September 26, 1990

Docket No. 50-281

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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 2 - EXEMPTION FROM APPENDIX J, 10 CFR PART 50

By letter dated September 14, 1990, as supplemented September 18, 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 enclosed one-time exemption from the schedular requirements of 10 CFR Part 50, Appendix J, Section III.D.3 (Enclosure 1). Our Safety Evaluation is also enclosed (Enclosure 2).

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

Enclosures:
As stated

cc w/enclosures:
See next page

LA:PDII-2	PM:PDII-2	D:PDII-2	AD:RIIR	OGC	D:DRP
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cc:
Michael W. Maupin, Esq.
Hunton and Williams
Post Office Box 1535
Richmond, Virginia 23212

Mr. Michael R. Kansler, Manager
Surry Power Station
Post Office Box 315
Surry, Virginia 23883

Senior Resident Inspector
Surry Power Station
U.S. Nuclear Regulatory Commission
Post Office Box 166, Route 1
Surry, Virginia 23883

Mr. Sherlock Holmes, Chairman
Board of Supervisors of Surry County
Surry County Courthouse
Surry, Virginia 23683

Mr. W. T. Lough
Virginia Corporation Commission
Division of Energy Regulation
Post Office Box 1197
Richmond, Virginia 23209

Regional Administrator, Region II
U.S. Nuclear Regulatory Commission
101 Marietta Street N.W., Suite 2900
Atlanta, Georgia 30323

C. M. G. Buttery, M.D., M.P.H.
Department of Health
109 Governor Street
Richmond, Virginia 23219

Attorney General
Supreme Court Building
101 North 8th Street
Richmond, Virginia 23219

Mr. E. Wayne Harrell
Vice President - Nuclear Operations
Virginia Electric and Power Company
5000 Dominion Blvd.
Glen Allen, Virginia 23060

Mr. J. P. O'Hanlon
Vice President - Nuclear Services
Virginia Electric and Power Company
5000 Dominion Blvd.
Glen Allen, Virginia 23060

Mr. R. F. Saunders
Manager - Nuclear Licensing
Virginia Electric and Power Company
5000 Dominion Blvd.
Glen Allen, Virginia 23060

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

In the Matter of VIRGINIA ELECTRIC AND POWER COMPANY (Surry Power Station, Unit 2)	)	Docket No. 50-281

EXEMPTION

I.

The Virginia Electric and Power Company (VEPCO, the licensee) is the holder of Operating License No. DPR-37, which authorizes operation of Surry Power Station (SPS), Unit 2. The operating license provides, among other things, that the SPS, Unit 2 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.

One of the conditions of all operating licenses for water-cooled power reactors, as specified in 10 CFR 50.54(o), is that the primary containment shall meet the leakage test requirements set forth in 10 CFR Part 50, Appendix J. More specifically, Section III.D.3 of Appendix J, "Type C tests," requires that:

> Type C tests shall be performed during each reactor shutdown for refueling but in no case at intervals greater than 2 years.

By letter dated September 14, 1990, as supplemented September 18, 1990, VEPCO requested a schedular exemption from the regulatory requirements of 10 CFR Part 50, Appendix J, Section III.D.3 until June 30, 1991. This Section requires, in part, periodic testing of isolation barriers (valves) associated with certain containment penetrations. The interval between leak rate tests is not to exceed 2 years. A recent quality assurance audit of the Surry Inservice Inspection program revealed that VEPCO's implementation of the Type C test program does not satisfy this test interval requirement. Due to a misinterpretation of Appendix J, VEPCO was unaware of this anomaly until September 7, 1990. VEPCO had interpreted Appendix J to mean that the 2-year inspection interval was initiated at the end of the overall Type C periodic testing rather than applied individually to each valve. VEPCO requested an exemption from this requirement so that the required testing on certain containment isolation valves can be performed during the 1991 SPS, Unit 2 refueling outage, which is in excess of the maximum allowed 2-year interval which expires on September 18, 1990. Therefore, the proposed exemption would allow a one-time relief from performing Type C tests for valves which would otherwise require testing between September 18, 1990 and April 1991. In the above submittals, VEPCO evaluated the acceptability of the exemption request. More details are contained in the NRC's Safety Evaluation issued concurrent with this exemption.

