

UNITED STATE NUCLEAR REGULATORY COMMISSION REGION II 101 MARIETTA STREET, N.W. ATLANTA, GEORGIA 30303

OCT 0 2 1984

Report Nos.: 50-269/84-19, 50-270/84-18, and 50-287/84-20

Licensee: Duke Power Company 422 South Church Street Charlotte, NC 28242

Docket Nos.: 50-269, 50-270, and 50-287

License Nos.: DPR-38, DPR-47, and DPR-55

Facility Name: Oconee 1, 2, and 3

Inspection Conducted: September 4-6, 1984

9-27-84 Inspector: Date Signed Th 9-27-84 Approved by: onlyme D. M. Montgomery, Section Chief Date Signed Emergency Preparedness and Radiological Safety Branch Division of Radiation Safety and Safeguards

SUMMARY

Scope: This routine, unannounced inspection involved 18 inspector-hours on site in the areas of radiological effluent accountability and radiological environmental monitoring.

Results: Violation - Failure to meet detection limits for radiological environmental samples.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

*W. D. Adair, Manager, Production Environmental Services

- *P. S. Wingo, System Environmentalist
- *W. M. Carter, Associate Health Physicist
- *G. T. Powell, Junior Engineer, Health Physics *M. J. Greer, Associate Health Physicists
- B. A. Broadway, Health Physics Specialist
- S. Jones, Junior Health Physicist
- **M. S. Tuckman, Station Manager
- **J. J. Sevic, Plant Chemist
- **G. W. Sain, Technical Associate Chemistry
- **R. I. Bond, Compliance Engineer
- **T. C. Matthews, Technical Specialist, Compliance

*Attended exit interview

**Attended telephone exit interview on September 21, 1984

2. Exit Interview

The inspection scope and findings were summarized on September 5, 1984, with those persons indicated in Paragraph 1 above. Three inspector followup items concerning procedural changes (Paragraph 4c), sampling modifications (Paragraph 5c) and evaluation of dose estimates from multiple pathways (Paragraph 5d) were discussed. One violation concerning licensee's failure to meet detection limits for environmental analyses (Paragraph 5c) was discussed with the Station Manager and cognizant staff during an exit interview conducted by telephone on September 21, 1984. Licensee representatives acknowledged the violation and inspector's comments.

3. Audits (80721)

Technical Specification 6.1.3.4 requires audits of station activities to be performed under the cognizance of the Nuclear Safety Review Board (NSRB). These audits shall encompass the Offsite Dose Calculation Manual and implementing procedures at least once per 24 months, and the Radiological Environmental Monitoring Program and the results thereof at least once per 12 months. The inspector selectively reviewed Departmental Audits Nos. PS-84-2(PS) and NP-83-7(PS) dated 6/15/84 and 7/13/83 respectively. The inspector noted that the Radiological Environmental Laboratory program was audited against Regulatory Guide 4.15, "Quality Assurance for Radiological Monitoring Programs". The inspector noted that audit findings concerning an improved employee Training Program and procedures for low-level iodine analyses were resolved. No violations or deviations were identified.

4. Procedures (80721)

- a. Technical Specification 6.4.1 requires the station to be operated in accordance with approved written procedures for normal startup, operations, and shutdown of the complete facility and of all components involving nuclear safety of the facility. The inspector selectively reviewed the following procedures:
 - ER/0/B/1000/01 Preparation of Environmental Radiological Monitoring Program Annual Report, Rev. 1, 2/2/84.
 - (2) ER/0/B/1000/06 Procedure for Records Management, 9/8/83.
 - (3) ER/0/B/2100/06 Receipt, Storage, Analysis and Disposal of Environmental Samples, Rev. 2, 2/1/84.
 - (4) ER/0/B/2100/02 Shipment of Samples to Vendor for Analysis, Rev. 2, 2/1/84.
 - (5) ER/0/B/2200/01 Collection of Water Samples, Rev. 1, 2/2/84.
 - (6) ER/0/B/2300/01 Preparation of Samples for Gamma Analysis, Rev. 2, 2/23/84.
 - (7) ER/0/B/2300/02 Preparation of Samples for Alpha & Beta Analysis, Rev. 1, 2/2/84.
 - (8) ER/B/0/23/03 Preparation of Samples for Low-Level Iodine-131 Analysis, Rev. 1, 2/3/84.
 - (9) ER/B/0/2400/01 Preparation of Sample Analysis Reports and Unavailable Analysis Reports and the Distribution of Analysis Data, Rev. 2, 2/2/84.
 - (10) ER/B/0/2400/04 Manually Stripping Gamma Spectra, Rev. 2, 2/2/84
 - (11) ER/B/0/3000/01 Daily Instrument Linearity, Source and Background Check, Rev. 4, 2/1/84.
 - (12) ER/0/B/3000/02 Redioactive Standard Preparation, Rev. 3, 2/1/84.
 - (13) ER/0/B/3000/03 Analysis of EPA Environmental Cross Check Samples, Rev. 2, 2/1/84.
 - (14) ER/0/B/3000/04 Blanks, Spikes, and Replicates, Rev. 2, 2/3/84.
 - (15) ER/0/B/4100/03 Operation of the Tennelec Series II LB 5100 Low Background Alpha/Beta Counting System, 8/7/84.
 - (16) ER/0/B/4100/04 Operation of the Nuclear Data 6600 Computer Based Gamma Analysis System, Rev. 3, 2/1/84.

