



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

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Report Nos: 50-348/91-22 and 50-364/91-22

Licensee: Alabama Power Company
600 North 18th Street
Birmingham, AL 35291-0400

Docket Nos.: 50-348 and 50-364 License Nos.: NPF-2 and NPF-8

Facility Name: Farley 1 and 2

Inspection Conducted: December 9 through 13, 1991

Inspector:

R. P. Carrion
R. P. Carrion

15 JAN '92
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

1/15/92
Date Signed

SUMMARY

Scope:

This routine, unannounced inspection was conducted in the areas of Chemistry and Radwaste organization, audits, plant water chemistry, the Count Room, liquid radiological effluent processing, the Semiannual Radioactive Effluent Release Report, the Control Room Emergency Ventilation System, the Meteorological Program, contaminated soil, and handling and transportation of radioactive waste.

Results:

The licensee's organization in the areas of Chemistry and Radioactive Waste was stable and staffed with competent personnel (Paragraph 2).

Licensee audits were well-planned, well-documented, and complete (Paragraph 3).

Plant water chemistry was maintained well within Technical Specification (TS) limits (Paragraph 4).

The Radiochemistry Count Room and associated instrumentation was well-maintained and the performance logs were complete (Paragraph 5).

The licensee's program for processing and monitoring liquid effluents was adequate (Paragraph 6).

Radiological effluents were maintained well within TS limits (Paragraph 7).

The Control Room Emergency Ventilation Systems were well-maintained, with no sign of physical degradation of any component (Paragraph 8).

The licensee's Meteorological Monitoring Program was well maintained and fulfilled its required function (Paragraph 9).

Contaminated soil was not a problem on site (Paragraph 10).

Radwaste handling and transportation was done by a capable, well-trained staff (Paragraph 11).

REPORT DETAILS

1. Persons Contacted

Licensee Employees

- *W. R. Bayne, Safety Audit and Engineering Review Supervisor
- *P. E. Farnsworth, Radwaste Supervisor
- *J. W. Kale, Chemistry/Environmental Superintendent
 - W. McGilvray, Nuclear Specialist I
- *M. Mitchell, HP Superintendent
- *D. N. Morey, General Manager - Nuclear Plant
 - W. Moore, Radwaste Technician
- *C. D. Nesbitt, Manager - Operations
- *J. K. Osterholtz, Technical Manager
- *J. R. Robinson, Chemistry Foreman
- *R. T. Wood, Chemistry Supervisor

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- *W. Cline, Radiological Protection and Emergency Preparedness Branch Chief
- *G. Maxwell, Senior Resident Inspector
 - M. Morgan, Resident Inspector

*Attended exit interview

2. Organization (84750 and 86750)

TS 6.2 describes the licensee's organization.

The inspector reviewed the licensee's organization, staffing levels, and lines of authority as they related to the Chemistry Department and Radioactive Waste Group to verify that the licensee had not made organizational changes which would adversely affect the ability to control radiation exposures or radioactive material.

The Chemistry Superintendent, who reported to the Technical Manager, supervised a staff of fifty seven, including the Chemistry Group and the Environmental and Emergency Planning Group. The Chemistry Group was stable with forty one positions, including the supervisor, five foremen, and thirty five technicians. There were no vacancies at the time of the inspection. The Environmental and Emergency Planning Group was undergoing some changes. The supervisor's position was vacant and was being filled on a temporary basis by the Chemistry Foreman of the Group. In addition, there was one vacancy for a Chemistry Technician in the area of dosimetry. An organizational change was being evaluated whereby the Emergency Planning function would be removed from the Group and be made a full-time position in the Training Department.

The Radwaste Supervisor, who reported to the Health Physics Superintendent, oversaw the activities of a staff of forty four when at full strength, including foremen, helpers-nuclear, radiation detection men, etc. Although there were four vacancies at the time of the inspection, the organization was stable and capable of executing its duties as related to radwaste shipping/handling.

The inspector concluded that the respective organizations were stable and capable of performing their assigned tasks.

No violations or deviations were identified.

