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

AUG 05 1985

Report Nos.: 50-269/85-18, 50-270/85-18, and 50-287/85-18

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: July 8-12, 1985

Inspectors: William B. Gloersen July 29, 1985
W. B. Gloersen Date Signed

G. B. Kuzo 29 July 1985
Date Signed

Approved by: P. G. Stoddart July 30, 1985
P. G. Stoddart, Section Chief (Acting) Date Signed
Emergency Preparedness and Radiological
Protection Branch
Division of Radiation Safety and Safeguards

SUMMARY

Scope: This routine, unannounced inspection entailed 76 inspector-hours on site during regular hours, in the areas of gaseous and liquid waste systems, radiological effluent accountability, reactor coolant and secondary water chemistry, semiannual effluent Technical Specification reporting requirements, and whole-body counter measurements using a fission product phantom.

Results: No violations or deviations were identified.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

*M. S. Tuckman, Station Manager
*T. S. Barr, Superintendent Technical Services
*T. B. Owen, Superintendent Maintenance
*C. T. Yongue, Station Health Physicist
*R. T. Bond, Compliance Engineer
*T. N. Glenn, Maintenance
*S. A. Coy, Associate Health Physicist
*E. H. Wehrman, Assistant Health Physicist
*T. C. Matthews, Compliance, Technical Specialist
C. L. Harlin, Health Physicist
S. L. Morgan, Health Physics Supervisor
P. A. Hull, Associate Chemist
R. C. Didgeon, Health Physics Shift Supervisor
J. B. Thompson, Maintenance

Other licensee employees contacted included technicians and office personnel.

NRC Resident Inspectors

*J. C. Bryant
*M. K. Sasser
*L. King

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on July 12, 1985, with those persons indicated in Paragraph 1. The inspector described an inspector followup item regarding the need to develop an effective maintenance program for the liquid and gaseous effluent monitors. During a telephone conversation on July 18, 1985, licensee representatives agreed to implement such a program by July 19, 1985. Licensee representatives acknowledged the inspectors' comments and expressed no contrary opinions. The licensee did not identify as proprietary any of the materials provided to or reviewed by the inspectors during this inspection.

3. Licensee Action on Previous Enforcement Matters

(Closed) 50-269/84-30-01, 50-270/84-29-01 & 50-287/84-32-01 Inadequate procedures for effluent measurements. From a review of selected procedures (Paragraph 5) the inspectors determined that tritium and gamma spectroscopy

analyses methodologies have been corrected to eliminate the previously noted deficiencies.

(Closed) 50-269/84-30-02, 50-270-84-29-02, 50-287/84-32-02 Failure to meet required lower limits of detection (LLD) for effluent measurements. From a review of revised procedures and subsequent sampling analysis results, the inspectors noted that effluent sampling was being conducted to meet Technical Specification effluent sample LLDs.

4. Audits (84723, 84724)

a. Technical Specification (TS) 6.1.3.4 requires audits of station activities to be conducted under the cognizance of the Nuclear Safety Review Board (NSRB) encompassing the conformance of station operation to provisions contained within the Technical Specifications and applicable facility operating license conditions at least once per year, 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 inspectors reviewed the following audit reports:

(1) Departmental Audit NP-84-4(ON) Operations and Technical Services, February 1984.

(2) Departmental Audit NP-84-4(ON) Technical Services and Operations Activities, August 1984.

(3) Departmental Audit NP-84-24(GO) Oconee and McGuire Semiannual Radiological Release Reports, December 1984 - January 1985.

(4) Departmental Audit NP-85-4(ON) Operations and Technical Services Activities, February - March 1985.

