

August 27, 1990

Docket No. 50-328

Mr. Oliver D. Kingsley, Jr.  
Senior Vice President, Nuclear Power  
Tennessee Valley Authority  
6N 38A Lookout Place  
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Chattanooga, Tennessee 37402-2801

Dear Mr. Kingsley:

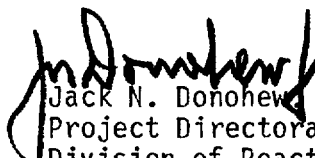
SUBJECT: FAILED APPENDIX J INTEGRATED LEAK RATE TESTS (TAC NO. 76846)  
(TS 90-09) - SEQUOYAH NUCLEAR PLANT, UNIT 2

The Commission has issued the enclosed Amendment No.126 to Facility Operating License No. DPR-79 for the Sequoyah Nuclear Plant, Unit 2. This amendment is in response to your application dated May 21, 1990.

The amendment modifies the Sequoyah Nuclear Plant, Unit 2, Technical Specifications (TSs) on containment Type A or integrated leak rate tests (CILRTs). The change adds a footnote to Surveillance Requirement (SR) 4.6.1.2.b regarding accelerated CILRT test schedules. Because the two consecutive tests performed on Unit 2 during the Unit 2 Cycle 2 refueling outage (November 1984) and the Unit 2 Cycle 3 refueling outage (March 1989) are classified as failed tests, SR 4.6.1.2.b required an accelerated test frequency. This change provides an exemption from the accelerated test frequency in SR 4.6.1.2.b for the Unit 2 Cycle 2 and Cycle 3 test failures so that a Unit 2 CILRT is not required in the upcoming Cycle 4 refueling outage, which is scheduled to begin in September 1990. An exemption to Appendix J of 10 CFR Part 50 was issued on August 27, 1990.

A copy of the Safety Evaluation is also enclosed. Notice of Issuance will be included in the Commission's biweekly Federal Register notice.

Sincerely,

  
Jack N. Donohew, Project Manager  
Project Directorate II-4  
Division of Reactor Projects - I/II  
Office of Nuclear Reactor Regulation

Enclosures:

- 1. Amendment No. 126 to License No. DPR-79
- 2. Safety Evaluation

cc w/enclosures:  
See next page

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OFC :PD II-4/LA :PD II-4/PM OGC :PD II-4/D  
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8/20 8/19/90 8/17/90 8/21/90

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AMENDMENT NO. 126 FOR SEQUOYAH UNIT NO. 2 - DOCKET NO. 50-328  
DATED: August 27, 1990

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UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-328

SEQUOYAH NUCLEAR PLANT, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 126  
License No. DPR-79

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Tennessee Valley Authority (the licensee) dated May 21, 1990, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
  - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
  - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
  - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
  - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

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2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment and paragraph 2.C.(2) of Facility Operating License No. DPR-79 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 126, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Frederick J. Heddon, Director  
Project Directorate II-4  
Division of Reactor Projects - I/II  
Office of Nuclear Reactor Regulation

Attachment:  
Changes to the Technical  
Specifications

Date of Issuance: August 27, 1990

ATTACHMENT TO LICENSE AMENDMENT NO. 126

FACILITY OPERATING LICENSE NO. DPR-79

DOCKET NO. 50-328

Revise the Appendix A Technical Specifications by removing the pages identified below and inserting the enclosed pages. The revised pages are identified by the captioned amendment number and contain marginal lines indicating the area of change.

REMOVE

3/4 6-3  
3/4 6-4

INSERT

3/4 6-3  
3/4 6-4

## CONTAINMENT SYSTEMS

### SURVEILLANCE REQUIREMENTS

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4.6.1.2 The containment leakage rates shall be demonstrated at the following test schedule and shall be determined in conformance with the criteria specified in Appendix J of 10 CFR 50 using the methods and provisions of ANSI N45.4-1972; however, the methods of ANSI/ANS 56.8-1987 for mass point data analysis may be used in lieu of the methods specified in ANSI N45.4-1972.