3. Audits (84750 and 86750)

TS 6.5.2.8 specifies the types and frequencies of audits to be conducted under the direction of the Manager-Safety Audit and Engineering Review (SAER). The inspector reviewed audits conducted during the past year by SAER within the scope of this report. In order to evaluate compliance with the TSS and assess quality of the licensee's programs, the inspector reviewed the following audits:

- Radioactive Waste Management, SAER-WP-31, conducted August 1 through September 19, 1990.
- On-Site Environmental Monitoring Program, SAER-WP-01, Appendices A and D, conducted February 1 through April 3, 1991.
- Chemistry, SAER-WP-06, Appendix A, conducted June 1 through August 27, 1991.

The audits were found to be well-planned and documented and included several findings of procedural noncompliance which were being tracked or had been closed out. A corrective action audit was undertaken every six months by the SAER Group. Findings were closed out formally at that time or left open. The inspector noted that the comments and recommendations were detailed and would aid the implementation of adequate corrective actions. The inspector verified that the audit program was conducted in accordance with the TSS.

The inspector concluded that the audit process was capable of identifying programmatic weaknesses and making recommendations for corrective action.

No violations or deviations were identified.

4. Plant Water Chemistry (79701)

TS 3.4.8 specifies the limits within which the reactor coolant system must be maintained for conductivity and chlorides. TS 3.4.9 specifies the limits for the specific activity of the reactor coolant. These parameters are related to corrosion resistance and fuel integrity.

Pursuant to these requirements, the inspector reviewed tabular summaries which correlated reactor power output to chloride, fluoride, dissolved oxygen concentrations, and specific activity of the reactor coolant for the period of October 1, 1991 through November 30, 1991, for both units. All of the reviewed parameters satisfied the TS requirements.

The inspector concluded that the Plant Water Chemistry was being maintained well within the TS requirements.

No violations or deviations were identified.

5. Radiochemistry Count Room and Instrumentation (84750)

To evaluate the licensee's analytical capability to make consistently accurate radioactivity measurements, the inspector examined the Unit 1 Count Room. It was equipped with a liquid scintillator system, an alpha/beta counter, two high purity germanium (HPGe) detectors, and two proportional counters.

The inspector reviewed records for the systems to verify compliance and assess quality. The inspector reviewed the background and response check log for the liquid scintillation counter for the period of mid-November to mid-December. Quenched and unquenched tritium sources were utilized. All counts were within the three-sigma band. The counter was standardized every three months (due February 15, 1992) and the electronics were calibrated annually (due July 10, 1992). Background and response checks for the alpha/beta counter were reviewed. Am-241 was utilized for the alpha counts while Sr-90 was utilized for the beta counts. The inspector noted that several alpha counts fell outside the three-sigma band. When this occurred, a recount was made. In each instance, the recount was within the three-sigma band. All beta counts were within the three-sigma band. The last calibration of the counter was conducted on October 5, 1991. The counter was standardized every three months (due January 3, 1992). The inspector reviewed the background and response check log for the proportional counters. A Pu-239 source was utilized for an alpha check while a Sr-90 source was utilized for the beta check. Standardization of the counters was done every three

months. The inspector also reviewed the calibration records for the HPGe detectors. They were calibrated annually for forty one different geometries. The last calibrations were completed between July 8 and September 27, 1991 for detector #1, and between July 8 and October 1, 1991 for detector #2, using a 5-isotope source. Count room personnel were familiar with the operation and capabilities of all Count Room instrumentation.

The inspector concluded that the Count Room and its associated instrumentation well-maintained and adequate for its intended purpose.

No violations or deviations were identified.

6. Liquid Effluent Processing and Monitoring (84750)

TS 3.11.1.1 states requirements for liquid effluent concentrations. TSS 4.11.1.1.1, 4.11.1.1.2, and 4.11.1.1.3 define the surveillance requirements for the associated sampling and analysis program. TSS 3.11.2.1, 3.11.2.2, and 3.11.2.3 state requirements for dose rates due to radioactive materials and noble gases released in gaseous effluents from the site, as well as dose rates from radioiodines and radioactive materials in particulate form and radionuclides with half-lives greater than eight days in gaseous effluents released. TSS 4.11.2.1, 4.11.2.2, and 4.11.2.3 define the surveillance requirements for dose rate calculations.

