March 5, 2003

Mr. Mark B. Bezilla
Vice President
FirstEnergy Nuclear Operating Company
Beaver Valley Power Station
Post Office Box 4
Shippingport, PA 15077

SUBJECT: BEAVER VALLEY POWER STATION, UNIT NOS. 1 AND 2 - ISSUANCE OF AMENDMENT RE: ONE-TIME DEFERRAL OF CONTAINMENT INTEGRATED LEAK RATE TEST (TAC NOS. MB6660 AND MB6661)

Dear Mr. Bezilla:

The Commission has issued the enclosed Amendment No. 254 to Facility Operating License No. DPR-66 and Amendment No. 134 to Facility Operating License No. NPF-73 for Beaver Valley Power Station, Unit Nos. 1 and 2 (BVPS-1 and 2). These amendments consist of changes to the Technical Specifications (TSs) in response to your application dated October 31, 2002, as supplemented by letters dated December 2, 2002, and January 24, 2003.

These amendments revise BVPS-1 and 2 TSs, Section 6.17, “Containment Leakage Rate Testing Program,” to allow a one-time 5-year extension to the current 10-year test interval for the containment integrated leak rate test (ILRT). Under the allowed extension, BVPS-1 and 2 shall perform their next ILRT within 15 years of their last successful ILRT, which was conducted on May 29, 1993, for BVPS-1 and November 10, 1993, for BVPS-2.

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

Sincerely,

/RA by RClark for/

Timothy G. Colburn, Senior Project Manager, Section 1
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-334 and 50-412

Enclosures: 1. Amendment No. 254 to DPR-66
2. Amendment No. 134 to NPF-73
3. Safety Evaluation

cc w/encls: See next page

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PENNSYLVANIA POWER COMPANY

OHIO EDISON COMPANY

FIRSTENERGY NUCLEAR OPERATING COMPANY

DOCKET NO. 50-334

BEAVER VALLEY POWER STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 254
License No. DPR-66

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

   A. The application for amendment by FirstEnergy Nuclear Operating Company (the licensee) dated October 31, 2002, as supplemented December 2, 2002, and January 24, 2003, 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 Facility Operating License No. DPR-66 is hereby amended to read as follows:

   (2) Technical Specifications

   The Technical Specifications contained in Appendix A, as revised through Amendment No. 254, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance and shall be implemented within 60 days.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Richard J. Laufer, Chief, Section 1
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: March 5, 2003

ATTACHMENT TO LICENSE AMENDMENT NO. 254

FACILITY OPERATING LICENSE NO. DPR-66

DOCKET NO. 50-334

Replace the following page of Appendix A Technical Specifications with the attached revised page. The revised page is identified by amendment number and contains marginal lines indicating the areas of change.

Remove	Insert
6-25	6-25

PENNSYLVANIA POWER COMPANY

OHIO EDISON COMPANY

THE CLEVELAND ELECTRIC ILLUMINATING COMPANY

THE TOLEDO EDISON COMPANY

FIRSTENERGY NUCLEAR OPERATING COMPANY

DOCKET NO. 50-412

BEAVER VALLEY POWER STATION, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 134
License No. NPF-73

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

   A. The application for amendment by FirstEnergy Nuclear Operating Company (the licensee) dated October 31, 2002, as supplemented December 2, 2002, and January 24, 2003, 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 Facility Operating License No. NPF-73 is hereby amended to read as follows:

   (2) Technical Specifications

   The Technical Specifications contained in Appendix A, as revised through Amendment No. 134, and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto are hereby incorporated in the license. FENOC shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of the date of its issuance and shall be implemented within 60 days.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Richard J. Laufer, Chief, Section 1
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: March 5, 2003

ATTACHMENT TO LICENSE AMENDMENT NO. 134

FACILITY OPERATING LICENSE NO. NPF-73

DOCKET NO. 50-412

Replace the following page of Appendix A Technical Specifications with the attached revised page. The revised page is identified by amendment number and contains marginal lines indicating the areas of change.

