June 30, 2008

Mr. David A. Christian
President and Chief Nuclear Officer
Virginia Electric and Power Company
Innsbrook Technical Center
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

SUBJECT: NORTH ANNA POWER STATION, UNIT NO. 2, ISSUANCE OF AMENDMENT REGARDING ONE-TIME 5-YEAR EXTENSION TO TYPE A TEST INTERVAL (TAC NO. MD7478)

Dear Mr. Christian:

The U.S. Nuclear Regulatory Commission has issued the enclosed Amendment No. 233 to Renewed Facility Operating License No. NPF-7 for the North Anna Power Station, Unit No. 2. The amendment changes the Technical Specifications (TSs) in response to your application dated December 5, 2007, as supplemented by letters dated March 14, April 3, and April 23, 2008.

This amendment will permit a one-time 5-year extension to the 10-year frequency of the performance-based leakage rate testing program for Type A tests as required by Regulatory Guide (RG) 1.163. The one-time extension will allow the next Type A test to be performed no later than October 9, 2014.

A copy of the Safety Evaluation is also enclosed. The Notice of Issuance will be included in the Commission's biweekly *Federal Register* notice.

Sincerely,

/RA/

Siva P. Lingam, Project Manager
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-338 and 50-339

Enclosures:
1. Amendment No. 233 to NPF-7
2. Safety Evaluation

cc w/encls: See next page

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VIRGINIA ELECTRIC AND POWER COMPANY

DOCKET NO. 50-339

NORTH ANNA POWER STATION, UNIT NO. 2

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 233
Renewed License No. NPF-7

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Virginia Electric and Power Company et al., (the licensee) dated December 5, 2007, as supplemented by letters dated March 14, April 3, and April 23, 2008, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Renewed Facility Operating License No. NPF-7 is hereby amended to read as follows:

   (2) Technical Specifications

   The Technical Specifications contained in Appendix A, as revised through Amendment No. 233, are hereby incorporated in the renewed license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented within 30 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA by LOlshan for/

Melanie C. Wong, Chief
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to License No. NPF-7
and the Technical Specifications

Date of Issuance: June 30, 2008

ATTACHMENT

TO LICENSE AMENDMENT NO. 233

RENEWED FACILITY OPERATING LICENSE NO. NPF-7

DOCKET NO. 50-339

Replace the following pages of the Licenses and the Appendix "A" Technical Specifications (TSs) with the enclosed pages as indicated. The revised pages are identified by amendment number and contain vertical lines indicating the areas of change.

Remove Pages	Insert Pages
License License No. NPF-7, page 3	License License No. NPF-7, page 3
TSs 5.5-14	TSs 5.5-14

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO

AMENDMENT NO. 233 TO RENEWED FACILITY OPERATING LICENSE NO. NPF-7

VIRGINIA ELECTRIC AND POWER COMPANY

NORTH ANNA POWER STATION, UNIT NO. 2

DOCKET NO. 50-339

1.0 INTRODUCTION

By letter dated December 5, 2007 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML073400457), as supplemented by letters dated March 14 (ADAMS Accession No. ML080780256), April 3 (ADAMS Accession No. ML080950111), and April 23, 2008 (ADAMS Accession No. ML081200370), Virginia Electric and Power Company (the licensee) submitted a request for changes to the North Anna Power Station, Unit No. 2 (North Anna 2), Technical Specifications (TSs). The requested changes would permit a one-time 5-year extension to the 10-year frequency of the performance based leakage rate testing program for Type A tests as required by Regulatory Guide (RG) 1.163. The one-time extension will allow the next Type A test to be performed no later than October 9, 2014. The supplements dated March 14, April 3, and April 23, 2008, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the Nuclear Regulatory Commission (NRC) staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on January 15, 2008 (73 FR 2550).