The inspector reviewed six Release Permits for the year (1991), including liquid batch and gaseous batch and continuous releases, to verify compliance. The releases were made from the waste monitor tanks (WMTs), from the waste gas decay tanks (WGDTs), and steam generator blow down (SGBD). Doses were calculated for each release and for the current week, month, quarter, and year for compliance with 10 CFR 20 and 10 CFR 50. Dose calculations were made for each nuclide and for each organ considering the average meteorological data (for gaseous releases). The inspector noted that the permits were complete and no irregularities were identified.

The inspector observed the activities associated with Liquid Waste Release 1-91-790, from the Unit 1 #2 Waste Monitor Tank (WMT). The inspector reviewed selected portions of the following procedures: FNP-CCP-643, Rev. 8, entitled "Sampling Points for Potential Radiological Effluents," issued March 6, 1991 and FNP-CCP-212, Rev. 8, entitled "Liquid Waste Release Program," issued June 10, 1991. These procedures specified where and how to take samples as well as the steps required to issue a release permit. After

recirculating the tank volume as required by procedure, a sample was taken for analysis by a technician. The inspector observed the technician as he obtained the sample and noted that he used good technique. The technician took the sample directly to the laboratory to be analyzed. The analysis showed that the sample's activity was low enough to allow the tank to be released to unrestricted areas. Setpoints for the Process Radiation Monitor (RE-18) were established and release approval was obtained. The inspector noted that the independent verification part of the procedure, which included items such as aligning the valves and pumps into the proper configuration, was completed prior to commencing the release. The technicians conducted their activities in a competent, professional manner. Once the release was initiated and stable, the inspector requested a copy of the records of the completed release and left to pursue other items. The requested copy was provided and showed that 3800 gallons were released with an activity of $2.65E+6$ uCi, which yielded a maximum dose of $2.23E-05$ mrem to the Gastrointestinal-Lower Large Intestine (GI-LLI).

The inspector concluded that the licensee's program for processing and monitoring liquid wastes was adequate.

No violations or deviations were identified.

7. Semiannual Radioactive Effluent Release Report (84750)

TS 6.9.1.8 requires the licensee to submit a Semiannual Radiological Effluent Release Report within the time periods specified in TS 6.9.1.9 covering the operation of the facility during the previous six months of operation. TS 6.9.1.9 also states the requirements for the content and format of the report. The inspector reviewed the reports for the first half of 1991 to verify TS compliance. These data are summarized below.

Radioactive Effluent Release Summary

Farley, Units 1 and 2	1989	1990	1991*
Abnormal Releases	0	1	2
Activity Released (curies)			
a. Liquid			
1. Fission and Activation Products	$1.47E-1$	$1.58E-1$	$1.69E-1$
2. Tritium	$1.31E+3$	$1.41E+3$	$4.08E+2$

b.	Gaseous			
1.	Fission and Acti- vation Gases	2.59E+2	8.82E+1	3.72E+2
2.	Particulates and Iodines	3.72E-5	3.15E-6	1.62E-3
3.	Tritium	2.08E+2	8.75E+1	2.58E+1

* First half of 1991.

The two 1991 releases noted were minor gaseous releases from Unit 1 in the second quarter, which resulted in a total activity of 5.89E-9 Ci being released.

No changes to the Process Control Program (PCP) were made during this reporting period.

The inspector concluded that the Report satisfied the requirements of the TSs.

No violations or deviations were identified.

8. Control Room Emergency Ventilation System (84750)

Per 10 CFR 50, Appendix A, Criterion 19, licensees shall assure that adequate radiation protection be provided to permit access to and occupancy of the control room under accident conditions and for the duration of the accident. Specifically, operability of the control room emergency ventilation system ensures that 1) the ambient air temperature does not exceed the allowable temperature for continuous duty rating for the equipment and instrumentation cooled by this system and 2) the control room remains habitable for operations personnel during and following all credible accident conditions such that the radiation exposure to personnel occupying the control room is limited to 5 rem or less whole body, or its equivalent.

