



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

October 9, 2015

Mr. Brian D. Boles  
Site Vice President  
FirstEnergy Nuclear Operating Company  
Mail Stop A-DB-3080  
5501 North State, Route 2  
Oak Harbor, OH 43449-9760

SUBJECT: DAVIS-BESSE NUCLEAR POWER STATION, UNIT NO. 1 - ISSUANCE OF  
AMENDMENT RELATED TO CONTAINMENT LEAKAGE RATE TESTING  
PROGRAM (TAC NO. MF5433)

Dear Mr. Boles:

The U.S. Nuclear Regulatory Commission has issued the enclosed Amendment No. 288 to Facility Operating License No. NPF-3 for the Davis-Besse Nuclear Power Station, Unit No. 1. The amendment is in response to your application dated December 19, 2014 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML14353A349), as supplemented by letter dated June 26, 2015 (ADAMS Accession No. ML15180A040).

The amendment revises Technical Specification (TS) 5.5.15, "Containment Leakage Rate Testing Program," to adopt the guidance in the Nuclear Energy Institute (NEI) topical report NEI 94-01, Revision 3-A, "Industry Guideline for Implementing Performance-Based Option of 10 CFR Part 50, Appendix J," dated July 2012 (ADAMS Accession No. ML12221A202), for Type C testing. This change allows the licensee to extend the containment Type C test interval from 60 months up to 75 months, based on acceptable performance. For non-routine, emergent conditions the change would allow an extension of the test interval up to 84 months. In addition, TS 5.5.15 is revised to correct a typographical error.

B. Boles

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

Sincerely,

A handwritten signature in black ink, appearing to read "BL Purnell". The signature is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

Blake Purnell, Project Manager  
Plant Licensing III-2 and  
Planning and Analysis Branch  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-346

Enclosures:

1. Amendment No. 288 to NPF-3
2. Safety Evaluation

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UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

FIRSTENERGY NUCLEAR OPERATING COMPANY

AND

FIRSTENERGY NUCLEAR GENERATION, LLC

DAVIS-BESSE NUCLEAR POWER STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

DOCKET NO. 50-346

Amendment No. 288  
License No. NPF-3

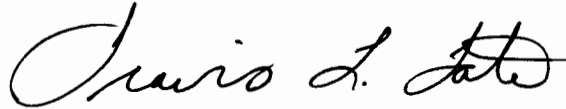
1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment filed by FirstEnergy Nuclear Operating Company (the licensee or FENOC) dated December 19, 2014, as supplemented by letter dated June 26, 2015, complies with the standards and requirements of 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-3 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 288, are hereby incorporated in the license. FENOC 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 45 days of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

A handwritten signature in black ink, appearing to read "Travis L. Tate". The signature is fluid and cursive, with a large initial 'T' and 'L'.

Travis L. Tate, Chief  
Plant Licensing III-2 and  
Planning and Analysis Branch  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical  
Specifications and Facility Operating License

Date of Issuance: October 9, 2015

ATTACHMENT TO LICENSE AMENDMENT NO. 288

FACILITY OPERATING LICENSE NO. NPF-3

DOCKET NO. 50-346

Replace the following pages of the Facility Operating License and Appendix A, Technical Specifications, with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

Remove

Insert

License NPF-3  
Page 4

License NPF-3  
Page 4

TS pages  
5.5-12

TS pages  
5.5-12

2.C. This license shall be deemed to contain and is subject to the conditions specified in the following Commission regulations in 10 CFR Chapter I: Part 20, Section 30.34 of Part 30, Section 40.41 of Part 40, Sections 50.54 and 50.59 of Part 50, and Section 70.32 of Part 70; and is subject to all applicable provisions of the Act and to the rules, regulations, and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:

(1) Maximum Power Level

FENOC is authorized to operate the facility at steady state reactor core power levels not in excess of 2817 megawatts (thermal). Prior to attaining the power level, Toledo Edison Company shall comply with the conditions identified in Paragraph (3) (o) below and complete the preoperational tests, startup tests and other items identified in Attachment 2 to this license in the sequence specified. Attachment 2 is an integral part of this license.