The reactor containment leakage test program requires the licensee to perform an integrated leak rate test (ILRT), also termed as a Type A test; and local leak-rate test (LLRT) termed as Type B and Type C tests. The Type A test measures the overall leakage rate of the primary reactor containment. Type B tests are primarily intended to detect leakage paths and measure leakage rates for primary reactor containment penetrations. Type C tests are intended to measure containment isolation valve leakage rates.

The North Anna 2 current 10-year interval for Type A test ends on October 9, 2009. The approval of the TS Amendment request will allow the licensee to perform the next Type A test for North Anna 2 no later than October 9, 2014.

Enclosure

This evaluation addresses the current condition of structural and leak-tight integrity of the containment structure and the ability of the licensee's LLRT program and inservice inspection (ISI) program to detect and manage aging degradation of the containment so that the structural and leak-tight integrity of the containment will be maintained, if the ILRT test interval is extended as proposed by the licensee.

2.0 REGULATORY EVALUATION

Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix J, Option B requires that a Type A test be conducted at a periodic interval based on historical performance of the overall containment system. North Anna 2 TS 5.5.15, "Containment Leakage Rate Testing Program," requires that leakage rate testing be performed as required by 10 CFR Part 50, Appendix J, Option B, as modified by approved exemptions, and in accordance with the guidelines contained in Regulatory Guide (RG) 1.163, "Performance-Based Containment Leak-Test Program," dated September 1995 (ADAMS Accession No. ML003740058). This RG endorses, with certain exceptions, Nuclear Energy Institute (NEI) Report NEI 94-01, Revision 0, "Industry Guideline for Implementing Performance-Based Option of 10 CFR Part 50, Appendix J," dated July 26, 1995.

A Type A test is an overall (integrated) leakage rate test of the containment structure. NEI 94-01 specifies an initial test interval of 48 months, but allows an extended interval of 10 years, based upon two consecutive successful tests. There is also a provision for extending the test interval an additional 15 months in certain circumstances. The most recent two Type A tests at North Anna 2 have been successful, so the current interval requirement would normally be 10 years.

The licensee is requesting a change to TS 5.5.15 which would add an exception from the guidelines of RG 1.163 and NEI 94-01, Revision 0, regarding the Type A test interval. Specifically, the exception states that the first Unit 2 Type A test performed after the October 9, 1999, Type A test shall be performed no later than October 9, 2014.

The local leakage rate tests (Type B and Type C tests), including their schedules, are not affected by this request.

Appendix J, Option B of 10 CFR Part 50 requires that a Type A test be conducted at a periodic interval based on historical performance of the overall containment system. North Anna 2 TS 5.5.15 requires that leakage rate testing be performed as required by 10 CFR Part 50, Appendix J, Option B, as modified by approved exemptions, and in accordance with the guidelines contained in RG 1.163. RG 1.163 endorses, with certain exceptions, NEI 94-01.

RG 1.163, Section C, "Regulatory Position," states; "licensees intending to comply with the Option B in the amendment to Appendix J should establish test intervals based upon the criteria in Section 11.0 of NEI 94-01 rather than using test intervals specified in ANSI/ANS-56.8-1994, 'Containment System Leakage Testing Requirements'." The industry guidelines in NEI 94-01 state that Type A testing shall be performed at a frequency of at least once in every 10 years. The licensee's proposed TS amendment would change the 10-year ILRT interval to a 15-year interval based on the results of the earlier ILRT supported by risk informed analysis performed in accordance with the NRC staff guidelines in RG 1.174, "An Approach For Using Probabilistic Risk Assessment In Risk-Informed Decisions On Plant-Specific Changes To The Licensing Basis," November 2002 (ADAMS Accession No. ML023240437). There are no changes to any Code or

regulatory requirement.

