



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

JUL 23 1986

Report Nos.: 50-327/86-36 and 50-328/86-36

Licensee: Tennessee Valley Authority
 6N38 A Lookout Place
 1101 Market Street
 Chattanooga, TN 37402-2801

Docket Nos.: 50-327 and 50-328

License Nos.: DPR-77 and DPR-79

Facility Name: Sequoyah 1 and 2

Inspection Conducted: June 16-20, 1986

Inspector: *Roy E. Weddington* 7/15/86
Date Signed

Accompanying Personnel: C. H. Bassett

Approved by: *C. M. Hosey* 7/15/86
Date Signed
 C. M. Hosey, Section Chief
 Division of Radiation Safety and Safeguards

SUMMARY

Scope: This was a special, announced inspection in the areas of previous enforcement matters; health physics restart issues; follow-up on allegations; organization and management controls; external exposure control; internal exposure control; control of radioactive material; facilities and equipment; licensee's program for maintaining occupational radiation exposures as low as reasonably achievable (ALARA); solid wastes; transportation; follow-up on previous inspector identified items; and IE Information Notices.

Results: One violation was identified for failure to perform radiation surveys on the top surfaces of exclusive use closed transport vehicles.

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REPORT DETAILS

1. Persons Contacted

Licensee Employees

*H. L. Abercrombie, Site Director
 P. R. Wallace, Plant Manager
 *D. E. Crawley, Site Radiological Controls Supervisor
 *L. M. Nobles, Superintendent Operations
 *M. R. Harding, Site Licensing Manager
 *P. H. Buchholz, ONP Site Representative
 *T. M. Galbreth, ECP Site Representative
 *J. M. Qualls, Radwaste Controller
 *W. E. Andrews, Site Quality Manager
 *J. Blankenship, Manager, Information Services
 *G. B. Kirk, Compliance Licensing Supervisor
 *W. S. Wilburn, Maintenance
 *M. A. Palmer, Dosimetry Unit Supervisor
 *A. King, Dosimetry Engineer
 *R. C. Birchell, Licensing Engineer
 S. P. Holdefer, Health Physics Assistant Supervisor
 J. S. Steigelman, Health Physics Assistant Supervisor
 J. Dills, Health Physics Assistant Supervisor
 T. Black, Health Physics Training Officer
 W. D. Tidwell, Chemistry Engineer
 A. W. McKinney, Low Level Radwaste Supervisor
 J. Osborne, Health Physics Shift Supervisor
 J. Leamon, ALARA Coordinator
 D. Smith, Health Physics Shift Supervisor
 M. Edwards, ALARA Technician
 T. Noble, ALARA Technician
 S. Harrison, Dosimetry Section Coordinator

Other licensee employees contacted included six technicians, three public safety employees, four craftsmen, and office personnel.

NRC Resident Inspectors

K. Jenison, Senior Resident Inspector
 L. Watson, Resident Inspector
 P. Harmon, Resident Inspector
 *D. Loveless, Resident Inspector

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on June 20, 1986, with those persons indicated in Paragraph 1 above. The following issues were discussed in detail: (1) an apparent violation for failure to perform adequate radioactive material transportation surveys (Paragraph 11); the licensee's ALARA program (Paragraph 9); reorganization of the health physics staff (Paragraph 5); and the quantity of material taken into the facility's controlled area requiring subsequent release surveys (Paragraph 8). The licensee acknowledged the inspection findings and stated, in regard to their ALARA program, that their employee concerns program and recent assignment of a health physics supervisor to the maintenance section should be taken into consideration when evaluating the overall effectiveness of the program. The licensee did not identify as proprietary any of the materials provided to or reviewed by the inspector during this inspection.

3. Licensee Action on Previous Enforcement Matters (92702)

(Closed) Violation (50-327/86-04-04.b and 50-328/86-04-04.b), Failure to perform adequate surveys of material and equipment being released for unrestricted use. The inspector reviewed the licensee's response of April 30, 1986, and verified that the corrective action specified in the response had been taken.

(Closed) Violation (50-327/84-04-04.c and 50-328/86-04-04.c), Failure to perform adequate evaluations of lost pocket dosimeter rezero sheets. The inspector reviewed the licensee's response dated April 30, 1986, and verified that the corrective action specified in the response had been taken.

