October 7, 2002

Mr. David A. Christian Senior Vice President - Nuclear Virginia Electric and Power Company 5000 Dominion Blvd. Glen Allen, Virginia 23060

SUBJECT: SURRY POWER STATION UNITS 1 AND 2 AND NORTH ANNA POWER STATION UNITS 1 AND 2 RE: REQUESTED CORRECTION TO SAFETY EVALUATION FOR USE OF ASME CODE CASE N-597 AT NORTH ANNA POWER STATION, UNIT 2 (TAC NOS. MB2276, MB2277, MB2223, AND MB2284)

Dear Mr. Christian:

By letter dated August 31, 2001, the staff granted Virginia Electric and Power Company's (VEPCO's) relief request to use American Society of Mechanical Engineers (ASME) Code Case N-597 as an alternative evaluation of pipe wall thinning at North Anna Power Station, Units 1 and 2, and Surry Power Station, Units 1 and 2.

VEPCO has informed the staff that the incorrect ASME Code edition and addenda is stated for North Anna, Unit 2 in the supporting Safety Evaluation (SE). The SE has been revised to show the correct ASME Code edition and addenda. A copy of the revised SE with the change noted by a vertical line in the margin is enclosed and should replace the previous version. This inaccuracy does not change our conclusion in the subject SE.

The thoroughness of your staff in identifying this inaccuracy is appreciated, and is an important contribution in ensuring the accuracy of the SEs that form the basis for approval of licensing actions. If you or your staff have any comments concerning the resolution of this matter, please contact me at (301) 415-1544.

Sincerely,

/RA/

Stephen R. Monarque, Project Manager, Section 2 Project Directorate II Division of Licensing Project Management Office of Nuclear Reactor Regulation

Docket Nos. 50-280, 50-281, 50-338, and 50-339

Enclosure: As stated

cc w/encl: See next page

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Mr. David A. Christian Virginia Electric and Power Company

CC:

Mr. Donald P. Irwin, Esq. Hunton and Williams Riverfront Plaza, East Tower 951 E. Byrd Street Richmond, Virginia 23219

Mr. Richard H. Blount, II Site Vice President Surry Power Station Virginia Electric and Power Company 5570 Hog Island Road Surry, Virginia 23883-0315

Senior Resident Inspector Surry Power Station U. S. Nuclear Regulatory Commission 5850 Hog Island Road Surry, Virginia 23883

Chairman Board of Supervisors of Surry County Surry County Courthouse Surry, Virginia 23683

Dr. W. T. Lough Virginia State Corporation Commission Division of Energy Regulation P. O. Box 1197 Richmond, Virginia 23209

Robert B. Strobe, M.D., M.P.H. State Health Commissioner Office of the Commissioner Virginia Department of Health P.O. Box 2448 Richmond, Virginia 23218

Mr. William R. Matthews Vice President - Nuclear Operations Virginia Electric and Power Company Innsbrook Technical Center 5000 Dominion Boulevard Glen Allen, Virginia 23060-6711 Office of the Attorney General Commonwealth of Virginia 900 East Main Street Richmond, Virginia 23219

Mr. Stephen P. Sarver, Director Nuclear Licensing & Operations Support Innsbrook Technical Center Virginia Electric and Power Company 5000 Dominion Blvd. Glen Allen, Virginia 23060-6711

Mr. David A. Heacock Site Vice President North Anna Power Station Virginia Electric and Power Company P. O. Box 402 Mineral, Virginia 23117-0402

Mr. C. Lee Lintecum County Administrator Louisa County P.O. Box 160 Louisa, Virginia 23093

Old Dominion Electric Cooperative 4201 Dominion Blvd. Glen Allen, Virginia 23060

Senior Resident Inspector North Anna Power Station U.S. Nuclear Regulatory Commission 1024 Haley Drive Mineral, Virginia 23117

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO THE USE OF CODE CASE N-597 AS AN ALTERNATIVE

FOR THE ANALYTICAL EVALUATION OF CLASS 2 AND 3

CARBON AND LOW-ALLOY STEEL PIPING ITEMS

NORTH ANNA POWER STATION, UNITS 1 AND 2

AND SURRY POWER STATION, UNITS 1 AND 2

VIRGINIA ELECTRIC AND POWER COMPANY

DOCKET NOS. 50-338, 50-339, 50-280, AND 50-281

1.0 INTRODUCTION

The inservice inspection (ISI) of the American Society of Mechanical Engineers (ASME) Code Class 1, 2, and 3 components shall be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel (B&PV) Code and applicable edition and addenda as required by Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.55a(g), except where specific written relief has been granted by the Commission pursuant to 10 CFR 50.55a(a)(3). 10 CFR 50.55a(a)(3) states, in part, that alternatives to the requirements may be used provided the licensee demonstrates that (i) the proposed alternatives would provide an acceptable level of quality and safety or (ii) compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Pursuant to 10 CFR 50.55a(g)(4), ASME Code Class 1, 2, and 3 components (including supports) shall meet the requirements, except the design and access provisions and the preservice examination requirements, set forth in the ASME Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," to the extent practical within the limitations of design, geometry, and materials of construction of the components. The regulations require that inservice examination of components and system pressure tests conducted during the first 10-year interval and subsequent intervals comply with the requirements in the latest edition and addenda of Section XI of the ASME Code incorporated by reference in 10 CFR 50.55a(b) 12 months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein and subject to Commission approval. The applicable ASME Code edition and addenda are as follows:

- 1. North Anna Unit 1 1989 Edition, no Addenda
- 2. North Anna Unit 2 1995 Edition, with addenda up to and including the 1996 Addenda
- 3. Surry Units 1 and 2 1989 Edition, no Addenda.

