

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

ACT 1 6 1987

Report Nos.: 50-259/87-34, 50-260/87-34 and 50-296/87-34

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

Docket Nos: 50-259, 50-260, 50-296 License Nos: DPR-33, DPR-52, DPR-68

Facility Name: Browns Ferry 1, 2, and 3

Inspection Conducted: September 21-25, 1987

Inspector:

Weddington

Accompanying Personnel: M. T. Lauer

Approved by:

C. M. Hosey, Section Chief Division of Radiation Safety and Safeguards Signed

SUMMARY

Scope: This was a routine, unannounced, onsite health physics inspection in the areas of: organization and management controls, training and qualifications, external and internal exposure control, dosimetry, facilities and equipment, solid wastes, transportation of radioactive material and followup on IE Information Notices.

Results: One violation was identified for failure to comply with the license condition of a radioactive waste disposal site.

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REPORT DETAILS

1. Persons Contacted

Licensee Employees

*J. G. Walker, Plant Manager *J. D. Martin, Assistant to Plant Manager *P. Carier, Compliance Manager *D. C. Smith, Chemistry Supervisor *J. M. Corey, Radcon Supervisor *F. S. Tsakeres, Radcon Supervisor *H. M. Crowson, Radcon Supervisor *D. S. Hixson, Radwaste Supervisor *D. C. Mims, Superintendent, Technical Services *C. S. Hseich, Licensing - Compliance *J. Olson, Unit 1 and Unit 3 Supervisor *L. W. Ivey, Licensing - Compliance *C. T. Dexter, Training Instructor *W. D. Dawson, Operations Training *H. W. Deason, Engineering and Technical Training *R. H. Albright, Radcon Supervisor *A. W. Sorrell, Site Radcon Supervisor *R. McKeon, Unit 2 Superintendent *L. J. Riales, Corporate Radwaste Supervisor *C. Beasley, Information Services *R. M. Tuttle, Site Security Manager *J. Shaw, Shift Technical Advisor Supervisor E. G. Pugh, Engineering and Technical Training B. Brooks, Training Supervisor L. J. Politte, Corporate Radcon R. Weeden, Site Radiological Assessor J. Barker, Manager, Radiological Controls, TVA

Other licensee employees contacted included technicians, security force members, and office personnel.

Nuclear Regulatory Commission

*G. L. Paulk, Senior Resident Inspector *C. A. Patterson, Resident Inspector *C. Brooks, Resident Inspector *E. Christnot, Resident Inspector

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on September 25, 1987, with those persons indicated in Paragraph 1 above. The following issues were discussed in detail: (1) An apparent violation for failure to comply with the license conditions of a disposal site (Paragraph 8), (2) A licensee identified violation concerning the failure to adequately perform alpha radioactive evaluations (Paragraph 9) and (3) The qualifications of a newly appointed supervisor in the Radcon group (Paragraph 4). The licensee acknowledged the inspection findings and stated that they believed the new supervisor met ANSI Qualification requirements. The licensee did not identify as proprietary any of the materials provided to or reviewed by the inspector during this inspection.

In a telephone conversation on September 28, 1987, between the inspector and the licensee's Site Radcon Manager, the licensee committed to establish a development plan for the newly appointed supervisor.

3. Organization and Management Controls (83722)

Technical Specification (TS) 6.1.B describes the licensee's radiation protection organization. The inspector reviewed the organization and staffing of the licensee's radiological control (radcon) and radwaste groups. Licensee representatives stated that due to TVA policy changes, 45 contract health physics (HP) technicians recently left the organization resulting in an increase in overtime hours for the remaining 100 technicians. Seventeen HP technician trainees will be ANSI qualified in approximately five months. Licensee representatives were unsure how much of the remaining staffing shortage will be filled through recruitment. One radwaste engineering supervisor position within the Solid Waste Unit was currently vacant. The licensee indicated that because of radwaste personnel cross training, this vacancy was not adversely impacting day to day radwaste operations.

No violations or deviation were identified.