Remove	Insert
6-25	6-25

SAFETY EVALUATION (SE) BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NOS. 254 AND 134 TO FACILITY OPERATING

LICENSE NOS. DPR-66 AND NPF-73

PENNSYLVANIA POWER COMPANY

OHIO EDISON COMPANY

THE CLEVELAND ELECTRIC ILLUMINATING COMPANY

THE TOLEDO EDISON COMPANY

FIRSTENERGY NUCLEAR OPERATING COMPANY

BEAVER VALLEY POWER STATION, UNIT NOS. 1 AND 2

DOCKET NOS. 50-334 AND 50-412

1.0 INTRODUCTION

By application dated October 31, 2002, as supplemented by letters dated December 2, 2002, and January 24, 2003, the FirstEnergy Nuclear Operating Company (FENOC, the licensee), requested changes to the Technical Specifications (TSs) for Beaver Valley Power Station, Units 1 and 2 (BVPS 1&2). The supplements dated December 2, 2002, and January 24, 2003, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the staff's original proposed no significant hazards consideration determination as published in the Federal Register on December 10, 2002 (67 FR 75877).

The proposed changes would revise BVPS 1&2 TSs, Section 6.17, "Containment Leakage Rate Testing Program," to allow a one-time 5-year extension to the current 10-year test interval for the containment integrated leak rate test (ILRT). BVPS 1&2 has implemented a performance-based containment leak rate test program in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Appendix J, Option B.

2.0 REGULATORY EVALUATION

Containment structures, including access openings and penetrations, are designed to ensure that they can accommodate the calculated pressure and temperature conditions resulting from a loss-of-coolant accident (LOCA) without exceeding the design-basis leakage rate. The design-basis leakage rate is specified such that leakage of radioactive materials to the

environment resulting from a LOCA would not result in off-site doses exceeding 10 CFR Part 100 limits.

In order to ensure that reactor containments are maintained properly, such that they will be able to perform their design-basis functions, the Nuclear Regulatory Commission's (NRC's) regulations require that licensees conduct leakage rate testing and inspections of containments and associated pressure-retaining components at periodic intervals. Section 50.54(o) of 10 CFR Part 50 specifies that primary reactor containments for water-cooled power reactors shall be subject to the leakage testing requirements contained in 10 CFR Part 50, Appendix J (Appendix J). Appendix J defines three types of leakage rate tests that must be conducted on containment pressure boundaries, and provides two options for testing programs that licensees may implement. In addition to these requirements, Appendix J and 10 CFR 50.55a specify certain containment inspection requirements that must also be satisfied.

2.1 Leakage Rate Tests

Type A - A Type A test (also known as an ILRT), is an overall leakage rate test of the containment structure, which measures the integrated leakage rate from all potential leakage paths including containment liner welds, valves, fittings, and components that penetrate containment. These tests typically involve pressurizing the containment atmosphere to a specified test pressure for a duration sufficient to determine what the containment leakage would be under design-basis accident (DBA) conditions.

The acceptance criteria for the Type A test and the TS leakage limits are conservatively established to ensure that, in the event of a DBA, the dose received by a member of the general public will not exceed the limits specified in 10 CFR Part 100.

Type B - A Type B test (also known as a local leakage rate test (LLRT), is intended to detect or measure leakage across pressure-retaining or leakage-limiting boundaries other than valves, such as: (1) containment penetrations whose design incorporates resilient seals, gaskets, sealant compounds, expansion bellows, or flexible seal assemblies, (2) seals, including door operating mechanism penetrations, which are part of the primary containment, or (3) doors and hatches with resilient seals or gaskets except for seal-welded doors.

This type of test typically involves pressurizing the penetration/seals with air (or dry nitrogen) to a specified test pressure and determining the leakage through the penetration.

Type C - A Type C tests (also known as an LLRT), is a pneumatic test to measure containment isolation valve leakage rates.

2.1.1 Leakage Rate Test Acceptance Criteria

The acceptance criteria for containment leakage rate tests are typically expressed in terms of the maximum allowable containment leakage rate, L_a, that would occur at the calculated peak containment internal pressure related to the design-basis LOCA. Plant TSs typically specify

values for L_a in terms of the allowable weight percent (w/o) of the containment atmosphere that may leak per 24 hours. The acceptance criteria for Type A tests, and the combined Type B and Type C tests are typically specified as multiples of L_a. For example, typical acceptance criteria for the ILRT are $1L_a$ for "as-found" tests and .75 L_a for "as-left" tests. Typical acceptance criteria for the combined Type B and Type C tests is .6 L_a.

