



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

MAY 29 1992

Report No.: 70-1201/92-03

Licensee: B&W Fuel Company
Commercial Nuclear Fuel Plant (CNFP)
P.O. Box 11646
Lynchburg, VA 24505-1646

Docket No.: 70-1201

License No.: SNM-1168

Facility Name: Commercial Nuclear Fuel Plant

Inspection Conducted: April 27-29, 1992

Inspector: D. A. Seymour

5/29/92
Date Signed

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

5/29/92
Date Signed

SUMMARY

Scope:

This routine, unannounced inspection was conducted in the areas of radioactive waste management, including radioactive liquid effluents, radioactive airborne effluents, liquid and airborne effluent monitoring instruments, radioactive waste transportation, and radioactive solid waste; and environmental protection.

Results:

Based on the results of this inspection, it was determined that the licensee was complying with the regulations and license requirements related to the release and disposal of liquid, airborne, and solid waste, and the reporting of waste disposal information to the NRC. In addition, the inspection revealed that the licensee was implementing license commitments for the environmental monitoring program; that the licensee maintained adequate management controls for the environmental monitoring

program; and that releases of radioactivity to the environment, and attendant sampling methods and analysis, provided reasonable assurance that the impact on the environment and the public was minimal. Non-cited violation 70-1201/91-04-01 for failure to have an approved written procedure to conduct an in-place test to measure the particle removal efficiency of the HEPA filters for the SERF-3 and PLR/SERF-1 ventilation systems was closed.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

- *C. W. Carr, Plant Manager, Fuel Manufacturing
- *D. Gordon, Health Physicist
- *K. S. Lester, Manager, Safety and Licensing
- *G. B. Lindsey, Health-Safety Foreman

*Denotes those present at the exit interview conducted April 29, 1991.

2. Audits (88035, 88045)

Section 2.7 of the License Application requires that an internal Health-Safety inspection program shall be maintained to provide assurance that plant activities are conducted safely and in accordance with license specifications. The Health-Safety inspection program included the following: monthly safety inspections, informal daily inspections, and independent audits.

The inspector reviewed selected quarterly Health Physics (HP) audits and selected monthly Health-Safety inspections for 1991 and 1992 to assess overall program quality and any adverse trends. The inspector reviewed the following audit reports:

- ° Quarterly Health Safety Audit (HS-92-01), dated April 15, 1992
- ° Quarterly Health Physics Audit of CNFP, dated October 4, 1991
- ° Quarterly Health Physics Audit of CNFP, dated April 15, 1991
- ° Health Physics Audit of CNFP (HS-90-4), dated January 14, 1991

In some cases, the audits noted above were conducted by personnel from B&W, Naval Nuclear Fuel Division (NNFD), which assured an independent review. Each audit report included an attached memo discussing the findings and recommendations and stating proposed or implemented corrective actions. Primarily, the monthly Health-Safety inspections identified problems that were related to occupational safety. Corrective actions were usually taken immediately.

No violations or deviations were identified.

3. Changes (88035, 88045)

Section 2.1 of the License Application delineates the licensee's organization and organizational responsibilities. The inspector reviewed changes in personnel to the licensee's organization and program since the last inspection. The inspector noted that effective September 18, 1991, that the position of Manager, Fuel Operations was eliminated from the organizational structure. Because of this change, the Manager, Fuel Manufacturing was recognized as a production manager. The Manager, Production and Inventory Control replaced the position of Manager, Production and Materials Control. These managers reported directly to the Plant Manager. The organization was also modified to indicate that the Health Safety Monitors reported directly to the Health Safety Foreman, who reported to the Manager, Safety and Licensing. These changes should not significantly impact the performance of the Health and Safety Organization.

No violations or deviations were identified.

4. Instrumentation (88035, 88045)

Sections 12.6.1 and 12.6.2 of the License Application require that calibration be performed at least semiannually on laboratory counting instruments and that functional checks are conducted prior to each use.

The inspector examined the Health-Safety office count room where effluent air and environmental air samples were counted. The count room was equipped with an NMC PC-4 Gas Flow Proportional Counter used mainly for alpha counting and an NMC PCC-11T gas flow proportional counter used mainly for beta counting. The daily quality control (QC) records for both instruments were readily available for review. The inspector reviewed the QC records for the two instruments noted above for April, 1992, including the background checks and did not observe any problem areas. The instruments were calibrated semiannually and were in calibration.

The inspector also reviewed selected quality control records for April, 1992, for the counting instrumentation located in the plant mezzanine. These instruments included a Tennelec LB 5100 gas flow proportional counter used for gross alpha and beta counting, an Eberline BC-4 gas flow proportional counter used for gross beta, and a Ludlum 1000 alpha scintillator used for gross alpha. No problems were noted.

No violations or deviations were identified.