Enclosure

By letters dated June 13, and June 26, 2001, as supplemented by letter dated July 12, 2001, Virginia Electric and Power Company (VEPCO, the licensee) submitted a request for relief from ASME Code Section XI (IWA-3100) for North Anna Power Station, Units 1 and 2 (NAPS), and Surry Power Station, Units 1 and 2 (SPS), that provides the process for the disposition of flaw examination evaluations that exceed the acceptance standards for materials and welds specified in the Section III Edition applicable to the construction of the component. This requirement is identical for all four units. The request provides for an analytical evaluation of Class 2 and 3 carbon and low-alloy steel piping items subjected to wall thinning as a result of flow-accelerated and other corrosion phenomena.

2.0 BACKGROUND

2.1 ASME Section XI Code Requirement

ASME B&PV Code Section XI (IWA-3100) provides the process for the disposition of flaw examination evaluations that exceed the acceptance standards for materials and welds specified in the Code applicable to the construction of the component. This provision stipulates that the disposition shall be subjected to review by the regulatory and enforcement authorities having jurisdiction at the plant site. This flaw evaluation requirement is identical for NAPS and SPS.

2.2 Proposed Alternative

As an alternative to the requirements of IWA-3100, "Evaluation," the licensee proposes to use the provisions of ASME B&PV Code Case N-597 for the analytical evaluation of Class 2 and 3 carbon and low-alloy steel piping items subjected to wall thinning as a result of flow-accelerated or other corrosion phenomena rather than to repair the component if the construction code minimum wall thickness has been reached. This Code case stipulates that the methods of predicting the rate of wall thickness loss and the predicted remaining wall thickness shall be the responsibility of the owner. The licensee has procedural controls in the VEPCO Flow Accelerated Corrosion (FAC) Program that provide direction for calculating wear rates, forecasting remaining life, and conducting inspections of piping components susceptible to FAC. The methodology is consistent with industry standard, NSAC-202L-R2, "Recommendations for an Effective Flow-Accelerated Corrosion Program," for calculating wear rates, forecasting remaining life, and conducting inspections as programmatic requirements.

3.0 EVALUATION

The Code requires that the component whose flaws exceed the acceptance standards shall be evaluated to determine disposition that shall be subjected to review by the regulatory and enforcement authorities having jurisdiction at the plant site. As an alternative to the Code requirements, the licensee has proposed to use Code Case N-597, *Requirements for Analytical Evaluation of Pipe Wall Thinning, Section XI, Division 1* for Class 2 and 3 carbon and low-alloy steel piping items for NAPS and SPS. The staff has reviewed this Code case previously in preparing its position for incorporation into 10 CFR Part 50 and determined that it is conditionally acceptable. Since the Code case does not address inspection requirements and wall thinning rates, the staff has determined that the Code case needs to be reviewed and approved prior to use.

The staff finds that the licensee's use of Code Case N-597 provides an acceptable approach for determining wall thinning as a result of flow-accelerated or other corrosion phenomena. However, the approach makes note of the owner's responsibility in developing the methods of predicting the rate of wall thickness loss and the value of the predicted remaining wall thickness. Although Code Case N-597 can be applied to flow-accelerated and other corrosion phenomena, the licensee provided information related only to the application of this Code case to FAC. The application of this Code case to corrosion phenomena other than FAC is not within the scope of this evaluation.

The licensee provided information on the plant inspection and evaluation procedures for calculating wear rates, remaining life, and predicting remaining wall thickness. These procedures are based on NSAC-202L-R2, "Recommendations for an Effective Flow-Accelerated Corrosion Program." The licensee, in its implementation procedures, has eliminated the ambiguities in NSAC-202L-R2; in particular, the licensee clarified the following definitions used in the plant procedures governing their FAC program:

"Shall" is a mandatory requirement.

"Should" is a non-mandatory requirement; however, it is the preferred/desired method to be adhered to unless the FAC program administrator or management determines otherwise.

This information was provided in a letter dated July 12, 2001.

Components to which this Code case is applied must be repaired or replaced in accordance with the construction code of record and owners' requirements or a later approved edition of ASME Section III prior to reaching the allowable minimum wall thickness as specified in this Code case.

Therefore, the staff finds that the licensee's alternative to the use of Code Case N-597 as applied through industry standard NSAC-202L-R2, with clarifications of the application of "shall" and "should" in this standard, provides an acceptable level of quality and safety for use in connection with Class 2 and 3 carbon and low-alloy steel piping subject to FAC.

4.0 CONCLUSION

The staff concludes that the use of Code Case N-597 and industry standard NSAC-202L-R2, with clarification of the terms "shall" and "should" in this standard, as an alternative evaluation for Class 2 and 3 carbon and low-alloy steel piping items subject to FAC is authorized pursuant to 10 CFR 50.55a(a)(3)(i) until such time as this Code case is incorporated into 10 CFR Part 50. The application of this Code case for corrosion phenomena other than FAC is not within the scope of this evaluation. In addition, components to which this Code case is applied must be repaired or replaced in accordance with the construction code of record and owners' requirements prior to reaching the allowable minimum wall thickness as specified in this Code case. At such time that Code Case N-597 is incorporated into 10 CFR Part 50 and the licensee intends to continue to implement Code Case N-597, the licensee should follow all the provisions in Code Case N-597 with limitations issued in the rule, if any.

Principal Contributor: C. Lauron

Date: August 31, 2001