

August 7, 1990

Mr. W. L. Stewart  
Senior Vice President - Nuclear  
Virginia Electric and Power Company  
5000 Dominion Blvd.  
Glen Allen, Virginia 23060

Dear Mr. Stewart:

SUBJECT: SURRY UNIT 1 - EXEMPTION FROM APPENDIX J, 10 CFR PART 50  
(TAC NO. 76855)

By letter dated April 5, 1990, the Virginia Electric and Power Company (VEPCO) requested an exemption from the requirements of Appendix J to 10 CFR Part 50.

Based on our evaluation, we have granted the one-time exemption from the schedular requirements of Section III.A.6(b) of Appendix J to 10 CFR Part 50 (Enclosure 1). The exemption allows VEPCO to resume the normal Type A retest schedule in accordance with Section III.D. of Appendix J.

Our Safety Evaluation is also enclosed (Enclosure 2). This completes our review of your exemption request.

A copy of the exemption is being filed with the Office of the Federal Register for publication.

Sincerely,

Original signed by

Bart C. Buckley, Senior Project Manager  
Project Directorate II-2  
Division of Reactor Projects - I/II  
Office of Nuclear Reactor Regulation

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Mr. W. L. Stewart  
Virginia Electric and Power Company

Surry Power Station

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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

In the Matter of  
VIRGINIA ELECTRIC  
AND POWER COMPANY  
(Surry Power Station,  
Unit 1)

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Docket No. 50-280

EXEMPTION

I.

The Virginia Electric and Power Company (VEPCO, the licensee) is the holder of Operating License No. DPR-32, which authorizes operation of Surry Power Station Unit 1. The operating license provides, among other things, that the Surry Power Station, Unit 1 is subject to all rules, regulations, and orders of the Commission now or hereafter in effect.

The facility consists of a pressurized water reactor at the licensee's site in Surry County, Virginia.

II.

The Code of Federal Regulations, 10 CFR 50.54(o), specifies that primary reactor containments for water-cooled power reactors shall comply with Appendix J, "Primary Reactor Containment Leakage Testing for Water-Cooled Power Reactors." Section III.A.6(b) of Appendix J of 10 CFR Part 50 states the following:

If two consecutive periodic Type A tests fail to meet the applicable acceptance criteria in III.A.5(b), notwithstanding the periodic retest schedule of III.D., a Type A test shall be performed at each plant shutdown for refueling or approximately every 18 months, whichever occurs first, until two consecutive Type A tests meet the acceptance criteria in III.A.5(b), after which time the retest schedule specified in III.D. may be resumed.

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In 1983 and 1986, the licensee conducted Type A tests at Surry Unit 1. These tests were considered to be failures due to leakage penalty additions from Type C (local leakage rate testing of containment isolation valves) testing. In each case the leakage was associated with penetrations/valves in systems that are normally filled with water under post-accident conditions and/or the containment sump isolation valves. The licensee indicated that the containment sump isolation valves have been replaced and they are no longer a continuing source of containment leakage, and that the last two Type A tests have demonstrated that containment integrity has not significantly degraded over the operating cycle. By letter dated April 5, 1990, the licensee requested a one-time exemption from the schedular requirements of paragraph III.A.6(b) so that the normal retest schedule can be resumed in accordance with Section III.D.

### III.

Surry Unit 1 failed the "as found" Type A tests that were conducted in 1983 and 1986, due to leakage rate additions from Type C testing. In each case the leakage was associated with either the normal containment sump isolation valves (TV-DA-100 A&B), or with valves in systems that are normally filled with water and operating under post-accident conditions. If these leakage additions had not been necessary, the plant would not have required an accelerated test schedule delineated in Section III.A.6(b). In order to avoid addition of a leakage penalty and an accelerated test schedule, the licensee elected to demonstrate to the staff's satisfaction that:

1. the corrective actions taken for the normal containment sump isolation valves for Unit 1 have eliminated the chronic leakage problem, and

2. for Surry Units 1 and 2, the design of the water-filled penetrations is such that it precludes leakage of containment atmosphere through the penetrations during an accident, thus making it unnecessary to add the associated Type C leakage rates to Type A leakage rates.

