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

SEP 15 1993

Report Nos.: 50-259/93-27, 50-260/93-27, and 50-296/93-27

Licensee: Tennessee Valley Authority
6N 38A Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

Docket Nos.: 50-259, 50-260, and 50-296

License Nos.: DPR-33, DPR-52, and DPR-68

Facility Name: Browns Ferry 1, 2, and 3

Inspection Conducted: August 16-20, 1993

Inspector: _____ Sept. 7, 1993
N. G. McNeill Date Signed

Approved by: _____ 9/10/93
T. R. Decker, Chief Date Signed
Radiological Effluents and Chemistry Section
Radiological Protection and Emergency Preparedness Branch
Division of Radiation Safety and Safeguards

SUMMARY

Scope:

This routine, announced inspection was conducted in the areas of audits, radioactive waste handling, radioactive waste transportation, effluent release monitoring, chemistry parameters, environmental laboratory performance, audits, and personnel training and qualifications.

Results:

The licensee's audits and activities in the areas of radioactive waste treatment, effluent, and environmental monitoring were detailed and well documented. The licensee effectively controlled, quantified, and monitored releases of radioactive materials in liquid, gaseous, and particulate forms to the environment; and maintained and operated radioactive waste treatment systems to keep offsite doses as low as reasonably achievable (ALARA) . (Paragraph 2).

Changes to the licensee's organizational structure were found to have no apparent negative effects on the ability of the affected units to perform required tasks (Paragraph 3).

The activities performed by the licensee prior to the filling of a High Integrity Container and use of the Resin Dewatering System were found to be performed within Technical Specification and ALARA guidelines (Paragraph 4).

The Environmental Laboratory was well-maintained and calibrated and was successfully participating in an interlaboratory Quality Assurance program. The laboratory analysis results for split samples with the State of Alabama showed good agreement (Paragraph 5).

A shipment of dewatered resin, shipped to the Barnwell burial site, was examined and all aspects reviewed were found to meet applicable DOT and NRC requirements (Paragraph 6).

The activities performed by the licensee required for a Liquid Batch Release to the river were found to be complete and thorough (Paragraph 7).

The training and qualifications of several licensee technicians in several different areas were found to be current and well documented (Paragraph 8).

The licensee's Unit 2 chemistry parameters were maintained within Technical Specification requirements (Paragraph 9).

REPORT DETAILS

1. Persons Contacted

Licensee Employees

S. Armstrong, Chemistry Technical Support Supervisor
S. Bugg, Radwaste Manager
*J. Sabados, Chemistry and Environmental Manager
*P. Salas, Compliance Manager
*J. Scalice, Plant Manager
*K. Schaus, Monitoring Manager, Quality Assurance
*A. Sorrell, Program Manager
R. Wells, Compliance Licensing Manager

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

Nuclear Regulatory Commission

*C. Patterson, Senior Resident Inspector
*J. Munday, Resident Inspector

*Attended exit meeting on August 20, 1993

2. Audits (84750)

Technical Specification (TS) 6.5.2.8 requires that audits of unit activities be performed under the cognizance of the Nuclear Safety Review Board (NSRB) in the following areas: (1) the radiological environmental monitoring program and the results thereof at least once per 12 months; (2) the OFFSITE DOSE CALCULATION MANUAL and implementing procedures at least once per 24 months; (3) the PROCESS CONTROL PROGRAM and implementing procedures for SOLIDIFICATION of wet radioactive wastes at least once per 24 months; (4) the performance of activities required by the Quality Assurance Program to meet the criteria of Regulatory Guide 4.15, December 1977 or Regulatory Guide 1.21, Rev. 1, 1974, at least once per 12 months; and (5) the Radiological Effluent Manual and implementing procedures at least once per 12 months.

