



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 120 TO FACILITY OPERATING LICENSE NO. DPR-32
AND AMENDMENT NO. 120 TO FACILITY OPERATING LICENSE NO. DPR-37
VIRGINIA ELECTRIC AND POWER COMPANY
SURRY POWER STATION, UNIT NOS. 1 AND 2
DOCKET NOS. 50-280 AND 50-281

INTRODUCTION

By letter dated March 1, 1988, as clarified by letter dated April 8, 1988, the licensee requested an exemption from 10 CFR Part 50, Appendix J, Paragraph II-A.3, which requires that all Containment Integrated Leakage Rate Tests (CILRTs) be performed in accordance with the American National Standard ANSI-N45.4-1972, "Leakage Rate Testing of Containment Structures for Nuclear Reactors." ANSI-N45.4-1972 requires that leakage rate calculations be performed using either the Total Time method or the Point-to-Point method. The licensee's requested exemption would allow use of the Mass Point method to calculate the containment leakage rates. The Mass-Point method is described in a more recent standard, ANSI/ANS-56.8-1987, "Containment System Leakage Testing Requirements." Also, in order to maintain consistency between the Technical Specifications (TSs) and the requested exemption, the licensee has proposed to revise Section 4.4, "Containment Test" of the Surry Units 1 and 2 Technical Specifications. This evaluation addresses the licensee's request for the changes in the TSs. The exemption was previously granted by letter dated May 9, 1988.

By letter dated April 8, 1988, the licensee provided clarifying information on the amendment request in response to the staff's request. This letter did not alter, in any way, the staff's initial determination of no significant hazards considerations as published in the Federal Register.

EVALUATION

The current TSs for the Surry Units limit the licensee to use the methods recommended by ANSI-N45.4-1972 for containment leakage rate testing. However, advances in leakage rate testing technology have provided improved test methods, including a newer method of evaluating the test data, which is called the Mass Point method. The Mass Point method was incorporated in a newer ANSI/ANS-56.8-1987 standard. Therefore, the licensee has requested to revise the TSs for the Surry Units which will allow the use of the Mass Point method for calculating containment leakage rates.

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It has been recognized by the professional community that the Mass Point method is superior to the Point-to-Point and Total Time methods which are referenced in ANSI-N45.4-1972 and endorsed by the present regulations. The Mass Point method calculates the air mass at a series of points in time, and plots it against time. A linear regression line is plotted through the mass-time points using a least square fit. The slope of this line is divided by the intercept of this line, and the result is multiplied by an appropriate constant to obtain the calculated leakage rate.

The superiority of the Mass Point method becomes apparent when it is compared with the two other methods. In the Total Time method, a series of leakage rates are calculated on the basis of containment air mass differences between an initial data point and each individual data point thereafter, and an average of these leakage rates is then determined. If, for any reason, the initial data point is not accurate (e.g., instrument error, lack of temperature equilibrium, ingassing, or outgassing), the results of the test will be affected. In the Point-to-Point method, the leakage rates are based on the mass difference between each pair of consecutive data points, and these leakage rates are then averaged to yield a single leakage rate estimate. Mathematically, this can be shown to be the difference between the air mass at the beginning of the test and the air mass at the end of the test, expressed as a percentage of the containment air mass. It follows from the above that the Point-to-Point method ignores any mass reading taken during the test and thus the leakage rate is calculated on the basis of the difference in mass between two measurements taken at the beginning and at the end of the test, which are 24 hours apart.

On February 29, 1988 (53 FR 5985), the staff published a proposed amendment to Appendix J which would explicitly permit the use of the Mass Point method, subject to certain conditions that have been accepted by the staff since approximately 1976, as well as to permit the use of the prior methods referenced in ANSI-N45.4-1972.

In addition to the method of calculation, consideration of the length of the test should also be included in the overall program. In accordance with Section 7.6 of ANSI-N45.4-1972, a test duration of less than 24 hours is only allowed if approved by the NRC staff, and the only currently approved methodology for such a test is contained in Bechtel Topical Report BN-TOP-1, Revision 1, "Testing Criteria for Integrated Leakage Rate Testing of Primary Containment Structures for Nuclear Power Plants," dated November 1, 1972. This approach only allows use of the Total Time method. Therefore, the staff requires a minimum test duration of 24 hours when the Mass Point method is used. By letter dated April 8, 1988, the licensee confirmed that a minimum test duration of 24 hours will be utilized when the Mass Point method is used. In addition, the licensee clarified that the latest revision of ANSI/ANS-56.8 (1987 revision) will be used for determining containment leakage rates.

Based on the above evaluation, the staff has determined that the Mass Point method is an acceptable method for calculation of containment leak rates, when used with a test duration of at least 24 hours. Therefore, the staff finds the proposed changes to the TS acceptable.

The staff has consulted with the State of Virginia concerning this action and there were no comments.

ENVIRONMENTAL CONSIDERATION

These amendments involve a change in the installation or use of the facilities components located within the restricted areas as defined in 10 CFR Part 20. The staff has determined that these amendments involve 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 these amendments involve no significant hazards consideration and there has been no public comment on such finding. Accordingly, these amendments meet 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 or environmental assessment need be prepared in connection with the issuance of these amendments.

CONCLUSION

We have 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 the issuance of these amendments will not be inimical to the common defense and security or to the health and safety of the public.

Dated: May 24, 1988

Principal Contributor:

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