2.2 Test Program Options

Appendix J provides licensees two alternatives for leakage testing programs. The first, Option A, provides prescriptive requirements with specific test methods, test frequencies, and acceptance criteria for all three types of leakage rate tests. Regarding the ILRT, Option A specifies that three tests must be conducted during each 10-year interval with the third test being conducted when the plant is shut down for the 10-year plant inservice inspections (ISIs).

In 1995, the NRC amended the Appendix J requirements to provide the second alternative program, Option B, which allows licensees to adjust the frequency of leakage rate testing based on the performance history of the tested components. In other words, under Option B, containment pressure boundary components that have a poor leakage rate test performance history are required to be leak rate tested more frequently than components that have a good performance history. The NRC's analysis to support that 1995 rule change is discussed in NUREG-1493, "Performance-Based Containment Leak-Test Program, Draft Report for Comment" (NUREG-1493, DFC), dated January 1995. That analysis, which included evaluations of historical leak-rate test experience prior to April 1993, found that Type B and C testing detected over 97 percent of all potential breeches in containment pressure boundary, where as, Type A testing detected only about 3 percent. That is, the majority of all containment pressure boundary leakages were discovered through LLRTs and not through ILRTs. The NRC's analysis to support the 1995 rule change also included a risk impact assessment associated with a range of extended leakage rate test intervals, which is discussed further in Section 3.5 of this SE.

Option B of 10 CFR Part 50, Appendix J, requires that a Type A test be conducted at a periodic interval based on historical performance of the overall containment system. Plant TSs typically require that the integrated leakage rate test frequency shall be performed in accordance with 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. This RG endorses, with certain exceptions, Nuclear Energy Institute (NEI) 94-01, Revision 0, "Industry Guideline for Implementing Performance-Based Option of 10 CFR Part 50, Appendix J," dated July 26, 1995 (NEI 94-01). 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 for an additional 15 months in certain circumstances.

In 1998, the staff issued RG 1.174, "An Approach for Using Probabilistic Risk Assessment [PRA] in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis." Since September 2000, many licensees have used the guidance in RG 1.174 to support amendment requests for one-time deferrals of containment ILRTs from 10 to 15-year intervals. To date, the NRC has approved license amendments to extend the ILRT intervals for 18 nuclear generating units. The FENOC amendment request for BVPS 1&2 is consistent with the requests that the NRC has approved.

In an effort to reduce the need for individual plant specific applications to extend ILRT intervals, NEI and the Electric Power Research Institute (EPRI) are developing a proposal for a generic change to NEI 94-01. Based on presentations that NEI and EPRI have made to the NRC staff, the NRC staff expects the proposed change will use insights of RG 1.174 to establish the maximum ILRT interval at 15 years, or perhaps as much as 20 years. While that effort is still ongoing, some licensees, such as FENOC, have decided to request plant-specific amendments to extend their ILRT intervals.

2.3 Inspections

In addition to the leakage rate tests discussed above, Appendix J specifies that visual examinations of the accessible interior and exterior surfaces of containment structures and components shall be performed prior to any Type A test, and at periodic intervals between Type A tests (Option B) to uncover any evidence of structural deterioration which may affect either the containment structural integrity or leak tightness. Furthermore, 10 CFR 50.55a(b)(2)(viii), (b)(2)(ix), and (g)(4)(v) specify inservice inspection (ISI), repair, and replacement requirements that licensees must meet with regard to reactor containment structures and associated pressure retaining components. Specifically, 10 CFR 50.55a incorporates, by reference, the requirements of the *American Society of Mechanical Engineers Boiler and Pressure Vessel Code* (ASME Code or Code), Section XI, Subsections IWE and IWL, which specify additional requirements.