5. Radioactive Liquid Effluents (88035)

Sections 5.1.2, 10.4.1, and 12.8.3 of the License Application specify the requirements for liquid effluent controls.

Inspection Report 70-1201/91-04 detailed the licensee's system for monitoring and controlling liquid waste releases. During this inspection, the inspector walked down the applicable systems and determined that no significant changes have been implemented.

The inspector reviewed the Semiannual Effluent Report for the second half of 1991. The inspector determined from the reports that the releases were well within both the Federal and license limits. During the reporting period from January 1, 1991 to June 30, 1991, a total of 44.1 μCi of uranium was released in liquid effluents. During the reporting period from July 1, 1991 to December 31, 1991, a total of 87.3 μCi of uranium was released in liquid effluents. Concentrations of liquid effluent releases for the periods noted above were less than one percent of the maximum permissible concentration (MPC) values specified in 10 CFR 20, Appendix B, Table 2, Column 2 for the isotopes listed in the semiannual reports.

No violations or deviations were identified.

6. Radioactive Airborne Effluents (88035)

Sections 3.2.2 and 5.1.1 of the License Application specifies the requirements for gaseous effluent controls.

The licensee's system for control of gaseous effluents was detailed in Inspection Report 70-1201/91-04. The licensee's main gaseous release point discharged both byproduct and uranium materials due to operations in the Pellet Loading Room (PLR) area and Service Equipment Refurbishment Facility (SERF-1) through the same stack. The introduction of byproduct materials (mixed fission products) into the waste stream was due to the licensee's increased field service operations. At the onset of the byproduct operations, the licensee began sampling for beta-gamma activity and attributed the beta activity to cobalt-60. The licensee had two additional stacks (SERF-2 and SERF-3) used primarily for field service operations. Both uranium and by-product effluent were in the waste stream. Operations in the SERF-2 Building were terminated on February 20, 1991, and operations in the SERF-3 Facility commenced on April 22, 1991.

The inspector reviewed the Quarterly Gaseous Effluent Reports for the last three quarters of 1991. These reports provided quarterly summation of the releases of uranium and cobalt. The totals released and the average concentrations were within required limits.

The inspector reviewed the Semiannual Effluent Reports for 1991. The inspector determined from the reports that the airborne releases were well within both the Federal and license limits. During the reporting period from January 1, 1991 to June 30, 1991, a total of 1.6 μCi of uranium and 36.4 μCi of Co-60 was released in airborne effluents. During the subsequent reporting period from July 1, 1991 to December 31, 1991, a total of 2.6 μCi of uranium and 44.1 μCi of Co-60 was released in airborne effluents. Concentrations of gaseous effluent releases for the periods noted above were less than three percent of the maximum permissible concentration (MPC) values specified in 10 CFR 20, Appendix B, Table 2, Column 2 for the isotopes listed in the semiannual reports.

No violations or deviations were identified.

7. Airborne Filtration Systems (88035)

Section 3.2.2.1 of the License Application specifies the requirements for airborne effluent to uncontrolled areas. Specifically, the effluent shall pass through single stage HEPA filtration before release. In addition, the filtration efficiency shall be evaluated in accordance with Regulatory Guide 3.2 upon installation, and following major maintenance. Section 3.2.2.3 states that air handling systems shall be operated to maintain areas of greater contamination at a slight negative pressure with respect to lesser contaminated areas.

The inspector examined the HEPA filtration system for the main plant vent and Serf 3, and reviewed selected records for 1991 for these systems, to ensure that the differential pressure across the HEPA filters were checked weekly in accordance with license conditions. There were no problems observed. The licensee was required to replace the filters when the differential pressure exceeded four inches of water. The inspector determined that the licensee had not replaced HEPA filters since March of 1991. The inspector reviewed the records for the in-place efficiency testing of the air cleaning systems for the PLR/SERF 1 and SERF-3 vent. The efficiency tests for both these vents were performed on March 22, 1991. The test results met the requirements specified in the license conditions. The inspector also reviewed the results of the negative pressure tests which were performed to verify that air flow was occurring from

areas of greater contamination to areas of lesser contamination. No problems were noted.

In addition, the inspector reviewed selected portions of Procedure RP-004, "Airborne Radioactivity," Rev. 1. The inspector noted that detailed instructions for performing particle removal efficiency tests had been added to this procedure in Section 11, "Air Cleaning Systems, Calibrations and Maintenance." Based on this review, and on discussions with the licensee, the inspector closed Non-Cited Violation (NCV) 70-1201/91-04-01 for failure to have an approved written procedure to conduct an in-place test to measure the particle removal efficiency of the HEPA filters for the SERF-3 and PLR/SERF-1 ventilation systems.

NCV 70-1201/91-04-01 was closed.

8. Radioactive Waste Management (84850, 86740)

- a. Section 10.4.2 of the License Application specifies the requirements for solid waste disposal.