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 288, are hereby incorporated in the license. FENOC shall operate the facility in accordance with the Technical Specifications.

(3) Additional Conditions

The matters specified in the following conditions shall be completed to the satisfaction of the Commission within the stated time periods following the issuance of the license or within the operational restrictions indicated. The removal of these conditions shall be made by an amendment to the license supported by a favorable evaluation by the Commission:

- (a) FENOC shall not operate the reactor in operational Modes 1 and 2 with less than three reactor coolant pumps in operation.
- (b) Deleted per Amendment 6
- (c) Deleted per Amendment 5

## 5.5 Programs and Manuals

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### 5.5.14 Safety Function Determination Program (continued)

3. Provisions to ensure that an inoperable supported system's Completion Time is not inappropriately extended as a result of multiple support system inoperabilities; and
  4. Other appropriate limitations and remedial or compensatory actions.
- b. A loss of safety function exists when, assuming no concurrent single failure, no concurrent loss of offsite power, or no concurrent loss of onsite diesel generator(s), a safety function assumed in the accident analysis cannot be performed. For the purpose of this program, a loss of safety function may exist when a support system is inoperable; and
1. A required system redundant to the system(s) supported by the inoperable support system is also inoperable; or
  2. A required system redundant to the system(s) in turn supported by the inoperable supported system is also inoperable; or
  3. A required system redundant to the support system(s) for the supported systems described in Specifications 5.5.14.b.1 and 5.5.14.b.2 above is also inoperable.
- c. The SFDP identifies where a loss of safety function exists. If a loss of safety function is determined to exist by this program, the appropriate Conditions and Required Actions of the LCO in which the loss of safety function exists are required to be entered. When a loss of safety function is caused by the inoperability of a single Technical Specification support system, the appropriate Conditions and Required Actions to enter are those of the support system.

### 5.5.15 Containment Leakage Rate Testing Program

- a. A program shall establish the leakage rate testing of the containment as required by 10 CFR 50.54(o) and 10 CFR 50, Appendix J, Option B, as modified by approved exemptions. For Type C tests, this program shall be in accordance with the guidelines contained in Nuclear Energy Institute (NEI) topical report NEI 94-01, Revision 3-A, "Industry Guideline for Implementing Performance-Based Option of 10 CFR Part 50, Appendix J," dated July 2012. For Type A and Type B tests, this program shall be in accordance with the guidelines contained in Regulatory Guide 1.163, "Performance-Based Containment Leak-Test Program," dated September 1995, as modified by the following exceptions:
1. A reduced duration Type A test may be performed using the criteria and Total Time method specified in Bechtel Topical Report BN-TOP-1, Revision 1.



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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 288 TO FACILITY OPERATING LICENSE NO. NPF-3  
FIRSTENERGY NUCLEAR OPERATING COMPANY  
FIRSTENERGY NUCLEAR GENERATION, LLC  
DAVIS-BESSE NUCLEAR POWER STATION, UNIT NO. 1

DOCKET NO. 50-346

1.0 INTRODUCTION

By application dated December 19, 2014 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML14353A349), as supplemented by letter dated June 26, 2015 (ADAMS Accession No. ML15180A040), FirstEnergy Nuclear Operating Company (the licensee) submitted a license amendment request for Davis-Besse Nuclear Power Station (DBNPS), Unit No. 1. The proposed amendment would revise Technical Specification (TS) 5.5.15, "Containment Leakage Rate Testing Program," to adopt the guidance in the Nuclear Energy Institute (NEI) topical report NEI 94-01, Revision 3-A, "Industry Guideline for Implementing Performance-Based Option of 10 CFR [Title 10 of the *Code of Federal Regulations*] Part 50, Appendix J," dated July 2012 (ADAMS Accession No. ML12221A202), for Type C testing. This change will allow the licensee to extend the containment Type C local leak rate test (LLRT) interval from 60 months up to 75 months, based on acceptable performance. For nonroutine, emergent conditions the change would allow an extension of the test interval up to 84 months. In addition, TS 5.5.15 would be revised to correct a typographical error.