3.0 TECHNICAL EVALUATION

As described in the licensee's letter dated December 5, 2007, and the North Anna Updated Final Safety Analysis Report (UFSAR), North Anna 2 is a pressurized water reactor with a steel-lined reinforced concrete primary containment structure with a vertical cylindrical wall (4 ft. 6 in. thick) and hemispherical dome (2 ft. 6 in. thick), supported on a flat 10 ft. 0 in. thick base mat. The base of the foundation mat is located approximately 67 feet below finished ground grade. A waterproof membrane was placed below the containment structural mat and carried up the containment wall to above ground-water level. The containment wall steel liner is 3/8-inch thick. The steel liner for the mat consists of a 0.25-inch plate except in the in-core instrumentation area, where an exposed 0.75-inch plate is used, and the inside recirculation spray pump sumps, where an exposed 0.5-inch plate is used. The mat (floor) liner plate is overlaid with a reinforced-concrete slab approximately 2 feet thick. The steel liner for the dome is 0.5 inches thick. The steel liner functions primarily as a gas tight membrane. No credit has been taken for the presence of the steel liner in the design of the containment structure to resist seismic forces or other design loads. During power operation, North Anna 2 is maintained at a sub-atmospheric condition.

The containment pressure boundary consists of the steel liner, containment access penetrations, and penetrations for process piping and electrical wiring. The integrity of the penetrations and containment isolation valves is verified through Type B and Type C tests as required by 10 CFR Part 50, Appendix J, and the overall integrity of the containment structure is verified through a Type A test. These tests are performed to verify the leak-tight integrity of the containment structure at the design basis accident (DBA) pressure. The leakage rate testing requirements of 10 CFR Part 50, Appendix J, Option B (Type A, Type B and Type C tests) and the containment inservice inspection (CISI) requirements mandated by 10 CFR 50.55a together ensure the continued leak-tight and structural integrity of the containment during its service life.

The licensee justifies the proposed change to extend the current ILRT interval based on historical plant-specific Type A test performances and the CISI results, supported by a risk-informed analysis.

The licensee in its supplemental letter dated April 3, 2008, provided a response to the NRC staff's request for additional information (RAI) to address issues related to the Type A test results, Type B and C tests and CISI.

The NRC staff reviewed the licensee's technical analysis in support of its proposed TS amendment which is described in Attachment 1 of its submittal dated December 5, 2007, and the licensee's response dated April 3, 2008, to the NRC staff's RAI.

3.1 North Anna 2 Type A Test

The licensee stated, in its letter dated December 5, 2007, that based on the October 1990 and October 1999 Type A tests at North Anna 2, the current Type A test interval is once every 10 years. With the requested 5-year extension of the ILRT interval, the licensee proposed performing the next overall verification of the containment leak-tight integrity by October 9, 2014.

The licensee, in its letter dated December 5, 2007, and in its April 3, 2008 response to the NRC staff's RAI, provided the results of the last three Type A ILRT results.

Test Date	April 1989	October 1990	October 1999	Acceptance Criteria
Total As-Found Leakage	0.3 La	0.25 La	0.584 La	≤ 1.0 La
Total As-Left Leakage	0.27 La	0.23 La	0.494 La	≤ 0.75 La

"La", as specified in North Anna 2 TS 5.5.15, is 0.1% of primary containment air weight per day.

The results of the Type A ILRT show containment leakage within the acceptance limit and an ample margin indicating a leak-tight Unit 2 containment structure.

Furthermore, Regulatory Position C.3 of RG 1.163 recommends that a visual examination of accessible interior and exterior surfaces of the containment structure should be conducted prior to initiating a Type A test, and during two other refueling outages before the next Type A test based on a 10-year ILRT interval. The NRC staff's RAI requested the licensee to describe the plan to supplement the 10-year interval-based visual inspection requirement to accommodate the requested 15-year ILRT interval. In its April 3, 2008 response to the NRC staff's RAI, the licensee stated that for the current 10-year ILRT interval, two visual examinations have been completed on February 21, 2001, and September 18, 2002. For the 15-year extended ILRT interval, the licensee stated that one visual examination will be performed prior to the Type A test during the fall 2014 outage and an additional visual examination of the containment structure will be performed during one of the prior outages (fall 2008, spring 2010 or fall 2011). In addition to these examinations, a general visual examination of the containment liner will be performed as part of the CISI.

