
- *K. E. Enzor, Director, Regulatory Compliance
- *R. M. Poulk, Senior Specialist, Regulatory Compliance
- *T. H. Wyllie, Manager, Engineering and Construction
- *W. Cain, Shift Foreman, Radwaste Operations
- F. Blackman, Radwaste Operations Supervisor
- C. Hensley, Manager, CP&L Vendor Inspection
- R. Barham, Project Quality Assurance Engineer
- R. Wilde, Senior Specialist, Environmental
- A. Richards, Principle Engineer, Quality Assurance
- J. Ross, Senior Specialist, Quality Assurance
- B. Conn, Radiation Control Foreman
- G. Worley, Radiation Control Foreman

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

Other Organizations

- J. Ott, Customer Service Representative, Chem-Nuclear Systems, Inc., BSEP
- R. J. Moffatt, Chem-Nuclear Process Operator, BSEP

Nuclear Regulatory Commission

- W. H. Ruland, Senior Resident Inspector

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on August 8, 1986, with those persons indicated in Paragraph 1 above. The inspector discussed an apparent violation of 10 CFR 20.311(d)(1) and 10 CFR 30.41(c) for failure to comply with the waste characteristic requirements of 10 CFR 61.56(a)(3) and

for the shipment of free-standing, unabsorbed oil contrary to the burial site's license conditions (Paragraph 4). The inspector also discussed two unresolved items concerning the licensee's Quality Control (QC) program for compliance with 10 CFR 61.55 and 10 CFR 61.56 and the presence of a contract worker inside a posted high radiation area without the required survey instrument. Licensee management acknowledged the inspection findings and took no exceptions. During the exit interview, licensee management made five verbal commitments regarding the conduct of operations in the Radwaste Operations area. These commitments are discussed in Paragraph 4 of the inspection report. The licensee did not identify as proprietary any of the materials provided to or reviewed by the inspector during this inspection.

In a telephone conversation between the Region II staff and licensee management on August 28, 1986, the licensee was informed that, based upon information provided to the inspector subsequent to the inspection, the unresolved items concerning the licensee's QC program for compliance with 10 CFR 61.55 and 10 CFR 61.56 and the presence of a contractor in a high radiation area without a radiation survey instrument in his possession would be closed.

3. Licensee Action on Previous Enforcement Matters

This subject was not addressed in the inspection.

4. Transportation of Radioactive Material (86721)

The licensee was required by 10 CFR 71.5 to prepare shipments of radioactive material in accordance with Department of Transportation regulations. The inspector reviewed the licensee's procedures for the transportation of radioactive materials and discussed the implementation of the procedures with licensee representatives. A licensee representative stated that transportation procedures were routinely revised to incorporate revisions to applicable regulations, guidance provided in IE Information Notices and other significant documents. After a transportation regulation was changed, the Onsite Quality Assurance (OQA) group audited the transportation procedures to insure that the revised procedure was approved and in use prior to the effective date of the regulation.

The inspector discussed the licensee's vendor inspection program with a member of the licensee's Corporate Office (CO) vendor inspection staff. On a three year basis, the CO inspection group performed audits of licensee vendors to ensure compliance with QA program requirements. The inspector also reviewed Quality Assurance Audit Report QAA/30-4 of Chem-Nuclear Systems, Inc. QA Program compliance.

Prior to each shipment of radioactive material greater than a Type A quantity, the OQA group performed a surveillance based on applicable regu-

*An Unresolved Item is a matter about which more information is required to determine whether it is acceptable or may involve a violation or deviation.

lations. Each shipment of radioactive material was inspected by a Health Physics (HP) shipping technician, not involved with that shipment, who verified procedural and regulatory requirements were met prior to the release of the transport vehicle from the protected area. The HPT performing this inspection signed the procedure when the appropriate shipping checklist had been completed.

