



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W.
ATLANTA, GEORGIA 30303

Report No.: 50-259/78-30, 50-260/78-33, 50-296/78-31

Docket No.: 50-259, 50-260, 50-296

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

Licensee: Tennessee Valley Authority
830 Power Building
Chattanooga, Tennessee 37401

Inspection at: Browns Ferry 1, 2, and 3

Inspection conducted: November 13-17, 1978

Inspector: L. L. Jackson

Approved by:

Jr

AY Jackson

J. T. Sutherland, Chief
Fuel Facility and Materials
Safety Branch

12/7/78

Date

Inspection Summary

Inspection on November 13-17, 1978 (Report Nos. 50-259/78-30, 50-260/78-33, and 50-296/78-31)

Areas Inspected: Routine, unannounced inspection of the radiation protection program including calibration of instrumentation and independent contamination surveys, made by the inspector, in the main lunchroom and in the hallway leading from the plant area to the lunchroom. The inspection involved 32 hours onsite plus eight hours at the Radiological Hygiene Branch facilities in Muscle Shoals, Alabama. Only one inspector was involved.

Results: Of the two areas inspected, no items of noncompliance or deviations were identified in one area; one apparent item of noncompliance was identified in one area [Infraction - Main Steam Line High Radiation Monitor Setpoints (78-33-01) - paragraph 4.d].

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DETAILS I

Prepared by:

A. F. Gibson
L. L. Jackson, Radiation Specialist
Radiation Support Section
Fuel Facility and Materials
Safety Branch

12/7/78
Date

Dates of Inspection: November 13-17, 1978

Reviewed by:

A. F. Gibson
A. F. Gibson, Chief
Radiation Support Section
Fuel Facility and Materials
Safety Branch

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Date

All information in DETAILS I applies equally to Units 1, 2, and 3, except where information is identified with a specific unit.

1. Individuals Contacted

Division of Power Production - Browns Ferry Nuclear Plant

- *J. G. Dewease, Plant Superintendent
- H. L. Abercrombie, Assistant Plant Superintendent
- W. C. Thomison, Chemical Engineer
- *S. G. Bugg, Plant Health Physicist
- J. R. Burns, Cognizant Engineer, I&C
- *J. R. Pittman, Instrument Engineer
- R. G. Metke, Results Supervisor
- *J. L. Harness, Quality Assurance Supervisor

Division of Environmental Planning - Radiological Hygiene Branch

- E. A. Belvin, Chief, Radiological Hygiene Branch
- T. H. Youngblood, Jr., Health Physicist
- J. L. Lobdell, Supervisor, Radiation Surveillance and Service Section

Division of Environmental Planning - Laboratory Branch

- R. F. Atwell, Jr., Supervisor, Equipment Design and Testing Section

The inspector also talked with other licensee employees, including health physics technicians, instrument and control technicians, plant operators and a shift engineer.

*Denotes those present at the exit interview.

2. Licensee Action on Previous Inspection Findings

(Open) Noncompliance (78-27-01, 78-30-01, and 78-26-01), Failure to issue ratemeters to individuals or groups of individuals entering high radiation areas. Because of the short time span between inspections the licensee has not had time to achieve a permanent solution to the problem; however, the inspector verified by discussion with a licensee representative that a temporary solution was in effect pending a permanent solution to the problem. This item will remain open pending a formal reply stating the permanent solution.

3. Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, items of noncompliance, or deviations. One unresolved item disclosed during this inspection is discussed in paragraph 4.d.(10).

4. Instrument and Equipment Calibrations

a. Portable Health Physics Equipment

- (1) In order to perform the surveys required by 10 CFR 20.201 health physics instrumentation and equipment must be calibrated. This is also a licensee commitment in the Operation's Quality Assurance Manual.
- (2) The inspector identified several portable radiation measuring instruments and several air samplers in use by the plant health physics organization and verified that calibrations had been performed at the intervals specified by the licensee's procedures. The inspector had no further questions in this area.

b. Thermoluminescent Dosimeters (TLD's)

- (1) 10 CFR 20.202 requires that personnel monitoring equipment be supplied to individuals when certain conditions, relating to radiation hazards, exist.
- (2) The inspector discussed the use and processing of TLD's with a licensee representative. The inspector observed the equipment used to process TLD's and discussed the procurement (purchase specifications); QA checks prior to use; calibration of the TLD's and the TLD reading equipment; and some of the computerized controls for alerting the attending technician of equipment problems and of TLD readings which exceed a predetermined action level.

No items of noncompliance or deviations were found.

c. Control Room Air Supply Duct Radiation Monitors

- (1) Technical Specification Table 4.2.G requires that the Control Room Air Supply Duct Radiation Monitors (RM-90-259 A&B) be calibrated once per three months and functionally tested once per month.
- (2) Technical Specification Table 3.2.G requires the trip setting for these monitors to be set at 270 cpm above background.
- (3) The inspector reviewed calibration and functional test records back to the first quarter of 1978. Records indicate that the calibration and functional tests were performed within the required intervals and that the setpoints were at or less than 270 cpm above background.