The inspectors discussed audit results with cognizant licensee representatives and noted the program areas were audited against Technical Specifications, procedural requirements, Duke Nuclear Guide 1.21, and Regulatory Guide 4.15 "Quality Assurance for Radiological Monitoring Programs (Normal Operations): Effluent Streams and the Environment." The inspectors reviewed corrective actions taken by the licensee to resolve items of concern and noted that corrective actions had been completed or were scheduled to be completed. Also, the inspectors discussed technical training requirements for auditors with cognizant licensee representatives.

No violations or deviations were identified.

5. Procedures (84723, 84724)

a. Technical Specification 6.4.1 requires the station to be operated and maintained in accordance with approved written procedures with appropriate check-off lists and instructions for the following

conditions: normal startup, operation, and shutdown of the complete facility and of all systems and components involving nuclear safety of the facility; emergency procedures involving potential or actual release of radioactivity; personnel radiation protection procedures; and Offsite Dose Calculation Manual implementation. The inspectors reviewed selected portions of the following procedures:

(1) HP/0/B/1000/57 Procedure for Quantifying Airborne Radioactivity, Rev. 7, 2/14/85.

(2) HP/0/B/1000/60A Waste Gas Decay Tank Sampling and Release Requirements, Rev. 22, 3/14/85.

(3) HP/0/B/1000/60D Procedure for Unit Vent, Hot Machine Shop Vent, and Interim Radwaste Building Vent Sampling and Analysis, Rev. 12, 3/14/85

(4) HP/0/B/1000/60E Procedure for Preparation and Counting of LWR Composite Samples, Rev. 8, 3/1/85.

(5) HP/0/B/1000/60F Procedure for Correlation of Effluent RIA Monitors and Area Gaseous RIA Monitors, 6/6/85.

(6) HP/0/B/1000/62/0 Procedure for Sampling and Analyzing the Discharge from the Chemical Treatment Pond #3, Rev. 7, 3/1/85.

(7) HP/0/B/1000/63 Body Burden Analysis and Evaluation of Results, 3/14/85.

(8) HP/0/B/1000/67 Procedure for Quality Assurance for Radiological Monitoring Systems, Rev. 3, 1/6/84.

(9) HP/0/B/1000/82 Dose Projections for Untreated Radioactive Wastes, 2/25/85.

(10) HP/0/B/1000/83 Cumulative Offsite Dose from Liquid and Gaseous Effluents, 10/26/84.

(11) HP/0/B/1001/14 Procedure for Nuclear Data 6600 System Operation, 4/3/85.

(12) HP/0/B/1003/09 Procedure for Calibration of Ge-Li and IGE Detectors on the Nuclear Data 6600 System, Rev. 5, 2/22/85.

(13) HP/0/B/1003/12 Calibration Procedure for the ND6600 System Body Burden Analyzer with Multiple NaI Detectors, 3/6/84.

(14) HP/0/B/1009/17 Operating Procedure for Post-Accident Containment Air Sampling System, 6/14/85.

(15) CP/1/A/2002/04D Test Procedure for Operation of the Post Accident Liquid Sampling (PALS) System, 6/14/85.

(16) PT/0/A/110/01 Spent Fuel Pool Ventilation System Test, Rev. 9, 3/5/76.

(17) PT/0/A/110/04 Penetration Room Ventilation System Filter Test, Rev. 9, 3/5/76.

(18) PT/0/A/110/05A Control Room Filter Test, Rev. 9, 3/5/75.

(19) PT/0/A/110/05C Reactor Building Purge Filter Test, Rev. 9, 3/5/76.

(20) Oconee Nuclear Station Health Physics Manual

Section 6.4 Radioactive Effluent Sampling, Analysis, and Control Requirements, 12/17/84.

Section 6.5 Radioactive Effluent Monitoring Instrumentation, 12/29/83.

Section 7.1 Process and Area Radiation Monitors, 3/28/85.

(21) Off-Site Dose Calculation Manual (Generic), Revision 5, 9/12/84.

The inspectors noted that procedures were being reviewed updated and approved in accordance with administrative requirements. Additional results of the procedure review were discussed with cognizant licensee representatives.