The inspector determined that the licensee had established procedures for the packaging and shipping of solid radwaste by discussions with the licensee, a review of shipping records, and a review of selected portions of the of Procedure AS-1110, "Waste Control, Rev. 16, and Procedure RP-007, "Shipment and Receipt of Radioactive Materials," Rev. 0. These procedures provided guidance and outlined the responsibilities of different groups and tasks at the facility, such as container inspection, packaging, surveying, and review of completed paperwork.

No violations or deviations were identified.

- b. Waste Manifests

10 CFR 20.311(d) requires that a shipment manifest be completed for each radioactive waste shipment sent to a licensed waste processor and that the manifest meet the requirements of Part 20.311(b) and (c) includes information concerning the physical description or the waste, the volume, radionuclide identity and quantity, the principle chemical form, and the total radioactivity.

The inspector reviewed selected portions of the records for three shipments made in March and April of 1992. Through the review of these shipping records and discussions with the licensee, the inspector determined

that the licensee was meeting the requirements as specified.

No violations or deviations were identified.

c. Tracking of Waste Shipments

The inspector determined, through a review of waste shipment records and the applicable shipping procedure, that the licensee had a program in place for forwarding manifests to the waste processor and for tracking shipments to assure that the shipment was received by the processor.

d. Transportation of Radioactive Materials

10 CFR 71.5 requires that each licensee who transports licensed material outside the confines of its plant or other place of use to comply with the applicable requirements of the DOT in 49 CFR Parts 170 Through 189. 49 CFR 173.443 requires that the non-fixed (removable) radioactive contamination on the external surfaces of each package offered for shipment must be below specified levels. The maximum permissible limit for beta-gamma contamination is 2200 disintegrations per minute (dpm) per 100 square centimeters ($\text{dpm}/100\text{cm}^2$). The maximum for alpha contamination is 220 $\text{dpm}/100\text{cm}^2$. If the packages are being transported in a dedicated, exclusive use vehicle, these levels may be increased by a factor of ten. 49 CFR 173.475 requires that before shipping a radioactive material package, the shipper shall ensure that the external radiation levels are within allowable limits.

The inspector reviewed the contamination survey and radiation level survey records for the three aforementioned shipments and determined that the licensee had performed the surveys as required, and that the results were within specifications.

No violations or deviations were identified.

9. Environmental Monitoring Program (88045)

Sections 5.2 and 13.1 of the License Application specify the requirements for the Environmental Monitoring Program. The Environmental Monitoring Program assesses the effectiveness of the controls on liquid and airborne effluent releases.

The inspector reviewed the results for selected environmental samples collected and analyzed in 1991, including air sampling, vegetation, water, sediment, and

soil samples. The inspector also reviewed third quarter thermoluminescent dosimeter (TLD) results for 1991. Typically, the results for these samples were similar to the data shown in Table 13.1 of the License Application. The inspector concluded that the licensee's program to control the release of effluents from the site was satisfactory, and that releases of radioactivity to the environment were minimal.

The inspector reviewed the operational history of the liquid effluent system which lead to the contamination of the discharge stream (detailed in Inspection Report 70-1201/91-04). The inspector examined the contaminated area and observed that the discharge area had been properly roped off and conspicuously posted to provide assurance against unauthorized entrance.

In 1984, the licensee incorporated nine soil sample locations in this area as part of their quarterly routine environmental program. The inspector determined that the licensee continued to monitor these sample results to determine if migration of the contamination towards the James River was occurring. The sample results indicated that migration towards the James River was not apparent.

The licensee had recognized that the only effective means for determining the extent of the spread of contamination was through an expanded sampling and analysis of the soil in this area. The inspector discussed the characterization plan the licensee had developed towards this aim for this area. The inspector determined, during a conversation held with the licensee on May 29, 1992 that this area (approximately 0.6 acres) had been gridded off into 30 feet by 30 feet squares. Five surface samples (0 to 6 inches deep), and one subsurface sample (6 to 12 inches deep) were being removed from each square. The subsurface samples were composites obtained from the five surface sample locations. In all, approximately 470 samples will be analyzed. The licensee expected the sampling to be completed by June 10, 1992; and the results obtained by September, 1992.

No violations or deviations were identified.

10. Exit Meeting

The inspector met with licensee representatives indicated in Paragraph 1 at the conclusion of the inspection on April 29, 1992. The inspector summarized the scope and findings of the inspection. Although proprietary documents and processes were occasionally reviewed during this inspection, the proprietary nature of these documents or processes have

been deleted in this report. Dissenting comments were not received from the licensee. Non-cited violation 70-1201/91-04-01 for failure to have an approved written procedure to conduct an in-place test to measure the particle removal efficiency of the HEPA filters for the SERF-3 and PLR/SERF-1 ventilation systems was closed.