III.

SPS, Unit 2 was shut down for refueling on September 10, 1988 and remained in refueling outage until September 19, 1989 (374 days) to perform maintenance and modifications. During this interval, the last local Type C tests were completed. Due to the extended maintenance outage, the next refueling outage is currently scheduled for the second quarter of 1991. The interval between the refueling

outages will exceed the 2-year limit of Appendix J. Therefore, an exemption to this Appendix J requirement in the form of a one-time extension of the interval is being requested. In addition to this exemption request, by letter dated September 14, 1990, VEPCO requested a one-time conforming Technical Specifications (TS) change to reflect the requested exemption by adding a footnote to TS 4.4.B.2 and 4.4.D denoting the Appendix J exemption.

As indicated above, the intent of Appendix J was that isolation valves and associated penetrations be tested during each refueling outage but at intervals not to exceed 2 years. SPS, Unit 2 is presently scheduled for a refueling outage in April 1991. The exemption would allow local leak rate Type C tests for the 76 affected containment isolation valves to be postponed until the next refueling outage, which is in excess of the 2-year interval. Such an extension is desirable in order to prevent the need for earlier shutdown of the plant to perform the required tests.

During the extended maintenance outage which lasted approximately 1 year, modifications and testing were performed on the emergency diesel generators, the circulating and service water systems and the electrical distribution system. In addition, during this time, plant components were not exposed to the normally severe operating temperatures, pressures and radiation conditions. As of April 30, 1991, when this exemption expires, the total exposure time for the valves and containment penetrations to the normal plant operating environment will be only about 19 months; the remainder calendar time between valve testing will have occurred during periods of cold shutdown in a less hostile environment. Based on the good material condition, improved maintenance history of the subject valves, and the projected leakage rate, the granting of an extension will not impair valve operability or significantly degrade leak tightness.

The 2-year interval requirement for the Type C penetrations is intended to be often enough to prevent significant deterioration from occurring and long enough to permit the local leak rate tests (LLRTs) to be performed during plant outages. In addition, leak testing of the penetrations during plant shutdown is preferable because of the lower radiation exposures to plant personnel. Moreover, some penetrations, because of their intended functions, cannot be tested at power operation. For penetrations that cannot be tested during power operation or those that, if tested during plant operation, would cause a degradation in the plant's overall safety (e.g., the closing of a redundant line in a safety system), the increase in confidence of containment integrity following a successful test is not significant enough to justify a plant shutdown specifically to perform the LLRTs within the 2-year time period, especially in light of the above discussions.

IV.

Pursuant to 10 CFR 50.12(a)(2)(v), the Commission will not consider granting a schedular exemption unless the licensee has made good faith efforts to comply with the regulation. The NRC staff believes that VEPCO has taken prudent steps to improve the containment integrity and, if not for the extended refueling outage, would have complied with Appendix J.

Based on our evaluation, the NRC staff has concluded VEPCO has made good faith efforts to comply with the requirements of Appendix J and that the special circumstances as described in 10 CFR 50.12(a)(2)(v) exist, in that the exemption would provide only temporary relief from the applicable regulation. However, based on the information provided, it is the staff's view that the exemption interval shall be effective until April 30, 1991 rather than the requested date of June 30, 1991, because this interval should provide sufficient

time to complete the required tests following the start of the April 5, 1991, refueling outage. Therefore, the staff has determined that a schedular exemption for 10 CFR Part 50, Appendix J should be granted.

V.

Accordingly, the Commission has determined that pursuant to 10 CFR 50.12, the exemption is authorized by law, will not endanger life or property or the common defense and security, and is otherwise in the public interest. Therefore, the Commission hereby approves the following exemption request.