2.4 Containment and Associated License Requirements

The BVPS containment buildings are reinforced concrete, steel-lined vessels with a flat base, cylindrical walls, and a hemispherical dome that completely encloses the reactor coolant system (RCS). Their purpose is to ensure that any leakage of radioactive materials to the environment, even if gross failure of the RCS were to occur, does not result in off-site dose exceeding 10 CFR Part 100 limits. Both containments are currently operating in the sub-atmospheric mode, with an air partial pressure range of 8.9 psia to 10.5 psia for Unit 1 and 9.0 psia to 10.5 psia for Unit 2. FENOC submitted a license amendment request (LAR) dated June 5, 2002, to the NRC containing a proposed change to operate BVPS 1&2 with atmospheric containments. This LAR is still under review. The containment leak rate test acceptance criteria, as specified in TS Section 6.17, “Containment Leakage Rate Testing Program,” for both units is:

L_a = 0.10 w/o of containment air at 40.0 psig for Unit 1 and 44.7 psig for Unit 2.

ILRT acceptance criteria:	As-found:	1.0 L_a	
	As-left:	.75 L_a	
LLRT (combined Type B & C):		.60 L_a	for containment isolation valves subject to gas pressurization, airlocks, penetrations and certain double-gasketed seals.

2.4.1 Leakage Testing Program

Both BVPS 1&2 have implemented the 10 CFR Part 50, Appendix J, Option B, performance-based containment leak rate test program. The two most recent Type A tests for both units

were successful. Thus, as discussed in Section 2.2 above, the minimum required ILRT frequency for both units is once per 10 years.

The licensee is requesting additions to TS Section 6.17 to allow an exception from RG 1.163 guidelines regarding the Type A test interval. Specifically, the licensee proposed that the Type A testing frequency (specified in NEI 94-01, paragraph 9.2.3), which per TS 6.17 requires that the testing frequency be "at least once per 10 years based on acceptable performance history," be changed to "at least once per 15 years based on acceptable performance history." It further specifies that this is a one-time only exception that applies only for the interval following the Type A test performed on May 29, 1993 for Unit 1 and November 10, 1993 for Unit 2.

2.4.2 Containment Inspection Requirements

With regard to the containment inspection requirements contained in 10 CFR 50.55a, the licensee is using the 1992 Edition and the 1992 Addenda of Subsections IWE and IWL of Section XI of the ASME Code with approved relief from certain Code requirements for conducting its ISI for the BVPS containment buildings. The first IWE examination of the containment liners for BVPS 1&2 were performed in conjunction with the containment structural inspections which were performed on April 5, 2000 and October 17, 2000, respectively. The first IWL inspection of the BVPS containment exterior concrete surfaces were performed during the summer of 2001. The licensee's request for a one-time only deferral of the Type A test does not affect these inspection requirements or the Appendix J inspection requirement to perform visual inspections at periodic intervals between Type A tests.

3.0 EVALUATION

The NRC staff reviewed the following in its evaluation of the licensee's amendment request:

- ILRT performance history
- recent LLRT performance history
- recent containment inspection results
- impact of atmospheric containment conversion
- risk impact assessment associated with extending the ILRT interval to 15 years

3.1 ILRT Performance History

FENOC's October 31, 2002, application included information regarding BVPS 1&2 ILRT performance history. These tests were performed to verify the essentially leak-tight characteristics of the containment structure at the DBA pressure. As stated in the request, BVPS Unit 1 has performed, including the pre-operational Type A test, six ILRTs during the period of its operating license. The completion dates for these tests are: August 4, 1975; November 3, 1978; May 9, 1982; August 3, 1986; December 14, 1989; and, May 29, 1993. BVPS Unit 2 has performed, including the pre-operational Type A test, three ILRTs during the period of its operating license. The completion dates for these tests are: February 15, 1987; November 1, 1990; and, November 10, 1993.

The results of the Type A leak tests confirm that the BVPS 1&2 containment structures have low leakage when compared to the acceptance criteria of 0.75 La. Except for temperature stabilization delays and early instrument resolution issues, the problems identified during the previous Type A leak tests were all due to components, which are capable of being tested locally. Hence, the containment structure and liner have performed acceptably during the operating cycles prior to these Type A tests.

3.2 Recent LLRT performance history

As discussed in Section 2.2 above, industry experience has shown that the vast majority of containment pressure boundary breaches have been through components that are subject to Type B and Type C LLRTs. Therefore, in evaluating the current condition of the BVPS containments, the NRC staff reviewed recent LLRT performance information provided by the licensee. Based on information provided by FENOC, the current running total of the combined Type B and Type C LLRTs is 0.16 L_a for Unit 1 and 0.13 L_a for Unit 2. These values are well within the .6L_a acceptance criteria for combined Type B and Type C LLRTs, and indicate that the licensee is effectively maintaining the leak tightness of the containment pressure boundary components that are subject to LLRTs.

