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

March 2, 2017

Mr. Marty L. Richey, Site Vice President
FirstEnergy Nuclear Operating Company
Beaver Valley Power Station
Mail Stop A-BV-SEB1
P.O. Box 4, Route 168
Shippingport, PA 15077

SUBJECT: BEAVER VALLEY POWER STATION, UNIT NOS. 1 AND 2 – RELIEF FROM THE REQUIREMENTS OF THE ASME CODE (CAC NOS. MF8330 AND MF8331)

Dear Mr. Richey:

By letter dated August 31, 2016 (Agencywide Documents Access and Management System Accession No. ML16245A320), FirstEnergy Nuclear Operating Company (FENOC or the licensee) submitted 28 proposed alternatives and relief requests to the U.S. Nuclear Regulatory Commission (NRC) for the use of alternatives to certain American Society of Mechanical Engineers (ASME) Code for Operation and Maintenance of Nuclear Power Plants (OM Code) requirements at Beaver Valley Power Station, Unit Nos. 1 and 2 (BVPS-1 and BVPS-2). The subject requests are related to surveillance period extension. The purpose of this letter is to provide the results of the NRC staff's review of Relief Request Nos. PR1 and VR1. The NRC staff will provide separate correspondence regarding the remainder of the alternatives and relief requests.

Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(z)(2), the licensee requested to use the proposed alternative Code Case OMN-20 in Relief Request Nos. PR1 and VR1 on the basis that it provides reasonable assurance that the components are operationally ready and that compliance with the ASME OM Code requirements would result in hardship or unusual difficulty, without a compensating increase in the level of quality and safety. The proposed alternative allows for an extension to component test frequencies.

The NRC staff has reviewed the subject request and concludes, as set forth in the enclosed safety evaluation, that FENOC has adequately addressed all of the regulatory requirements set for in 10 CFR 50.55a, that the proposed alternative provides reasonable assurance that the affected component is operationally ready, and complying with the ASME OM Code requirements would result in hardship or unusual difficulty, without a compensating increase in the level of quality and safety. Accordingly, the NRC staff concludes that FENOC has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(z)(2). Therefore, the NRC staff authorizes Alternative Requests PR1 and VR1 for BVPS-1 and BVPS-2 current and future 10-year inservice testing program intervals until Code Case OMN-20 is incorporated in 10 CFR 50.55a.

All other ASME OM Code requirements for which relief was not specifically requested and approved in this relief request remain applicable.

If you have any questions, please contact the Project Manager, Taylor Lamb, at 301-415-7128 or Taylor.Lamb@nrc.gov.

Sincerely,

Stephen S. Koenick, Acting Chief
Plant Licensing Branch I
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-334 and 50-412

Enclosure:
Safety Evaluation

cc w/encl: Distribution via Listserv

UNITED STATES
NUCLEAR REGULATORY COMMISSION
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# SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

# REQUEST FOR ALTERNATIVES PR1 AND VR1 TO USE CODE CASE OMN-20

# REGARDINGTHE FIFTH 10-YEAR INSERVICE TESTING INTERVAL AND

# FOURTH 10-YEAR INSERVICE TESTING INTERVAL

# FIRSTENERGY NUCLEAR OPERATING COMPANY

# BEAVER VALLEY POWER STATION, UNIT NOS. 1 AND 2

# DOCKET NOS. 50-334 AND 50-412

## 1.0 INTRODUCTION

By letter dated August 31, 2016 (Agencywide Documents Access and Management System Accession No. ML16245A320), FirstEnergy Nuclear Operating Company (FENOC or the licensee) submitted 28 proposed alternatives and relief requests to the U.S. Nuclear Regulatory Commission (NRC) for the use of alternatives to certain American Society of Mechanical Engineers (ASME) Code for Operation and Maintenance of Nuclear Power Plants (OM Code) requirements at Beaver Valley Power Station, Unit Nos. 1 and 2 (BVPS-1 and BVPS-2). The subject requests are related to surveillance period extension. The purpose of this safety evaluation is to provide the results of the NRC staff's review of Relief Request Nos. PR1 and VR1. The NRC staff's review of the remaining alternative and relief requests will be documented in a separate safety evaluation.

Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(z)(2), the licensee requested to use the proposed alternative Code Case OMN-20 in Relief Request Nos. PR1 and VR1 on the basis that it provides reasonable assurance that the components are operationally ready and that compliance with the ASME OM Code requirements would result in hardship or unusual difficulty, without a compensating increase in the level of quality and safety. The proposed alternative allows for an extension to component test frequencies.

The NRC staff notes as part of this relief, the licensee is modifying the start of BVPS-2 fourth 10-year inservice testing interval to align with the BVPS-1 fifth 10-year inservice testing interval. The licensee's letter dated August 31, 2016, states, in part:

> The fifth 10-year inservice testing interval for BVPS Unit No. 1 commences on September 20, 2017. The fourth 10-year inservice testing interval for BVPS Unit No. 2 was to commence on November 18, 2017; however, this interval start date will be moved to September 20, 2017 to coincide with the BVPS Unit No. 1 interval start date. This ensures that the same edition and addenda of the

American Society of Mechanical Engineers, Code for Operation and Maintenance of Nuclear Power Plants will be applied to both units.

## 2.0 REGULATORY EVALUATION

The regulations in 10 CFR 50.55a(f), "Inservice testing requirements," require, in part, that the inservice testing (IST) of certain ASME Code Class 1, 2, and 3 components must meet the requirements of the ASME OM Code and applicable addenda, except where alternatives have been authorized by the NRC pursuant to 10 CFR 50.55a(z)(1) or 10 CFR 50.55a(z)(2).

The regulations in 10 CFR 50.55a(z), state, in part, that alternatives to the requirements of 10 CFR 50.55a(f) may be authorized by the NRC if the licensee demonstrates that: (1) the proposed alternative provides an acceptable level of quality and safety (10 CFR 50.55a(z)(1)), or (2) compliance with the specified requirements would result in hardship or unusual difficulty, without a compensating increase in the level of quality and safety (10 CFR 50.55a(z)(2)).

Based on the above, and subject to the following technical evaluation, the NRC staff finds that regulatory authority exists for the licensee to request, and the NRC to authorize, the alternative proposed by the licensee.

## 3.0 TECHNICAL EVALUATION

### 3.1 Licensee's Alternative Request Nos. PR1 and VR1 for the Use of Code Case OMN-20

#### 3.1.1 Applicable Code Requirements

This request applies to the frequency specifications of the ASME OM Code for all pumps and valves testing contained within the IST program scope. The frequencies for tests given in the ASME OM Code include the following, but do not include a tolerance band:

ISTA-3120, "Inservice Test Interval," (a) states, "The frequency for inservice testing shall be in accordance with the requirements of Section IST."

ISTB-3400, "Frequency of Inservice Tests," states, "An inservice test shall be run on each pump as specified in Table ISTB-3400-1."

Table ISTB-3400-1, "Inservice Test Frequency," notes that Group A and Group B pump tests are to be conducted quarterly and comprehensive pump tests are to be conducted biennially.

ISTC-3510, "Exercising Test Frequency," states, "Active Category A, Category B, and Category C check valves shall be exercised nominally every 3 months, except as provided by ISTC-3520, ISTC-3540, ISTC-3550, ISTC-3570, ISTC-5221, and ISTC-5222. Power-operated valves shall be exercise-tested once per fuel cycle."

ISTC-3540, "Manual Valves," states, "Manual valves shall be full-stroke exercised at least once every 2 years, except where adverse conditions may require the valve to be tested more frequently to ensure operational readiness. Any increased testing frequency shall be specified by the Owner. The valve shall exhibit the required change of obturator position."

ISTC-3630, "Leakage Rate for Other Than Containment Isolation Valves," (a) "Frequency," states, "Tests shall be conducted at least once every 2 years."

ISTC-3700, "Position Verification Testing," states, in part, "Valves with remote position indicators shall be observed locally at least once every 2 years to verify that valve operation is accurately indicated."

ISTC-5221,"Valve Obturator Movement," (c)(3), states, "At least one valve from each group shall be disassembled and examined at each refueling outage; all valves in each group shall be disassembled and examined at least once every 8 years."