The licensee addressed the normal containment sump isolation valves in its letter dated April 5, 1990. The issue of water-filled penetrations was addressed in submittals dated February 29, 1988, and August 15, 1988, pertaining to an exemption for Surry Unit 2. Section 6.2.2.2 of the Surry Updated Final Safety Analysis Report also contains pertinent information. The staff reviewed these submittals and concluded that the subject water-filled containment penetrations are sealed with water to the extent that they need not be vented or drained during Type A tests, and the associated Type C leakage rates need not be added to Type A leakage rate. The staff further concluded that the original leakage path of concern that caused the recent Type A "as found" failures (the normal containment sump isolation valves) has been corrected since these valves no longer exhibit excessive leakage. The staff's detailed evaluation of the containment sump isolation valves for Unit 1 is contained in a Safety Evaluation dated August 7, 1990. The staff's detailed evaluation of the water-filled penetration issue is provided in a Safety Evaluation dated November 21, 1988.

Therefore, on the basis of the licensee's corrective actions to reduce the "as found" containment leakage, the staff concludes that a return to the normal Type A test schedule of Section III.D. of Appendix J to 10 CFR Part 50 is justified.

By letter dated April 5, 1990, the licensee also submitted information to identify the special circumstances for granting this exemption for Surry Unit 1 pursuant to 10 CFR 50.12. The licensee stated that the purpose of Type A

testing is to measure and ensure that the leakage through the primary reactor containment does not exceed the maximum allowable leakage. It also provides assurance that periodic surveillance, maintenance and repairs are made to systems or components penetrating the containment. The licensee has replaced the valves which were a continuing source of containment leakage. The licensee also stated that it has met the intent of the regulations in establishing containment integrity, and maintaining that integrity over the operating cycle. Therefore, the licensee believes that this exemption should be granted pursuant to 10 CFR 50.12(a)(2)(ii) and (v), in that application of the regulation in this particular instance is not necessary to achieve the underlying purpose of the rule, which is to measure and ensure that leakage through the primary containment does not exceed the allowable leakage rate at any time during the operating cycle; and, that the exemption would provide only temporary relief from the applicable requirement and the licensee has made a good faith effort to comply with the regulation. This one-time exemption will enable Surry Unit 1 to resume the retest schedule specified in Section III.D. of 10 CFR Part 50, Appendix J and therefore, prevent unnecessary pressurization of the containment to design basis pressure. The staff agrees that the source of leakage which caused the prior failures has been corrected and an additional Type A test at this time is not required to achieve the underlying purpose of the rule.

#### IV.

Accordingly, the Commission has determined that, pursuant to 10 CFR 50.12(a)(1), 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 has further determined that special circumstances,

as set forth in 10 CFR 50.12(a)(2)(ii) and (v) are present, justifying the exemption; namely that application of the regulation in this particular circumstance is not necessary to achieve the underlying purpose of the rule and the exemption is for a one-time relief only. Accordingly, the Commission hereby grants an exemption to Section III.A.6(b) of Appendix J to 10 CFR Part 50 to allow the licensee to resume the Type A retest schedule of Section III.D. of Appendix J for Surry Unit 1. This exemption does not apply if the next test is deemed a failure by the NRC acceptance criteria. Such a failure would constitute two consecutive failures and Section III.A.6(b) would again apply.

Pursuant to 10 CFR 51.32, the staff has determined that the granting of this exemption will not have a significant effect on the quality of the human environment (55 FR 31911 , August 6, 1990 ).

A copy of the licensee's request for exemption dated April 5, 1990 is available for public inspection at the Commission's Public Document Room, 2120 L Street, N.W., Washington, D.C., and at the Swem Library, College of William and Mary, Williamsburg, Virginia 23185.