6. Records (84723, 84724)

a. The inspector reviewed selected portions of the following records:

(1) Gaseous Radioactive Waste Release Reports for January - July 1985.

(2) Liquid Radioactive Waste Release Reports for January - July 1985 for the following sampling areas:

a. Turbine Building Samples
b. Processed Waste Release Analyses
c. Chemical Treatment Pond No. 3

(3) Whole Body Counter Records and Control Charts from, January - June 1985 including:

a. Daily Background Checks
b. Daily Performance Checks
c. Annual Calibration Records

(4) 1985 Interlaboratory Body Burden Analyses (BBA) Crosscheck results.

(5) Reactor Coolant Parameter Records and Trend Charts for Units 1, 2, & 3 during January - June 1985 including:

a. Daily gross gamma activity
b. Daily gross beta activity
c. Monthly H-3 activity
d. Monthly Sr-89, Sr-90 activity
e. Daily I-131 and I-133 concentrations
f. Daily Cs-134 and Cs-137 concentrations
g. E-bar determinations.

(6) Control Room Filtering System Operational Test, 1984 - 1985.

(7) Reactor Building Purge Filter Test Results, 1984 - 1985.

(8) Penetration Room Ventilation System Filter Test Results, 1984 - 1985.

(9) Spent Fuel Pool Ventilation System Test Results, 1984 - 1985.

(10) 1984 - 1985 Annual Calibration Data and Correlation Graphs for Effluent Process Instrumentation RIA Monitors.

Results of the record review were discussed with cognizant licensee representatives.

7. Reports (84723, 84724)

Technical Specification 6.6.1.4 requires that routine Radioactive Effluent Release Reports covering the operation of the unit during the previous six months of operation shall be submitted within 60 days after January 1 and July 1 of each year. The inspectors reviewed the Oconee Nuclear Station Semiannual Radioactive Effluent Release Report for second half 1984 (dated April 1, 1985). The report was reviewed for mistakes, anomalous measurements, omissions, and trends. The Oconee Nuclear Station liquid radioactive effluent total releases for 1984 were summarized as follows:

. Gross Radioactivity	1.58 E+0 curies
. Tritium	1.28 E+3 curies
. Dissolved Noble Gases	1.71 E+1 curies
. Volume of Liquid Waste to Discharge Canal	6.81 E+7 liters

The inspectors noted that the semiannual radioactive effluent release report was one month late as documented in a letter dated March 1, 1985, from H. B. Tucker, Vice President, Nuclear Production, Duke Power Company to J. N. Grace, Regional Administrator, Region II, USNRC. The March 1, 1985, letter indicated that the vendor had not completed some of the data analyses

and that the completed report would be submitted by April 1, 1985. The inspectors informed licensee representatives that timely submittals of these reports were important and that vendor laboratory performance and timeliness of data analyses should be evaluated. Additionally, the inspectors noted that the licensee had failed to include an explanation (required by Technical Specification 3.5.5) in the Semiannual Effluent Report dated April 1, 1985, as to why several effluent monitors were inoperable for more than 30 days during the latter half of 1984. This concern is addressed in more detail in IE Inspection Report Nos. 50-269/85-20, 50-270/85-20, and 50-287/85-20.

No violations or deviations were identified.