The inspector reviewed the following audit reports:

- Browns Ferry Nuclear Plant (BFN) - Nuclear Assurance - Radiological Effluent and Environmental Monitoring Audit BFA92303

- Browns Ferry Nuclear Plant (BFN) - Nuclear Assurance- Radiological Controls and Radioactive Material Management Audit SSA93306

- Browns Ferry Nuclear Plant (BFN) - Plant Chemistry/Plant Layup and Equipment Preservation Audit SSA93301

The inspector also reviewed the following monthly and quarterly assessments:

- Browns Ferry Nuclear Plant (BFN) - Fiscal Year 1993 First Quarter assessment of Radiological Control (RADCON) and Chemistry - NQA-BF-92-0015
- Browns Ferry Nuclear Plant (BFN) - Nuclear Assurance and Licensing - June 1993 - Monthly Assessment of Environmental/Waste Control - NA-BF-93-107
- Browns Ferry Nuclear Plant (BFN) - Nuclear Assurance and Licensing - June 1993 - Monthly Assessment of Radiological Control - NA-BF-93-105
- Browns Ferry Nuclear Plant (BFN) - Nuclear Assurance and Licensing - June 1993 - Monthly Assessment of Chemistry - NA-BF-93-106

The above audits assessed the adequacy and effectiveness of the radiological effluent monitoring program, radiological environmental program, and the waste management program. The audits covered the areas specified in TS 6.5.2.8. In general, the audits were detailed and well documented. The audits identified some program weaknesses and licensee management made adequate commitments to correct the few deficiencies identified.

No violations or deviations were identified.

3. Organizational Changes (84750 and 86750)

The inspector and the licensee discussed any changes in the radwaste and radiological environmental monitoring organizations. These discussions focused on management and personnel changes which could have an impact on the affected departments ability to perform their required tasks.

The primary change which had occurred in the abovementioned areas concerned the combining of the RADCON Manager, Chemistry Manager, and the Environemntal/Waste Control under a RAD-CHEM Manager. This reorgainization had been implemented in May 1993. The change, beside the removal of Chemistry from Operations, is primarily a combination of similar areas under a single RAD-CHEM Manager. The impact of this reorganization is being evaluated at this time.

There were no other significant organizational changes in the areas noted above since the last inspection.

No violations or deviations were identified.

4. Liquid Radioactive Waste Processing and Disposal (84750)

The BFNP RETS Manual, Section III, ODCM, Revision 13, Section 1.2.1.3, specifies that the liquid radwaste system will be used to reduce the radioactive materials in liquid discharge from the site when the projected monthly dose would exceed 0.06 mrem to the total body or 0.21 mrem to any other organ per unit.

The inspector observed the activities associated with receipt of a High Integrity Container (HIC), the hookup of that container to the Resin Dewatering System 1000 (RDS-1000), and preparations for filling and dewatering the container. The Dewatering bay area is set up so that a flatbed trailer can be backed into the bay and the RDS-1000 can be hooked up to the HIC so as to fill the container while the HIC is still in its shielding cask on the trailer.

The inspector observed swipes and direct readings of the container taken by Health Physics personnel. The inspector also observed all of the acivities completed prior to and including the hook up of the RDS-1000 fillhead to the HIC. These procedures are included in the following Operating Instruction:

- O-OI-77E, Solid Radwaste Operating Instruction, Revision 12

Completion of the hookup of the fillhead and set up for filling the container with resin involves personnel from Health Physics, Maintenance, and Operations, as well as the vendor supplied contract personnel. The inspector observed that all of the personnel involved followed the procedural instructions that each performed their specified tasks competently.

No violations or deviations were identified.

5. Environmental Laboratory (84750)

The Radiological Effluents Manual (REM), Section E, states the requirements for the radiological environmental monitoring program.

The inspector visited the Western Area Radiological Laboratory (WARL) in Muscle Shoals, AL. The WARL performs environmental sampling and analyses for the Browns Ferry site as well as for the Sequoyah and Watts Bar sites. The WARL also splits samples and does comparisons with the States of Alabama and Tennessee. The Laboratory also participates in the Environmental Protection Agency's (EPA's) Intercomparison Cross-check Program.

The inspector toured the laboratory and reviewed analytical equipment records for calibaration and maintainence, The equipment and records were maintained in an exemplary manner and revealed a high degree of expertise in the operation of the laboratory.

Records for the results of splits with the State of Alabama for sampling locations around the Browns Ferry plant were examined for comparison. There were no anomalous data reports and the samples revealed a high degree of agreement on the samples reviewed. Data for comparisons of the environmental samples for the Sequoyah and Watts Bar site with the State of Tennessee were also collected. These comparisons will be reviewed by Region II inspectors, who have responsibilities for the respective sites, during future inspections.

