



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION II  
101 MARIETTA STREET, N.W., SUITE 2900  
ATLANTA, GEORGIA 30323-0199

MAY 20 1994

Report Nos.: 50-269/94-13, 50-270/94-13, and 50-287/94-13

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: April 18-21, 1994

Inspector: D. W. Jones  
D. W. Jones

5/18/94  
Date Signed

Approved by: T. R. Decker  
T. R. Decker, Chief  
Radiological Effluents and Chemistry Section  
Radiological Protection and Emergency Preparedness Branch  
Division of Radiation Safety and Safeguards

5/18/94  
Date Signed

SUMMARY

Scope:

This routine, announced inspection was conducted in the areas of transportation of radioactive material, radiological effluents, audits, and radiological environmental monitoring.

Results:

No violations or deviations were identified.

One unresolved item (URI) was identified regarding the licensee's procedure for shipping radioactive waste not including provisions for making advance notifications of shipments. Otherwise, the licensee had effectively implemented a program for shipping radioactive materials. No transportation incidents involving the licensee's shipments of radioactive material have occurred during the last three years (Paragraph 2).

The licensee had implemented and maintained an effective program to control liquid and gaseous radioactive effluents. The projected offsite doses resulting from those effluents were well within the limits specified in the Technical Specifications (TSs) and 40 CFR 190 (Paragraph 3).

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One Inspector Followup Item (IFI) was identified regarding the licensee's implementation of corrective actions for audit findings in the Chemistry area (Paragraph 4).

The licensee plans to enhance their onsite environmental monitoring program by installing additional ground water sampling wells. Permission to drill those wells must be obtained from the South Carolina Department of Health and Environmental Control (Paragraph 5).

## REPORT DETAILS

### 1. Persons Contacted

#### Licensee Employees

- \*M. Bartley, Licensing Coordinator, Regulatory Compliance
- \*S. Benesole, Manager, Regulatory Compliance
  - L. Benge, General Supervisor, Chemistry
  - D. Berkshire, Senior Scientist, Radiation Protection
  - J. Bryant, Technical Specialist, Safety Review Group
- \*B. Dolan, Manager, Safety Assurance
- †W. Elliott, General Supervisor, Chemistry
- †B. Elrod, Engineer, Civil Engineering
  - G. Hamrick, Manager, Chemistry
- \*E. Lampe, Scientist, Radiation Protection
- \*C. McIlwain, Senior Scientist, Chemistry
- \*B. Peele, Station Manager
- †S. Perry, Licensing Coordinator, Regulatory Compliance
- \*T. Pettit, Manager, Community Relations
  - T. Smith, Supervisor, Radiation Protection
- \*S. Spear, General Supervisor, Radiation Protection
- M. Thorne, Supervising Scientist, Radiation Protection
- †E. Wehrman, Scientist, Radiation Protection
  - C. Yongue, Manager, Radiation Protection

Other licensee employees contacted included engineers, technicians, and office personnel.

#### Nuclear Regulatory Commission

- P. Harmon, Senior Resident Inspector
- G. Humphry, Resident Inspector
- L. Keller, Resident Inspector
- K. Poertner, Resident Inspector

†Attended entrance Interview

\*Attended exit interview.

### 2. Transportation of Radioactive Material (86750)

10 CFR 71.5 required the licensee to comply with the applicable regulations of the Department of Transportation (DOT) in 49 CFR Parts 170 through 189 when transporting licensed material outside the confines of the plant or other place of use, or when delivering licensed material to a carrier for transport. 10 CFR 20.2006(d) and Section III.A.1. of Appendix F to 10 CFR 20.1001 - 20.2402 required the licensee to prepare all radioactive waste transferred to a land disposal

facility, or a licensed waste collector, such that the waste is classified in accordance with 10 CFR 61.55 and meets the waste characteristics requirements of 10 CFR 61.56.

The inspector reviewed the procedures listed below and determined that they adequately addressed the following: assuring that the receiver has a license to receive the material being shipped; assigning the form, quantity type, and proper shipping name of the material to be shipped; classifying waste destined for burial; selecting the type of package required; labeling and marking the package; placarding the vehicle; assuring that the radiation and contamination limits are met; and preparing shipping papers.

