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

Report Nos.: 50-259/78-27, 50-260/78-30 and 50-296/78-26

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

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

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

Facility Name: Browns Ferry Nuclear Plant, Units 1, 2 and 3

Inspection at: Browns Ferry Site, Athens, Alabama

Inspection Conducted: October 23-27, 1978

Inspector: Larry L. Jackson

Reviewed by: A. F. Gibson, Chief 11/24/78
Date
Radiation Support Section
Fuel Facility and Materials Safety Branch

Inspection Summary

Inspection on October 23-27, 1978 (Report Nos. 50-259/78-27, 50-260/78-30 and 50-296/78-26):
Areas Inspected: Routine, unannounced inspection of the radiation protection program including: licensee audits; training; radiological protection procedures; calibration of instrumentation; exposure control; posting; control; surveys; notifications and reports; follow-up on previously identified items and one other area concerning discharges from the laundry drier vent. The inspection involved 37 inspector-hours on-site by one NRC inspector.
Results: Of the eleven areas inspected, no items of noncompliance were identified in nine areas; one apparent item of noncompliance was identified in each of two areas (infraction - failure to follow procedures 78-27-03, 78-30-03 and 78-26-03; infraction - failure to provide instruments that continuously indicate the dose rate to individuals or groups of individuals entering a High Radiation Area 78-27-01, 78-30-01 and 78-26-01).

DETAILS I

Prepared by: A F Gibson 11/24/78
for L. L. Jackson, Radiation Specialist Date
Radiation Support Section
Fuel Facility and Materials
Safety Branch

Dates of Inspection: October 23-27, 1978

Reviewed by: A F Gibson 11/24/78
A. F. Gibson, Chief Date
Radiation Support Section
Fuel Facility and Materials
Safety Branch

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
*J. L. Harness, Quality Assurance Supervisor
*S. G. Bugg, Health Physics Supervisor
J. L. Pittman, Instrument and Controls Supervisor
R. Burns, Instrument Engineer
R. Turberville, Senior Instrument and Controls Foreman

Division of Environmental Planning - Radiological Hygiene Branch

E. V. Kingery, Backup Unit Health Physics Supervisor
W. Holley, H. P. Training Unit Supervisor

Division of Medical Services

D. H. Gilbert, Nurse

Office of Power - Quality Assurance and Audit Staff

*R. Cole, OPQA Site Representative

The inspector also talked with and interviewed other licensee employees including several health physics technicians.

2. Licensee Action on Previous Inspection Findings

(Closed) Noncompliance (77-23-01) Radiation Protection Training. Although training evaluation is not formally incorporated into the training program by means of an approved procedure, the inspector determined that the training is being evaluated through the use of written tests given to trainees. Procedural guidance is being prepared to govern the evaluation portion of the training program. This item is closed.

(Closed) Noncompliance (78-2-01) Respiratory Protection Program. The inspector reviewed corrective actions for the deficient areas described in paragraph 4 of Details I of RII Report Nos. 50-259/78-2, 50-260/78-2 and 50-296/78-2. The corrective actions are now complete. This item is closed.

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 6. (78-27-02, 78-30-02 and 78-26-02)

4. Licensee Audits of Health Physics Program

a. Technical Specifications Section 6.2.c requires that the Office of Power Quality Assurance and Audit Staff (QA and AS) shall formally audit operation of the nuclear plant and that audits should include verification of compliance with internal rules, procedures (including radiation control procedures), regulations and license provisions. These audits are being conducted by the Radiological Hygiene Branch (RHB) under an agreement whereby RHB will conduct the audits and QA and AS will audit the RHR program, including the audit reports and corrective actions. This arrangement has been reviewed on a previous inspection and found to be acceptable.

b. The inspector reviewed three audit reports (RHB/QA-78-6, RHR/QA-78-1 and RHB/QA-77-2). These audit reports appear to fulfill the requirements of Technical Specification 6.2.c. as it relates to the health physics area.

c. Specific comments on audit reports

(1) Audit Report RHB/QA-78-6 unsatisfactory condition A-1.

(a) In reviewing audit report RHB/QA-78-6, the inspector noted that the auditors had identified that the licensee was in violation of Technical Specification 6.3.D which requires that any individual or group of individuals permitted to enter a high radiation area shall be provided with a radiation monitoring device which continuously indicates the radiation dose rate in the area.

(b) The inspector discussed this finding with a management representative who stated that the plant health physics staff had interpreted T.S. 6.3.D as applying only to operations personnel who frequently enter high radiation areas without routine health physics coverage and that it did not apply to those personnel whose work in high radiation areas is covered by a special work permit (SWP) providing for intermittent health physics coverage.