- a. Three Type A tests (Overall Integrated Containment Leakage Rate) shall be conducted at  $40 \pm 10$ -month intervals during shutdown at  $P_a$ , 12 psig, during each 10-year service period. The third test of each set shall be conducted during the shutdown for the 10-year plant inservice inspection.
- b. If any periodic Type A test fails to meet  $0.75 L_a$  the test schedule for subsequent Type A tests shall be reviewed and approved by the Commission. If two consecutive Type A tests fail to meet  $0.75 L_a$ , a Type A test shall be performed at least every 18 months until two consecutive Type A tests meet  $0.75 L_a$  at which time the above test schedule may be resumed.\*
- c. The accuracy of each Type A test shall be verified by a supplemental test which:
  1. Confirms the accuracy of the Type A test by verifying that the difference between supplemental and Type A test data is within  $0.25 L_a$ .
  2. Has a duration sufficient to establish accurately the change in leakage rate between the Type A test and the supplemental test.
  3. Requires the quantity of gas injected into the containment or bled from the containment during the supplemental test to be equivalent to at least 25 percent of the total measured leakage at  $P_a$ , 12 psig.
- d. Type B and C tests shall be conducted with gas at  $P_a$ , 12 psig, at intervals no greater than 24 months except for tests involving:
  1. Air locks,
  2. Penetrations using continuous leakage monitoring systems, and
  3. Values pressurized with fluid from a seal system.

\*An exemption from the 18-month accelerated frequency requirement is allowed for the Type A test failures conducted during the Unit 2 Cycle 2 and Unit 2 Cycle 3 refueling outages.

## CONTAINMENT SYSTEMS

### SURVEILLANCE REQUIREMENTS (Continued)

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- e. The combined bypass leakage rate to the auxiliary building shall be determined to be less than or equal to  $0.25 L_a$  by applicable Type B and C tests at least once per 24 months except for penetrations which are not individually testable; penetrations not individually testable shall be determined to have no detectable leakage when tested with soap bubbles while the containment is pressurized to  $P_a$ , 12 psig, during each Type A test.
- f. By verifying that each containment air lock is in compliance with the requirements of Specification 3.6.1.3.
- g. Leakage from isolation valves that are sealed with fluid from a seal system may be excluded, subject to the provisions of Appendix J, Section III.C.3, when determining the combined leakage rate provided the seal system and valves are pressurized to at least  $1.10 P_a$ , 13.2 psig, and the seal system capacity is adequate to maintain system pressure (or fluid head for the containment spray system and RHR spray system valves at penetrations 48A, 48B, 49A and 49B) for at least 30 days.
- h. Type B tests for penetrations employing a continuous leakage monitoring system shall be conducted at  $P_a$ , 12 psig, at intervals no greater than once per 3 years.
- i. All test leakage rates shall be calculated using observed data converted to absolute values. Error analyses shall be performed to select a balanced integrated leakage measurement system.
- j. The provisions of Specification 4.0.2 are not applicable.





UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

ENCLOSURE

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 126 TO FACILITY OPERATING LICENSE NO. DPR-79

TENNESSEE VALLEY AUTHORITY

SEQUOYAH NUCLEAR PLANT, UNIT 2

DOCKET NO. 50-328

1.0 INTRODUCTION

By letter dated May 21, 1990, the Tennessee Valley Authority (the licensee) requested a change to Section 3/4.6.1, Primary Containment, of the Sequoyah Nuclear Plant, Unit 2, Technical Specifications (TSs) on containment Appendix J Type A or integrated leak rate tests (CILRTs). The proposed change is to add a footnote to Surveillance Requirement (SR) 4.6.1.2.b regarding accelerated CILRT test schedules. The two tests performed on Unit 2 during the Unit 2 Cycle 2 refueling outage (November 1984) and the Unit 2 Cycle 3 refueling outage (March 1989) were classified as failed tests. In accordance with SR 4.6.1.2.b, these two consecutive failures require an accelerated test frequency. The licensee's proposed TS change requests an exemption from the accelerated test frequency in SR 4.6.1.2.b for the Unit 2 Cycle 2 and Cycle 3 test failures. Without this change, the accelerated test frequency would require a Unit 2 CILRT in the upcoming Cycle 4 refueling outage which is scheduled to begin in October 1990.

2.0 DISCUSSION

In its application, the licensee also requested an exemption for Unit 2 from the requirements of 10 CFR Part 50, Appendix J, Section III.A.6.(b) on consecutive CILRT (i.e., Type A test) failures. The last two Type A tests performed on Unit 2 during the Cycle 2 (November 1984) and Cycle 3 (March 1989) refueling outages were classified as failures. Due to these two consecutive failures, Unit 2 is required to perform Type A tests at an accelerated frequency of at least every 18 months until two consecutive Type A tests meet 0.75 La. The licensee's bases for the exemption are that (1) increasing the frequency of Type A tests and conducting a test in the Unit 2 Cycle 4 refueling outage would not increase the level of confidence for containment integrity, and (2) the hardships and impact of performing a test during the Cycle 4 refueling outage. The exemption will be a separate evaluation issued by the staff.