In summary, for the 15-year extended ILRT interval, the containment structure will have at least three visual examinations (two already performed in 2001 and 2002, and one planned for upcoming outages in 2008-2011) prior to performance of pre-ILRT visual examination in 2014.

The NRC staff finds three additional visual examinations prior to pre-ILRT visual examination for a 15-year interval, which is consistent with Regulatory Position C.3 of RG 1.163 (two additional examinations prior to ILRT for a 10-year interval), acceptable.

3.2 North Anna 2 Type B and C Tests

As stated in the proposed TS Amendment dated December 5, 2007, the current interval for Type B and Type C testing of containment penetrations and isolation valves will not be affected by extension of Type A test interval. In its April 3, 2008 response to the NRC staff's RAI, the licensee provided a table identifying the electrical and mechanical penetrations that are planned to be tested during the requested 5-year extension of the ILRT interval. The licensee's April 3, 2008 RAI response indicates that currently the electrical penetrations are on a 10-year testing interval (normally every 6th outage). If an electrical penetration fails a test, it will be returned to the short interval (every outage) until it passes three consecutive refueling outage tests. The mechanical penetrations (including containment isolation valves) are on a 60-month testing interval (normally every 3rd outage). If a mechanical penetration fails a test, it will be returned to the short interval (every outage) until it passes two consecutive refueling outage tests. The table in the licensee's

April 3, 2008 RAI response also indicates that between the fall 2008 outage and the fall 2014 outage (total of five outages), approximately 50 percent of the mechanical penetrations will be tested once and the remaining 50 percent will be tested at least twice. The majority of the electrical penetrations will be tested once as indicated in the table in the licensee's RAI response dated April 3, 2008. Approximately 15 percent of the total number of electrical penetrations will not be tested during the requested 5-year extension (between the fall 2008 outage and the fall 2014 outage) because they were tested in the spring 2007 outage.

As described in North Anna UFSAR and based on the licensee's April 3, 2008 RAI response, the fuel transfer tube connects the refueling canal in the containment structure and the spent-fuel pit in the fuel building. The penetration consists of a stainless steel pipe installed inside a sleeve, as shown in Figure 3.8-11 of North Anna UFSAR. The outer pipe of the fuel transfer tube consists of cylindrical sections connected by bellows. These bellows are designed to accommodate any differential movement between the spent-fuel pit in the fuel building and the refueling canal in the containment structure. The containment boundary is the welded connection at the containment liner to the inner and outer pipes and the double O-ring blind flange on the inner tube. Pressure test channels were installed on the weld interface for leak testing of all welds essential to the integrity of the penetration. The blind flange is Type B tested every refueling outage. The operating experience at North Anna 2 has not identified any bellow leakage. The overall penetration integrity is verified during the performance of Type A test.

The local leak-rate testing interval for the equipment hatch, escape air lock, and the personnel air lock are in accordance with the North Anna 2 TS requirements and are not affected by the proposed TS Amendment.

Based on the above, the NRC staff finds that the integrity of the containment pressure boundary penetrations and isolation valves are effectively monitored through Type B and C testing as required by 10 CFR Part 50, Appendix J and the North Anna 2 TS.

3.3 Containment In-Service Inspection

The licensee, in its letter dated December 5, 2007, stated that the first 10-year concrete containment IWL examinations were completed by August 31, 2007, in accordance with the requirements of 1992 edition through the 1992 addenda of American Society of Mechanical Engineers (ASME), *Boiler and Pressure Vessel Code* (Code), Section XI, Subsection IWL. The second 10-year interval IWL examinations will be performed in accordance with the 2001 edition through 2003 addenda of ASME Section XI. The next two 5-year IWL interval dates have been scheduled for August 31, 2011, and August 31, 2016.

