



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D. C. 20555

August 27, 1990

Docket No. 50-328

Mr. Oliver D. Kingsley, Jr.  
Senior Vice President, Nuclear Power  
Tennessee Valley Authority  
6N 38A Lookout Place  
1101 Market Street  
Chattanooga, Tennessee 37402-2801

Dear Mr. Kingsley:

SUBJECT: EXEMPTION TO APPENDIX J OF 10 CFR PART 50, TWO CONSECUTIVE  
FAILED TYPE A TESTS (TAC 76846) - SEQUOYAH NUCLEAR PLANT, UNIT 2

By letter dated May 21, 1990, the Tennessee Valley Authority (TVA) requested an exemption for Unit 2 from the requirement in Section III.A.6(b) of Appendix J to 10 CFR Part 50 for an accelerated Type A test frequency if two consecutive Type A tests fail to meet the acceptance criteria. For Unit 2, the last two containment Type A tests performed were classified as failures and, in accordance with Section III.A.6(b), TVA is required to perform Type A tests at Unit 2 in each refueling outage until the unit passes two consecutive Type A tests, at which time the normal test frequency is resumed. The normal test frequency in Section III.D of Appendix J is three tests at approximately equal intervals during each 10-year service period. The exemption would allow TVA (1) to continue the normal test frequency for Unit 2 and conduct the third Type A test of the first 10-year service period in the Unit 2 Cycle 5 refueling outage in 1992 and (2) avoid conducting a Type A test at Unit 2 in the upcoming Unit 2 Cycle 4 refueling outage which is scheduled to begin in September 1990.

In its letter, TVA stated that it evaluated the two Type A test failures and determined that the increased test frequency would be inappropriate for the particular conditions that caused each test failure. TVA stated that the measured leakage results for the two tests were below the maximum allowed leakage for the Unit 2 containment and a general containment leakage problem does not exist. A corrective action program that addresses the cause of the test failures has been implemented by TVA at Sequoyah. TVA concluded that increasing the frequency of the Type A tests at Unit 2 would not provide a corresponding increase in the level of confidence of demonstrating Unit 2 containment integrity. TVA further stated that the economic impact of performing the test in engineering time and the additional unit shutdown time to conduct the test would be an imprudent use of its resources.

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Mr. Oliver D. Kingsley, Jr.

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Enclosed is the Exemption for Unit 2 from the requirement in Section III.A.6(b) of Appendix J to increase the Type A test frequency after two consecutive Type A test failures. The exemption applies only to the Type A test failures in the Unit 2 Cycle 2 and Unit 2 Cycle 3 refueling outages as being two consecutive test failures. Thus, if a Type A test failure were to occur during the Unit 2 Cycle 5 refueling outage, the next scheduled test for Unit 2, that failure would constitute a second consecutive failure following the test failure in the Unit 2 Cycle 3 outage and TVA would be required to take action accordingly. The Commission granted this exemption without any condition on the operation of Unit 2.

In the letter dated May 21, 1990, TVA also proposed an amendment to the Unit 2 Technical Specifications. This proposed amendment will be issued as a separate evaluation.

Sincerely,

Original signed by

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

Enclosure:  
Exemption to 10 CFR 50.46(a)(1)

cc w/enclosure:  
See next page

\*SEE PREVIOUS CONCURRENCE

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Mr. Oliver D. Kingsley, Jr.

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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

In the Matter of )  
TENNESSEE VALLEY AUTHORITY ) Docket No. 50-328  
(Sequoyah Nuclear Plant, Unit 2) )

EXEMPTION

I.

The Tennessee Valley Authority (TVA) holds Facility Operating License No. DPR-79 which authorizes operation of the Sequoyah Nuclear Plant, Unit 2 (the facility, Unit 2). The license provides, among other things, that the facility is subject to all rules, regulations, and orders of the Nuclear Regulatory Commission (the Commission) now or hereafter in effect.

The facility consists of a pressurized water reactor located on TVA's Sequoyah site in Hamilton County, Tennessee.

## II.

Section III.A.6(b) of Appendix J to 10 CFR Part 50 requires that if two consecutive Type A tests fail to meet the applicable acceptance criteria, a Type A test shall be conducted at each refueling outage. This increased testing frequency would continue until two consecutive Type A tests shall meet the acceptance criteria, after which time the normal retest frequency of three Type A tests at approximately equal intervals within each 10-year service period would resume. The approximately equal intervals are defined in Surveillance Requirement 4.6.1.2.a of the Sequoyah Technical Specifications (TSs) as  $40 \pm 10$  months. Type A tests means tests of the primary reactor containment to measure the expected overall integrated leakage rate of the containment for the loss-of-coolant accident conditions.

The exemption would allow (1) Unit 2 to continue on the normal Type A test frequency having TVA conduct the third Type A test of the first 10-year service period in the Unit 2 Cycle 5 refueling outage in 1992 and (2) TVA not to conduct a Type A test in the upcoming Unit 2 Cycle 4 refueling outage which is scheduled to begin in September 1990. Type A tests conducted in the Unit 2 Cycle 2 (November 1984) and Unit 2 Cycle 3 (March 1989) refueling outages are both considered failures because they did not meet the leak rate acceptance criteria.