Mandatory Appendix I, "Inservice Testing of Pressure Relief Devices in Light-Water Reactor Nuclear Power Plants," I-1320, "Test Frequencies, Class 1 Pressure Relief Valves," (a), "5-Year Test Interval," states, in part, "Class 1 pressure relief valves shall be tested at least once every 5 years, starting with initial electric power generation."

Mandatory Appendix I, I-1330, "Test Frequency, Class 1 Nonreclosing Pressure Relief Devices," states, "Class 1 nonreclosing pressure relief devices shall be replaced every 5 years unless historical data indicates a requirement for more frequent replacement."

Mandatory Appendix I, I-1340, "Test Frequency, Class 1 Pressure Relief Valves That Are Used for Thermal Relief Application," states, "Tests shall be performed in accordance with I-1320, Test Frequencies, Class 1 Pressure Relief Valves."

Mandatory Appendix I, I-1350, "Test Frequency, Classes 2 and 3 Pressure Relief Valves," (a), "10-Year Test Interval," states, in part, "Class 2 and 3 pressure relief valves, with the exception of PWR [pressurized-water reactor] main steam safety valves, shall be tested every 10 years, starting with initial electric power generation."

Mandatory Appendix I, I-1360, "Test Frequency, Classes 2 and 3 Nonreclosing Pressure Relief Devices," states, "Classes 2 and 3 non-reclosing pressure relief devices shall be replaced every 5 years, unless historical data indicates a requirement for more frequent replacement."

Mandatory Appendix I, I-1370, "Test Frequency, Classes 2 and 3 Primary Containment Vacuum Relief Valves," states, "(a) Tests shall be performed on all Classes 2 and 3 containment vacuum relief valves at each refueling outage or every 2 years, whichever is sooner, unless historical data requires more frequent testing. (b) Leak tests shall be performed on all Classes 2 and 3 containment vacuum relief valves at a frequency designated by the Owner in accordance with Table ISTC-3500-1."

Mandatory Appendix I, I-1380, "Test Frequency, Classes 2 and 3 Vacuum Relief Valves, Except for Primary Containment Vacuum Relief Valves," states, "All Classes 2 and 3 vacuum relief valves shall be tested every 2 years, unless performance data suggest the need for a more appropriate test interval."

Mandatory Appendix I, I-1390, "Test Frequency, Classes 2 and 3 Pressure Relief Devices That Are Used for Thermal Relief Application," states, "Tests shall be performed on all Classes 2 and 3 relief devices used in thermal relief application every 10 years, unless performance data indicate more frequent testing is necessary. In lieu of tests the Owner may replace the relief

devices at a frequency of every 10 years, unless performance data indicate more frequent replacements are necessary."

Mandatory Appendix II, "Check Valve Condition Monitoring Program," II-4000, "Condition-Monitoring Activities," (a), "Performance Improvement Activities," (1), states, in part, "If sufficient information is not currently available to complete the analysis required in II-3000, or if this analysis is inconclusive, then the following activities shall be performed at sufficient intervals over an interim period of the next 5 years or two refueling outages, whichever is less, to determine the cause of failure or the maintenance patterns."

Mandatory Appendix II, II-4000, (b), "Optimization of Condition-Monitoring Activities," (1)(e), states, "Identify the interval of each activity. Interval extensions shall be limited to one fuel cycle per extension. Intervals shall not exceed the maximum intervals shown in Table II-4000-1. All valves in a group sampling plan must be tested or examined again, before the interval can be extended again, or until the maximum interval would be exceeded. The requirements of ISTA-3120, Inservice Test Interval, do not apply."

In summary, ASME OM Code, Division 1, Section IST, 2009 Edition through OMa-2011 Addenda, and all earlier editions and addenda, specify component (pump and valve) test frequencies based either on elapsed time periods (e.g., quarterly, 2 years, etc.) or on the occurrence of plant conditions or events (e.g., cold shutdown, refueling outage, upon detection of a sample failure, following maintenance, etc.), without any tolerance.

3.1.2 Applicable Code Edition and Addenda

The Code of Record for the BVPS-1 fifth 10-year IST program and the BVPS-2 fourth 10-year IST program is the 2004 Edition through 2006 Addenda of ASME OM Code.