3.3 Recent Containment Inspection Results

Because the leak rate testing requirements of 10 CFR Part 50, Appendix J, Option B, and the containment ISI requirements mandated by 10 CFR 50.55a complement each other in ensuring the leak-tightness and structural integrity of the containment, the NRC staff, from its review of Type A test interval extension applications of licensees for other plants, identified several generic issues related to the ISI of the containment and potential areas of weaknesses. The NRC staff's evaluation of the licensee's response to these concerns is discussed in the following paragraphs.

3.3.1 Question 1

Describe the ISI methods that provide assurance that in the absence of an ILRT for 15 years, the containment structural and leak-tight integrity will be maintained.

Licensee's Response to Question 1

The licensee stated that the ISI of the BVPS 1&2 containment buildings is conducted in accordance with its containment ISI program which was developed based on the rules and requirements of the 1992 Edition through the 1992 addenda of ASME Code, Section XI, Subsections IWE and IWL, within the limitations and modifications required by 10 CFR 50.55a. The program requirements include inspection of containment surfaces, pressure retaining welds, bolting, seals, gaskets, and moisture barriers using visual, surface, and volumetric techniques as required. Examinations that detect flaws, or evidence of degradation, are documented through the site corrective action program and are dispositioned in accordance with the requirements of IWE-3000. Personnel performing the IWE/IWL containment examinations are also qualified and certified in accordance with industry recommendations and practices. Based on the information provided by the licensee, the NRC staff finds that the schedule for implementing the containment ISI program will not be affected by the proposed ILRT extension to 15 years.

3.3.2 Question 2

Subarticle IWE-1240 requires licensees to identify the surface areas requiring augmented examinations. Please provide the locations of containment liner surfaces that BVPS 1&2 have identified as requiring augmented examination and a summary of the findings of the examinations performed.

Licensee's Response to Question 2

The licensee stated that the first IWE examinations of the containment liners for BVPS 1&2 were performed in conjunction with the containment structural inspections performed on April 5, 2000 (refueling outage 1R13) and October 17, 2000 (refueling outage 2R08), respectively. The first ASME Code, Section XI, Subsection IWL inspections for the BVPS containment exterior concrete surfaces were performed during the summer of 2001. The licensee stated that the deficiencies identified were minor in nature and did not affect the structural integrity of the containment buildings. The licensee also stated that the program development and the subsequent examinations in 1R13 and 2R08 identified no surfaces likely to experience accelerated degradation and aging that would require augmented examinations in accordance with Subarticle IWE-1240. Based on the information provided by the licensee, the NRC staff finds that the structural integrity of the containment has been maintained and verified through periodic ISIs.

3.3.3 Question 3

For the examination of seals and gaskets, and examination and testing of bolts associated with the primary containment pressure boundary (examination categories E-D and E-G), relief from the requirements of the ASME Code had been requested. As an alternative, it was proposed to examine them during the leak rate testing of the primary containment. With the flexibility provided in Appendix J, Option B, for Type B and C testing (per NEI-94-01 and RG 1.163), and the extension requested in these amendments for Type A testing, please provide your schedule for examination and testing of seals, gaskets, and bolts that provide assurance regarding the integrity of the containment pressure boundary.

Licensee's Response to Question 3

The licensee stated that the alternative examination uses the 10 CFR Part 50, Appendix J, primary leakage testing program to verify the leak-tight integrity of the seals, gaskets and bolting at each refueling outage. Plant procedures establish the maximum frequency for any individual penetration, based on acceptable performance, as once every 60 months. Prior to any maintenance that could affect containment integrity, seals and gaskets of bolted penetrations are examined by a Type B local leak rate test in order to establish an as-found condition of the penetration. Prior to re-assembly, the seals and gaskets are examined, and replaced if necessary. After the penetration is reassembled, an as-left test is performed to ensure that the penetration leakage meets the administration limits. Bolted connections are examined in accordance with Table IWE-2500-1, "Examination Category E-G, Pressure Retaining Bolting," Item E8.10. A general visual examination of the entire containment is conducted once each inspection period in accordance with 10 CFR 50.55a(b)(ix)(E). On the basis discussed above, the NRC staff finds that the licensee's ISI program for seals, gaskets,

and bolts that provide assurance regarding the integrity of the containment pressure boundary is acceptable.