In its application dated May 21, 1990 for relief, TVA stated that it was requesting an exemption from Appendix J because it considered the increased frequency of the type A tests inappropriate for the causes of the two consecutive Type A test failures. TVA stated that the measured leakage results

for the two tests were below the maximum allowed leakage for the Unit 2 containment and a general containment leakage problem does not exist. A corrective action program that addresses the causes of the test failures has been implemented at Sequoyah. TVA concluded that increasing the frequency of the Type A tests at Unit 2 would not provide a corresponding increase in the level of confidence of demonstrating Unit 2 containment integrity. TVA further stated that the economic impact of performing the test in engineering time and the additional unit shutdown time to conduct the test would be an imprudent use of its resources.

The staff has reviewed the history of Type A tests conducted at the plant and found that the last two Type A as-found test results have been failures as noted below:

Type A Tests 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 test results exceeded the acceptance limit of 0.75 La required by Appendix J but did not exceed the maximum allowable rate of 1.0 La for Sequoyah. TVA stated that the root cause of the Cycle 2 failure was packing leakage from two outboard root valves on two containment pressure sensing lines. TVA stated that it performed maintenance on the pressure sensing lines during the Unit 2 Cycle 2 refueling outage and repaired the root valves

which resulted in an immediate reduction in the measured leak rate to below the acceptance limit. TVA further stated that it had also implemented corrective actions to prevent the pressure sensing line leakage in the future. These actions include the following:

- (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".

TVA stated that the primary cause of the Cycle 3 test failure was due to excessive leakage through Penetration X-59. The root cause was a personnel error in connecting the hose from the test equipment to the test connection for the valves associated with Penetration X-59. TVA further stated that 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. TVA stated that it has implemented corrective actions for the root causes of excessive leakage from Penetration X-59. These actions include the following:

- (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 TVA's submittal and agrees with TVA that the root cause of each of the last two Type A test failures was due to excessive leakage of a single component or penetration in the containment boundary and that a general containment leakage problem does not exist. Even with the excessive leakage, the test results were below the maximum allowable leak rate of 1.0 La for Sequoyah Unit 2. TVA has corrected and repaired the components that caused the two Type A test failures and implemented a corrective action program that addresses the causes of these test failures to prevent future test failures. Additionally, the current Appendix J leak rate limit for Type A tests contains a 25% safety margin between the leak rate test acceptance criteria and the leak rate assumed for a loss-of-coolant accident (i.e., La). A proposed revision to Appendix J currently under consideration would remove this margin in the future. With the above corrective actions and the fact that the last two test failures were below the maximum allowable leak rate of 1.0 La, the staff has concluded that the requested exemption has no significant impact on containment integrity and no benefit would be gained by requiring TVA to perform Type A tests on an accelerated test frequency. Therefore, the staff concludes that the licensee's requested exemption from the accelerated Type A test frequency for the Type A test failures should be granted. This exemption applies only to

the Type A test failures in the Unit 2 Cycle 2 and Unit 2 Cycle 3 refueling outages as two consecutive test failures. Thus, if a Type A test failure were to occur during the Unit 2 Cycle 5 refueling outage, the next scheduled test for Unit 2, that failure would constitute a second consecutive failure following the test failure in the Unit 2 Cycle 3 outage and TVA would be required to take action accordingly. There is no condition on the operation of Unit 2.

### III.

Accordingly, the Commission has determined that, pursuant to 10 CFR 50.12, this exemption is authorized by law, will not present an undue risk to the public health and safety, and is consistent with the common defense and security. The Commission further determines that special circumstances, as provided in 10 CFR 50.12(a)(2)(ii), are present justifying the exemption; namely, that the application of the regulation in the particular circumstances for Unit 2 in the Unit 2 Cycle 4 refueling outage would not serve, and is not necessary, to achieve the underlying purpose of the rule. The application of the regulation is not necessary to assure the integrity of the containment in the event of a postulated design basis loss-of-coolant accident.

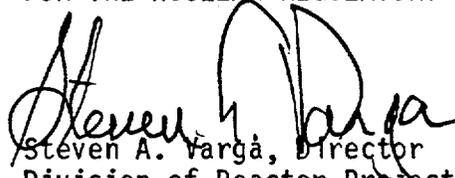
Accordingly, the Commission hereby grants an exemption from Section III.A.6(b) of Appendix J to 10 CFR Part 50 for Sequoyah Unit 2.

Pursuant to 10 CFR 51.32, the Commission has determined that the granting of this Exemption will have no significant impact on the environment. An "Environmental Assessment and Finding of No Significant Impact" related to this Exemption was published in the Federal Register (55 FR 34972) on August 27, 1990.

For further details with respect to this action, see the request for exemption dated May 21, 1990, which is available for public inspection at the Commission's Public Document Room, Gelman Building, 2120 L Street, N.W., Washington, D.C., and at the Chattanooga-Hamilton County Library, 1001 Broad Street, Chattanooga, Tennessee 37402.

This Exemption is effective upon issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Steven A. Varga, Director  
Division of Reactor Projects - I/II  
Office of Nuclear Reactor Regulation

Dated at Rockville, Maryland,  
this 27th day of August, 1990.