VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

October 17, 1995

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

Serial No. 95-533
NL&OS/JBL: R1
Docket No. 50-339
License No. NPF-7

Gentlemen:

VIRGINIA ELECTRIC AND POWER COMPANY
NORTH ANNA POWER STATION UNIT 2
PROPOSED TECHNICAL SPECIFICATIONS CHANGE
STEAM GENERATOR INSPECTION SCOPE REDUCTION

Pursuant to 10 CFR 50.90, Virginia Electric and Power Company requests an amendment, in the form of a change to the Technical Specifications, to Facility Operating License No. NPF-7 for North Anna Power Station Unit 2. The proposed change would modify Table 4.4-1 of Technical Specification 4.4.5.1 to reduce from two to one the minimum number of steam generators required to be inspected during the first inservice inspection following steam generator replacement. This change would considerably reduce resources required for this outage without any corresponding reduction in nuclear safety.

A discussion of the proposed change is provided in Attachment 1. The proposed Technical Specifications change is provided in Attachment 2. It has been determined that the proposed 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 3. The proposed Technical Specifications change has been reviewed and approved by the Station Nuclear Safety and Operating Committee and the Management Safety Review Committee.

This proposed Technical Specifications change is needed for the North Anna Unit 2 refueling outage currently scheduled to begin October 18, 1996. However, the steam generator inspection scope needs to be defined considerably in advance of the outage in order to appropriately plan the associated outage activities. Therefore, Virginia Electric and Power Company requests approval of the proposed Technical Specifications change by June 1, 1996.

210013

A001
1/1

The proposed Technical Specifications change would provide a cost savings of greater than $100,000 during the affected refueling outage. Therefore, this proposed Technical Specifications change is being submitted as part of our Cost Beneficial Licensing Actions (CBLA) Program and complies with the NRC guidelines for consideration as a CBLA.

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

Very truly yours,

James P. O'Hanlon
Senior Vice President - Nuclear

Attachments

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

Mr. R. D. McWhorter
NRC Senior Resident Inspector
North Anna Power Station

Commissioner
Department of Radiological Health
Room 104A
1500 East Main Street
Richmond, Virginia 23219

COMMONWEALTH OF VIRGINIA)
)
COUNTY OF HENRICO)

The foregoing document was acknowledged before me, in and for the County and Commonwealth aforesaid, today by J. P. O'Hanlon, who is Senior Vice President - Nuclear, of Virginia Electric and Power Company. He is duly authorized to execute and file the foregoing document in behalf of that Company, and the statements in the document are true to the best of his knowledge and belief.

Acknowledged before me this 17TH day of October, 1995.

My Commission Expires: May 31, 1998.

Vicki L. Hull
Notary Public

(SEAL)

ATTACHMENT 1

DISCUSSION OF CHANGE

VIRGINIA ELECTRIC AND POWER COMPANY

Discussion of Change

Steam Generator Inspection Scope Reduction
North Anna Power Station Unit 2

Introduction

Pursuant to 10 CFR 50.90, Virginia Electric and Power Company is requesting a change to the Technical Specifications for North Anna Power Station Unit 2. The North Anna Technical Specifications (Table 4.4-1) currently require a minimum of two steam generators be inspected during the first inservice inspection (including the first inspection following steam generator replacement) and at least one steam generator be inspected during the second and subsequent inservice inspections. However, inspection of more than one steam generator is considered to be unnecessary for essentially new components after operating only one fuel cycle. The purpose of this proposed change is to reduce from two to one the minimum number of steam generators required to be opened for inspection during the first inspection (i.e., refueling outage) following the North Anna Unit 2 steam generator replacement.

Background

Current Licensing Basis

Surveillance Requirements 4.4.5.1 through 4.4.5.5 of the North Anna Power Station Unit 2 Technical Specifications describe an inservice inspection program which is required to be performed in conjunction with the inservice inspection requirements of Section XI of the ASME Boiler and Pressure Vessel Code. The program for inservice inspection of steam generator tubes as described in the Technical Specifications is based on a modification of Regulatory Guide 1.83, Revision 1, Inservice Inspection of Pressurized Water Reactor Steam Generator Tubes, dated July 1975.

The existing requirement that two steam generators be inspected during the first inservice inspection is located in Table 4.4-1 of Technical Specifications Surveillance Requirement 4.4.5.1. This table specifies the minimum number of steam generators required to be inspected during inservice inspections. These Technical Specifications requirements were issued as part of the original operating license for North Anna Unit 2, dated August 21, 1980, and were based on the Standard Technical Specifications for Westinghouse Pressurized Water Reactors (NUREG-0452).