3.3.4 Question 4

Stainless steel bellows have been found to be susceptible to trans-granular stress corrosion cracking, and the leakage through them is not readily detectable by Type B testing (see NRC Information Notice 92-20). If applicable, please provide information regarding inspection and testing of the bellows, and how such behavior has been factored into the risk assessment.

Licensee's Response to Question 4

The licensee stated that there are four penetrations (1X-83, 84, 85, and 86) at BVPS Unit 1 and no penetrations at BVPS Unit 2 that contain metal expansion joint bellows. The licensee further stated that the four bellows installed at BVPS Unit 1 are of single-ply construction, and are Type B tested at a maximum frequency of once every 60 months based on acceptable performance. Therefore, the concern of NRC Information Notice 92-20 is not applicable to the bellows installed at BVPS Unit 1.

3.4 Impact of Atmospheric Containment Conversion

The risk assessment performed to evaluate the impact of the ILRT extension to 15 years assumed that BVPS 1&2 are operated with atmospheric containments. The risk assessment is also applicable to operation of the BVPS units with sub-atmospheric containments and results in conservatively overstating the increase in the large early release frequency (LERF). These increases to the baseline LERF and population dose are due to the assumption of pre-existing leakage associated with an atmospheric containment, which is less likely for a sub-atmospheric containment design since pre-existing leakage would be detectable by changes in containment vacuum. Therefore, the NRC staff concludes that the results of the risk assessment performed assuming operation with an atmospheric containment, are also conservatively applicable to plant operation with a sub-atmospheric containment.

3.5 Risk Impact Assessment

The licensee has performed a risk impact assessment of extending the Type A test interval to 15 years. The assessment was provided to the NRC staff in the October 31, 2002, application for license amendments. Additional analysis and information were provided by the licensee in a letter dated January 24, 2003. In performing the risk assessment, the licensee considered the guidelines of NEI 94-01, the methodology used in EPRI Research Project Report TR-104285, "Risk Impact Assessment of Revised Containment Leak Rate Testing," and RG 1.174.

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 development of the performance-based Option B to Appendix J. Section 11.0 of NEI 94-01 states that NUREG-1493, DFC, provided the technical basis to support rulemaking to revise leakage rate testing requirements contained in Option B to Appendix J (NUREG-1493 was published in final form in September 1995). 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 the NRC's rulemaking basis, NEI/EPRI undertook a similar study. The results of that study are documented in EPRI 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 EPRI study estimated that relaxing the test frequency from 3-in-10 years to 1-in-10 years increased the average time that a leak, 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 LLRTs 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 confirmed the NUREG-1493 conclusion that a reduction in the frequency of Type A tests from 3-in-10 years to 1-in-20 years leads to an "imperceptible" increase in risk on the order of 0.2 percent and a fraction of one person-rem per year.

Building upon the methodology of the EPRI study, the licensee assessed the change in the predicted person-rem/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 in 1995, the NRC staff has issued RG 1.174 on the use of PRA in risk-informed changes to a plant's licensing basis. The licensee has proposed using RG 1.174 to assess the acceptability of extending the Type A test interval beyond that established during the Option B rulemaking. RG 1.174 defines very small changes in the risk-acceptance guidelines as increases in core damage frequency (CDF) less than 10^{-6}/year and increases in LERF less than 10^{-7}/year. 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 and the cumulative change from the original 3-in-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 an analysis which estimated all of these risk metrics and whose methodology is consistent with previously approved submittals. The following conclusions can be drawn from the analysis associated with extending the Type A test frequency:

