

VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

November 20, 1995

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC. 20555

Serial No. 95-601
NLOS/ETS:
Docket Nos. 50-338
50-339
License Nos. NPF-4
NPF-7

Gentlemen:

VIRGINIA ELECTRIC AND POWER COMPANY
NORTH ANNA POWER STATION UNITS 1 AND 2
PROPOSED TECHNICAL SPECIFICATIONS CHANGE
10 CFR 50 APPENDIX J OPTION B
PERFORMANCE-BASED CONTAINMENT LEAKAGE RATE TESTING

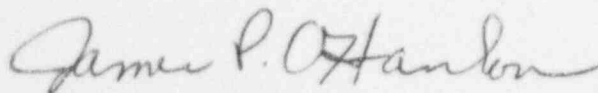
Pursuant to 10 CFR 50.90, the Virginia Electric and Power Company requests amendments, in the form of a change to the Technical Specifications, to Facility Operating License Nos. NPF-4 and NPF-7 for North Anna Power Station Units 1 and 2. The proposed Technical Specifications change will permit the use of 10 CFR 50 Appendix J, Option B, Performance-Based Containment Leakage Rate Testing.

A discussion of the proposed Technical Specifications change for North Anna is provided in Attachment 1. The proposed Technical Specifications changes for Units 1 and 2 are provided in Attachments 2 and 3, respectively. It has been determined that the proposed Technical Specifications change does not involve an unreviewed safety question as defined in 10 CFR 50.59 or a significant hazards consideration as defined in 10 CFR 50.92. The basis for our determination that the change does not involve a significant hazards consideration is provided in Attachment 4. The proposed Technical Specifications change has been reviewed and approved by the Station Nuclear Safety and Operating Committee and the Management Safety Review Committee.

To take advantage of the performance-based containment leakage rate testing option of 10 CFR 50 Appendix J, we request your prompt review and approval of the proposed change prior to the next refueling outage. This refueling outage is currently scheduled to begin in February of 1996.

Should you have any questions or require additional information, please contact us.

Very truly yours,



James P. O'Hanlon
Senior Vice President - Nuclear

Attachments

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Attachment 1
Discussion of Change
North Anna Power Station

DISCUSSION OF CHANGES

INTRODUCTION

The Nuclear Regulatory Commission has amended its regulations to provide a performance-based option for leakage-rate testing of containments. This testing option (designated Option B) is available in lieu of compliance with the present prescriptive requirements contained in Appendix J regulations. In order to implement the performance-based leakage rate testing option, the Technical Specifications must be changed to eliminate reference to the present prescriptive Appendix J requirements. Therefore, Virginia Electric and Power Company (Virginia Power) is proposing a change to the North Anna Technical Specifications to eliminate the existing prescriptive testing requirements for leakage rate testing of the containment and instead reference Option B of 10 CFR 50 Appendix J and NRC Regulatory Guide 1.163, "Performance-Based Containment Leak-Test Program," dated September 1995. This change will permit use of the performance-based leakage rate testing.

The operation and operability requirements of the containment and containment penetrations are not affected by the proposed Technical Specification change. Increasing the leakage rate test interval for the containment and containment penetrations does lead to a slight increase in the probability of a malfunction of equipment important to safety. Due to the longer intervals between tests, the proposed change will increase the overall accident risk to the public by approximately 0.7% and 2.2% for changes in the frequency of Type A tests and Type B and C tests, respectively. However, this increase in the probability of a malfunction has been judged by Virginia Power to be insignificant. This increase in risk has been reviewed and judged to be acceptable by the NRC as documented in NUREG-1493, "Performance-Based Containment Leakage-Test Program," and the recent changes to 10 CFR 50 Appendix J.

The proposed change does not involve any physical modifications to the plant or modification in the methods of plant operation which would could cause an accident or event of a different type than previously analyzed. The operational leakage criteria for the containment and the containment penetrations are not affected by the proposed change. The accident analysis assumptions are not altered by the proposed change in containment surveillance frequency. Thus, the margin of safety for design basis accidents is unaffected by the proposed change. Therefore, the proposed change to the surveillance intervals for the containment and the containment penetrations do not result in an unreviewed safety question or a significant hazards consideration.