Current Design Basis

Periodic inservice inspection of steam generator tubing provides for early detection of defects and deterioration thus ensuring that the structural integrity of this portion of the reactor coolant system (RCS) is maintained. Inservice inspection of steam generator tubing is essential in order to assess the condition of the tubes in the event that there is

evidence of mechanical damage or progressive degradation due to design, manufacturing errors, or inservice conditions that lead to corrosion. Inservice inspection of steam generator tubing also provides a means of characterizing the nature and cause of any tube degradation so that corrective measures can be taken.

The North Anna Unit 2 steam generators were replaced during the second quarter of 1995. The replacement steam generator components utilize tubing made of thermally treated Alloy 690 material which, along with other design enhancements, reduce the possibility of corrosion degradation. Thermally treated Alloy 690 is generally accepted as the currently available steam generator tube material of choice due to its significant resistance to stress corrosion cracking.

Discussion

The North Anna Unit 2 steam generators were replaced during the second quarter of 1995. The general purpose of steam generator replacement was to restore the integrity of the steam generator tubes to a level equivalent to new steam generators. In reality, replacement steam generator components incorporate a large number of design improvements which reflect the "state-of-the-art" technology that currently exists for steam generator design. These design improvements will improve the long-term maintainability and reliability of the repaired steam generators.

The replacement steam generator components for North Anna were manufactured using current codes and manufacturing techniques without compromising the requirements of the original code, thus reflecting current technology in the areas of design, fabrication, and materials. Design changes and enhancements made to replacement steam generator components address the operating experience of the industry and the original steam generators and enhance the overall reliability and maintainability of the steam generators. These enhancements do not adversely affect the mechanical or thermal-hydraulic performance of the steam generators. Thus, the replacement steam generators are considered superior to the original steam generators in terms of design and materials.

The North Anna Unit 1 steam generators were replaced in 1993 using essentially the same design and materials as used for the North Anna Unit 2 replacement. The first inservice inspection for the Unit 1 replacement steam generators was performed in the fall of 1994. As expected, the results of the North Anna Unit 1 inspection identified no signs of deterioration. In fact, the performance history of replaced Westinghouse steam generators fully supports the position that degradation of the tubes is not significant in the early cycles of operation.

The North Anna Unit 1 and Unit 2 steam generators utilize Alloy 690 thermally treated (TT) tubing. Alloy 690 TT tubing material has been utilized in service in domestic replacement steam generators since 1989. As stated above, Alloy 690 TT is generally accepted as the currently available steam generator tube material of choice due to its

significant resistance to stress corrosion cracking. To date, there have been no reported instances of localized tube wall corrosion induced degradation involving Alloy 690 TT tube material.

Other steam generator design enhancements also contribute to the overall long-term integrity of the North Anna Unit 2 replacement steam generator tubes. Full-depth hydraulic expansion of the tube within the tubesheet minimizes the crevice between the tube and the tubesheet where sludge and corrosion products could accumulate. The hydraulic expansion process results in relatively low localized stresses in the transition region at the top of the tubesheet. Quatrefoil broached holes in stainless steel tube support plates significantly reduces the potential for corrosion products to form between the tube and the tube support plate. Finally, the small radius U-bends were stress relieved to reduce to possibility of stress corrosion cracking in that region of the steam generators.

North Anna Power Station also continues to adhere to industry guidelines and standards for operating chemistry performance. The secondary system chemistry control program, adopted even prior to the replacement, continues to be used in its basic form with refinements that have been implemented through ongoing industry experience. Continuing efforts in the area of secondary side pH and oxygen control with attendant actions to avoid condenser contaminant ingress have significantly improved chemistry performance at North Anna. The secondary system chemistry controls and awareness of industry trends provide early warning of impending concerns that may affect steam generator reliability and reduce the possibility of corrosion attack.

Experience indicates that the development of defects or degradation in the North Anna Unit 2 steam generators after only one cycle of operation is not likely. The enhanced corrosion-resistant performance of Alloy 690 TT tubing and steam generator design enhancements further reduce the possibility of defects or degradation developing during the initial cycle of operation. Therefore, based on the above evaluation, a reduction from two to one in the minimum number of steam generators required to be opened for inspection during the first inspection is warranted.