The June 26, 2015, supplement contained clarifying information within the scope of the proposed action noticed and did not change the U.S. Nuclear Regulatory Commission (NRC) staff's proposed finding of no significant hazards consideration published by the staff in the *Federal Register* on July 7, 2015 (80 FR 38759).

2.0 REGULATORY EVALUATION

2.1 Regulations and Guidance

Section 50.54(o) of 10 CFR requires that the primary reactor containments for water cooled power reactors shall be subject to the requirements set forth in Appendix J, "Primary Reactor Containment Leakage Testing for Water-Cooled Power Reactors," to 10 CFR Part 50. Appendix J includes two options, "Option A – Prescriptive Requirements" and "Option B – Performance-Based Requirements," either of which can be chosen to meet the requirements of the Appendix. The testing requirements in Appendix J ensure that (a) leakage through



containments or systems and components penetrating containments does not exceed allowable leakage rates specified in the TS and (b) integrity of the containment structure is maintained during the service life of the containment.

Option B of 10 CFR Part 50, Appendix J, specifies performance-based requirements and criteria for preoperational and subsequent leakage rate testing. These requirements are met by performing Type C pneumatic tests to measure containment isolation valve leakage rates. After the preoperational tests, these tests are required to be conducted at periodic intervals based on the historical performance of each isolation valve to ensure integrity of the overall containment system as a barrier to fission product release.

Section V.B.3 of 10 CFR 50, Appendix J, Option B, requires that the regulatory guide (RG) or other implementation document used by a licensee to develop a performance-based leakage-testing program must be included, by general reference, in the plant TSs.

The NRC RG 1.163, "Performance-Based Containment Leak-Test Program," dated September 1995 (ADAMS Accession No. ML003740058), endorsed NEI 94-01, Revision 0, as an acceptable method, with some exceptions, for licensees to use to comply with Option B of 10 CFR 50, Appendix J.

NEI 94-01, Revision 3-A, has also been approved by the NRC staff as an acceptable method for licensees to use to comply with Option B of 10 CFR 50, Appendix J. The staff's final safety evaluation, which is incorporated into NEI 94-01, Revision 3-A, includes two specific limitations and conditions on the approval, both of which relate to the Type C testing.

## 2.2 Licensee's Proposed Changes

TS 5.5.15 incorporates the general reference to the RG used by the licensee to develop the performance-based leakage-testing program requirement as required by Section V.B.3 of 10 CFR 50, Appendix J, Option B. TS 5.5.15(a) currently states, in part:

A program shall establish the leakage rate testing of the containment as required by 10 CFR 50.54(o) and 10 CFR 50, Appendix J, Option B, as modified by approved exemptions. This program shall be in accordance with the guidelines contained in Regulatory Guide 1.163, "Performance-Based Containment Leak-Test Program," dated September, 1995, as modified by the following exceptions:

The licensee proposed action is to change this part of TS 5.5.15(a) to read as follows:

A program shall establish the leakage rate testing of the containment as required by 10 CFR 50.54(o) and 10 CFR 50 Appendix J, Option B, as modified by approved exemptions. For Type C tests, this program shall be in accordance with the guidelines contained in Nuclear Energy Institute (NEI) topical report NEI 94-01, Revision 3-A, "Industry Guideline for Implementing Performance-Based Option of 10 CFR Part 50, Appendix J," dated July 2012. For Type A and Type B tests, this program shall be in accordance with the guidelines contained in Regulatory Guide 1.163, "Performance-Based Containment Leak-Test Program," dated September 1995, as modified by the following exceptions:

The proposed change does not affect the licensee's performance of the Type A and Type B testing. The exceptions in TS 5.5.15(a) are also not affected as they only relate to the Type A and Type B testing requirements. The typographical correction removes the comma in "September, 1995" that appears in the current TS.