4. Allegations

a. Allegation (RII-86-A-0006)

The following concerns were expressed regarding the licensee's health physics technician training program: (1) the oral board examinations are unfair and unrealistic; (2) trainees must live with threats regarding sign-offs in their qualification record; (3) too much emphasis is placed on survey paperwork appearance as opposed to quality work; (4) first line shift supervisors show favoritism and are unfair; (5) it is difficult to obtain appointments with middle management; (6) a trainee failed his oral exam because he was not liked by one of the board members; (7) health physics technicians hired from outside TVA do not have to go through an oral board; and (8) the few good supervisors are not allowed to be on the oral board.

b. Discussion and Finding

This allegation was referred to the licensee for review and action by letter dated March 19, 1986. The inspector reviewed documentation of an investigation conducted by the Supervisor of the licensee's

Personnel Services Staff into the concerns and a memorandum from the health physics training unit at the licensee's Power Operations Training Center. The licensee did not substantiate any of the allegations, however, several recommendations were made regarding improvements in communications and employee relations. The inspector discussed with licensee representatives several of the concerns. The inspector determined that concern number (7) was essentially factual in that the licensee did not require health physics technicians hired from outside TVA to go through an oral board if they meet the ANSI 18.1-1971 standard for a fully qualified technician. This practice is, however, consistent with regulatory requirements. The inspector determined that the licensee's review had been adequate and no violations or deviations were identified.

With the exception of concern number (7), the allegation was not substantiated.

5. Organization and Management Controls (83722)

The inspector reviewed the licensee's organization, staffing level and lines of authority as they related to radiation protection, radioactive material control and transportation of radioactive material and verified that the licensee had not made organizational changes which would adversely affect the ability to control radiation exposures, radioactive material or transportation activities.

Licensee representatives stated they are preparing to implement a reorganization of their onsite health physics staff. The reorganization will involve upgrading qualification requirements for several positions and adding more technical positions to the staff. The effectiveness of the reorganized staff and individual qualifications will be reviewed during subsequent inspections (50-327, 328/86-36-02).

6. External Exposure Control (83724)

The inspector discussed changes in the licensee's dosimetry procedures with dosimetry section personnel. Since the previous inspection, the licensee had established a system of individual employee working files containing such information and documents as Form NRC-4's, dose assignments, lost dosimetry reports, whole body count reports, dosimetry processing reports and deficiency reports. The documents had been previously filed by type of record. The licensee also implemented a system of log books for these various forms to provide an audit trail for the documents and to facilitate management reviews and trending. Changes were made to applicable procedures to reflect the revised practices.

A TVA employee was recently transferred to the facility to fill the vacant position of dosimetry engineer. The inspector reviewed the individual's qualifications and discussed his duties with licensee management. The inspector determined that the individual was qualified for the position and his recent efforts in training dosimetry personnel and reviewing the

functioning of the dosimetry office had enhanced the licensee's dosimetry program.

The inspector reviewed the staffing of the licensee's dosimetry section. In addition to the section supervisor and senior technician, who functions as a shift coordinator, the section has 11 assigned technicians. The licensee's dosimetry technician training program consists of an initial three month formal training course followed by a period of on-the-job training ending in an oral board examination. The complete qualification program was typically completed within 19 months. Two of the 11 technicians had completed the dosimetry technician training program. Another five of the technicians were within three months of becoming qualified. The remaining four technicians had only recently completed initial formal training. Licensee representatives stated that within approximately three months, sufficient individuals will have completed the qualification program to permit assignment of a fully qualified technician to each shift. The inspector determined by interviews and observations that the technicians were sufficiently knowledgeable in their assigned duties and appeared comfortable with the responsibilities given them when supervision was not present. Based on the additional experience level of the dosimetry section personnel and the technical expertise provided by the recently assigned dosimetry engineer, the inspector determined that the staffing level and expertise in the dosimetry section was adequate and the inspector followup item in this area was closed (50-327, 328/86-04-05).

No violations or deviations were identified.

7. Internal Exposure Control (83725)

The inspector reviewed the following licensee procedures relating to internal exposure control:

DSIL-24, Internal Dosimetry, Revision 2, December 23, 1985
RCI-11, Bioassay Program, Revision 5, April 10, 1985

The inspector discussed with licensee representatives the operation and calibration of the whole body counting equipment, which consisted of two Massey Boulton chair-type counters. The chairs were equipped with two NaI detectors for measuring radioactivity in the lung and thyroid. The inspector observed dosimetry section personnel perform a daily response check of the whole body counter and perform a routine whole body count.