The inspector concluded that environmental sampling and analyses were being conducted in a competent and thorough manner as required in the REM. The Laboratory also exhibited a good working relationship with the State of Alabama.

No violations or deviations were identified.

6. Radiological Waste Transportation (86750)

10 CFR 71 estblishes the requirements for packaging, preparation for shipment, and transportation of licensed material. 10 CFR 71.5 requires the licensee to comply with the applicable requiermnets 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 20.311 specifies the requirements for control of transfers of radioactive waste intened for disposal at a land disposal facility and establishes a manifest tracking system.

10 CFR 61.55 and 61.56 establish the requirements for classification and characterization of radioactive waste shipped to a near-surface disposal site.

The inspector reviewed the following procedures:

- RWI-123, "Radwaste Instruction, Use of Casks," Revision 3
- FO-IP-9, Field operations Implementing Instruction Procedure No.9, "Radiation and Contamination Surveys"

The inspector reviewed these procedures and the Pre-Shipment Checklist for Shipment No. 930806. This shipment of dewatered resin was bound for the Barnwell burial site in South Carolina. The inspector reviewed all of the surveys performed, the inspection of the vehicle, the instructions given to the driver, the certification check of the driver, the placarding of the vehicle, and other requirements for the transfer of the shipment.

In all of the areas examined, the vehicle and the paperwork were found to be in compliance with the applicable regulatory requirements. The licensee was observed to handle all aspects of the shipment in a thorough and competent manner.

After the shipment had left the site, the emergency telephone number, as contained in the shipping manifest, was called and found to be operable. The number as listed on the manifest connected the inspector with the Central Emergency Control Center (CECC) in Chattanooga, Tennessee. The Operations Duty Specialist (OPS) who answered the call was immediately able to give detailed instructions for handling several types of emergency situations involving the shipment. This number is manned 24 hours a day and the OPS has copies of each shipment in transit for the TVA sites.

The licensee was found to handle all activities relative to the shipment observed in accordance with NRC and DOT regulations.

No violations or deviations were identified.

7. Liquid Effluent Releases (84750)

TS 3.8.A.1 states the requirements for liquid releases to unrestricted areas to be the concentrations specified in 10 CFR Part 20, Appendix B, Table II, Column 2 for radionuclides other than dissolved or entrained noble gases. For dissolved or entrained noble gases, the concentrations shall be limited to 2E-04 mCi/mL total activity.

TS 4.8.A.1 through 4.8.A.6 outlines the surveillance requirements for liquid discharges to unrestricted areas.

The inspector reviewed the following Surveillance Instruction:

- O-SI-4.8.A.1-1, "Release Procedure - Liquid Effluents," Revision 31

The inspector also reviewed the last four liquid Batch release permits from the Floor Drain Sample Tanks. Pre-Release and Post-Release data was reviewed for compliance with the Technical Specification and Offsite Dose Calculation Manual criteria. In addition, Pre- and Post-Release calculations were reviewed. The inspector reviewed each of the gamma analysis data sheets which accompanied the Release Permits.

In all of the areas outlined above, the Release Permits were found to be in compliance with the Technical Specifications. A review of the calculations found them to be accurate and to meet the requirements of the Offsite Dose Calculation Manual. Some select portions of the Surveillance Procedure were observed by the inspector as they were performed by licensee personnel. In the cases observed close adherence to the procedures was followed.

No violations or deviations were identified.

8. Training and Qualifications (84750)

10 CFR 19.12 requires the licensee to instruct all individuals working or frequenting any portions of the restricted areas in the health protection aspects associated with exposure to radioactive material or radiation, in precautions or procedures to minmize exposure, and in the applicable provisions of the Commission Regulations, individual responsibilities and the availability of radiation exposure data. The inspector reviewed the qualifications of several of the personnel observed performing the various tasks as outlined in this report. Names were presented to the Training coordinator and records for these personnel were reviewed to determine the level of training each individual had revceived for each task observed.

In all of the cases reviewed by the inspector, records were available for each of the personnel requested. The records, some of which go back as far as 1984 were found to be complete and applicable for the jobs as completed. The records revealed whether the individual had performed the task identified, when the individual was signed of by a supervisor as qualified to perform the task unsupervised, and in some cases whether a written test was required.

In general the inspector found the training and qualifications records for the individuals reviewed to meet the TSs.

