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

SAFETY EVALUATION
VIRGINIA ELECTRIC AND POWER COMPANY
NORTH ANNA POWER STATION, Units NO. 1 AND NO. 2
DOCKET NOS. 50-338 AND 50-339
GENERIC LETTER 83-28, ITEMS 3.1.1,
3.1.2, 3.2.1, 3.2.2, 4.1 AND 4.5.1

I. Introduction

In February 1983, the Salem Nuclear Power Station experienced two failures of the reactor-trip system upon the receipt of trip signals. These failures were attributed to Westinghouse - Type DB-50 reactor trip system (RTS) circuit breakers. The failures at Salem on February 22 and 25, 1983, were believed to have been caused by a binding action within the undervoltage trip attachment (UVTA) located inside the breaker cubicle. Due to problems of the circuit breakers at Salem and at other plants, NRC issued Generic Letter 83-28, Required Actions Based on Generic Implementation of Salem Anticipated Transient Without Scram (ATWS) Events, dated July 8, 1983. This letter required the licensees to respond on immediate-term actions to ensure reliability of the RTS. Actions to be performed included development of programs to provide for post-trip review, classification of equipment, vendor interface, post-maintenance testing, and RTS reliability improvements. The Generic Letter stated that for Actions 3.1.1., 3.1.2, 3.2.1, 3.2.2, 4.1, 4.4 and 4.5.1, NRC Regional Offices would perform a post-implementation review and issue Safety Evaluation Reports (SER). This report is the Regional SER for North Anna Units 1 and 2 and includes the results of RII's review of the licensee's submittals to Generic Letter 83-28. A Regional inspection was conducted at the North Anna facility during April 8-12, 1985, to review the licensee's current program, planned program improvements, and implementation of present procedures associated with post-trip review, equipment classification, vendor interface, post-maintenance testing, and RTS reliability. The details of the inspection findings are discussed in Inspection Report No. 338, 339/85-11.

II. Review Guidelines

The licensee's responses dated November 4, 1983, and February 8, 1985, were evaluated for compliance to the staff's positions delineated in Generic Letter 83-28 for Action Items 3.1.1, 3.1.2, 3.2.1, 3.2.2, 4.1 and 4.5.1. Item 4.4 is applicable to Babcock and Wilcox (B&W) plants and therefore is not applicable to North Anna 1 and 2. The requirements of the above action items as described in the Generic Letter are paraphrased below:

3.1. POST-MAINTENANCE TESTING (REACTOR TRIP SYSTEM COMPONENTS)

Position

1. Licensees and applicants shall submit the results of their review of test and maintenance procedures and Technical Specifications to assure that post-maintenance operability testing of safety-related components in the RTS is required to be conducted and that the testing demonstrates that the equipment is capable of performing its safety functions before being returned to service.

2. Licensees and applicants shall submit the results of their check of vendor and engineering recommendations to ensure that any appropriate test guidance is included in the test and maintenance procedures or the Technical Specifications, where required.

3.2 POST-MAINTENANCE TESTING (ALL OTHER SAFETY-RELATED COMPONENTS)

Position

The following actions are applicable to post-maintenance testing:

1. Licensees and applicants shall submit a report documenting the extending of test and maintenance procedures and Technical Specifications review to assure that post-maintenance operability testing of all safety-related equipment is required to be conducted and that the testing demonstrates that the equipment is capable of performing its safety functions before being returned to service.

2. Licensees and applicants shall submit the results of their check of vendor and engineering recommendations to ensure that any appropriate test guidance is included in the test and maintenance procedures or the Technical Specifications where required.

4.1 REACTOR TRIP SYSTEM RELIABILITY (VENDOR-RELATED MODIFICATIONS)

Position

All vendor-recommended reactor trip breaker modifications shall be reviewed to verify that either: (1) each modification has, in fact, been implemented; or (2) a written evaluation of the technical reasons for not implementing a modification exists.

For example, the modifications recommended by Westinghouse in NCD-Elec-18 for the DB-50 breakers and a March 31, 1983, letter for the DS-416 breakers shall be implemented or a justification for not implementing shall be made available. Modifications not previously made shall be incorporated or a written evaluation shall be provided.

4.5 REACTOR TRIP SYSTEM RELIABILITY (SYSTEM FUNCTIONAL TESTING)

Position

On-line functional testing of the reactor trip system, including independent testing of the diverse trip features, shall be performed on all plants.