- HP/O/B/1006/01 "Procedure for Packaging and Shipment of Radioactive Materials"
- HP/O/B/1006/01A "Procedure for Packaging and Shipment of Radioactive Waste"
- "Oconee Nuclear Station 10 CFR 61 Waste Classification and Waste Form Implementation Program"

The inspector noted that Section 3.0, "Limits and Precautions" of the procedure for shipment of radioactive waste (HP/O/B/1006/01A) referenced the requirement in 10 CFR 71.97 for advance notification of shipments of radioactive waste, but Section 4.0, "Procedure" did not include provisions for making those notifications. The referenced requirement specified that, prior to the transport or delivery to a carrier for transport of licensed material outside the confines of the licensee's plant or other place of use or storage, each licensee shall provide advance notification to the governor of a State, or the governor's designee, of shipments to, through, or across the boundary of the State. Advanced notifications were required to be made in writing to the office of each appropriate governor or governor's designee and to the Regional Administrator of the appropriate NRC Regional Office when the quantity of licensed material exceeded specified activity levels. The licensee indicated that the requirement for advanced notifications had been interpreted as being applicable only to interstate shipments and not applicable to their shipments of waste within the State of South Carolina. The issue of whether the requirement for advance notification applies to intrastate shipments of radioactive waste has been referred to the NRC Office of General Counsel (OGC) for interpretation. The adequacy of the licensee's procedure with regard to not having included provisions for making advance notifications has been deemed to be an unresolved item pending interpretation by OGC of the applicability of the requirement for advance notifications to intrastate shipments of radioactive waste (URI 50-269, 270, 287/94-13-01).

The inspector reviewed the licensee's records for four recent shipments. Those records indicated that the shipments were made in accordance with the above procedures. No transportation incidents involving the licensee's shipments of radioactive material have occurred during the last three years.

Based on the above reviews, it was concluded that the licensee had effectively implemented a program for shipping radioactive materials.

One URI was identified.

### 3. Radiological Effluents (84750)

Technical Specification (TS) 6.6.1.4 and Section 16.11-9 of the Final Safety Analysis Report (FSAR) described the reporting schedule and content requirements for the Annual Radioactive Effluent Release Reports. The reports were required to be submitted before May 1 of each year covering the operation of the facility during the previous calendar year. (Prior to 1994, radioactive effluent release reports were required to be submitted on a semi-annual basis.) Summaries of the quantities of radioactive liquid and gaseous effluents released from the facility and an assessment of the radiation doses due to those releases were required to be included in the reports.

The effluent data presented in Table 1 below were compiled from the licensee's effluent release reports for the years 1989, 1990, 1991, 1992, and 1993. The inspector reviewed the reports for the year 1993 and discussed their content and the data presented in Table 1 with the licensee.

Table 1

#### Effluent Release Summary for Oconee Units 1, 2, and 3

##### Activity Released (curies)

<u>Year</u>	<u>Liquid Effluents</u>			<u>Gaseous Effluents</u>			
	<u>Fission and Activation Products</u>	<u>Tritium</u>	<u>Dissolved Noble Gases</u>	<u>Noble Gases</u>	<u>Halogens</u>	<u>Particulates</u>	<u>Tritium</u>
1989	3.88	1023	6.36	8970	3.11E-2	1.76E-2	118
1990	3.11	992	1.17	8830	1.69E-2	1.59E-2	101
1991	1.40	1130	2.86	3450	4.06E-2	8.50E-2	109
1992	2.58	998	3.12	3280	2.13E-2	8.35E-1	64
1993	0.47	1100	0.53	658	2.20E-2	1.06E-1	44

Table 1 (Contd.)