No violations or deviations were identified.

9. Chemistry Parameters (84750)

TS 3.6.B.3.a through c outlines the limiting condition level requirements for conductivity, chloride concentration, and pH.

TS 4.6.B.3.a through c outlines the surveillance requirements conductivity, chloride concentration, and pH.

The inspector reviewed chemistry performance data for the calender year 1992 to date. In all areas specified in the TSs, the licensee was well below the maximum values permitted. On average the values for the chloride concentration were averaging 0.7 parts per billion (ppb), the conductivity was averaging 0.096 umho, and the pH was averaging 6.5 to 7.25. The licensee was also monitoring several parameters which are not required by TS but are important for fuel integrity and radwaste system surveillance. In this later category would be the sulfate analysis which was averaging 1.2 ppb and the dissolved oxygen levels which were averaging 35.0 ppb . In general the parameters listed were an order of magnitude lower than TS analytes and well within operational gudelines for the conductivity and pH.

The review of the Reactor Coolant System parameters revealed a high degree of compliance with both regulatory as well as industry guidelines for the optimal operation of the unit.

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 August 20, 1993. The inspector summarized the scope and findings of the inspection. The inspector also discussed the likely informational content of the inspection report with regard to documents or processes reviewed by the inspector during the inspection. The licensee did not identify any proprietary documents or processes during this inspection. Dissenting comments were not received from the licensee.

NRC FORM (11-91) U.S. NUCLEAR REGULATORY COMMISSION

IFS Data Entry Form

Reviewed By: _____

Date: 09/15/93

SPECIFY ALL THAT APPLY Page ___ of ___

___ Reactor/Vendor Inspection (IFS Option 1) ___ Docket Related/P21 Items (IFS Option 4)

Items Opened (Y/N): N Enter Log Number: _____

___ Material Inspection (IFS Option 2) ___ LER Items (IFS Option 5)

501 (Y/N): ___ Enter LER Number: _____

Letter (Y/N): ___

Clear (Y/N): ___ ___ Non-Docket Related Items (IFS Option 6)

Site/Name: BROWNS FERRY

Report Transmittal Date: ___/___/___

Lead Inspector: NIGHY

Responsible Org. Code: [ ][ ][ ]

Report End Date: 9/20/93

Region: 2

	Report NBR	Docket NBR	Materials Only License NBR
A	50-259		
B	50-260		
C	50-296		

Update? (Y/N): N Opened IR/LER/P21 LOG/IFS Number: _____

***Sequence NBR: _____ Item Type: _____ **Severity: _____ **Supplement: _____, _____

	Status	*UPD I/R	*Proj. Closeout	*Actual Closeout	Materials Only 10 CFR	Materials Only License Cond.	Materials Only Tie Down
A			___/___/___	___/___/___			
B			___/___/___	___/___/___			
C			___/___/___	___/___/___			

Title: _____ (55 character width)

Closeout Org: REC *Closeout EMP: _____ *Contact EMP: _____ *Procedure: _____ *Functl Area: _____, _____

*Cause CD: ___, ___ **EA Number: _____ **NOV/NNC Issue Date: ___/___/___

Text: NO VIOLATIONS, NO DEVIATIONS, NO OPEN ITEMS

Update? (Y/N): _____ Opened IR/LER/P21 LOG/IFS Number: _____

***Sequence NBR: _____ Item Type: _____ **Severity: _____ **Supplement: _____, _____

	Status	*UPD I/R	*Proj. Closeout	*Actual Closeout	Materials Only 10 CFR	Materials Only License Cond.	Materials Only Tie Down
A			___/___/___	___/___/___			
B			___/___/___	___/___/___			
C			___/___/___	___/___/___			

Title: _____ (55 character width)

Closeout Org: _____ *Closeout EMP: _____ *Contact EMP: _____ *Procedure: _____ *Functl Area: _____, _____

*Cause CD: ___, ___ **EA Number: _____ **NOV/NNC Issue Date: ___/___/___

Text: _____

* Optional Fields.

** Severity, Supplement, and NOV/NCC only applicable for Violations; EA Number only applicable for Escalated Enforcement Items.

*** Sequence NBR is not applicable for docket related/P21, LER, or non-docket related items.

ITEMS CONTINUED? (Y/N): N