TS 3.7.7 defines operability requirements for the control room emergency air cleanup systems under the various design scenarios. TS 4.7.7 sets the surveillance requirements for the system.

The inspector reviewed Piping and Instrumentation Diagrams (P&IDs) D-175-012 and D-205-012 which showed the general layout of the components of the Control Room Air Conditioning System for Unit 1 and Unit 2, respectively. The inspector walked down the system, from the air intake to the Control Room, to air exhaust, noting the major components, such as isolation dampers, filter banks, and fans as well as detectors for radiation, etc. All components were well maintained, with no sign of physical degradation. The inspector reviewed the System Description

and discussed system operation under both normal and emergency conditions with cognizant licensee personnel.

The inspector reviewed summaries of surveillances conducted in the last several years for HEPA filter testing and carbon adsorption, as required by TS, and determined that TS compliance had been met and acceptance criteria satisfied. The most recent surveillances had been conducted during the summer of 1991.

Based on the scope of this review, the inspector concluded that the System was adequate for its intended function and that it was being maintained in compliance with the applicable TSs.

No violations or deviations were identified.

9. Meteorological Tower and Instrumentation (84750)

TS 3/4.3.3.4 states operability and surveillance requirements of the meteorological monitoring system. Requirements are implemented by Procedure FNP-ENV-17, Rev. 17, issued April 9, 1991.

The inspector and an Environmental Technician inspected the Primary and Secondary Meteorological Towers, associated instrument buildings and included equipment, and logbooks to verify TS compliance and to evaluate instrument operability. The inspector noted that both towers were located such that there would be no interference with the flow of air. The Primary Tower was 150 feet tall with instrument packages at the 35- and 50-foot levels. Calibrations were done on a semi-annual basis for both towers. The Chemistry and Environmental Group performed checks three times per week. The primary system had three channels for the vertical temperature differential, which was used to determine the air stability index. The inspector observed that the recorders showed that calibrations were due on December 12, 1991, coincidentally the very day that the inspector was reviewing the tower. Conversation with the technician determined that the calibration would be done shortly, within the 25% grace period allowed by the TSs. (It was not done previously due to the priority given to preparations for an Emergency Preparedness drill.)

Wind speed and horizontal wind direction were measured at each level. Temperature and dew point were measured at the 35-foot level. A solar radiation measuring instrument was located on a platform near the Primary Tower. A rain gauge was located near the instrument building and was observed to be in good operating order. The inspector noted that they were operating properly. A mercury barometer was mounted on

the interior wall of the primary tower's instrument building. The inspector noted that Maintenance Work Request (MWR) 213751 had been initiated on November 18, 1991 to repair a bad sensor in the bi-vane wind direction indicator at the 150-foot level.

The Secondary Tower served as a backup to the Primary Tower. It was 10 meters tall with detectors at a single level. This tower was equipped with a system for measuring horizontal and vertical wind components as well as wind speed and ambient temperature. The systems at this tower were due to be calibrated on December 13, 1991, but like those of the Primary Tower would be done within the 25% grace period allowed by the TSs.

The inspector went to the Instrument Room and observed the panel on which two radiometers indicated wind speed and direction at the 35 and 150-foot levels as well as the temperature difference between the two levels.

From examination of the above-addressed systems, the inspector determined that the meteorological measurement system was capable of fulfilling its required functions.

The inspector reviewed selected calibration records of 1990 and 1991 and maintenance records of the past several years of both the Primary and Secondary Meteorological Towers to verify TS compliance and/or identify chronic problems. No irregularities were noted by the inspector.

The inspector concluded that the Meteorological Towers and their associated instrumentation were well-maintained and satisfied the TS requirements.

No violations or deviations were identified.

10. Contaminated Soil (84750)

The inspector discussed the issue of contaminated soil with the Radioactive Waste Supervisor to determine on-site quantities, activity levels and associated isotopic characterization, contamination sources, and plans for dealing with it.

Basically, the only contaminated soil on site is that which was excavated during the foundation work for the Solidification/Dewatering Facility (SDF). At the time, three 91-cubic foot containers of identified contaminated soil/building rubble was shipped offsite for disposal. Other, slightly contaminated, soil was utilized as backfill material around the foundation of the SDF. No other contaminated soil had been identified. None was being

stored for future disposal and none had been disposed of via onsite burial, per se.