The licensee, in its letter dated December 5, 2007, stated that the first 10-year interval (March 20, 1998 to October 11, 2008) IWE examinations of containment liner and penetration liner are in progress and are performed in accordance with the 1992 edition with the 1992 addenda of ASME Code, Section XI, Subsection IWE. The licensee also stated that the second 10-year interval IWE examinations will be performed in accordance with the 2001 edition through 2003 addenda of ASME Code, Section XI, as modified by the 10 CFR 50.55a(b).

Under its CISI program, as required by 10 CFR 50.55a(b)(2)(viii)(E) and 10 CFR 50.55a(b)(2)(ix)(A), the licensee evaluates the acceptability of inaccessible areas of the

containment structure and metallic liner if conditions exist in the accessible areas that could indicate the presence of, or result in, degradation to such inaccessible areas. In response to the NRC staff's RAI, the licensee provided further information relative to a condition report described in the North Anna 2 ISI summary report for the fall 1999 refueling outage. Discovery of a blister in the liner plate protective coating prompted an examination of the liner plate which revealed the presence of a through-thickness hole. Subsequent examination of the exposed concrete surface revealed the presence of a 4-inch by 4-inch piece of wood approximately 6 feet in length which had been left in the concrete during construction and was in contact with the liner plate causing corrosion of the liner plate. The licensee stated that necessary evaluations were performed to ensure the affected components were adequate for their intended design basis function and implemented corrective actions such as replacing all of the liner plates requiring replacement, removing embedded wood and performing concrete repair as required. In addition, the licensee performed augmented Category E-C examinations of the liner plate thickness using ultrasonic tests during the next three ISI periods.

In response to the NRC staff's RAI relative to the inspection of the containment moisture barrier between the containment wall liner and containment concrete floor, the licensee responded that North Anna 2 containment design does not include a moisture barrier at the interface of the containment wall liner and concrete floor as depicted in the 2001 edition of ASME Code, Section XI, Figure IWE-2500-1, examination area C-D. The licensee stated that during the North Anna 2 fall 1999 refueling outage, evidence of some rust in a number of areas at the concrete floor interface with the containment wall liner was discovered. The licensee performed necessary evaluations to ensure the affected liner areas were adequate for their intended design-basis function and implemented augmented Category E-C examinations (UT thickness and visual VT-1) for the affected liner plate areas. As stated in response to the NRC staff's RAI, no evidence of continued degradation has been observed as evidenced by three consecutive UT examinations (March 2001, October 2005 and March 2007 refueling outages) and VT-1 examinations (March 2001, May 2004, and March 2007 refueling outages).

In response to the NRC staff's RAI, the licensee stated that in subsequent IWL inspections of the containment concrete surfaces that were completed in August 2007, six locations on the dome and three locations on the wall were found to be suspect. To date, two locations on the dome and three on the wall have been excavated to further investigate the condition. All excavations were relatively shallow (maximum 6 inches deep) with respect to the thickness of the concrete. The licensee evaluated the condition and concluded that the containment structural integrity and the liner plate were not adversely affected. The concrete repair will be performed in accordance with the ISI and maintenance programs, as applicable.

On the basis of its review of the information provided in the licensee's TS change request and responses to the NRC staff's RAI, the NRC staff finds that: (1) the results of the past ILRT demonstrate that the leak-tight integrity of the containment structure has been adequately managed; (2) the structural integrity of the containment vessel is verified through periodic ISIs conducted as required by Subsections IWE and IWL of ASME Code, Section XI; (3) the integrity of the penetrations and containment isolation valves are periodically verified through Type B and Type C tests as required by 10 CFR Part 50, Appendix J, and North Anna 2 TSs; (4) the licensee is employing a CISI program that requires evaluation of any potential degradation of inaccessible areas of the containments, and (5) the containment liner protective coating is inspected visually every refueling outage and repair of any identified damage is adequately managed. Based on

these findings, the NRC staff concludes that the licensee has an adequate ISI program and procedures in place to examine, monitor and correct potential age-related and environmental degradations of the pressure retaining components of the North Anna 2 containment structure. Therefore, the licensee's proposed one-time extension of the ILRT interval from 10 to 15 years is acceptable.