(c) A management representative stated that the plant was submitting a formal request for clarification of the requirements in Technical Specification 6.3.D and that the plant was still not routinely issuing dose rate meters to individuals or groups of individuals working in high radiation areas. The inspector confirmed this through a review of active SWP's and by direct work area observation.

(d) The inspector informed plant management that even though plant management is seeking clarification of the requirement and considering submission of a change to the Technical Specifications to reflect the licensee's interpretation of the requirement, the Technical Specification clearly states the requirement in terms of "any individual or group of individuals" and is not limited to operations personnel.

(e) The inspector informed plant management that because of the explicit statement of the requirement in the Technical Specifications the licensee should have implemented the Tech Specs as stated until a Tech Spec change has been submitted and approved.

(f) Plant management was informed that this would be an item of noncompliance (78-27-01, 78-30-01 and 78-26-01) even though identified by the licensee, because the corrective action was inadequate.

(2) Audit Report RHB/QA-78-6, Unsatisfactory Condition B-3

(a) In reviewing audit report RHB/QA-78-6, the inspector determined that the auditors had recorded a recurring problem relating back to audit RHB/QA-77-2, in that occasionally, Special Work Permits are being issued for which survey data was taken more than seven days prior to issuance of the SWP. This is contrary to procedural guidance.

(b) The inspector reviewed a letter dated October 11, 1978, from the Supervisor of the Health Physics Section of the Radiological Hygiene Branch to the Chief of the Radiological Hygiene Branch, which stated the corrective actions to be taken to resolve the unsatisfactory conditions reported in RHB/QA-78-6. Excluding the Unsatisfactory Conditions discussed in (1) and (2) above, the inspector had no questions.

5. Radiation Protection Training

a. Technical Specification 6.1.F states that retraining and replacement training of station personnel shall be in accordance with ANSI-N18.1, "Selection and Training of Nuclear Power Plant Personnel," and that the minimum frequency of the retraining program shall be every two years. Paragraph 5.5.1 of ANSI-N18.1 states that the minimum frequency of the retraining program shall be every two years. Paragraph 5.5.1 of ANSI-N18.1 states that the retraining program should include radiation safety. Paragraph 5.5 of ANSI-N18.1 states that a means should be provided in the training program for appropriate evaluation of its effectiveness. Plant administrative instructions BFA-17, "General Employee Training" states that personnel shall receive radiation protection training every two years and that the course instructor is responsible for providing a method (written or oral test, discussion, etc.) of evaluating class comprehension of the material presented.

b. The inspector viewed the videotapes used for unescorted access training. These videotapes are used to satisfy the requirements

of 10 CFR 19.12 "Instructions to Workers" and Regulatory Guide 8.15 "Acceptable Programs for Respiratory Protection".

c. The inspector noted that the tapes do not clearly state:

(1) What exposure reports the workers are entitled to. (10 CFR 19.12)

(2) The responsibility of the worker to report promptly to the licensee any condition which may lead to or cause a violation of commission regulations and licenses or unnecessary exposure to radiation or to radioactive materials. (10 CFR 19.12)

(3) The physiological action, toxicity, physical properties, and means of detection of airborne contaminants. (NUREG 0041, Section 8.3.a. by reference in R.G. 8.15)

These items were discussed with the licensee representative who is primarily responsible for producing the training tapes. The licensee representative stated that the tapes were being revised and errors and omissions would be corrected in the revised tapes.

d. The inspector had two general observations which were discussed with plant management.

(1) The training room is located between the training coordinators office and the only door to the facility which is a modified mobile home. As a result, the classroom is frequently interrupted by personnel going to visit the coordinator.

(2) The television set, on which the videotapes were played, had a serious flicker which was very distracting.

e. The inspector had no further comments.

6. Radiation Protection Procedures

a. Technical Specification 6.3.A states that plant procedures shall be prepared, approved and adhered to, including radiation protection procedures.

b. During a review of calibration check records and later during a tour of the plant the inspector determined that health physics

personnel were not adhering to the provisions of Health Physics Section Instruction Letter 25 (HP SIL 25) for source checking instruments and Radiation Control Instruction 3, (RC1-3) for fitting workers with respiratory protection devices.

(1) HP SIL 25

(a) HP SIL 25 contains instructions for source checking ionization chambers (Cutie Pies) on a weekly basis. In reviewing the weekly Calibration Check Worksheet, the inspector noted that the work sheet was not being properly completed for the CP-2 model of the Cutie Pie type instruments. The procedure requires a check of each of the scales (X1, X10, X100) against a corresponding known source (X1 = 21±4 mr/hr, X10 = 300±30 mr/hr and X100 = 6500±650 mr/hr). The CP-10 model Cutie Pie can be checked on all three scales as required. The CP-2 which has a readout scale of 0-25 was being checked as follows:

X1 scale: 21±4 mr/hr
X10 scale: Not checked since 0-25 could not be adequately checked with any of the sources due to range problems.
X100 scale: 300±30 mr/hr since the instrument could not read the 6500±650 mr/hr as required by the procedure.