Specific Change

The proposed change would modify Table 4.4-1 of Technical Specification 4.4.5.1 to reduce from two to one the minimum number of steam generators required to be inspected during the first refueling outage following a steam generator replacement. The table has also been revised to remove those sections of the table not applicable to North Anna because of the total number of steam generators involved. These changes to the table in turn eliminate Note 2. Note 3 has subsequently been renumbered. (Elimination of the non-applicable information from the table is considered an editorial correction.)

Safety Significance

The current Technical Specifications requirement to inspect more than one steam generator, after the initial cycle of operation, is considered unnecessary. A full baseline inspection of the steam generator tubes was performed for the replacement components and the quality of the replacement steam generators' design, fabrication, and materials is superior to the original steam generators. In addition, as evidenced by industry experience, no degradation is expected during this cycle of operation.

Although the proposed change reduces the number of steam generators required to be opened for inspection, the minimum number of tubes required to be examined during the inspection is not being changed. Specifically, for one steam generator, 9% of the tubes in that steam generator are required to be examined and, for two steam generators, 4.5% of the tubes in each steam generator are required to be examined for a total of 9% also.

The capability and reliability of primary-to-secondary leakage detection have been greatly increased since these Technical Specifications inspection requirements were originally imposed. Improvements in primary-to-secondary leak rate monitoring and trending capabilities provide added assurance that any potential degradation of steam generator tubes will be detected.

Finally, approval of this change request will reduce radiation exposure of those personnel involved in opening and closing the steam generator manways and setting up the tube inspection equipment.

This proposed change does not affect or change any limiting conditions for operation (LCO) or any other surveillance requirements in the Technical Specifications and the Technical Specifications Bases for this surveillance requirement remains unchanged.

The proposed change has been evaluated by Virginia Electric and Power Company and it has been determined that the proposed change would not involve an unreviewed safety question.

1. The proposed inspection scope change does not increase the probability of occurrence of an accident previously evaluated. The performance history of replaced Westinghouse steam generators has shown that degradation of the tubes is not significant in the early cycles of operation. In addition, the minimum number of tubes required to be inspected during the first refueling outage following steam generator replacement is not being changed.

2. The proposed inspection scope change does not increase the consequences of an accident previously evaluated. Any hypothetical tube leak or failure is bounded by the consequences of a postulated steam generator tube rupture event.

3. The proposed inspection scope change does not create the possibility of an accident of a different type than any previously evaluated. As noted previously, the effect of any hypothetical failure of a tube would be bounded by existing tube rupture analyses. The proposed change does not introduce any new failure mechanisms or postulated accident effects. Therefore, operation of the steam generators with this modified inspection schedule will not result in an accident previously not analyzed in the UFSAR.

4. The proposed inspection scope change does not increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated. Each of the replacement steam generators is manufactured and operated essentially identically. The minimum number of steam generator tubes required to be examined during the first refueling outage following steam generator replacement is not being changed. The proposed change does not affect the inspections of steam generators during the second and subsequent refueling outages. Thus, the size of the inspection population has not changed and there is no increase in the probability of occurrence of a steam generator tube leak or rupture. No other components or equipment important to safety would be affected.

5. The proposed inspection scope change does not increase the consequences of a malfunction of equipment important to safety previously evaluated. As stated in items 1, 2, and 3 above, the reduction in the number of steam generators required to be opened during the first refueling outage following steam generator replacement does not increase the probability or consequences of any event or accident in excess of the effects due to the rupture of a steam generator tube. Current UFSAR analysis results remain bounding.

6. The proposed inspection scope change does not create the possibility of a malfunction of equipment important to safety of a different type than any previously evaluated. Overall steam generator tube bundle integrity and leaktightness continue to be required during all plant operating conditions. The Technical Specifications inservice inspection program continues to sample the steam generator tubes to assure their condition.

7. The proposed inspection scope change does not reduce the margin of safety as defined in the basis for any Technical Specification. The margin of safety with respect to sampling inspections of tubes continues to provide assurance of tube bundle integrity. Nondestructive examination of the same number of steam generator tubes is still required -- only the number of steam generators required to be opened is changed.

Based on the above evaluation, reducing the minimum number of steam generators required to be opened during the first refueling outage following steam generator replacement will not adversely affect the safe operation of the steam generators or the plant. Therefore, the proposed Technical Specifications change for the North Anna Unit 2 steam generators does not result in an unreviewed safety question as defined in the criteria of 10 CFR 50.59.