ANSI standard N343-1978, Internal Dosimetry for Mixed Fission and Activation Products, recommends in Section 15.1 that the in-vivo detector shall be sufficiently shielded and located to allow measurements of five percent of the maximum permissible organ burden (MPOB) of the radionuclides listed in Section 8.2 of the standard for at least 95 percent of the in vivo measurements performed. The inspector observed that the whole body counter's lower limits of detection for Ruthenium 106 and Barium-Lanthanum 140 were typically in excess of ten percent of a MPOB for those radionuclides. Licensee representatives stated that they were not

able to achieve a greater sensitivity with the equipment that was being used. They also stated they were in the process of replacing the current equipment with newer whole body counters which should permit greater sensitivity.

No violations or deviations were identified.

8. Control of Radioactive Materials and Contamination, Surveys, and Monitoring (83726)

The inspector reviewed records of radiation and contamination surveys maintained in the health physics field office and those posted at selected job sites. During tours of the facility, the inspector performed independent radiation surveys and noted no inconsistencies with area postings.

A violation identified in Inspection Report No. 50-327, 328/86-04 concerned failure to perform adequate surveys to release material and equipment from the licensee's regulated area. In the written response to the violation, the licensee stated that health physics personnel had been instructed in appropriate survey practices and in plant procedures. It was observed during the inspection that a significant quantity of material was apparently being taken into the regulated area and subsequently surveyed for release unnecessarily. Many of the items were common hand tools such as socket wrenches, screwdrivers, electric drills and electronic test equipment. At one point, it was observed that four licensee health physics technicians required over an hour and a half to survey workers' tools for release from the regulated area at the end of a shift. Licensee employees interviewed indicated that this type of backlog at shift change was typical since the licensee began performing more careful release surveys. The inspector noted that the possibility of failing to detect radioactivity likely increases with the quantity of material requiring survey, and that minimizing the quantity of material taken into the regulated area which would require subsequent surveys for release would reduce this potential. The licensee acknowledged the inspector's observation. This area will be reviewed during subsequent inspections.

No violations or deviations were identified.

9. ALARA (83728)

The inspector reviewed a recent change in the licensee's ALARA Procedure, RCI-10, Revision 11, ALARA Planning, May 1, 1986. The change involved new criteria for preplanning radiological work utilizing two levels of preplanning, Level I and Level II. Level I preplanning consisted of basic considerations to be taken by a health physics technician or supervisor in the formulation of a radiation work permit for work that was not considered high risk. The next higher level of preplanning criteria, Level II, dealt with work that involved one or more of the following: (1) whole body dose per individual of one rem per day, (2) extremity dose per individual of greater than 25 percent of the quarterly limit per day, (3) cumulative whole body dose for the job greater than five man-rem, or (4) internal exposures

greater than 10 MPC-hours per individual per day. Jobs which met Level II criteria were reviewed by the responsible work group supervisor, health physics shift supervisor and the ALARA engineer. No higher level of management involvement in ALARA planning was provided since the licensee did not have an ALARA review committee. Such committees typically review pre-plans and post-job critiques for major radiological work, actions on suggestions and problem reports, ALARA progress and trending reports and changes to the facilities and equipment impacting on radiation protection.

A licensee representative stated that only about ten percent of the jobs preplanned in 1985, would have required preplanning under the new criteria due primarily to deletion of the requirement that jobs in exposure fields greater than 1 Rem/hour be preplanned and several RWPs were typically written for major radiological work and the new preplanning criteria was applied independently to each RWP. Only one job had been preplanned since the procedure change and it had not technically met Level II preplanning criteria. The work involved sludge lancing steam generators and preplanning had been directed by health physics. The inspector stated to licensee representatives that it appeared that the consideration of ALARA applications in prejob planning had greatly decreased as evidenced by the fact that few to no jobs any longer qualified for review under the new ALARA preplanning criteria.

The licensee had an ALARA suggestion and problem reporting system, however, the inspector noted that participation by employees was historically poor and was currently averaging only about one suggestion per month. The licensee did not have an incentives program to promote employee interest in the suggestion program.