- 4. Training and Qualification (83723)
 - a. Qualifications

TS 6.1.E requires that the qualifications of the Browns Ferry Nuclear Plant management and operating staff meet the minimum acceptable levels as described in ANSI-N18.1. Within the radcon group, the position of Radiological Protection Supervisor, Technical Section had recently been filled. The inspector reviewed the position description, the qualifications of the individual who filled the position, and numerous documents which discuss the applicability of the individual's employment history to the position's experience requirements. The inspector determined that the individual did not meet ANSI-N18.1, Paragraph 4.3.2 requirements for a supervisor not requiring NRC license in that the individuals ten year employment history did not include four years of experience in the craft or discipline he now supervises. In response to the inspector's observation, the licensee indicated that it would be more appropriate to characterize the position of Radcon Technical Supervisor as Staff Specialist described in Paragraph 4.6.2 of ANSI-N18.1 for which less defined experience levels are stated. ANSI-N18.1 also states that one of the responsibilities of a Staff Specialist is to supervise. The inspector indicated to the licensee that the absence of any commercial nuclear power plant experience would appear to affect the individuals ability to adequately fulfill many of the responsibilities delineated in the position description which included conducting field investigations of radiological incidents, performing periodic assessments of the radiological control program and development of radiological controls program policies. The inspector also stated that this individual may require additional indoctrination or training to enable him to fulfill all of these responsiblities. The licensee agreed that additional training may be required to enable him to be fully effective in his new position. This was identified as an inspector followup item and will be reviewed during subsequent inspections (IFI 50-259/260/296/87-34-01).

No violations or deviations were identified.

b. Training

10 CFR 19.12 describes instruction the licensee is required to give to individuals working in or frequenting any portion of a restricted area. The inspector reviewed lesson plans for Level I (restricted area access) and Level II (RWP access) General Employee Training (GET). Through discussions with licensee representatives it was determined that the GET program had recently been modified to separate and intensify the respiratory protection information taught during GET. This effort included separate lectures, tests, and practical factors covering supplied air/air purifying devices and the self-contained breathing apparatuses.

Licensee representatives stated that they are currently sending HP technicians to an operating BWR nuclear power plant in the region to maintain the technician's working knowledge of an operating plant as it relates to HP coverage. Groups of two were sent for eight weeks of field work acting in a contract HP technician capacity. It was indicated that this program is ongoing with 16 individuals having completed the eight week rotation to date.

No violations or deviations were identified.

- 5. External Occupation Exposure Control and Dosimetry (83724)
 - a. Surveys

10 CFR 20.201(b) requires that each licensee shall make or cause to be made such surveys as may be necessay for the licensee to comply

with the regulations in 10 CFR 20 and are reasonable under the circumstances to evaluate the extent of radiation hazards that may be present. During tours of the facility, the inspector reviewed Radiation Work Permits (RWP) posted at work areas. The licensee indicated that the survey maps associated with RWPs are located at the RWP issuance station and easily accessible to the worker for his review. During tours of the plant, the inspector performed independent radiation surveys and noted no inconsistencies with licensee survey results.

No violations or deviations were identified.

b. Processing Dosimeters

The inspector reviewed the licensee's methodology for TLD processing. Currently, all TLDs, approximately 5000 for the current calendar quarter were read onsite. The raw data was then electronically transferred to a licensee offsite facility where the data was processed with algorithms after which the resulting exposure data was transmitted to both the site and to the licensee's corporate office. The licensee indicated that in the event that the site was unable to electronically transfer raw data to the offsite facility, the data could be hand carried to the offsite facility or calculated onsite by hand. The inspector reviewed a "watch list" which was produced twice daily and contained pertinent exposure and training data for all individuals granted access to the site. This data included quarterly exposure limits, quarter-to-date exposure totals, Maximum Permissible Concentration (MPC) hour totals, and complete training status. Abnormal pocket dosimeter reading investigations for the third quarter were reviewed by the inspector with no inadequacies identified. The licensee indicated that no TLD/Pocket Chamber Discrepancy Reports were generated during the third quarter. After reviewing the action limits that require the generation of such reports, the inspector noted that the action limits appeared to result in few evaluations being performed since the licensee read TLDs when the cumulative pocket dosimeter reading approached 500 millirem and one of the criteria for performing the evaluation was that the exposure exceed 500 millirem. Licensee representatives stated that they would reevaluate the criteria.

c. Cumulative Exposure Totals

Licensee representatives stated that the person-rem exposure total thru September 13, 1987, was 868.8 person-rem which was 58.4 percent of the goal for 1987.