The inspector concluded that contaminated soil did not represent a problem on this site.

No violations or deviations were identified.

11. Radwaste Processing and Transportation (86750)

10 CFR 71.5 (a) requires that each licensee who transfers licensed material outside of the confines of its plant or other place of use, or who delivers licensed material to a carrier for transport, shall comply with the applicable requirements of the regulations appropriate to the mode of transport of the Department of Transportation (DOT) in 49 CFR, Parts 170 through 189.

Pursuant to these requirements, the inspector reviewed the licensee's activities affiliated with these requirements, to determine whether the licensee effectively processes, packages, stores, and ships radioactive solid materials.

The licensee's program for the packaging and transportation of radioactive materials, including solid radwaste, was conducted by the Radioactive Waste Group within the Health Physics Department. Radwaste was processed and packaged by the Radwaste Group, including compacting contaminated material, loading shipments, and preparing shipping documentation.

a. Radwaste Shipping Documentation

The inspector reviewed shipping packages for Radwaste Shipment Nos. 91-13 and 91-14. The packages documented the shipments and included items such as unique shipment and shipping container numbers, waste content and volume, total activity, analytical summary and breakdown of isotopes with a half-life greater than five years. The radiation and contamination survey results were within the limits specified and the shipping documents were being maintained as required.

b. Radwaste Shipments

Shipment of radioactive materials was the responsibility of the Radioactive Waste Group, which prepared all shipping documents and procured the necessary disposal containers and shipping casks. No radwaste shipments were made during the period that the inspector was on site and, therefore, no observation of the actual activities involved therein

could be made to evaluate the effectiveness of training, activities of personnel, etc.

However, a shipment (RMS 91-74) of LSA material in the form of twenty two metal boxes of non-compacted metal scrap and wood scrap was being sent to a recycling center for decontamination. The inspector reviewed Radiation Control and Protection Procedure FNP-O-RCP-811, Rev. 14, entitled "Shipment of Radioactive Material," issued September 12, 1991. Its purpose was to provide procedural guidance in the preparation of shipments of radioactive material and to ensure compliance of such shipments with all applicable regulations and requirements. The inspector observed part of the process of loading the boxes on the truck and noted that the technicians were closely following the procedure, including conducting radiation/contamination surveys and checking labels and package markings on the shipping boxes prior to loading.

Before the truck left the site, the inspector reviewed the final survey record of the truck and conducted a "spot check" of several of the survey points. The inspector found one spot where the radiation level was somewhat higher than that indicated on the survey record. The licensee explained that the discrepancy probably resulted from the use of different survey instruments by the inspector and the group which had conducted the original survey. All other survey points checked by the inspector were in agreement. In general, the inspector thought that the survey was properly done and well documented.

The inspector concluded that the Radwaste Group was stable, staffed with competent personnel, and executed its responsibilities in a professional manner.

No violations or deviations were identified.

12. Exit Interview

The inspection scope and results were summarized on December 13, 1991, with those persons indicated in Paragraph 1. The inspector described the areas inspected and discussed the inspection results, including likely informational content of the inspection report with regard to documents and/or processes reviewed during the inspection. The licensee did not identify any such documents or processes as proprietary. Dissenting comments were not received from the licensee.

13. Acronyms and Initialisms

APCo - Alabama Power Company
CFR - Code of Federal Regulations
Ci - curie
DOT - Department of Transportation
FNP - Farley Nuclear Plant
GI - Gastrointestinal
HEPA - High Efficiency Particulate Air
HPGe - High Purity Germanium
LLI - Lower Large Intestine
LSA - Low Specific Activity
MWR - Maintenance Work Request
No. - Number
P&ID - Piping and Instrumentation Diagram
PCP - Process Control Program
RCP - Radiation Control and Protection Procedure
Rev - Revision
SAER - Safety Audit and Engineering Review
SDF - Solidification Dewatering Facility
SGBD - Steam Generator Blow Down
TS - Technical Specification
WGDT - Waste Gas Decay Tank
WMT - Waste Monitor Tank