A temporary exemption is granted from the requirements of Section III.D.3, which requires a local leak rate test be conducted within 2-year interval. For good cause shown, this exemption extends that period by approximately 7 months from September 18, 1990 until April 30, 1991.

Pursuant to 10 CFR 51.32, the Commission has determined that the granting of this exemption will have no significant impact on the environment (55 FR 38616).

A copy of the licensee's request for exemption dated September 14, 1990, as supplemented September 18, 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

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

Dated at Rockville, Maryland
this 26th day of September 1990

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO APPENDIX J INTERVAL EXEMPTION

VIRGINIA ELECTRIC AND POWER COMPANY

SURRY POWER STATION, UNIT NO. 2

DOCKET NO. 50-281

1.0 INTRODUCTION

By letter dated September 14, 1990, as supplemented September 18, 1990, Virginia Electric and Power Company (the licensee) requested a one-time exemption for Surry Power Station, Unit No. 2 (Surry 2) from the requirements of 10 CFR Part 50, Appendix J pertaining to Type C leak rate test intervals. Paragraph III.D.3 of Appendix J requires that Type C testing be performed during each reactor shutdown for refueling but in no case at an interval of greater than 2 years. The licensee requested an extension of the 2-year Type C test interval of up to 9 months for 76 containment isolation valves associated with 42 penetrations which cannot be tested during power operation. The licensee intends to test these valves during the scheduled Cycle 10 refueling outage starting on April 5, 1991.

Surry 2 was shut down for refueling on September 10, 1988 and remained in the refueling outage for 374 days to perform maintenance and modifications. Local leak rate tests (LLRTs) commenced in September 1988 and were completed in September 1989. Due to the extended outage, certain containment isolation valves will exceed the 2-year Type C test interval before the scheduled refueling outage date. Among the 76 valves requested for test postponement, 14 first-tested valves exceeded the 2-year test interval on September 18, 1990. In order to eliminate plant shutdown solely for performing LLRTs, the licensee requested a one-time exemption of up to 9 months until June 30, 1991 to complete the LLRTs. A temporary waiver of compliance was issued on September 18, 1990 to remain in effect until the NRC staff had processed the requested exemption.

2.0 EVALUATION

To support the exemption from the requirements of Appendix J, the licensee provided the following rationale:

(1) The actual power operation inservice period for the majority of the components will be 19 months, which is less than the 2-year allowable interval; the remaining calendar time was during a period of cold shutdown which was considered to be less severe conditions than power operation.

(2) Primary containment integrity and compliance with the allowable leakage limits are not required when the reactor is in cold shutdown. An exemption would not be necessary, as considered by the licensee, in the event that Type C tests are not performed in 2 years if the interval expires during cold shutdown and the tests are completed prior to restart.

(3) The LLRT program has undergone significant changes and improvements to minimize leakage. The latest Type B and C test results are well below 0.6La limit.

(4) Compliance with the regulation would result in undue hardship or other costs in the form of lost revenues due to plant shutdown for performing Appendix J testing.

(5) Extending the LLRTs would not affect the probability of occurrence of accidents. Increasing the LLRT interval would also eliminate one heatup and cooldown cycle and lower the probability of events which are likely during such plant evolutions.

The staff has reviewed the Appendix J exemption request and the associated justification and believes that the technical rationale has merit. The staff agrees that during a shutdown period the environment seen by a containment barrier can generally be considered to be less severe than during power operation conditions. However, the licensee's interpretation implies that little or no significant barrier degradation occurs during cold shutdown. The staff's experience with TMI-1 Appendix J leakrate testing during its long-time shutdown found that valves did degrade even if they were not in service. TMI-1 containment isolation valves were Type C tested almost every year during the cooldown period and increased valve leakage was found during each test. Extending LLRTs will increase the probability of valve leakage, especially when the valve is aged. As a result, the staff reaffirms its interpretation that the time referred to within Appendix J is calendar time. The intent of Appendix J Type C testing is to test valve leakage in a 24-month interval regardless of whether the valve is exposed to power operation or not.