On June 13, 1986, the State of South Carolina notified Region II that a high integrity container (HIC) shipped from the licensee's facility had arrived at the Barnwell burial site and was in noncompliance with state regulations. Through a review of records and discussions with licensee representatives, the inspector determined the following sequence of events:

On May 8, 1986, spent bead resin was transferred to an HIC. Final dewatering of the HIC took place on June 2, 1986. A licensee representative stated that at three times during dewatering operations on May 15, 1986, the Chem-Nuclear Systems, Inc. (CNSI) operator backflowed air through the HIC dewatering filter elements to clear obstructions. The licensee representative also stated that a dense, muddy material was observed in the HIC on top of the resin after dewatering had been completed. The CNSI operator stated that the dewatering pump malfunctioned during the dewatering process and the maintenance group was contacted to make the necessary repairs.

On June 11, 1986, HIC Number 414319-317, was transferred to the Barnwell burial site as radioactive material Shipment Number 0683-082-A. The shipment was described as Radioactive Material, Low Specific Activity (LSA), n.o.s., containing dewatered bead resin. Upon arrival at the burial site, a hole was punched in the bottom of the liner for the purpose of verifying compliance with the free-standing liquid criteria in 10 CFR 61. Upon punching the liner, a flow of water was received into a five gallon container. The subject liner was allowed to drain throughout the next day. On June 13, 1986, the licensee was notified by the State of South Carolina that the volume of free-standing liquid drained from the liner exceeded the one percent limit specified in 10 CFR 61. The licensee was also notified that an oily substance had been drained from the liner. Draining of the liner continued through the week and the liner was subsequently buried after collecting approximately 36 gallons of water, which was 3.2 percent of the liner volume, in addition to two quarts of oil was drained from the liner.

The inspector reviewed a licensee evaluation which concluded that bead resin could contain as much as 0.1 gallons per cubic foot of interstitial water following mechanical dewatering, and that the presence of oil could cause entrapment of additional water within the resin volume. The evaluation further stated that such water could be dislodged and become free-standing during transfer due to vibration. The presence of oil in the bead resin was a result of oil intrusion into the floor drains which was later processed through the resin.

The inspector determined that during the processing of Liner Number 414319-317, various indicators were present which would indicate a problem with the HIC, including binding of the pumps during dewatering, the

need to frequently backflush the dewatering tree to reduce clogging and the presence of a sludge type material on top of the resin. Although these indicators were present, the CNSI operator failed to notify licensee personnel of the processing problems.

Through discussions with licensee representatives, the inspector determined that the CNSI operator worked without direct supervision while performing the Process Control Program (PCP). The only documentation verifying dewatering or solidification was in the form of a checklist completed by the operator. The inspector determined that no independent verification of the various portions of the PCP took place. Representatives of the OQA group stated that random surveillances were performed in the processing area, but that no routine program was in place, and that procedural compliance was left to the CNSI operator. Upon completion of the PCP, a "User's checklist" and certification was completed by the operator and the HIC was transferred to the HP Shipping group for final disposition.

10 CFR 20.311(d)(1) required that any generating licensee who transferred radioactive waste to a land disposal facility prepare all wastes so that the waste was classified according to 10 CFR 61.55 and met the waste characteristics in 10 CFR 61.56. 10 CFR 61.56(a)(1) required that solid waste contain as little free-standing liquid as is reasonably achievable, but in no case shall the liquid exceed one percent of the volume.

10 CFR 30.41(c) required the licensee, prior to transferring by-product material, to verify that the transferee's license authorized the receipt of the type, form and quantity of by-product material to be transferred.

The State of South Carolina radioactive material license for the Barnwell burial site, in License Condition 52, prohibited the licensee from receiving or burying oil or lubricants in any physical form. The License Condition did not prohibit the receipt and disposal of waste containing incidental or trace amounts of oil which had been absorbed, provided the amount of absorbed oil did not exceed one percent by waste volume in a container.

The failure to meet the waste characteristics requirements specified in 10 CFR 61.56(a)(1) and the burial site criteria for free standing oil for the shipment of HIC Number 414319-317 was identified as an apparent violation of 10 CFR 20.311(d)(1) and 10 CFR 30.41(c) (50-325/86-20-01 and 50-324/86-21-01).

