UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA ST., N.W., SUITE 3100
ATLANTA, GEORGIA 30303

Report No. 50-261/81-13

Licensee: Carolina Power and Light Company
411 Fayetteville Street
Raleigh, NC 27602

Facility Name: H. B. Robinson

Docket No. 50-261

License No. DPR-23

Inspection at the Robinson Facility near Hartsville South Carolina

Inspector: John R. Wray — 5/11/81
J. R. Wray — Date Signed

Approved by: C. M. Hosey — 5/11/81
C. M. Hosey, Acting Section Chief — Date Signed
Technical Inspection Branch
Engineering and Technical Inspection Division

SUMMARY

Inspected on April 21-22, 1981

Areas Inspected

This special, announced inspection involved 12 inspector-hours onsite reviewing circumstances surrounding the identification of low-level radioactivity in the Unit 1 fossil plant.

Results

Of the area inspected, no violations or deviations were identified.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

*H. S. Zimmerman, Director of Planning and Scheduling
*D. S. Crocker, Manager Environmental and Radiation Control
W. T. Traylor, Operating Supervisor - Unit 1
W. T. Richie, RC&T Foreman
D. R. Gainey, Jr., RC&T Foreman

NRC Resident Inspector

S. Weise, Resident Inspector
*P. Taylor, Project Inspector

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on April 22, 1981 with those persons indicated in paragraph 1 above. The licensee representatives acknowledged the inspector's comments concerning the presence of removable low-level radioactive contamination in Unit 1 and agreed to perform the following corrective and preventive actions: (1) whole body count all Unit 1 workers involved in the current outage and evaluate results by May 1, 1981; (2) identify material removed from Unit 1 during this outage and ensure that each item is within established contamination and radiation limits for uncontrolled release by May 22, 1981; (3) implement by May 1, 1981, health physics controls to preclude the spread of contamination during the opening of Unit 1 systems; (4) establish by May 1, 1981, a routine radiation and radioactive contamination surveillance program for Unit 1; (5) maintain the health physics controls and the surveillance program until such time as radiation and contamination levels in Unit 1 are within established limits for uncontrolled release; and (6) submit a report to the Region II office by May 22, 1981, of the results of these actions. On April 27, 1981, a Confirmation of Action letter was issued to Carolina Power and Light Company documenting the above actions which the licensee agreed to undertake.

3. Licensee Action on Previous Inspection Findings

Not inspected.

4. Unresolved Items

Unresolved items were not identified during this inspection.

5. Sequence of Events

On April 16, 1981, the licensee surveyed moisture separators removed from the Unit 1 fossil plant steam drum for disposal as scrap, and found them to be contaminated to 12,000 dpm/100 sq cm. Cobalt-60 was identified as the principal isotope. Subsequent surveys disclosed slight contamination in the plant maintenance shop and on three workers. The shop area and personnel were decontaminated. Whole body counts of the three workers indicated no internal uptake for two workers and 0.7 percent of a maximum permissible body burden for the third.

Contamination of the Unit 1 fossil plant had been previously identified when on April 6, 1980, the licensee received notification from a pump vendor that a pump removed from Unit 1 for repair after eight years of service had been surveyed and found to be contaminated upon receipt at the vendor facility. Radiation levels from fixed contamination up to 3 mR/hr were found on the pump impellar. No removable contamination was identified. The licensee had identified a flow path, in accordance with plant design, from the previously contaminated Unit 2 Primary Water Storage Tank and potentially contaminated Condensate Storage Tank to the Unit 1 Condensate Storage Tank (reference CP&L letter RSEP/80-1038 dated July 9, 1980). The licensee eliminated the connection between units by July 1980. Surveys of Unit 1 indicated that contamination existed in certain equipment.

Based on data obtained from the pump vendor and negative radiological sample results of Unit 1 boiler water, the licensee concluded that the contamination of Unit 1 equipment was fixed internally. When Unit 1 was brought down for a lengthy inspection outage, the boiler was drained and its components permitted to dry. It is believed by the licensee that the fixed contamination had, as a result, begun flaking off interior surfaces as loose iron oxide contamination. It appears that persons become contaminated only when they come in vigorous contact with these surfaces.

6. Contamination Control

On April 21, 1981, an inspector arrived onsite to evaluate the extent to which the Unit 1 fossil plant had become contaminated with radioactviity from Unit 2. The inspector reviewed records of surveys conducted in offices, the guard shack, canteen, cold chemistry laboratory, Unit 1 turbine deck, machine shop, tool room and tools, and the I and C shop. The only evidence of contamination was on the coveralls worn by three workers inside the steam drum, the work bench and the floor around the work bench where the coveralls were located, the Unit 1 elevator used by the workers, and the floor area around the steam drum itself. Contamination levels ranged from 1120 dpm/100 sq cm at the entrance to the steam drum to 272 dpm/100 sq cm in the Unit 1 elevator. It appeared that identification of smearable radioactivity in Unit 1 had been made expeditiously enough to permit the health physics department to control and limit the spread of contamination from this source. A licensee representative stated that the

contamination on the moisture separators was discovered within 30 minutes of their removal and the contaminated areas and personnel decontaminated before the contamination was spread further. Based on discussions with workers, licensee representatives, and review of records, the inspector concluded that no additional areas were contaminated from the steam drum moisture separators.

7. Additional Surveys

On April 21 and 22, 1981, the inspector requested samples and surveys of specific areas and equipment in Unit 1. No fixed or smearable contamination was identified in samples taken from the base of the Unit 1 effluent stack, the electrostatic precipitator, and the Flash Tank vent. A review of offsite environment sample results identified no abnormal fluctuations. The inspector stated that it appeared no measurable release of radioactivity occurred.

Swipes and samples from the mud drum, the evaporator, the hotwell, and the insides of a defective boiler tube removed and replaced during this outage revealed loose Co-60, Cs-134, and Cs-137 throughout the water side of the Unit 1 boiler. The evaporator was labeled "Fixed Internal Contamination". The remaining components of the boiler system were assumed to contain only fixed internal contaminants. The inspector recommended that the licensee perform whole body counts on each worker involved in the current Unit 1 outage. Results of the whole body counts indicated no significant internal radioactivity uptakes. The inspector stated that health physics controls to preclude the spread of contamination during future openings of Unit 1 systems should be implemented as soon as possible and that the routine radiation and contamination surveillance program for Unit 1 should be formalized to ensure contamination is quickly identified and contained. These programs should be maintained until such time as radiation and contamination levels in Unit 1 are within established limits for uncontrolled release.

The inspector, accompanied by a licensee representative, surveyed a pile of scrap stored beyond the site boundary on licensee property. A Unit 1 valve and affixed pipe on a pallet recently added to the scrap pile was found to be contaminated to 1699 dpm/100 sq cm smearable contamination and read 5.2 micro R per hour on contact. The valve and pipe was retrieved and discarded as radwaste. A licensee representative stated that a second defective boiler tube, other than the one already surveyed onsite, had been removed from the boiler and shipped to the boiler manufacturer. At the time of the inspection, radiological data regarding this boiler tube was not known. The inspector stated that all material removed from Unit 1 during this outage should be identified and insurances made that each item is within established contamination and radiation limits for uncontrolled release. The inspector stated that the results of the corrective and preventive actions documented in the Confirmation of Action letter dated April 27, 1981, will be examined during a future inspection (50-261/81-13-01).