In assessing the possible degradation of containment integrity resulting from the extended test period, the staff has reviewed previous LLRTs performed at Surry 2 in 1986 and 1988. The total "as-found" leakage for the 76 valves tested in 1986 was 925.66 SCFH, which was a failed LLRT. Corrective action for valve repair and replacement was taken to reduce valve leakage. Following these repairs, the final "as-left" leakages for the combined Type B and C tests, as shown in Attachment 2 of the submittal, were below the 0.6La allowable value of 180 SCFH. The total "as-found" leakage for the 76 valves tested in 1988 was 110.26 SCFH. Following valve repair and replacement, the final "as-left" combined Type B and C leakages were found acceptable. The licensee also identified the valves that had poor leakage history. The major contributors to the 1986 Type C test failure were valves TV-DA-200A/B, TV-CH-2160, MOV-RS-256A, and 2-VP-12. Both penetrations 38 (TV-DA-200A/B) and 46 (FCV-2160) had 300 SCFH leakage rates and penetration 28 (CH-2204) had a 169 SCFH leakage rate. The licensee stated that TV-DA-200A/B and CH-2204 were replaced and FCV-2160 is a water-filled valve, which is not considered a credible leakage path. The major contributors to the 1988 Type C test failure were valves 02-RS-11, MOV-RS-256 and 02-VP-12. The licensee stated that these valves were repaired and retested satisfactorily, as demonstrated by the test results in Attachment 2 of the submittal. The staff has reviewed the leakage data for valves included in the exemption request and finds that 80% of the valves tested in the "as found" condition had very low leakage except for the valves mentioned above.

The licensee also estimated leakage rates for the 1991 extended Type C testing based on 1986 and 1988 test results. The licensee first calculated the leakage trend per month for each valve and then found the projected leakage increase for the valve as a summation of the 1988 "as found" leakage and the 33-month leakage trend. If a valve had a negative leakage trend, the most recent "as found" leakage value was used for calculating the trend value. For valves that were overhauled or replaced, the most recent post-maintenance "as-found" leakage value was used. If the "as-found" leakage was not available, then the "as-left" leakage value was used. The projected leakage for the 76 valves was calculated to be 42.44 SCFH. The licensee then estimated leakages for all 122 valves using the same method and found the total "as found" leakages to be 91.52 SCFH. The staff has reviewed the valve leakage projection and finds that the methodology for estimated leakage for the extended period is acceptable. Furthermore, the ample margin between the estimated leakage and the allowable leakage should accommodate any degradation likely to be experienced for the 76 valves during the extended period.

The staff has completed its review of the licensee's submittals. The licensee has provided evidence to justify that extending the test interval should not result in a situation wherein the measured leakage from these valves would cause the 0.6La limit to be exceeded. However, based on the information provided, it is the staff's view that the exemption interval shall be effective until April 30, 1991, rather than the requested date of June 30, 1991, because this interval should provide sufficient time to complete the required tests following the start of the April 5, 1991 refueling outage. The staff has previously approved a similar test extension on Surry Unit 1. To ensure proper containment integrity, the licensee committed to perform Appendix J testing as soon as possible during any earlier outage of suitable duration should one occur prior to the scheduled refueling outage. If testing is performed, the following priorities, which the staff finds acceptable, have been established by the licensee: (1) first test the valves with the highest leakage, (2) then test all stop check valves, (3) and then larger-sized valves, (4) and finally, test the smaller-sized valves.

3.0 CONCLUSION

Based on the above, the staff has concluded that a 7-month test interval extension is acceptable for Surry Unit 2. This is a one-time exemption from the 2-year Type B and Type C test interval requirements as prescribed in Appendix J and will be in effect until April 30, 1991.

Dated: September 26, 1990

Principal Contributor:
J. Guo