10 CFR 20.311(d)(3) required the licensee to conduct a quality control program to assure compliance with 10 CFR 61.55 and 61.56, including management evaluation of audits. The inspector reviewed an audit performed by the Corporate Quality Assurance (CQA) group on July 28 - August 4, 1986. The focus of the CQA audit was the transportation of radioactive materials, of which two audit points were directly related to compliance with 10 CFR 61.55 and 61.56. The inspector stated that the CQA audit program did not appear to meet the intent of 10 CFR 20.311(d)(3), as only two audit points addressed the subject of compliance with 10 CFR 61.55 and 10 CFR 61.56. Licensee management stated that they felt the intent to conduct a QC program

of 10 CFR 61 was met in that the licensee's QA plan had been reviewed and approved by the NRC and approved procedures were in place to control operations in the radioactive waste area. The inspector initially identified this item as an unresolved item pending review of a CQA audit to be provided by the licensee. In a telephone conversation on August 18, 1986, the licensee was informed that after discussions with the Regional staff and a review of additional documents, this unresolved item would be closed. Licensee management stated that a consultant would be contracted to further audit the licensee's program for compliance with the applicable regulations. The inspector stated that the audit performed by a consultant to assure compliance with 10 CFR 61.55 and 61.56 would be an inspector followup item and would be reviewed during future inspections (50-325/86-20-02 and 50-324/86-21-02).

In response to the apparent violation, licensee management stated the following corrective actions would be implemented immediately:

- a. Any waste to be processed in accordance with approved procedures for bead and powder resin will be from an oil-free system.
- b. Any liner of waste processed using the above procedures, which exceeds 7000 pounds for type "L14-195" liners, will be investigated to ensure it meets the requirements of the approved Process Control Program (PCP).
- c. Every filled liner of waste processed from Radwaste systems to the Mobile Solidification Unit will be sampled and visually observed by the Radwaste Shift Foreman and the Mobile Solidification Unit operator to verify the correct PCP is being used.
- d. The Radwaste Shift Foreman will verify that the sample has been obtained from a homogeneous mixture.
- e. The above will be documented by a separate procedure which will be initiated by operating procedures.

5. Solid Wastes (84722)

The inspector reviewed the licensee's work in removing activated materials from the Unit 1 spent fuel pool and discussed the operation with licensee representatives. The materials being removed included local power range monitors (LPRMS) and control rod blades. A licensee contractor was onsite to perform the pool cleanout operation under the supervision of the licensee's Operations and HP personnel. The inspector reviewed the radioactive material shipping manifest for a Class C activated material shipment and discussed the shipment with licensee representatives. The licensee utilized a direct sampling method to determine the radionuclide distribution on each item and used a dose to Curie conversion to determine the Curie content of the shipping package.

The inspector reviewed the status of the Low Level Waste Facility and discussed its operation with licensee representatives. Permanent enclosures had been added at the sorting, surveying and lathing stations and a fire protection sprinkler system was completed since the last inspection. The building's HEPA ventilation system was completed and downcomers from the system maintained negative pressure on the process enclosures, with additional downcomers available for expanded operations. Licensee representatives stated that the ventilation system would provide three building air changes per hour when in use.

The licensee had developed a computer program for use in tracking solid and liquid waste statistics. The program output consisted of the volume of waste generated, stored and released or shipped, and the data was updated on a weekly basis. For radioactive material shipments, the program also included the waste class of the material shipped.

The licensee sampled the plant's waste streams on an annual basis in accordance with the guidance provided in the NRC Low-Level Waste Licensing Branch Technical Position on Waste Classification and Waste Form, and forwarded those samples to a vendor for analysis. The licensee developed the scaling factors for use at the facility. The plant General Manager has requested that Corporate Quality Assurance perform an audit of the licensee's program for compliance with 10 CFR 20.311, and in particular, an audit of the role of the HEEC personnel involved in the computer program development used by BSEP for Part 61 compliance on each shipment of radioactive waste.

No violations or deviations were identified.