3.4 Risk Analysis

The licensee has performed a risk impact assessment of extending the Type A test interval to 15 years. The risk assessment was provided in the December 5, 2007, application for license amendment. Additional analysis and information was provided by the licensee in its supplemental letters dated March 14, 2008, and April 23, 2008. In performing the risk assessment, the licensee considered the guidelines of NEI 94-01, the methodology used in Electric Power Research Institute (EPRI) TR-104285, "Risk Impact Assessment of Revised Containment Leak Rate Testing," the NEI Interim Guidance for Performing Risk Impact Assessments in Support of One-Time Extensions for Containment Integrated Leakage Rate Surveillance Intervals, and RG 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis."

The basis for the current 10-year test interval is provided in Section 11.0 of NEI 94-01, Revision 0, and was established in 1995 during the development of the performance-based Option B to Appendix J. Section 11.0 of NEI 94-01 states that NUREG-1493, "Performance-Based Containment Leak-Test Program," provided the technical basis to revise leakage rate testing requirements contained in Option B to Appendix J. The basis consisted of qualitative and quantitative assessments of the risk impact (in terms of increased public dose) associated with a range of extended leakage rate test intervals. To supplement this basis, industry undertook a similar study. The results of that study are documented in EPRI Research Project Report TR-104285.

The EPRI study used an analytical approach similar to that presented in NUREG-1493 for evaluating the incremental risk associated with increasing the interval for Type A tests. The Appendix J, Option A, requirements that were in effect for North Anna 2 early in the plants' life required a Type A test frequency of three tests in 10 years. The EPRI study estimated that relaxing the test frequency from three tests in 10 years to one test in 10 years would increase the average time that a leak, that was detectable only by a Type A test, goes undetected from 18 to 60 months. Since Type A tests only detect about 3 percent of leaks (the rest are identified during local leak rate tests based on industry leakage rate data gathered from 1987 to 1993), this results in a 10-percent increase in the overall probability of leakage. The risk contribution of pre-existing leakage for the pressurized water reactor and boiling water reactor representative plants in the EPRI study confirmed the NUREG-1493 conclusion that a reduction in the frequency of Type A tests from three tests in 10 years to one test in 20 years leads to an "imperceptible" increase in risk that is on the order of 0.2 percent and a fraction of one person-rem per year in increased public dose.

Building upon the methodology of the EPRI study and the NEI Interim Guidance, the licensee assessed the change in the predicted person-rem per year frequency. The licensee quantified the risk from sequences that have the potential to result in large releases if a pre-existing leak were present. Since the Option B rulemaking was completed in 1995, the NRC staff has issued

RG 1.174 on the use of probabilistic risk assessment (PRA) in evaluating risk-informed changes to a plant's licensing basis. The licensee has proposed using RG 1.174 guidance to assess the acceptability of extending the Type A test interval beyond that established during the Option B rulemaking.

RG 1.174 provides risk-acceptance guidelines for assessing the increases in core damage frequency (CDF) and large early release frequency (LERF) for risk-informed license amendment requests. Since the Type A test does not impact CDF, the relevant criterion is the change in LERF. The licensee has estimated the change in LERF for the proposed change based on the cumulative change from the original frequency of three tests in a 10-year interval. RG 1.174 also discusses defense-in-depth and encourages the use of risk analysis techniques to help ensure and show that key principles, such as the defense-in-depth philosophy, are met. The licensee estimated the change in the conditional containment failure probability for the proposed change to demonstrate that the defense-in-depth philosophy is met.