Annual DosesLiquid Effluents

<u>Year</u>	<u>Total Body Dose</u> <u>(Limit: 9 mrem)</u>	<u>Percent of</u> <u>Limit</u>	<u>Maximum</u> <u>Organ Dose</u> <u>(Limit: 30 mrem)</u>	<u>Percent of</u> <u>Limit</u>
1989	0.62	6.91	2.61	8.70
1990	0.99	11.00	1.47	4.90
1991	0.36	3.97	0.47	1.57
1992	0.29	3.22	0.58	1.93
1993	0.13	1.44	0.17	0.57

Gaseous Effluents

<u>Year</u>	<u>Air Dose</u> <u>(Limits: Gamma 30 mrad,</u> <u>Betta 60 mrad)</u>	<u>Percent of</u> <u>Limit</u>	<u>Maximum Organ Dose</u> <u>[From Iodine, Tritium,</u> <u>and Particulates]</u> <u>(Limit: 45 mrem)</u>	<u>Percent of</u> <u>Limit</u>
1989	Gamma 0.047 Beta 0.145	0.16 0.24	0.31	0.70
1990	Gamma 0.067 Beta 0.19	0.22 0.32	0.11	0.24
1991	Gamma 0.026 Beta 0.059	0.09 0.10	0.24	0.54
1992	Gamma 0.034 Beta 0.057	0.11 0.09	0.12	0.27
1993	Gamma 0.005 Beta 0.018	0.02 0.03	0.02	0.04

The licensee provided the following information regarding the amounts of activity released during 1993, and the resulting doses from those releases. The decrease in the activity released during 1993 as fission and activation products in liquid effluents and the corresponding decrease in the total body dose from liquid effluents was achieved by a reduction in the Cs-137 concentration in the effluent. Cs-137 was known to be the major contributor to total body dose in liquid effluents. The licensee found that by processing laundry water and miscellaneous waste water through powdered resin before release, the Cs-137 concentration in

the effluent could be significantly reduced, thereby reducing the dose. The resin used for this treatment had initially been used in the condensate polishers. Radwaste personnel found that mixing the waste water with the partially spent resin for several hours in a storage tank provided sufficient contact between the water and the resin to significantly reduce the activity concentration in the water. This additional step in liquid radwaste processing was begun during 1992, and continued through 1993. Before this second use for the resin was found, the resin was disposed of by discarding it to the onsite chemical treatment (settling) ponds due to the low level of activity on the resins. During the mixing operation additional activity was deposited on the resin. The resin is currently disposed of by shipment to a licensed waste processor for incineration. The decrease in the activity released as dissolved noble gases in liquid effluents was a result of continuous agitation of the liquid radwaste as it was being accumulated in the radwaste collection tanks for treatment. The initial purpose for agitating the waste water was to keep particulates in suspension in order to capture them during waste treatment rather than allow them to accumulate as sludge in the collection tanks. Agitation also liberated dissolved gases from the waste water. The decrease in the activity released as noble gases in gaseous effluents was a result of a more representative method of accounting for the amount of activity released during reactor building purges. Previously a sample of containment air was taken to determine the initial activity concentration prior to commencement of the purge. That initial activity concentration was applied for the duration of the purge when in fact the concentration would be decreasing during the purge. For improved accountancy, samples of containment air were taken at specified intervals during the purge to determine more representative values for the activity concentration.

As indicated in Table 1, the annual total body and organ doses from liquid effluents were less than 12 percent of their limits. The air and organ doses from gaseous effluents were less than 1 percent of their limits.

The effluent reports indicated that during 1993, there were no unplanned releases but there were several effluent monitors inoperable for more than 30 days. The Gaseous Waste Disposal System (GWDS) high and low range noble gas activity monitors for Unit 1 (1-RIA-37 and 1-RIA-38) were out of service from mid-March through December. The GWDS monitors for Unit 3 (3-RIA-37 and 3-RIA-38) were out of service all year. These monitors were designed to terminate releases when their high alarm setpoints were exceeded. A problem exists in the systems control logic which allows automatic resumption of releases following high alarm trips. The problem was expected to be corrected by mid-1994. The common monitor for Units 1 and 2 Turbine Building Sumps (1/2-RIA-54) was out of service from February 2 until March 5 when the monitor was replaced. The Low Pressure Service Water (LPSW) monitor for Unit 2 (2-RIA-35) was out of service from mid-January through mid-December due to spurious loss of flow alarms caused by air bubbles in the sample line. The monitor was returned to service after the sample line was relocated. The LPSW monitor for Unit 3 (3-RIA-35) was out of service from mid-March

to mid-April due to air having entered the detection chamber. The air was purged from the chamber and the monitor was returned to service. That same monitor (3-RIA-35) was out of service from mid-October through mid-December while the system was being upgraded with a new detector. The Interim Radwaste Building Ventilation System monitor (RIA-53) was out of service from January through mid-September while a new sample line was being installed.