1. The diverse trip features to be tested include the breaker undervoltage and shunt-trip features on Westinghouse, Babcock and Wilcox (B&W) and Combustion Engineering (CE) plants; the circuitry used for power interruption with the silicon-controlled rectifiers on B&W plants and the scram pilot valve and backup-scram valves (including all initiating circuitry) on General Electric (GE) plants.

III. Evaluation and Conclusion

By letters dated November 4, 1983, and February 8, 1985, Virginia Electric and Power Company (VEPCO), the licensee of North Anna Power Station, Units 1 and 2, provided information regarding their compliance to Sections 3.1, 3.2, 4.1 and 4.5 of Generic Letter 83-28. We have evaluated the licensee's responses against the NRC positions described in Section II above for completeness and adequacy. We concluded that the licensee's responses to Action Items 3.1.1, 3.1.2, 3.2.1 and 3.2.2 are incomplete and additional information is required to determine acceptability. The responses to Action Items 4.1 and 4.5.1 are acceptable and meet the intent of Generic Letter 83-28. Delineated below is a brief summary of the licensee's response and the results of the Regional Evaluations:

a. Item 3.1.1, Review of Test and Maintenance Procedures and Technical Specifications (RTSC).

The licensee's response to this item is considered incomplete and additional information is needed to determine acceptability. The licensee needs to confirm in their response that test and maintenance procedures and Technical Specifications have been reviewed for all safety-related components in the RTS. This review is to assure that post-maintenance testing is specified in the working level procedures and that the testing will verify component capability to perform safety functions prior to being returned to service. The licensee's response dated February 8, 1985, only states that the Administrative Procedures, QA procedures, and Technical Specifications require demonstration of equipment operability before returning to equipment service. The response does not confirm that individual maintenance and test procedures have been reviewed to ensure they contain post-maintenance testing requirements specified by Administrative Procedures, QA procedures, and Technical Specifications. We request that the licensee provide a statement confirming that test and maintenance procedures and Technical Specifications associated with the Reactor Trip System were reviewed to assure that

post-maintenance testing is required. In addition, the statement should indicate whether such testing adequately verifies component capability to perform its intended safety functions.

b. Item 3.1.2, Check of Vendor and Engineering Recommendations for Testing and Maintenance

The licensee's response to this item is considered incomplete and additional information is needed to determine acceptability. The licensee states in their response that Station Controlling Administrative procedures require current vendor information be referenced or included in test and maintenance procedures. The licensee also states that vendor recommendations for testing and maintenance of the Reactor Trip Breakers have been reviewed and incorporated into plant procedures. However, the licensee does not state whether a review was made of test and maintenance procedures for other safety-related components in the RTS to verify that appropriate vendor and engineering information was included in the procedures. It is concluded from the response and from discussion with plant personnel (Inspection Report 338, 339/85-11) that only new and revised vendor information will be reviewed and evaluated for incorporation into plant procedures. The Generic Letter is quite specific in this area in that it states in part that, "licensees shall submit the results of their check of vendor and engineering recommendations to ensure that any appropriate test guidance is included in the test and maintenance procedures or the Technical Specifications." However, the response does not address the adequacy of current (in use) procedures which are developed from older vendor and engineering recommendations. We request that the licensee provide additional information on:

(1) How VEPCO's administrative procedures ensure that all previous vendor and engineering recommendations were appropriately incorporated into test and maintenance procedures or Technical Specifications.

(2) The results of VEPCO's check to determine if vendor and engineering recommendations have been included in current test and maintenance procedures.

c. Item 3.2.1, Review of Test and Maintenance Procedures and Technical Specifications (All Other Safety-Related Components)

The licensee's response to this item is considered incomplete and additional information is needed to determine acceptability. We request that the licensee provide a statement confirming that test and maintenance procedures and Technical Specifications were reviewed for all other safety-related components to assure that post-maintenance testing is required and that the testing verifies component capability to perform safety functions prior to being returned to service.

d. Item 3.2.2, Check of Vendor and Engineering Recommendations for Testing and Maintenance (All Other Safety-Related Components)

The licensee's response to this item is considered incomplete and additional information is needed to determine acceptability. For further discussion see paragraph b. We request that the licensee provide additional information on how VEPCO's administrative procedures ensure that all previous vendor and engineering recommendations were appropriately incorporated into test and maintenance procedures or Technical Specifications.