The licensee had a program to review the number of contaminated areas in the plant and plan for their reduction. Review meetings were conducted on a biweekly basis when the plant was operating and were attended by operations, health physics and maintenance senior management. No such program existed during shutdowns. During tours of the facility, the inspector noted what appeared to be a large number of areas controlled as contamination control areas.

In August 1985, a health physics technician was assigned to the maintenance section. The licensee recently replaced the technician with a health physics supervisor to enhance the level of coordination between the two groups. The inspector interviewed the supervisor concerning his duties and accomplishments and determined that his assignment had had a positive effect on the involvement of health physics in the early stages of job planning.

The licensee's total man-rem exposure for the year as of June 4, 1986, was 705.5 compared to the estimate of 1150.

The effectiveness of the licensee's ALARA program will be reviewed during subsequent inspections (50-327, 328/86-36-03).

No violations or deviations were identified.

10. Solid Wastes (84722)

The licensee's chemistry section has the responsibility for maintaining the 10 CFR Part 61 compliance program. The inspector interviewed the chemistry engineer who was principally involved in the program. The inspector reviewed licensee Procedure TI-61, Revision 2, November 1, 1985, Waste Classification, Scaling Factors, and Quantity Determination.

The inspector reviewed the licensee's identification of waste streams, sampling program and computerized waste classification procedures. The licensee normally sampled each waste stream annually, except for dry active waste which was performed every two years. The next set of annual waste stream samples were due in October, however, the licensee planned to postpone the sampling until after the units restarted to ensure that their derived scaling factors were representative. The inspector stated this would be acceptable since the scaling factors currently being used would likely remain valid as long as the units were not operating.

The licensee had contracted with Chem-Nuclear Systems, Inc. (CNSI) to perform an evaluation of burnable poison rods and a thimble plug stored in the spent fuel pool to determine if they were acceptable for disposal (i.e., radionuclide concentrations were within at least waste class C limits). The evaluation would be based on radiation surveys performed on the components. The inspector reviewed the procedures associated with the work and observed CNSI and licensee personnel performing the inventory of components and underwater radiation surveys. The highest level found was on the thimble plug which was 420 rem/hour at six inches and 1600 rem/hour at contact. The results of the radiation survey were being evaluated at the conclusion of the inspection.

As of June 13, 1986, the licensee had shipped 8,627 cubic feet of radioactive waste to low level waste disposal facilities compared to the estimate for the year of 23,400 cubic feet.

No violations or deviations were identified.

11. Transportation (86721)

The inspector reviewed the following licensee procedures regarding the transportation of licensed material:

TVA, Office of Nuclear Power, Radioactive Material Shipment Manual, Revision 24, February 28, 1986

Radwaste Handling and Shipping Instruction-2.1, DAW Shipment to Chem-Nuclear, Barnwell, South Carolina, Revision 0, February 25, 1986

Radwaste Handling and Shipping Instruction-3, Shipment of Radioactive Waste to Chem-Nuclear Systems, Inc., Barnwell, S.C., Revision 7, April 3, 1986

Radwaste Handling and Shipping Instruction-4, Shipping of Radioactive Articles or Equipment Offsite and to Other Plants, Utilities, or Vendors, Revision 1, December 10, 1985

The inspector reviewed the following documents related to the maintenance and use of NRC approved packages:

Certificate of Compliance No. 9139, January 20, 1985, General Electric Model No. 589 Cask

Certificate of Compliance No. 6568, June 12, 1984, Docket No. 71-0227, Approval No. 0227, Revision 5, December 23, 1985

The inspector verified that the licensee had established implementing quality assurance procedures and that they were registered users for the above NRC approved packages.

The inspector selectively reviewed records of shipments performed during calendar year 1986. The inspector verified that the radioactive waste manifests reviewed had been properly completed.

The inspector noted the radiation survey records filed with the shipping papers for two shipments performed on May 2, 1986, and June 5, 1986, under Control Numbers SNP-428 and SNP-430 did not indicate that any radiation surveys had been taken at contact on the top surfaces of the vehicles. Both shipments consisted of dry active waste contained in drums and boxes and shipped in exclusive use closed transport vehicles. The inspector also noted that shipping records of casks transported on flatbed vehicles indicated that radiation surveys had been taken on the top surfaces of the casks.

The inspector noted that licensee Procedure RHSI-3 required radiation surveys on the top of casks, but the required survey points described in licensee Procedure RHSI-2.1 for exclusive use closed transport vehicles omitted the top surfaces of the vehicle.