### 3.0 TECHNICAL EVALUATION

The licensee's proposed change from RG 1.163 to NEI 94-01, Revision 3-A, for Type C testing will allow the licensee to extend the containment Type C test interval from 60 months up to 75 months, based on acceptable performance. For nonroutine, emergent conditions, the change would allow an extension of the test interval up to 84 months.

The NRC staff reviewed the application using the guidance in NEI 94-01, Revision 3-A, including the associated staff safety evaluation. As discussed below, the staff reviewed the information the licensee provided regarding recent leak rate test results for DBNPS and how the licensee proposes to address the two NRC conditions on the approval of NEI 94-01, Revision 3-A.

#### 3.1 Type C Leak Rate Test Results

The guidance in NEI 94-01, Revision 3-A, permits the extensions of Type C test intervals based upon completion of two consecutive periodic as-found tests where the results of each test are within a licensee's allowable administrative limits and other requirements specified in Section 10.2.3, "Type C Test Interval," of the guidance.

In its June 26, 2015, letter, the licensee provided the DBNPS LLRT results (see Table 1 below) from the last five refueling outages. The results show that the as-found minimum pathway leakage and as-found minimum pathway secondary containment bypass leakage are below the TS limits of 0.6  $L_a$  and 0.03  $L_a$ , respectively (where  $L_a$  is the maximum allowable leakage rate for design-basis accident conditions). Therefore, the NRC staff determined that the licensee meets the requirement in NEI 94-01, Revision 3-A, for extension of Type C test intervals since the licensee has completed at least two consecutive periodic as-found tests within the allowed limits and meets the other requirements in Section 10.2.3 of the guidance.

Table 1: DBNPS Type C Leak Rate Results

Refueling Outage	As-Found Min Path	Percentage of 0.6 $L_a$ (599,400 sccm)	As-Found Min Path Bypass	Percentage of 0.03 $L_a$ (29,970 sccm)
Winter 2008	30,099 sccm	5.03%	5,679 sccm	18.95%
Spring 2010	14,945 sccm	2.50%	2,723 sccm	9.09%
Fall 2011	17,495 sccm	2.92%	6,244 sccm	20.84%
Spring 2012	29,469 sccm	4.92%	5,961 sccm	19.89%
Spring 2014	27,603 sccm	4.61%	7,271 sccm	24.27%

sccm = Standard Cubic Centimeters per Minute

### 3.2 NRC Condition 1

NRC Condition 1 for the use of NEI 94-01, Revision 3-A, states, in part:

The [NRC] staff is allowing the extended interval for Type C LLRTs be increased to 75 months with the requirement that a licensee's post-outage report include the margin between the Type B and Type C leakage rate summation and its regulatory limit. In addition, a corrective action plan shall be developed to restore the margin to an acceptable level. The staff is also allowing the non-routine emergent extension [9-month grace period] out to 84-months as applied to Type C valves at a site, with some exceptions that must be detailed in NEI 94-01, Revision 3. At no time shall an extension be allowed for Type C valves that are restricted categorically, and those valves with a history of leakage, or any valves held to either a less than maximum interval or to the base refueling cycle interval. Only non-routine emergent conditions allow an extension to 84 months.

The licensee stated in its June 26, 2015, letter that the DBNPS post-outage report will include "the margin between the Type B and Type C minimum pathway leak rate summation value, as adjusted to include the estimate of applicable Type C leakage understatement and its Technical Specification performance criterion of 0.6 L<sub>a</sub>."

The licensee stated in its June 26, 2015, letter that corrective actions and corrective maintenance is determined on a case-by-case basis. The letter further states:

The Maintenance Rule program manual at DBNPS contains plant level performance criteria for containment integrity. Per the program, the combined leakage rate for all Type B and Type C penetrations is less than or equal to 0.45 L<sub>a</sub>, otherwise a Maintenance Rule Condition Monitoring Failure occurs. Additionally, the combined leakage rate for all bypass penetrations is less than or equal to 0.0225 L<sub>a</sub>; otherwise, a Maintenance Rule Condition Monitoring Failure occurs. In accordance with 10 CFR 50.65(a)(1), an evaluation would be performed to determine if the containment system is capable of performing its intended safety function and if corrective action is necessary to restore the leakage summation margin to less than the DBNPS Maintenance Rule administrative leakage limit. The corrective action plan would prioritize those components contributing the most to the increase in the leakage summation value and focus on the prevention of future component leakage performance issues.