(b) Upon discussing this with a licensee representative, it was determined that the procedure had been written for the older CP-10 model instrument and the procedure had not been revised when the newer model CP-2 instruments were purchased and put into use.

(c) The inspector also determined that instruments were being retained in use even after failing the acceptance criteria set forth in the procedure. Even when instruments failed the acceptance criteria, the Weekly Calibration Worksheet was signed off as if the instruments had met the acceptance criteria. Examples: Instrument 437337 read 250 mr/hr on October 15, 1978 and October 20, 1978, instead of 300±30 as required, yet the worksheet was signed as acceptable. Other examples are:

Instrument 437333 on October 15, 1978 and October 20, 1978
Instrument 437332 on October 15, 1978
Instrument 437339 on October 12, 1978 and October 15, 1978
Instrument 432533 on October 20, 1978

(d) The inspector requested one of the Health Physics Technicians (SE-4) to source check four of the instruments which were in the Health Physics office and ready for use. Instruments 437337, 437339 and 288114 gave responses that met the acceptance criteria for the ranges on which they were checked. Instrument 437333 read 225 mr/hr when it should have read 300±30 mr/hr. The technician immediately removed the instrument from service and tagged it to indicate it needed maintenance and/or recalibration prior to use. It may be noted that instruments 437337, 437339 and 437333 are model CP-2's and that the procedure does not adequately address source checking these instruments. At this point, the inspector was not testing the procedure, but merely trying to determine the operational status of the instruments that were ready for use.

(e) All of the CP-2 model Cutie Pies were removed from service and were to be sent to licensee's calibration facility at Muscle Shoals, Alabama for evaluation.

(f) The inspector informed the plant management representative, via telephone, on November 3, 1978, that HP-SIL25 appeared to be required to meet the intent of The Operational Quality Assurance manual Part III, Sec. 3.1 paragraphs 3.4 and 3.5. The management representative was informed that this item would be carried as an unresolved item (78-27-02, 78-30-02, and 78-26-2) until the relationship of section instruction letters to the Operational Quality Assurance Manual and to Technical Specification 6.3.A can be established.

(g) During the inspector's telephone conversation with the management representative on November 3, 1978, the inspector was informed that shields were being designed for use with the check sources to allow the CP-2 model Cutie Pies to be checked on all scales. The management representative further stated that HP-SIL-25 was being revised to incorporate the CP-2's into the procedure and the health physics personnel would be informed of the importance of adhering to this procedure.

(2) RCI-3 Respiratory Protection Program

(a) During a tour of the plant, the inspector was fitted for a respirator prior to entry into the Unit 3 drywell to observe personnel at work. The health physics technician on duty was questioned about the requirement for fitting the inspector since the Special Work Permit required only a half-face mask for the workers to prevent facial contamination. The HP technician stated that it would not be necessary for the inspector to wear a mask but the inspector should be fitted for future inspections.

(b) The HP technician proceeded to fit the inspector with a full face mask and issued the inspector a completed form indicating that the inspector had completed the respirator fitting portion of his training.

(c) Upon completion of the tour through the drywell, the inspector returned to the administrative building and checked the fitting requirements in RCI-3. RCI-3 requires that a challenge atmosphere of amyle (SIC) acetate or smoke, as appropriate, be used during the fitting portion of the training.

(d) The HP Supervisor was informed that failure to use smoke or amyle acetate during fitting of the inspector was an item of noncompliance for failure to follow procedures as required by Technical Specification 6.3.A. (78-27-03, 78-30-03 and 78-26-03)

(e) The HP Supervisor notified the outage HP Supervisor of the problem and HP personnel were reminded that amyle acetate would be used to challenge respirators during the fitting process.

(f) Health Physics personnel were using the qualitative method of fitting respirators at the work site because the van mounted quantitative fitting apparatus normally used was inoperable.