e. Item 4.1 Reactor Trip System Reliability (Vendor-Related Modifications)

The licensee's response to this action item is acceptable and meets the intent of Generic Letter 83-28. The licensee states in their submittal that all vendor recommended reactor trip breaker modifications have been implemented at North Anna Units 1 and 2. The licensee further states in their response that there are only two modifications recommended by the vendor for the DB-50 type reactor trip breakers used at North Anna. The modifications performed on the breakers are identified as follows:

NCD-Elect-18 dated December 17, 1971, requiring replacement of the undervoltage trip assembly.

WES-3023 dated April 19, 1983, requiring removal of the overcurrent trip bracket on the trip bar.

f. Item 4.5.1 Reactor Trip System Reliability (System Functional Testing)

The licensee's response to this item is acceptable and meets the intent of Generic Letter 83-28. The licensee confirmed in their response that on-line functional testing of the undervoltage and shunt-trip features shall be performed as part of the routine monthly logic testing. The procedures utilized for the testing will be based on the Westinghouse Owners Group test procedure submitted to NRC in a letter dated June 14, 1983. The Shunt Modification has been completed on Unit 2 and is scheduled to be completed on Unit 1 during the next outage of sufficient duration in 1985 (See Inspection Report 338, 339/85-11). Unit 2 Periodic Test Procedure No. 2-PT-36.1, Reactor Protection and Engineered Safety Feature (ESF) Logic Test, has been revised to incorporate on-line functional testing of the auto shunt trip feature. This action was confirmed by the Region and is discussed in Inspection Report 338, 339/85-11. In conclusion, we recommend that the licensee should complete the shunt modification on North Anna Unit 1 during the next outage and implement the revised periodic test procedures. Finally the licensee should submit a statement confirming that this action has been completed for North Anna Unit 1.

g. Conclusion

Based on our review, we conclude that the licensee's submittals to items 3.1.1, 3.1.2, 3.2.1 and 3.2.2 are incomplete and additional information is needed to determine acceptability. However, items 4.1 and 4.5.1 were determined to be acceptable and meet the intent of GL 83-28.

Acceptable responses to the above noted deficiencies are required before we can complete our review of the licensee's Post-Maintenance Testing (Reactor Trip System Components) and Post-Maintenance Testing (All Other Safety-Related Components) for the North Anna Power Station. Region II will review these responses when received and will report our findings in a supplement to this Safety Evaluation (SE).

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

North Anna Power Station

Richard M. Foster, Esq.
Musick, Williamson, Schwartz,
Leavenworth & Cope, P.C.
P. O. Box 4579
Boulder, Colorado 80306

Michael W. Maupin, Esq.
Hunton, Williams, Gay and Gibson
P. O. Box 1535
Richmond, Virginia 23212

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

Ellyn R. Weiss, Esq.
Harmon, Weiss and Jordan
2001 S Street NW
Washington, DC 20009

Mr. J. H. Ferguson
Executive Vice President - Power
Virginia Electric and Power Co.
Post Office Box 26666
Richmond, Virginia 23261

Mr. Anthony Gambardella
Office of the Attorney General
Supreme Court Building
101 North 8th Street
Richmond, Virginia 23219

Resident Inspector/North Anna
c/o U.S. NRC
Senior Resident Inspector
Route 2, Box 78
Mineral, Virginia 23117

Mrs. Margaret Dietrich
Route 2, Box 568
Gordonsville, Virginia 22042

Mr. Paul W. Purdom
Environmental Studies Institute
Drexel University
32nd and Chestnut Streets
Philadelphia, Pennsylvania 19104

Atomic Safety and Licensing Appeal
Board Panel
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Regional Administrator
USNRC, Region II
Office of Executive Director
for Operations
101 Marietta Street N.W., Suite 2900
Atlanta, Georgia 30323

Mr. E. W. Harrell
P. O. Box 402
Mineral, Virginia 23117

Old Dominion Electric Cooperative
c/o Executive Vice President
Innsbrook Corporate Center
4222 Cox Road, Suite 102
Glen Allen, Virginia 23060

Mr. Richard C. Klepper
Board of Supervisors
Louisa County Courthouse
P. O. Box 27
Louisa, Virginia 23093