Based on the above reviews, it was concluded that the licensee had implemented and maintained an effective program to control liquid and gaseous radioactive effluents. The projected offsite doses resulting from those effluents were well within the limits specified in the TSs and 40 CFR 190.

No violations or deviations were identified.

#### 4. Audits (84750)

TSs 6.1.3.4 and 6.1.3.5.d required the licensee to perform audits of station activities, under the cognizance of the Nuclear Safety Review Board, and to forward the audit reports to licensee management within 30 days of completion of each audit. The audits were required to encompass, in part, the following: the conformance of station operation to provisions contained within the TSs and applicable facility operating license conditions; the performance, training and qualifications of the station staff; the Offsite Dose Calculation Manual (ODCM) and implementing procedures; the Radiological Environmental Monitoring Program (REMP) and the results thereof; the Process Control Program (PCP) and implementing procedures for solidification of radioactive wastes; and the performance of activities required by the Quality Assurance (QA) Program for effluent and environmental monitoring.

The inspector reviewed the report for Audit No. IPR94-04, "Chemistry Procedure Use and Adherence Review" which was conducted on March 7 through 24, 1994, by the licensee's Safety Review Group. A number of substantive issues were identified by the audit and, as a result, 28 Problem Investigation Process (PIP) Items were initiated to address those audit findings. The following types of issues were identified: inconsistencies between Station Directives and Chemistry procedures; duties and responsibilities not clearly defined; records for procedural steps not initialed as completed; omitting "N.A." (Not Applicable) from records for procedural steps not performed; procedural instructions not strictly followed; and personnel not familiar with PIP program requirements. The inspector reviewed the records for the above PIP Items and noted that the proposed corrective actions included corrections to records, revisions to procedures, and additional training of personnel. The licensee's implementation of corrective actions for the audit results will be reviewed during a subsequent inspection and will be tracked as an Inspector Followup Item (IFI 50-268, 270, 287/94-13-02).



Based on the above reviews, it was concluded that the licensee had implemented an effective program for conducting audits of station activities.

No violations or deviations were identified.

5. Radiological Environmental Monitoring Program (84750)

TS 6.4.7 required the licensee to establish, implement, and maintain a program to monitor the radiation and radionuclides in the environs of the plant as described in Chapter 16 of the Final Safety Analysis Report (FSAR). The sampling locations, types of samples or measurements, sampling frequency, types and frequency of sample analysis, reporting levels, and analytical lower limits of detection (LLDs) were specified in FSAR Section 16.11-6.

During this inspection, the licensee informed the inspector of a planned enhancement of their onsite environmental monitoring program and provided the following information pertaining to that program. Although not required by the monitoring program described in the FSAR, the licensee samples the ground water from 3 wells near the onsite chemical treatment ponds Nos. 1 and 2 on a quarterly frequency. Since 1992, the only non-naturally occurring radionuclides detected in those samples has been tritium (H-3) and cobalt-60 (Co-60). The highest activity levels found were 7393 pCi/l ( $10^{-12}$  curies per liter) for H-3 and 16.8 pCi/l for Co-60, which were 37 percent and 5 percent of their respective reporting levels. In order to provide further assurance that radioactive material has not migrated from the chemical treatment ponds into the ground water, the licensee plans to submit a request to the South Carolina Department of Health and Environmental Control for permission to drill six additional ground water sampling wells down-gradient from the existing wells. The target submittal date was June 1994. Implementation of the environmental monitoring program enhancements will be reviewed during a subsequent inspection.

No violations or deviations were identified.

6. Exit Interview

The inspection scope and results were summarized on April 21, 1994, with those persons indicated in Paragraph 1. The inspector described the areas inspected and discussed in detail the inspection results listed above. No dissenting comments were received from the licensee. Proprietary information is not contained in this report.

<u>Item No.</u>	<u>Status</u>	<u>Description and Reference</u>
50-269, 270, 287/94-13-01	Open	URI - Applicability of the requirement for advance notifications to intrastate shipments of radioactive waste (Paragraph 2).
50-268, 270, 287/94-13-02	Open	IFI - Implementation of corrective actions for the audit results (Paragraph 4).