This exemption is effective upon issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Gus C. Lainas, Acting Director  
Division of Reactor Projects-I/II  
Office of Nuclear Reactor Regulation

Dated at Rockville, Maryland  
this 7th day of Aug. 1990.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

REQUEST FOR EXEMPTION FROM CONTAINMENT INTEGRATED LEAK RATE

RETEST SCHEDULE

SURRY POWER STATION UNIT 1

DOCKET NO. 50-280

1.0 INTRODUCTION

By letter dated April 5, 1990, Virginia Electric and Power Company (VEPCO or the licensee) requested a one-time exemption from the requirements of 10 CFR Part 50, Appendix J, Section III.A.6.(b) for Surry Unit 1. This exemption would allow the normal retest schedule of Section III.D.1.(a) to be resumed. The normal schedule requires that a Containment Integrated Leak Rate Test (CILRT) be conducted three times during each 10-year service period. Section III.A.6.(b) states that, if two consecutive Type A tests fail to meet the applicable acceptance criteria, a retest must be performed during each subsequent refueling outage, or approximately every 18 months, whichever comes first, until two consecutive tests meet the acceptance criteria given in Section III.A.5.(b). Surry Unit 1 failed the "as found" Type A tests that were conducted in 1983 and 1986 due to leakage rate additions from Type C testing (local leakage rate testing of containment isolation valves). In each case, the leakage was associated with the normal containment sump isolation valves (TV-DA-100 A&B), or with valves in systems that the licensee states are normally filled with water under post-accident conditions. If these leakage additions had not been necessary, the subject Type A tests would have passed, and the plant would not require an accelerated test schedule. In a Safety Evaluation Report dated November 21, 1988, the staff determined that, for both Surry Units 1 and 2, the penetrations that would be filled with water after an accident were not credible leakage paths. Therefore, the licensee's objective was to show that the corrective action taken for the normal containment sump isolation valves for Unit 1 has eliminated the leakage problem, thus making it unnecessary to add the associated Type C leakage rates to the Type A leakage rate.

2.0 EVALUATION

In order to establish the "as found" condition of integrated containment leakage, licensees would ideally conduct a Type A test near the beginning of a refueling outage, before making any repairs or adjustments to containment boundary components such as containment isolation valves. However, for various practical reasons, most licensees instead conduct local leak rate tests (Type C tests) before the Type A test, making repairs and adjustments as necessary to



reduce excessive leakage. The Type A test is then performed near the end of the refueling outage. In order to determine the "as found" integrated leak rate under these conditions, the licensee performs Type C tests both before and after repairing a valve, and the difference in leakage rates is then added to the Type A leakage rate. In this manner, an "as left" leakage rate (actually measured in the Type A test) and an "as found" leakage rate (Type A measurement plus Type C "penalties") is determined. If either exceeds the test acceptance criterion, a test failure is indicated and an increased Type A test frequency may be required in accordance with the requirements of Appendix J, Section III.A.6.

In the case of Surry Unit 1, Type C "penalties" (high leakage rates) from the normal containment sump isolation valves have contributed to several "as found" Type A test failures. To correct this problem, the licensee redesigned and replaced these valves, in both Unit 1 and Unit 2, in 1986. The new valves were of a different type that was intended to be more resistant to wear caused by the frequent cycling that the valves experienced. This cycling occurred since these valves served as process control valves, controlling the flow of water out of the normal containment sump. When the valve replacement did not completely resolve the problem, the licensee installed a check valve in each line to serve as a process control valve. This allowed the containment isolation valves to remain open during normal plant operation, thus avoiding excessive wear. The most recent Type C testing, conducted in June 1988, indicates that these valves no longer exhibit excessive leakage. The results of this testing were detailed in the licensee's letter of August 12, 1988. The staff finds that this corrective action has been effective and supports the requested exemption.

### 3.0 CONCLUSION

The most recent Type A leak test for Surry Unit 1, conducted in June 1988, shows that the containment meets the criteria of 10 CFR Part 50 Appendix J, Paragraph III.A.5(b)(2) for containment leakage. The significant decrease in the "as left" leakage as a result of the replacement of the containment sump isolation valves and the addition of the check valves in the lines indicates that the licensee has identified and corrected a large part of the cause for the test failure in 1986. Therefore, the staff concludes that a return to the normal Type A test schedule of Section III.D.1.(a) of Appendix J to 10 CFR Part 50 is justified, and the requested exemption from the requirements of Section III.A.6 for increased Type A containment leakage rate testing for Surry Unit 1 should be granted.

Dated: August 7, 1990

Principal Contributor:  
G. Wunder