d. Personnel Contamination Event

On September 8, 1987, an individual became contaminated with a radioactive particle which resulted in an extremity exposure of 2.073 rem to the foot. The NRC limit for such exposures is 18.75 rem

per calendar guarter. The inspector reviewed the Personnel Contamination Report (PCR) for this event which indicated that the particle was located inside of the individual's shoe which prevented easy detection. The individual had been released from the regulated area on several occasions after setting off the hand and foot monitor. On each occasion health physics was unable to find any contamination on his shoe. The last time a check was made the inside of his shoe was checked and contamination up to 2400 counts per minute was detected with a frisker. Review of the gamma spectroscopy results indicate a cumulative activity of approximately 0.011 microcuries of Cobalt-60 (95%) and Zinc-65 (5%). The licensee determined that the individual had probably picked up the particle in a dressing area and that it had been in his shoe for approximately 26.5 hours. After review of the above data, the chronology of events, statements by individuals involved, and the licensees proposed corrective actions, which included training HP technicians on particle detection and control and revising their procedure for such events, the inspector determined that the licensee's actions were acceptable.

No violations or deviations were identified.

6. Facilities and Equipment (83727)

During plant tours, the inspector examined calibration and response check stickers on radiation protection instruments in use by licensee personnel. Flow rate meters on continuous air samplers in use throughout the plant were observed to be above the 30 liters per minute minimum as required by the licensee's procedures. The inspector toured the issue station for respirators, pocket chamber (PC) dosimeters, alarming dosimeters, and radiation detection instruments. Most of the equipment was bar coded which allowed for rapid and accurate data input into the computerized tracking system. This tracking system maintained real time personnel data on current PC readings, qualification status for specific types of respirators, respirator assignments, and radiation detection equipment assignments. The computerized system also tracked data on specific instruments such as recalibration due dates and preventative maintenance requirements.

Licensee representatives stated that they will soon begin using newly acquired, state of the art, whole body (WB) friskers at the exit from the regulated area. Such monitors were already in use at the exits from several contaminated areas. The licensee had conducted field tests to demonstrate the acceptability of using these devices rather than hand held friskers as the primary personnel contamination detection device. The inspector reviewed the technical basis and field test results for the adoption of the WB frisker. This review included an operational test by the inspector using a 7500 dpm Co-60/Cs-137 source and a Technetium-99 frisker check source. The WB frisker alarmed during each test.

No violations or deviations were identified.

7. Solid Wastes (84722)

Through discussions with licensee representatives it was determined that the scaling factors used to assure proper waste classification as required by 10 CFR 61.55 were last updated in 1984. The licensee stated that an update of these scaling factors would be complete before startup.

The inspector toured the resin dewatering process area. The licensee stated that the current process requires three 8-hour dewaterings separated by 16 hours of settling. However, prior to startup the licensee plans to begin operation of a new rapid dewatering system thereby decreasing the complete dewatering process to 12 hours.

The licensee stated that an aggressive attempt was being made to reduce the generation and current onsite inventory of solid waste. In keeping with these efforts, onsite solid waste inventory had decreased from 12,070 ft³ in March 1987 to 6,178 ft³ by the end of August 1987. A monthly waste generation goal of 4,700 ft³ had been set with an actual total during the month of August 1987 of 3,205 ft³. All of this data included dry active waste, dewatered resin, and solidified oil. The inspector reviewed a Radwaste Minimization Project Progress Report dated September 14, 1987. This report included completed and ongoing efforts such as the formation of a Radwaste Volume Reduction Committee, comparison of C-zone RWP entries and the amount of protective clothing waste generated, and the creation of separate tool rooms for the clean area and the regulated area. The inspector indicated to the licensee that this program appeared to be an aggressive initiative for decreasing solid waste generation of the site.

No violations or . litions were identified.

- 8. Transportation (86721)
 - a. Transportation Events

10 CFR 30.41(c) requires that before transferring byproduct material to a specific licensee of an Agreement State, the licensee transferring the material shall verify that the transferee's license authorizes the receipt of the type, form, and quantity of the byproduct material to be transferred.

License Condition 32A of Radioactive Material License 097, Amendment 41, issued to the low level radioactive waste disposal facility operation, Chem-nuclear Systems, Inc. by the State of South Carolina, Department of Health and Environment Control, requires that the licensee not receive any liquid radioactive waste regardless of the chemical or physical form.

License Condition 34 of Radioactive Material License 097, Amendment 41, requires that the licensee not accept liquid radioactive waste packaged in absorbent materials, or where absorbent materials have been used to absorb liquids rather than using an approved media to properly solidify the waste.