- (17) ER/0/B/4100/06 Operation of the Tennelec LB 5100 Low Background Alpha/Beta Counting System, Rev. 2, 2/2/84
- (18) ER/0/B/4200/01 Laboratory Radiation Measurement System Efficiency Calibration, Rev. 2, 2/1/84.
- (19) ER/0/B/4200/02 Calibration of Low Background Gas Flow Proportional Detector Systems, Rev. 2, 2/1/84.
- (20) ER/0/B/4200/03 Calibration of the Nuclear Data 6600 Computer Based Gamma Analysis System, Rev. 2, 2/3/84.
- (21) ER/0/B/5100/04 Operation of the Mettler PC 4400 Balance, Rev. 2, 9/1/83.
- (22) ER/0/B/6000/03 Routine Contamination Survey, Rev. 3, 2/3/84.

The inspector noted the procedures were being reviewed, updated and approved in accordance with administrative procedures. The procedure review was discussed with cognizant licensee representatives as noted in Pararaph 4b-c.

- b. The inspector noted procedure ER/0/B/2100/02 "Shipment of Samples to Vendor for Analysis" required either cold storage or the addition of formaldehyde for liquid sample preservation. The inspector informed licensee representatives that addition of the chemical preservative could result in erroneous results for radiochemical analyses of milk samples. Licensee representatives stated that formaldehyde was not utilized for sample storage prior to analysis.
- C. The inspector discussed selected sample preparation and radioanalysis procedures with cognizant licensee representatives in regard to sampling deviations listed in the 1983 Oconee Nuclear Station Annual Radiological Environmental Monitoring Program Operating Report (Paragraph 5c) and the cesium concentrations in catfish listed in the Anomalous Radiological Environmental Sample Report dated June 13, 1984 (Paragraph 5d). The inspector noted that failure to meet required lower limits of detection for gross alpha/beta analyses in water may have been corrected by appropriate procedures to remove excessive solids from the sample matrix. The inspector noted that the fish sampling and analysis preparation procedures should be refined to properly evaluate the environmental impact through this food chain pathway, e.g., separation of gut and muscle tissue prior to analyses. The inspection disclosed a need for improved coordination in sample collection, preparation and analysis between the Oconee Nuclear Station staff and the Radiological Environmental Laboratory starf. Cognizant licensee representatives agreed to evaluate sample collection, preparation and analysis procedures for water, sediment and fish samples and informed the inspector that changes in the fish sampling locations and sample preparation were in progress. The inspector informed licensee representatives that these procedural changes would

be reviewed in a subsequent inspection (50-269/84-19-01, -270/84-18-01, -287/84-20-01).

5. Records (8721)

- a. The inspector reviewed selected portions of the following records:
 - Ge(Li) Detector Nos. A, B, C, and D Radiological QC Sample Logs for January - September 1984 including
 - i. Cumulative Average Background Counts
 - ii. Spiked Sample Results
 - iii. Calibration Check
 - iv. Replicates
 - (2) Tennelec Nos. LB 5100 and LB 5100-II QC Log for January August 1984 including:
 - i. Daily Background Check
 - ii. Daily Source Check
 - iii. Alpha/Beta Blank Results
 - iv. Low Level I-131 Blanks
 - v. Calibration Checks
 - vi. Replicates
 - (3) Ge(Li) Detector Nos. A, B, C, & D Logs for January September 1984 including:
 - i. Daily Source Check Linearity Adjustment
 - ii. Daily Source Check Background Data and Graphs
 - iii. Source Check Performance Graph
 - (4) 1983/1984 Ge(Li) Detector Nos. A, B & C Efficiency Calibration Records and Graphs for the following geometries: 47 mm filter, 2 inch planchet and filter, CP-100 Charcoal Cartridge, 3.5 liter solid in GA-MA Beaker, 50 ml bottle, 1 liter marinelli beaker.
 - (5) NBS Traceable Calibration Certificates for the following geometries: 47 mm Glass Fiber Filter in Tape; Face Loaded CP 100 Charcoal Cartridges; 47 mm Glass Fiber Filter in Planchette.
 - (6) ND 6600 Ge(Li) Detector Systems 1st and 2nd Quarter Calibration Checks.
 - (7) EPA Cross Check Results for the Ge(Li) Detector Systems and Proportional Counter Systems.
 - (8) Teledyne Isotopes Quality Control Manual IWL-0032-361 9/25/84.