BACKGROUND

Current Design and Licensing Basis - Appendix J

Appendix J to 10 CFR 50, "Primary Reactor Containment Leakage Testing for Water-Cooled Reactors," became effective in March 1973. The safety objective of reactor containments is stated in 10 CFR 50, Appendix A, "General Design Criteria for Nuclear Power Plants," Criterion 16, "Containment Design." GDC Criterion 16 mandates "an essentially leak-tight barrier against the uncontrolled release of radioactivity to the environment." Appendix J to 10 CFR 50 implements, in part, GDC 16 and specifies containment leakage-testing requirements, including the type of test required. For each type of test required, Appendix J specifies how the test should be conducted, the

frequency of testing, and reporting requirements. Appendix J requires the following type of containment leakage tests:

- Measurement of the containment integrated leakage rate (Type A tests).

The current test requirement is three tests approximately equally spaced over the 10 year inservice inspection interval. The third test must be performed when the unit is shutdown for the 10 year inservice inspections.

- Measurement of the leakage rate across each pressure containing or leakage limiting boundary for various primary reactor containment penetrations (Type B tests).

Except for airlocks, the current test requirement is testing during every reactor shutdown for refueling, or other convenient interval, but in no case at intervals greater than 2 years. Airlocks are tested every six months and after each use.

- Measurement of the containment isolation valve leakage rates (Type C tests).

The current test requirement is testing during every reactor shutdown for refueling, but in no case at intervals greater than 2 years.

DISCUSSION

The recent NRC conclusions on containment leak rate testing, as documented in NUREG-1493, are based on two fundamental components. First is the insight gained through the use of probabilistic risk assessment techniques. This insight allows the NRC to better assess and apply the relative significance of systems important to safety. The second is the significant data base of practical, hands-on experience regarding containment leakage-rate testing gained since 1973, when Appendix J became effective. This operating and testing experience provides solid evidence of the need and activities necessary to conduct Appendix J testing and the cost of those activities both in resources and occupational radiation exposure.

The new risk-based regulation is based on the performance history of components (containment, penetrations, and valves) as a means to justify an increase in the interval for Type A, B, and C tests. The new regulation requires tests to be conducted on an interval based on the performance of the containment structure, penetrations, and valves without specifying the interval in the regulation.

Allowable Leakage Rate

The extensive operations and testing experience show that risk to the general population is generally insensitive to changes in the allowable leakage rate. Specific findings include:

- The allowable containment leakage can be increased by approximately two orders of magnitude with marginal impact on population dose estimates from reactor accidents.

- Calculated population risks are several orders of magnitude below the NRC's Safety Goals as documented in its policy statement "Safety Goals for Operation of Nuclear Power Plants," dated August 4, 1986.

Leakage Rate Test Interval

Reducing the Type A test frequency from the current three tests every ten years to one test every ten years as endorsed by the rulemaking leads to a marginal increase in risk. However, this marginal increase is insignificant relative to the current risk estimates.

Specific findings include:

Type A

Reducing the frequency of Type A tests from the current three every ten years to one every twenty years as documented in NUREG-1493 was found to lead to an imperceptible increase in risk. The estimated increase in risk is very small because Type A tests identify only a few potential containment leakage paths that cannot otherwise be identified by Type B and C testing. Furthermore, operating experience shows that leaks found by Type A tests have only marginally exceeded existing requirements. Given the insensitivity of risk to containment leakage rate and the small fraction of leakage paths detected solely by Type A testing, increasing the interval between Type A tests is possible with minimal impact on public risk.

Although still below previously stated NRC safety goals, decreasing the frequency of testing to one in ten years as endorsed by the rulemaking decreases the timeliness of finding those leaks and, thus, increases the expected overall population risk by 0.7 percent.

Type B and C

Type B and C tests detect a very large fraction, over 97 percent, of containment leakage paths. Since leakage through Type B penetrations is infrequent and small (less than 1% of the allowable leakage rate) changing the test frequency to coincide with the Type A test schedule is not estimated to result in any change in the overall risk.

Virtually all leakage paths (greater than 97%) are identified by Type C tests of containment isolation valves. Based on the model of component failure, it has been found that performance-based Type C testing alternatives are feasible without significant risk impacts. Although still below previously stated NRC safety goals, for Type B and C testing, the population risk for a performance-based testing schedule would increase overall accident risk by 2.2 percent per year. This increase is considered marginal by the NRC.

The NRC's safety objective established for the Appendix J rulemaking initiative was to allow licensees more flexibility in the allocation of resources while maintaining a high degree of assurance of containment integrity. The performance-based containment leakage testing program endorsed by Regulatory Guide 1.163, "Performance-Based Containment Leak-Test Program," and NEI 94-01, "Industry Guidelines for

Implementing Performance-Based Containment Option of 10 CFR 50, Appendix J," meets this objective.