The licensee's June 26, 2015, letter states that the 9-month grace period would not likely be used due to misalignment with the 24-month operating cycle at DBNPS. The licensee further states that if a component became eligible to apply the 9-month grace period, the use and basis would be documented in a surveillance change form.

Based on the above, the NRC staff determined that the licensee has adequately addressed NRC Condition 1 for NEI 94-01, Revision 3-A. Specifically, the staff has reasonable assurance that the licensee will: (1) include the margin between Type B and Type C leakage rate

summation and its regulatory limit in the post-outage report; (2) have a corrective action plan to restore the margin to an acceptable levels; and (3) apply the 9-month grace period only for non-routine emergent conditions.

### 3.3 NRC Condition 2

NRC Condition 2 for the use of NEI 94-01, Revision 3-A, states, in part:

When routinely scheduling any LLRT valve interval beyond 60 months and up to 75 months, the primary containment leakage rate testing program trending or monitoring must include an estimate of the amount of understatement in the Type B and Type C total, and must be included in a licensee's post-outage report. The report must include the reasoning and determination of the acceptability of the extension, demonstrating that the LLRT totals calculated represent the actual leakage potential of the penetrations.

In its June 26, 2015, letter, the licensee confirmed it will include an estimate of understatement in its post-outage report. An adjustment factor of 1.25 to the as-left leakage total for each Type C component tested at the 75-month periodicity will be added. The licensee stated that the adjustment factor accounts for the 25 percent increase in the LLRT periodicity. Additionally, the post-outage report will include the reasoning and determination of the acceptability of the extension to demonstrate that the LLRT totals calculated represent the actual leakage potential of the penetrations.

Based on the above, the NRC staff concludes that the licensee's primary containment leakage rate testing program will contain trending or monitoring that includes an estimate of the amount of understatement in the Type B and Type C total. A conservative leakage understatement factor will be used to account for the extended interval and the post-outage report will contain the necessary information. Therefore, the staff determined that the licensee has adequately addressed NRC Condition 2 for NEI 94-01, Revision 3-A.

### 3.4 Technical Summary

In summary, NEI 94-01, Revision 3-A, has been approved by the NRC staff as an acceptable method for licensees to use to comply with Option B of 10 CFR 50, Appendix J. The licensee's recent LLRT results for DBNPS show that it meets the criteria in NEI 94-01, Revision 3-A, for extension of Type C test intervals. In addition, the staff determined that the licensee has adequately addressed how it will comply with the two NRC conditions for use of NEI 94-01, Revision 3-A. Therefore, the NRC staff concludes that the adoption of NEI 94-01, Revision 3-A, for Type C testing at DBNPS is acceptable.

### 3.5 Typographical Correction

The licensee proposes to correct a typographical error that appears in TS 5.5.15(a) by removing the comma in "September, 1995." The NRC staff agrees this is a typographic error and that the change does not alter the requirements in TS 5.5.15(a). Based on this, the staff determined the removal of the comma is acceptable.

#### 4.0 STATE CONSULTATION

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

#### 5.0 ENVIRONMENTAL CONSIDERATION

This amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes surveillance requirements. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types of any effluent that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission issued a proposed finding that the amendment involves no significant hazards consideration on March 31, 2015 (80 FR 17090) and July 7, 2015 (80 FR 38759). 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 NRC staff 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) there is reasonable assurance that such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributors: Diana Woodyatt, NRR

Date of issuance: October 9, 2015

B. Boles

- 2 -

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

Sincerely,

*/RA/*

Blake Purnell, Project Manager  
Plant Licensing III-2 and  
Planning and Analysis Branch  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-346

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