7. Calibration of Single Channel Constant Air Monitors

a. The licensee has stated in Instrument Maintenance Instruction (IMI) 90.9 that single channel constant air monitors (CAMS) will be functionally tested quarterly and calibrated annually.

b. The inspector reviewed calibration records for several of the single channel cams. The annual calibrations were documented for the selected CAMs. Records of the quarterly functional tests for the selected cams were not readily available and it was not determined if the funtional checks had or had not been conducted.

c. Because of time limitations, the inspector could not complete inspection of this item. It will be followed up on a future inspection. (Open Item 78-27-04, 78-30-04 and 78-26-04)

8. External Exposure Control

a. The inspector reviewed the licensee's external exposure control program for compliance with the following regulatory requirements:

(1) 10 CFR 20.202.a - personnel monitoring, including extremity monitoring
(2) 10 CFR 20.101.a - permissible doses
(3) 10 CFR 20.101.b - extended permissible doses
(4) 10 CFR 20.102 - exposure history

The inspector verified that several workers who were authorized to receive extended permissible doses had a current NRC Form-4 on file. The records of several workers were reviewed to ensure that exposures were within 10 CFR 20 limits and that NRC Form 5's were current.

The inspector had no further questions.

b. Regulatory Guide 8.13, "Instruction Concerning Prenatal Radiation Exposure" states that female workers should be given specific instruction about prenatal exposure risks. The inspector reviewed the instructions to female workers contained in the videotape training program. The videotapes adequately discussed this subject. The inspector had no further questions.

9. Posting and Control

The inspector toured the plant and made some independent measurements of exposure rates to verify compliance with 10 CFR 20.203(b). All areas inspected were properly posted.

10. Surveys

a. 10 CFR 20.201 requires the licensee to make surveys of levels of radiation or concentrations of radioactive materials, as necessary to ensure compliance with regulations in 10 CFR 20.

b. The inspector reviewed the results of contamination surveys for several areas. The inspector had no questions concerning the survey results except for Survey Number 0-78-4163.

(1) Survey 0-78-4163 documented contamination measurements in the laundry personnel office, the main lunchroom, the hall in front of the HP lab and the hall from the lunchroom to the front door. These are normally clean areas. The inspector became aware of this survey after finding radiation warning tape on stairs in the administrative building. A licensee representative stated that these areas occasionally become contaminated by personnel leaving the laundry area after highly contaminated protective clothing has been processed. The licensee representative stated that frequent routine surveys were performed of these areas in order that contamination could be detected and promptly cleaned up.

(2) The inspector stated to plant management representatives that repeated contamination in this area was of concern because:

(a) The main lunchroom is involved.

(b) The location of the laundry is such that the only portal monitor personnel pass through after leaving the laundry area is the monitor at the security building. The inspector informed plant management that personnel were not always properly utilizing the portal monitors at the security building. This was determined by observation.

(3) A management representative stated that a new laundry dry cleaning system was being purchased for installation on the refueling floor which is a controlled area. Highly contaminated clothing will be cleaned in the new system. The representative also stated that they were striving to achieve better control over utilization of the portal monitors at the security building.

c. The inspector reviewed the results of several airborne contamination surveys. There were no questions regarding the surveys reviewed.

d. The inspector reviewed the records of Sealed Source Surveys required by Technical Specification 4.8.D.1. The inspector reviewed the results of leak tests on 109 sources and determined that results were less than the limits in Technical Specification 3.8.D.1. The inspector had no further questions.

11. Notifications and Reports

The inspector determined, through discussion with a cognizant licensee representative, that there were no reports or notifications due for 1978, prior to the inspection dates, for the following areas:

a. 10 CFR 20.402 loss of theft of radioactive material
b. 10 CFR 20.403 incidents
c. 10 CFR 20.405 overexposures

The inspector had no further questions.

12. Other Areas

Because of interest in whether or not significant levels of radioactive material might be present in contaminated laundry clothes drier exhausts, the inspector reviewed several data sheets from Surveillance Instruction S.I.4.8.B.1.b which showed smearable contamination at the vent exhaust to be <100 dpm/100 cm^2. The inspector had no further questions in this area.

13. Exit Interview

At the conclusion of the inspection on October 27, 1978, the inspector met with licensee representatives denoted in paragraph 1. The inspector summarized the scope and findings of the inspection. Licensee representatives had the following comments relative to the items of noncompliance.

a. The Plant Superintendent acknowledged the item of noncompliance concerning the failure to issue dose rate instruments to individuals entering high radiation areas. He also stated that he did not implement corrective actions based on the Radiological Hygiene Branch audit finding because it was the opinion of his staff that the requirement only applied to operations personnel

who must frequently check various areas of the plant. Discussions between his staff and RHB personnel had not yielded a clear answer. Mr. Dewease said the plant would acquire the necessary instruments and use them as stated in the Technical Specifications. He is also considering requesting a change to the Technical Specifications to eliminate or reduce this requirement.

b. The Plant Superintendent, acknowledged the item of noncompliance concerning the failure to follow procedure RCI-3, Respiratory Protection Program. Mr. Dewease stated that he would have his staff find out why the HP Technician failed to follow the procedure.