SPECIFIC CHANGES

Specification 3/4.6 Containment

- Specification 4.6.1.1.a - "Verifying" is being spelled correctly in the surveillance requirement for both Units.
- Specification 4.6.1.1.c - Replace the current leakage verification requirement with the following:

"Results shall be evaluated against the criteria of Specification 3.6.1.2.b in accordance with 10 CFR 50 Appendix J, Option B, as modified by approved exemptions and Regulatory Guide 1.163."

- Specifications 4.6.1.2.a through d - Replace the current prescriptive testing requirements with the following:

"The containment and containment penetrations leakage rates shall be demonstrated by performing leakage rate testing in accordance with 10 CFR 50 Appendix J, Option B, as modified by approved exemptions and Regulatory Guide 1.163. The provisions of Specification 4.0.2 are not applicable."

- Specifications 4.6.1.3.a (and footnote) and b - Replace the current prescriptive testing requirements with the following:

"a. By performing leakage rate testing in accordance with 10 CFR 50 Appendix J, Option B, as modified by approved exemptions and Regulatory Guide 1.163. The provisions of Specification 4.0.2 are not applicable."

- Specification 4.6.1.3.b - Change the frequency from "once every 18 months during shutdown" to "once per refueling outage."

This is consistent with removing the prescriptive testing requirements for leak rate testing from the remaining Technical Specifications.

- Specifications 4.6.1.6.1 and 2 - Replace the current prescriptive testing requirements with the following:

Containment Surfaces - The structural integrity of the exposed accessible interior and exterior surfaces of the containment, including the liner plate, shall be determined by performing visual examinations in accordance with 10 CFR 50 Appendix J, Option B, as modified by approved exemptions and Regulatory Guide 1.163. The provisions of Specification 4.0.2 are not applicable."

The Unit 1 Specification is changing from inspection of just the liner plate to reflect the Unit 2 inspection requirements, which include the accessible interior and exterior surfaces of the containment.

Specification 6.9.2, Special Reports

- Specification 6.9.2.r. and 6.9.2.q for Units 1 and 2, respectively - This containment structural integrity inspection reporting requirement is being deleted. Option B requires specific recordkeeping for leakage rate testing in lieu of reporting.

SAFETY SIGNIFICANCE

The proposed Technical Specifications change is necessary to permit the use of Option B, of the revised 10 CFR 50, Appendix J. Option B permits performance-based testing of the containment and containment penetrations. Performance based testing will significantly reduce the amount of testing and personnel exposure for each outage. The proposed change has been reviewed against the criteria of 10 CFR 50.59 and it has been determined that an unreviewed safety question does not exist for the following reasons:

Plant systems and components will not be operated in a different manner as a result of the proposed Technical Specifications change. The proposed change permits a performance-based approach to determining the leakage-rate test frequency for the containment and containment penetrations (Type A, B, and C tests). There are no plant modifications, or changes in methods of operation. Therefore, the changes in testing intervals for the containment and containment penetrations have no affect on the probability of occurrence of a LOCA. The Limiting Conditions for Operation and the leakage-rate acceptance criteria are not being changed. Therefore, the design base consequence of a LOCA are not being increased by the proposed changes in leak rate test interval.

Plant systems and components will not be operated in a different manner as a result of the proposed Technical Specifications change. Changing the test interval for the containment and containment penetrations does not create any new accident precursors or methods of operation. Therefore, the possibility for an accident of a different type than was previously evaluated in the Safety Analysis Report is not created by the proposed Technical Specifications change.

The proposed change increases the probability of a malfunction due to the longer intervals between leakage tests. It has been estimated that the longer test intervals will increase the overall accident risk to the public by approximately 0.7% and 2.2% (for changes in the frequency of Type A tests and Type B and C tests, respectively). This increase has been reviewed and found to be acceptable by the NRC as documented in NUREG-1493 and the recent rulemaking to 10 CFR 50 Appendix J. We also agree that this increase in accident risk is insignificant.

Plant systems and components will not be operated in a different manner. The Limiting Conditions for Operation for the containment and the containment penetrations are not changed as a result of the proposed Technical Specifications change. Therefore, the accident analysis assumptions for design basis accidents are unaffected and the margin of safety is not decreased by the proposed Technical Specifications change.

Attachment 2

Technical Specifications Change

North Anna Power Station - Unit 1