The licensee provided analyses, as discussed below. The following comparisons of risk are based on a change in test frequency from three tests in 10 years (the test frequency under Appendix J, Option A) to one test in 15 years. This bounds the impact of extending the test frequency from one test in 10 years to one test in 15 years. The following conclusions can be drawn from the analysis associated with extending the Type A test frequency:

1. Given the change from a three in 10-year test frequency to a one in 15-year test frequency, the increase in the total integrated plant risk is estimated to be less than 0.1 person-rem per year. This increase is comparable to that estimated in NUREG-1493, where it was concluded that a reduction in the frequency of tests from three in 10 years to one in 20 years leads to an "imperceptible" increase in risk. Therefore, the increase in the total integrated plant risk for the proposed change is considered small and supportive of the proposed change.

2. The increase in LERF resulting from a change in the Type A test frequency from the original three in 10 years to one in 15 years is estimated to be about 3.79×10^{-7} per year based on the plant-specific internal events PRA, and 4.22×10^{-7} per year when external events are included. There is some likelihood that the flaws in the containment estimated as part of the Class 3b frequency would be detected as part of the IWE/IWL visual examination of the containment surfaces (as identified in ASME Code, Section XI, Subsections IWE/IWL). Visual inspections are expected to be effective in detecting large flaws in the visible regions of containment, and this would reduce the impact of the extended test interval on LERF. The licensee's risk analysis considered the potential impact of age-related corrosion/degradation in inaccessible areas of the containment shell on the proposed change. The increase in LERF associated with corrosion events is estimated to be less than 1×10^{-8} per year.

   When the calculated increase in LERF is in the range of 10^{-7} per year to 10^{-6} per year, applications are considered if the total LERF is less than 10^{-5} per year (RG 1.174). Based on information provided by the licensee, the total LERF for internal and external events, including the requested change, is about 1.34×10^{-6} per year, which meets the total LERF criteria. The LERF contribution from external events

was determined based on an assumption that the LERF for external events is comparable to that for internal events. This assumption is reasonable since the results of the Individual Plant Examination of External Events (IPEEE) for North Anna indicate that fire events are the dominant external event risk contributor, and that the fire CDF as reported in the IPEEE is approximately one decade lower than the internal events CDF. The NRC staff concludes that increasing the Type A interval to 15 years results in only a small change in LERF and is consistent with the acceptance guidelines of RG 1.174.

3. RG 1.174 also encourages the use of risk analysis techniques to help ensure and show that the proposed change is consistent with the defense-in-depth philosophy. Consistency with the defense-in-depth philosophy is maintained if a reasonable balance is preserved between prevention of core damage, prevention of containment failure, and consequence mitigation. The licensee estimates the change in the conditional containment failure probability to be an increase of approximately one percentage point for the cumulative change of going from a test frequency of three in 10 years to one in 15 years. The NRC staff finds that the defense-in-depth philosophy is maintained based on the small magnitude of the change in the conditional containment failure probability for the proposed amendment.

Based on these conclusions, the NRC staff finds that the increase in predicted risk due to the proposed change is within the acceptance guidelines, while maintaining the defense-in-depth philosophy, of RG 1.174 and, therefore, is acceptable.

Based on the foregoing evaluation, the NRC staff finds that the interval until the next Type A test at North Anna 2 may be extended to 15 years, and that the proposed change to TS 5.5.15 is acceptable. According to Section 5.5.15 of the proposed TS Amendment, the Type A test shall be performed no later than October 9, 2014. The NRC staff strongly recommends that the licensee plan well ahead to conduct the next ILRT for North Anna 2 within the 15-year interval being approved without seeking further extension.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Virginia State official was notified of the proposed issuance of the amendments. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes requirements with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendment involves 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 the amendment involves no significant hazards consideration, and there has been no public comment on such finding (73 FR 2550). Accordingly, the amendment meets 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 the amendment.

6.0 CONCLUSION

The Commission has 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, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

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