6. External Occupational Exposure Control and Personal Dosimetry (83524)

TS 6.12.1.1-a requires the licensee to barricade and conspicuously post high radiation areas in which the intensity of radiation was 1000 millirem per hour (mrem/hr) or less, and to control the entrance to those areas by issuance of a radiation work permit. Any individual or group of individuals permitted to enter such areas are required to be provided with a radiation monitoring device which continuously indicates the radiation dose rate in the area, or radiation monitoring device which continuously integrates the radiation dose rate in the area and alarms when a preset integrated dose is received. Entry into such areas with this monitoring device may be made after the dose rate levels in the area have been established and personnel have been made knowledgeable of them. The TS also allowed individuals entering such areas to be accompanied by an individual qualified in radiation protection procedures who is equipped with a radiation dose rate monitoring device. This individual shall be responsible for providing positive control over the activities within the area and shall perform periodic radiation surveillance at the frequency specified by the facility Health Physicist in the Radiation Work Permit.

On August 6, 1986, the inspector observed the CNSI radwaste operator in a posted high radiation area without an instrument which would continuously

indicate the radiation dose rate in the area. The inspector questioned the HP technician on the loading dock as to where the operator's instrument was located and the HP technician stated that it was in the corner of the high radiation area, approximately 25 feet from the operator's work location. In discussions with the inspector, the CNSI operator stated that health physics performed a daily survey in the area at approximately 10:00 a.m., and when the operator reported for work, he also performed a survey of the area. The inspector reviewed a licensee survey performed on August 6, 1986, and determined that the general area dose rates measured up to 150 mrem/hr. This item was initially identified as an unresolved item in the exit interview on August 8, 1986, pending review by the Regional Office staff. In a telephone call between Region II and licensee representatives on August 28, 1986, the inspector stated that since the CNSI operator had performed a survey of the processing area prior to work, and knew the dose rates present in his work area, the unresolved item would be closed.

7. Allegation Followup (99014)

Allegation (2860018009)

Two contract workers from a low level waste solidification work unit found radioactive readings in the storm sewers at Brunswick.

Discussion and Finding

The licensee's storm drain system feeds by gravity flow into the storm drainage basin, located northwest of the Turbine Building. The storm drainage basin is a concrete structure with a capacity of 102,000 gallons. The basin is equipped with a locked butterfly valve and a blank flange to ensure no inadvertent release of liquids occurs. The basin is routinely pumped to the stabilization pond after the basin is sampled by Chemistry personnel. The liquids from the stabilization pond are sampled by a proportional composite sampler prior to release into the facility's intake canal.

The inspector determined that the storm drainage system had been contaminated as a result of previous events which had been reported to the NRC and that the storm drain system, prior to the catch basin, had low levels of contamination. The storm drain system from the radwaste processing area was isolated from the storm drain catch basin by a gate valve. Liquid accumulation in the storm drain piping was sampled by the plant chemistry group prior to the liquid's release to the catch basin.

Prior to the transfer of liquid from the catch basin to the retention pond, the liquid was again sampled by chemistry personnel. An oil skimmer was also used to remove any inleakage of oil into the basin.

The inspector reviewed the liquid release data for releases made during 1985 and 1986 from the retention pond into the facility's intake canal and determined that no isotopes were present greater than the counting system's lower limit of detection.

The allegation was substantiated, however, releases from the retention pond to unrestricted areas did not exceed NRC regulatory limits in 1985 and 1986.

8. Facility Statistics

As of August 1, 1986, the licensee had shipped 21,101 cubic feet (ft³) of solid radioactive waste containing 8,652 Curies of activity. The licensee had 7,146 ft³ of waste stored onsite, of which 3,960 ft³ was awaiting shipment and 3,185 ft³ was awaiting processing. The licensee estimates that 10,639 ft³ of burial space has been saved in 1986 due to decontamination and waste sorting.

As of June 30, 1986, the total man-rem was 1,620 as measured by TLD. The estimate for the year is 2000 man-rem, and has not been revised since initially established by management. Licensee management stated that it appeared that the facility would finish calendar year 1986 at less than the 2000 man-rem estimate.