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### 3.0 EVALUATION

Appendix J, Section III.A.6.(b) requires that if two consecutive periodic CILRT tests fail to meet the applicable acceptance criteria (i.e., 0.75 La), a test shall be performed at each plant shutdown for refueling or approximately every 18 months, whichever occurs first, until two consecutive tests meet the acceptance criteria, after which time the retest schedule of these tests will be three approximately equal intervals during each 10-year service period. The staff has reviewed the history of CILRT tests conducted at the plant and found that the last two CILRT as-found results have been failures as noted below:

CILRTs performed	As-found leak rate (% per day)	0.75 La limit (% per day)	1.0 La limit (% per day)	Status
Preoperational test (1981)	0.14	0.1875	0.25	pass
Test 1 (1984)	0.22	0.1875	0.25	failure
Test 2 (1989)	0.20	0.1875	0.25	failure

The staff noted that the last two CILRT results exceeded the acceptable limit of 0.75 La required by Appendix J but did not exceed the maximum allowable rate of 1.0 La. This is the leakage rate assumed for the containment during a loss-of-coolant accident. The licensee stated that the root cause of the Cycle 2 CILRT failure was packing leakage from two outboard root valves on two containment pressure sensing lines. The licensee performed maintenance on the pressure sensing lines during the Cycle 2 refueling outage and repaired the root valves which resulted in an immediate reduction in the measured leak rate to below the TS limit and the applicable Appendix J acceptance criteria. The licensee also implemented corrective actions to prevent the pressure sensing line leakage. These actions include:

- (1) Programmatic review of the instrument maintenance and operation activities to identify potential impacts on containment integrity, and
- (2) Expansion of the local leak rate test (LLRT) program to require an LLRT following any maintenance performed on the pressure sensing lines. Post-maintenance leak rate testing is required and added to the Surveillance Instruction (SI) 159.1, "Leak Rate Test on Containment Pressure Instrumentation."

The licensee stated that the primary cause of the Cycle 3 CILRT failure was due to excessive leakage through Penetration X-59. The root cause was stated to be personnel error in connecting the hose from the test equipment to the test connection for the valves associated with Penetration X-59. Another factor that contributed to the excessive leakage through Penetration X-59 involved a maintenance sequence that occurred when the outboard containment isolation valve (FCV-67-88) was previously disassembled, cleaned, and reassembled during the outage. The licensee has implemented corrective actions for the root causes of excessive leakage from Penetration X-59. These actions include:

- (1) Revision of the LLRT program (SI-158.1) to include instructional steps that require the test hoses to be visually inspected to ensure that no restrictions or crimped conditions exist, and
- (2) Revision of the Maintenance Instructions (O-MI-MVV-000-008.0) to ensure that when soft-seated butterfly valves without internal disc stops are removed from the piping, the valve operator limits are set with the valve body attached to ensure that valve position is established prior to reinstallation.

The staff has reviewed the licensee's submittal and agrees with the licensee that the root cause of each of the last two CILRT failures was due to excessive leakage of a single component or penetration in the containment boundary and not a general containment integrity problem. Even with the leakage, the CILRT results were found within the maximum allowable leak rate of 1.0 La. The licensee has corrected and repaired the components that caused the CILRT failure and implemented corrective actions to prevent future component failure. Additionally, the current Appendix J allowable leak rate limit on Type A tests contains a 25% safety margin between the leak rate acceptance criteria and the leak rate assumed for the containment during a loss-of-coolant accident. A proposed revision to Appendix J currently under consideration would remove the margin. With the above corrective actions and the fact that the last two CILRT failures were below the maximum allowable leak rate of 1.0 La, and the staff issued an exemption to Section III.A.6.(b) of Appendix J of 10 CFR Part 50 in its letter dated August 27, 1990, the staff concludes that the failures have no significant impact on containment integrity and no benefit would be gained by requiring the licensee to perform an accelerated Type A test. Therefore, the staff concludes that the proposed TS changes are acceptable.

#### 4.0 ENVIRONMENTAL CONSIDERATION

This amendment involves a change to a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes to the surveillance requirements. The staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that this amendment involves no significant hazards consideration and there has been no public comment on such finding. Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement nor environmental assessment need be prepared in connection with the issuance of this amendment.

## 5.0 CONCLUSION

The Commission made a proposed determination that the amendment involves no significant hazards consideration which was published in the Federal Register (55 FR 26296) on June 27, 1990 and consulted with the State of Tennessee. No public comments were received and the State of Tennessee did not have any comments.

The staff has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendments will not be inimical to the common defense and security nor to the health and safety of the public.

Principal Contributor: J. S. Guo

Dated: August 27, 1990