On August 5, 1987, a licensee radioactive waste shipment arrived at the Barnwell, SC disposal site. The shipment consisted of trash, filters, and mop heads packaged in 55-gallon drums within metal boxes (6 per box). Some of the drums were randomly selected and checked for excessive free liquids by puncturing the drum. A small amount of clear liquid (approximately 1 to 2 ounces) was immediately drained from one of the drum, followed by a sludge comprised of absorbent material and water. After several hours, approximately a pint of liquid and absorbent had drained from the drum. The licensee was notified of the problem by the State of South Carolina. No enforcement action was taken by the State other than sending a letter notifying the licensee of the problem and that the State license requirements had been violated.

The licensee conducted an investigation into the excess liquid in the waste drum containing mop heads. The mops packaged in the drum had been used in contaminated areas of the facility and then taken to a central area in the radwaste building. The mops were not allowed to dry completely because of the concern that the contamination might become airborne. The mop heads, along with absorbent material, were placed in the drums. The licensee did not identify any unusual circumstances concerning the processing of this drum such as procedure noncompliance or involvement of inexperienced personnel. The licensee concluded that the mop heads were probably excessively wet when placed in the drum. Licensee representatives stated that they were evaluating means of ensuring that the mop heads were completely dry before being placed in a drum and were developing policies that would reduce the number of mops used in the controlled area. Shipment of the drum of mop heads containing liquid and the use of absorbent material rather than a solidification agent was identified as an apparent violation of 10 CFR 30.41(c) (50-259/260/296/87-34-02).

b. Audits

10 CFR 71.137 requires that the licensee shall carry out a comprehensive system of planned and periodic audits to verify compliance with all aspects of the radioactive waste packaging quality assurance program.

The inspector reviewed records of selected audits performed by the Onsite Quality Surveillance Section in the area of transportation. No deficient areas were documented in the reports reviewed.

No violations or deviations were identified.

c. 10 CFR 71.5(a) requires each licensee who transports 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.

The inspector reviewed selected records of radioactive material shipments performed during 1987. The inspector verified that the radioactive material manifests, shipment classification, marking, labeling and placarding were consistent with DOT requirements.

No violations or deviations were identified.

9. Internal Exposure Control and Assessment (83725)

The licensee is required by 10 CFR 20.103, 20.201(b), 20.401 and 20.403 to control intakes of radioactive material, assess such intakes and keep records of and make reports of such intakes. Chapter 12 of the Final Safety Analysis Report (FSAR) also includes commitments regarding internal exposure control and assessment.

The inspector reviewed a Condition Adverse to Quality Report (CAQR) involving internal dose control and assessment during the Unit 2 drywell safe end replacement project from December 1986 to April 1987. At the initiation of this project, air samples taken were not adequately assessed for alpha contamination until several days after the air samples were taken. The licensee indicated that this delay was caused by pre-job assessments and surveys which indicated that no significant airborne alpha contamination was expected during the project and the nonavailability of sufficient equipment to perform alpha counting.

Approximately one month into the project, sufficient data was available for the licensee to realize the magnitude of the alpha radiation problem. An analysis of air samples indicated that the average alpha Maximum Permissible Concentration (MPC) fraction was seven times the beta/gamma MPC fraction on these samples. The highest single sample was taken following a breach in a glove bag which indicated peak alpha concentrations of 2500 times MPC. Personnel working in the area at the time had been wearing respiratory protection and had left the area immediately. The licensee established a task force that, with corporate assistance, was asked to evaluate the alpha problem and to recommend corrective actions. The licensee took effective action to implement appropriate controls for the remainder of the outage. The highest exposure assigned to any individual who had been working in the areas where airborne alpha radioactivity was present was 10 MPC-hours.

The inspector determined that the failure of the licensee to perform adequate evaluations prior to the work to indicate that an alpha radiation hazard may be present and failure to promptly count samples for alpha at the beginning of the outage, was an apparent violation of 10 CFR 20.201(b). However, because the licensee had identified the problem and had initiated corrective actions, the inspector determined that the licensee had met the self-identification criteria in 10 CFR Part 2, Appendix C for not issuing a Notice of Violation. The licensee's long term corrective action will be reviewed during a subsequent inspection (50-259/260/296/87-34-03).

10. IE Information Notice (IEN) (92717)

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The inspector determined that the following information notices had been received by the licensee, reviewed for applicability, distributed to appropriate personnel and that action, as appropriate, was taken or scheduled.

IEN 87-31, Blocking, Bracing, and Securing of Radioactive Materials Packages in Transportation

IEN 87-37, Control of Hot Particle Contamination at Nuclear Power Plants