8. Changes to Equipment (84723, 84724)

The inspectors discussed with licensee representatives the changes that were made to the post-accident liquid sampling (PALS) system since the previous inspection. The changes and modifications on the PALS were partly in response to the findings from an NRC NUREG-0737 inspection conducted at the McGuire Nuclear station (50-369/84-07; 50-370/84-07). The Oconee Nuclear Station's PALS system is similar to the system at McGuire. The inspectors reviewed the nuclear station modification safety evaluation and it appeared that PALS changes were in accordance with 10 CFR 50.59. The post-accident liquid sampling system changes involved various sample line changes including installation of a flow transmitter, various sample cylinder removals, replacements, and installations, and the addition of a wider range differential pressure transmitter and bottled nitrogen gas (as opposed to the previous practice of using plant supplied nitrogen which typically contains moisture). Modifications and systems tests were not completed for all the units at the time of this inspection. PALS system modifications, tests, and reviews for all units was scheduled for completion by September 3-13, 1985 (re: Intrastation letter dated June 27, 1985). The licensee had a test procedure for the operation of the post-accident liquid sampling system: CP/1/A/2002/04D Test Procedure for Operation of the Post-Accident Liquid Sampling (PALS) System (6/14/85). In general, test results from pre-PALS system modifications showed poor correlation between the PALS system and the normal chemistry sampling system for radiochemical and chemical determinations. Comparisons between the two systems will be reviewed during future inspections.

The inspectors also examined the post-accident containment air sampling system and determined that no major hardware changes or modifications had been made since the last inspection. The licensee had a procedure for the operation of the post-accident containment air system which covered the periodic testing of the system (HP/1/A/1009/17 - Operating Procedure for Post-Accident Containment Air Sampling System). The inspectors reviewed functional test records for all three units covering the period July 1984 to February 1985.

No violations or deviations were identified.

9. Reactor Coolant Water Chemistry (84723)

Technical Specification 3.1.4 specifies that the total activity of the reactor coolant due to nuclides with half lives longer than 30 minutes shall not exceed 224/E-bar microcuries per ml whenever the reactor is critical. Technical Specification 3.1.5 establishes the maximum reactor coolant concentration limits for oxygen, chloride, and fluoride.

The inspectors reviewed selected records covering the period January 1985 to June 1985 as noted in Paragraph 6, Records. The inspectors reviewed the licensee's trending of the above parameters and, in addition, the parameters listed in Paragraph 6. The inspectors did not note any significant trends. The inspectors discussed with the licensee the newly developed automated system to track and display the various reactor coolant and secondary chemistry parameters. The system known as "Chemplot" became operational July 1, 1985.

No violations or deviations were identified.

10. Effluent Radiological Monitoring Instrumentation (84723, 84724)

Technical Specification 3.5.5 specifies the requirements for the operability of radioactive liquid effluent, gaseous effluent, and gaseous process monitoring instrumentation.

The inspectors examined the effluent monitors for the low pressure service water discharge (RIA-31, RIA-35), liquid waste disposal line (RIA-33, RIA-34), waste gas decay tank (RIA-37, RIA-38), air ejector off gas system (RIA-40), unit vent stack for particulates, iodine, and noble gas (RIA-43, RIA-44, RIA-45, RIA-46), and reactor building vent for particulates, iodine, and noble gas (RIA-47, RIA-48, RIA-49). The inspectors reviewed calibration records for selected gaseous and liquid effluent monitors. The inspectors noted the following effluent monitors had been out of service (dates to the right of effluent monitor identification indicate onset of the period of inoperability):

1-RIA-33	July 6, 1985
1-RIA-35	November 9, 1984
2-RIA-35	January 23, 1985
3-RIA-35	November 25, 1984
1-RIA-38	October 12, 1984

The inspectors verified that the licensee had collected and analyzed grab samples every 12 hours when RIA-35 was inoperable as required by Table 3.5.5-1 of the Technical Specifications. Additionally, the inspectors verified that two independent samples were collected and analyzed prior to initiating a waste gas decay tank release when 1-RIA-38 was inoperable, as required by Table 3.5.5-2 of the Technical Specifications.