No items of noncompliance or deviations were found.

d. Main Steam Line High Radiation Monitors

- (1) Technical Specification Table 4.1.B requires that the main steam line high radiation monitors be calibrated every three months using a standard current source and every refueling using a known radiation source.
- (2) Technical Specification Table 4.2.A requires that the main steam line high radiation monitors be functionally tested every month.
- (3) Technical Specification Table 3.2.A requires that the main steam line radiation monitor trip setting be ≤ 3 times the normal full power background and that the alarm setting be ≤ 1.5 times the normal full power background.
- (4) The inspector reviewed the latest radioactive source calibrations for all three units.

The inspector had no questions in this area.

- (5) The inspector reviewed the standard current source calibrations and functional tests completed in 1978 (prior to the inspection).

The inspector found no problem as to the timeliness of the calibrations and functional tests.

- (6) The inspector compared the actual readings (Unit at nominal full power of 1090+ MWe) on the Unit 2 main steam line high radiation monitors with the trip level setpoints as given in Surveillance Instruction 4.1.B-10, (Calibration) and Surveillance Instruction 4.1.A-10, (Functional Test). The trip level setpoints on Channels B, C, and D exceeded the monitor readings by more than a factor of three.

The inspector confirmed by discussions with an Instrument Technician who was performing calibrations on the Unit 2 main steam line high radiation monitors, that the values given in Surveillance Instruction 4.1.B-10 were the values to which the trip level settings were adjusted. (See setpoint values in Table I) The inspector observed an actual check of the setpoint on Channel D and found it to be approximately 1375 mr/hr. Based on this check it was assumed that the setpoints for the other channels would be at or near the values specified in Surveillance Instruction 4.1.B-10.

- (7) The inspector gathered the following data:

TABLE I

Unit 2 at Nominal Full Power (1092 + MWe)

Channel	Background Reading			Setpoint ⁽²⁾	<u>Setpoint</u> <u>Background</u>
	11/14/78	X1.5	X 3.0		
A	550 ⁽¹⁾	825	1650	1025	1.9
B	300	450	900	1025	3.4
C	160	240	480	850	5.3
D	400	600	1200	1375	3.4

(1) All readings in mr/hr.

(2) Setpoints from Technical Instruction 24.

- (8) The inspector informed licensee management this would be an item of noncompliance (78-33-01) in that Trip Level Settings for three of the four main steam line high radiation monitors (Channels B, C, and D) on Unit 2 exceeded 3X the normal full power background.

- (9) The inspector identified a potential problem concerning the alarm level settings for the main steam line high radiation monitors. The alarms are actuated by cam operated switches on a recorder. The recorder is a two pen recorder with one pen monitoring Channel A or C and one pen monitoring Channel B or D. Only one setpoint can be set for each pen. By referring to Table 1, one can see that if the recorder Alarm Level Setpoint were set on 1.5X, the channel A reading, then the recorder switched to monitor channel C, channel C could exceed the Trip Level Setting without having actuated an alarm. (The one alarm setting must serve both channels.)
- (10) The inspector informed licensee management that the present arrangement for initiating the alarm would be carried as an Unresolved Item (78-30-01, 78-33-02, 7831-01) since it was possible, because of the single setpoint per two channels, to have a nonconservative combination. This problem is common to all three units.
- (11) The inspector observed that as a result of calibration, the Channel A reading went from 550 mr/hr to 340 mr/hr. Later in the week the inspector was informed that Channel C had been adjusted to bring the reading from approximately 170 mr/hr to approximately 340 mr/hr. The inspector informed licensee representatives that these large changes indicate that the instruments are drifting significantly between calibrations and that plant operators should be given procedural guidance for determining when an instrument should be considered inoperable. This item will be followed-up in conjunction with the Unresolved Item in paragraph (10).

5. Independent Measurements

The inspector, utilizing a pancake type Geiger-Mueller detector held very close to the surface being surveyed, surveyed large areas of the main lunch room floor and the hallway floor leading from the contaminated laundry area to the lunchroom.

Nothing above what the inspector determined to be background was found.

6. Exit Interview

- a. At the conclusion of the inspection on November 17, 1978, the inspector met with the licensee representatives (denoted in paragraph 1) and summarized the scope and findings of the inspection.

- b. The Plant Superintendent, acknowledged the item of noncompliance. He further stated that the instrument trip level setpoints had been reset to conform to Technical Specifications and that a Licensee Event Report had been submitted. The Plant Superintendent also stated that a requirement to compare main steam line high radiation monitor readings with monitor trip setpoints would be included in a refueling test procedure.
- c. The Plant Superintendent acknowledged the unresolved item and stated that his staff would pursue an acceptable solution to the problem.