The results of the record review were discussed with cognizant licensee representatives as noted in Paragraph 5b-d.

- b. From a review of the EPA Cross Check Program required by Technical Specification 4.11.3.a, the inspector noted significant imprecision among results for Ge(Li) detectors Nos. A, B, and C and a lack of adequate and timely review of data following analyses. For example, the gamma-in-water analyses, dated June 1, 1984, showed significant differences between detectors for the low energy gamma emitters, and the results had not been adequately evaluated by supervision prior to submitting the final results of the EPA. The inspector noted that for many of the analyses, time between completion and review by a cognizant supervisor was excessive, i.e., exceeding 30 days. Following discussion of the EPA Cross Check Program for quality control at the Environmental Radiological Laboratory, licensee representatives agreed to evaluate the need for improved management review of data.
- Technical Specification 6.6.1.5 requires an Annual Radiological с. Environmental Operating Report covering the operation of the unit during the previous calendar year to be submitted prior to May 1 of each year. The inspector reviewed the Oconee Nuclear Station Environmental Radiological Monitoring Program Annual Operating Report for January 1 - December 31, 1983. The inspector noted excessive deviations from required sample analyses including: 21 deviations resulting from equipment failure and sampling problems; and 42 analyses not meeting the lower limits of detection specifications. Analyses not meeting required sensitivities included: Sr-89 and Cs-134 in air samples; I-131 in vegetation; gross alpha, I-131, and Ba-La-140, and Sr-90 in water; and Sr-89 in fish. The inspector notified cognizant licensee representatives by telephone on September 21, 1984, that failure to meet sensitivity limits required by Technical Specification 4.11.1 dated July 19, 1974, and Table 4.11-3, dated January 27, 1977, was a violation. The referenced Technical Specifications were applicable during the reporting period for the 1983 Environmental Report (50-269/84-19-02, 270/84-18-02, 287/84-20-02). The inspector discussed the anomalous data reported for sediments and fish referenced in the report and the need to adequately evaluate nuclide concentrations in environmental media, concentrations in water, sediments and fish samples where anomalous reporting levels have been observed. Licensee representatives informed the inspector that the Oconee Environmental Monitoring Program was undergoing review to evaluate these areas. The inspector informed licensee representatives that changes in the Oconee Environmental monitoring program would be reviewed in a subsequent inspection (50-269/84-19-03, -270/84-18-03, -287/84-20-03).
- d. Technical Specification Table 4.11.3 lists the reporting level requirements for the Oconee Nuclear Station. The inspector discussed the Anomalous Radiological Environmental Sample Report, dated June 13, 1984 with cognizant licensee representatives. This report listed Cs-134 and Cs-137 concentrations above reporting levels in catfish samples and a calculated annual whole body dose of 14.5 mR/yr to a member of the general public. The inspector reviewed preliminary analyses of whole

body and critical organ dose estimates for the fish pathway and noted that results did not exceed 40 CFR 190 limits of 25 mR whole body and organ annual dose equivalent. The inspector informed licensee representatives that additional dose analyses for all pathways were needed. Licensee representatives agreed to conduct the above mentioned analyses. The inspector informed licensee representatives that this area will be reviewed during a subsequent inspection (50-269/84-19-04, -270/84-18-04, -287/84-20-04).

No violations or deviations were identified.

- Tour of the Laboratory Sample Process and Storage Areas and Counting Room Facilities
 - a. The inspector toured the Radiological Environmental Laboratory facilities and noted adequate organization and cleanliness. The inspector observed selected water samples containing significant quantities of suspended and non-suspended solids. The inspector informed licensee representatives that the presence of these materials could affect the results for various radiological analyses due to absorption of radionuclides on sediment. The inspector noted this as an example of where improved standardized procedures for collection and/or analysis could improve radioanaytical results for environmental samples as noted in Paragraph 4.

No violations or deviations were identified.