The inspectors discussed with instrumentation and equipment maintenance personnel and plant management the need for an effective program to ensure that effluent monitors are properly maintained, used, and calibrated. Licensee representatives indicated that a vendor had been on site approximately one month prior to this inspection to investigate the "correlation problems" associated with the 1-RIA-38 monitor. The vendor made a recommendation to revise the correlation procedure, which the licensee was preparing at the time of this inspection. In a telephone conversation on July 18, 1985, licensee representatives agreed to get the various gaseous and liquid effluent monitors back in service and to develop an effective maintenance program for the effluent monitors by July 23, 1985. The development of an adequate maintenance program for effluent monitors will be reviewed during a subsequent inspection (50-269/85-18-01, 50-270/85-18-01, 50-287/18-01).

No violations or deviations were identified.

11. Use of Fission Product Phantom for Checking Whole-Body Counter Measurements (84725, TI 2500/09)

During this inspection, the inspectors verified the licensee's capability to perform radiological bioassays using their whole-body counting system. A fission product phantom containing radioactive sources identified in Table 1 was provided to the licensee for analysis. The phantom duplicated nuclides and organ burdens that the licensee might encounter during normal operation. The phantom was analyzed using the licensee's normal methods and equipment.

The licensee's whole-body counter was a standard chair geometry system consisting of Nuclear Data electronics and three NaI detectors for the thyroid, lungs, and lower torso. The inspectors reviewed the quality assurance program and procedures for the operation and calibration of the whole-body counting system (see Paragraph 5). Calibrations were conducted using vendor-supplied block phantoms for the thyroid, lung, and lower torso. The licensee used individual Fe-59, Y-88, Sn-113, Cs-137, and Ce-139 nuclide sources for calibration.

The results of the intercomparison are presented in Table 1. The licensee values were based on an average of five measurements. All measurements were based higher with a range of 16% to 64% higher than the known values (see Table 1).

No violations or deviations were identified.

12. Inspector Followup Items (92701)

(Closed) 50-269/82-21-01, 50-270/82-21-01 Acceptance Criteria for Crosscheck Program. From review of licensee crosscheck program results the inspectors determined that acceptance limits for the radiochemistry crosscheck program have been established and implemented.

(Closed) 50-269/82-21-03, 50-270/82-21-03 & 50-287/82-21-03 Inadequate Sampling Methodology for Gaseous Effluents. The inspectors noted that procedures (Paragraph 5) detailing gaseous effluent sampling had been developed and appropriate equipment had been installed. The inspectors verified equipment operability during a tour of selected gaseous effluent process monitoring and sampling stations.

(Closed) 50-269/83-22-02, 50-270/83-22-02 & 50-287/83-22-03 Review of Gamma Spectroscopy Calibration Details. The inspectors noted from review of selected procedures that calibration procedures for the gamma spectroscopy systems were adequately detailed.

(Closed) 50-269/84-18-01, 50-270/84-17-01 & 50-287/84-15-01 Licensee evaluation of elevated nuclide concentrations in selected environmental pathways. The inspectors informed licensee representatives that this item would be combined with and followed as inspector followup item 50-269/84-19-04, 50-270/84-18-04 & 50-287/84-20-04.

(Open) 50-269/84-18-02, 50-270/84-17-02 & 50-287/84-15-02 Deficiency in Comsip Inc. Standard Bed Catalyst. This item was not inspected.

(Open) 50-269/84-18-03, 50-270/84-17-03 & 50-84-15-03 Evaluation of increased background data for gas flow proportional counters. This item was not inspected.

TABLE 1: RESULTS OF WHOLE BODY COUNTER MEASUREMENTS
USING A COMMERCIALLY AVAILABLE FISSION PRODUCT PHANTOM AT
OCONEE NUCLEAR PLANT, JULY 10, 1985

Nuclide	Organ	Licensee[1] (nCi)	NRC (nCi)	Ratio (Licensee/NRC)
Mn-54	Lung	34.6	27	1.28
Co-57	Lung	73.7	45	1.64
Co-60	Lung	189.0	161	1.17
Cs-137	Lung	97.8	84	1.16

1. Licensee value represents the arithmetic mean of five measurements, each measurement was counted 600 seconds.