1. A slight increase in risk is predicted when compared to that estimated from current requirements. Given the change from a 3-in-10 year test interval to a 1-in-15 year test interval, the increase in the total integrated plant risk, in person-rem/year, is estimated to be 0.04 percent for Unit 1 and 0.02 percent for Unit 2. This increase is comparable to that estimated in NUREG-1493, in which it was concluded that a reduction in the frequency of tests from 3-in-10 years to 1-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 interval from the original 3-in-10 years to 1-in-15 years is estimated to be 2.1×10^{-7}/year for Unit 1 and 3.8×10^{-8}/year for Unit 2. However, there is some likelihood that the undetected flaw in the containment liner 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 the

ASME Code, Section XI, Subsections IWE/IWL). The most recent visual examinations of the BVPS 1&2 containments were performed in April 2000 and October 2000 for Units 1 and 2, respectively. The next scheduled IWE/IWL containment inspection is 2003 for both units. Visual inspections are expected to be effective in detecting large flaws in the visible regions of the containment, and would reduce the impact of the extended test interval on LERF. The licensee performed additional risk analysis to consider the impact of hypothetical corrosion in inaccessible areas of the containment shell on the proposed change. The risk analysis considered the likelihood of an age-adjusted flaw that would lead to a breach of the containment. The risk analysis also considered the likelihood that the flaw was not visually detected but could be detected by a Type A test. When possible corrosion of the containment surfaces is considered, the increase in LERF resulting from a change in the Type A test interval from the original 3-in-10 years to 1-in-15 years is estimated to be 2.2×10^{-7}/year for Unit 1 and 3.9×10^{-8}/year for Unit 2. Therefore, 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 among prevention of core damage, prevention of containment failure, and consequence mitigation. The licensee estimates the change in the conditional containment failure probability to be about 0.3 percentage points for both units for the cumulative change of going from a test interval of 3-in-10 years to 1-in-15 years. The NRC staff finds that the defense-in-depth philosophy is maintained based on the change in the conditional containment failure probability for the proposed amendments.

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.

3.6 Summary

The NRC staff finds the overall procedure used by the licensee in its analysis to be reasonable.

Based on the considerations previously discussed, the NRC staff finds that granting the requested ILRT extension will not adversely affect the leak-tight integrity of the primary containment. To summarize, the key points supporting the NRC staff's finding are as follows:

- Historical performance of ILRTs and recent LLRTs at BVPS 1&2 have been acceptable.

- Historically, most leakage has occurred through containment isolation valves and penetrations that are subject to LLRTs. The LLRT program requirements are unchanged by these amendments and, thus, the LLRT program will continue to ensure the leak-tight integrity of the containment isolation valves and penetrations.

- Requirements for periodic visual inspection of the containment are unchanged by these amendments.

- A hypothetical flaw in an inaccessible area of the liner is included in the risk assessment of the effects of extending the ILRT interval. This assessment demonstrated that the increase in predicted risk due to the proposed change is within the acceptance criteria while maintaining the defense-in-depth philosophy of RG 1.174.

It should also be noted that Subarticle IWE-5000 of the ASME Code, Section XI, requires leak rate testing following major repair, modification, or replacement of containment components. Thus, in the event that the licensee performs major repair, modification, or replacement of containment pressure boundary components, an ILRT might be required to confirm that the repair/replacement activities are adequate and that additional degradation does not exist in other areas of the containment. Additionally, the licensee will still be required to report serious degradation of the containment pressure boundary pursuant to 10 CFR 50.72 and/or 10 CFR 50.73.

On the basis of the above findings, the NRC staff finds that a one-time only extension for performing the ILRT from a 1-in-10 year to a 1-in-15 year interval, and the proposed changes to TS Sections 6.17 for BVPS 1&2, are acceptable.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Pennsylvania State official was notified of the proposed issuance of the amendments. The State official had a verbal comment that considering the licensee’s pending and separate application to convert the BVPS 1&2 containments from subatmospheric to atmospheric, an ILRT should be performed in advance of the NRC staff’s completion of the review of that application. The NRC Project Manager contacted the Pennsylvania State official, and described that the conversion of the containments from subatmospheric to atmospheric had been considered in the review of this amendment request as discussed in Section 3.4 of this SE. The Pennsylvania State official had no further comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendments change surveillance requirements. The NRC staff has determined that the 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 the amendments involve no significant hazards consideration, and there has been no public comment on such finding (67 FR 75877). Accordingly, the 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 the amendments.

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

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