Both shipments in question had been transferred to the CNSI low level waste disposal facility near Barnwell, S.C. The shipping records indicated that the highest level container within the two shipments had read 400 millirem/hour at contact and 50 millirem/hour at three feet from the container. Receipt verification documents from CNSI for the two shipments indicated that no discrepancies had been noted upon the shipment's arrival at the disposal site.

10 CFR 71.5(a) requires that 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, 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.

49 CFR 173.475(i) requires that before each shipment of any radioactive materials package, the shipper shall ensure by examination or appropriate tests that external radiation levels are within the allowable limits.

49 CFR 173.441(b)(2) requires that the radiation levels on packages transported by exclusive use shipment not exceed 200 millirem per hour at any point on the outer surfaces of the vehicle, including the top and underside of the vehicle.

Failure to perform radiation level measurements on the top surfaces of the exclusive use transport vehicles for Shipments SNP-428 and SNP-430 was identified as an apparent violation of 10 CFR 71.5(a) (50-327, 328/86-36-01).

12. Inspector Follow-Up Items (92701B)

(Closed) IFI (50-327/84-21-07 and 50-328/84-22-07), Disconnected ventilation duct on the radioactive waste compactor. The inspector verified that the ventilation duct had been connected to the facility filtered ventilation system.

(Closed) IFI (50-327, 328/86-04-07), Performance of routine radiation surveys in outside uncontrolled areas within the plant protected area. The inspector reviewed licensee Procedure HPSIL-35, Environmental Monitoring Surveys, Revision 0, April 29, 1986. The procedure required that radiation and contamination surveys and soil sampling be performed in outside areas of the plant within the protected area on an annual basis. A portion of these areas were to be surveyed each calendar quarter.

(Closed) IFI (50-327, 328/86-04-05), Increase staffing and technical expertise in the dosimetry section. See Paragraph 6.

(Closed) IFI (50-327, 328/86-04-06), Review licensee's revised radiation work permit system. The inspector reviewed licensee Procedure RCI-14, Radiation Work Permit (RWP) Program, Revision 5, May 1, 1986. The inspector also interviewed health physics technicians responsible for completing RWPs and reviewed selected RWPs on file in the health physics field office and at job sites. The inspector determined that the new RWP system appeared to be an improvement over the previous system, especially in regard to clarity, more efficient administration and more timely capture of MPC-hour and skin dose assessment information.

(Closed) IFI (50-327, 328/86-28-06), Review requirements for monitoring leakage from regulated areas and establishing controls. Through discussions with licensee representatives, the inspector determined that health physics personnel had been instructed in appropriate actions to take in the event leakage from regulated areas was observed.

13. IE Information Notices (IEN) (92717)

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 86-20: Low-Level Radioactive Waste Scaling Factors, 10 CFR Part 61
- IEN 86-22: Underresponse of Radiation Survey Instrument to High Radiation Fields
- IEN 86-23: Excessive Skin Exposures Due to Contamination with Hot Particles
- IEN 86-24: Respirator Users Notice: Increased Inspection Frequency for Certain Self-Contained Breathing Apparatus Air Cylinders
- IEN 86-42: Improper Maintenance of Radiation Monitoring Systems
- IEN 86-43: Problems with Silver Zeolite Sampling of Airborne Radioiodine
- IEN 86-44: Failure to Follow Procedures When Working in High Radiation Areas

14. Health Physics Restart Issues

(Open) VIO (50-327, 328/86-04-04.a), Inadequate evaluation of lens of the eye exposure due to noble gas. Item to remain open pending receipt and evaluation of supplemental response from licensee.

(Closed) VIO (50-327, 328/86-04-04.b), Inadequate release surveys. See Paragraph 8.

(Closed) VIO (50-327, 328/86-04-04.c), Inadequate evaluation for lost pocket dosimeter rezero sheets. See Paragraph^b 3.

(Closed) IFI (50-327, 328/86-04-05), Increase staff expertise in dosimetry section. See Paragraph 6.

(Closed) IFI (50-327, 328/86-04-06), Revised radiation work permit program. See Paragraph 12.

(Open) IFI (50-327, 328/86-36-02), Review reorganized health physics staff. See Paragraph 5.

(Open) IFI (50-327, 328/86-36-03), Review licensee's resolution of weaknesses identified in the ALARA program. See Paragraph 9.