3.1.3 Components for Which Alternative Relief is Requested

All pumps and valves contained within the BVPS-1 fifth 10-year IST interval and BVPS-2 fourth 10-year IST interval programs scope.

3.1.4 Licensee's Reason for Requesting Relief

ASME OM Code Section IST establishes the IST frequency for all components within the scope of the Code. The frequencies (e.g., quarterly) have always been interpreted as "nominal" frequencies, which is generally as defined in the Table 3.2 of NUREG-1482, Revision 2 (ADAMS Accession No. ML13295A020). Additionally, owners routinely applied the surveillance extension time period, also known as the grace period, contained in the plant technical specifications (TSs) surveillance requirements (SRs). The TSs typically allow for a less than or equal to 25 percent extension of the surveillance test interval to accommodate plant conditions that may not be suitable for conducting a TS surveillance (SR 3.0.2). However, Regulatory Issue Summary (RIS) 2012-10, "NRC Staff Position on Applying Surveillance Requirements 3.0.2 and 3.0.3 to Administrative Control Program Tests" (ADAMS Accession No. ML12079A393), states that SRs 3.0.2 and 3.0.3 cannot be applied to TS 5.5, "Programs and Manuals," for tests that are not associated with a TS SR.

The lack of a tolerance band on the ASME OM Code IST frequency restricts operational

flexibility. The NRC recognized this potential issue in the TSs by allowing a frequency tolerance as described in TS SR 3.0.2. The lack of a similar tolerance applied to the ASME OM Code testing places an unusual hardship on the plant to adequately schedule work tasks, without operational flexibility.

With the TS-required surveillance testing, some tolerance is needed to allow adjusting ASME OM Code testing intervals to suit the plant conditions and other maintenance and testing activities. This assures operational flexibility when scheduling IST that would minimize the conflicts between the need to complete the testing and plant conditions.

3.1.5 Licensee's Proposed Alternative

The licensee proposed to perform IST per ASME OM Code Case OMN-20 for determining acceptable tolerances for pump and valve test frequencies. This Code Case was approved by the ASME OM Code Standards Committee in February 2012 and subsequently published in the 2012 Edition through 2015 Edition of the ASME OM Code. The proposed alternative will be utilized for the current and future 10-year IST intervals at BVPS-1 and BVPS-2 and will apply to the various frequency specifications of the ASME OM Code for all pumps and valves contained within the IST program scope.

ASME OM Code Case OMN-20, "Inservice Test Frequency"

ASME OM, Division 1, Section IST, and earlier editions and addenda of the ASME OM Code, specify component test frequencies based either on elapsed time periods (e.g., quarterly, 2 years, etc.) or on the occurrence of plant conditions or events (e.g., cold shutdown, refueling outage, upon detection of a sample failure, following maintenance, etc.).

(a) Components whose test frequencies are based on elapsed time periods shall be tested at the frequencies specified in Section IST with a specified time period between tests as shown in the table below.

| Frequency | Specified Time Period Between Tests |
|---|---|
| Quarterly (or every 3 months) | 92 days |
| Semiannually (or every 6 months) | 184 days |
| Annually (or every year) | 366 days |
| x Years | x calendar years where 'x' is a whole number of years ≥ 2 |

The specified time period between tests may be reduced or extended as follows:

(1) For periods specified as less than two years, the period may be extended by up to 25 percent for any given test.

(2) For periods specified as greater than or equal to two years, the period may be extended by up to 6 months for any given test.

(3) All periods specified may be reduced at the discretion of the Owner (i.e., there is no minimum period requirement).

Period extension is to facilitate test scheduling and considers plant operating conditions that may not be suitable for performance of the required testing (e.g., performance of the test would cause an unacceptable increase in the plant risk profile due to transient conditions or other ongoing surveillance, test, or maintenance activities). Period extensions are not intended to be used repeatedly merely as an operational convenience to extend test intervals beyond those specified.

Period extensions may also be applied to accelerated test frequencies (e.g., pumps in alert range) and other less than 2-year test frequencies not specified in the table above.

Period extensions may not be applied to the test frequency requirements specified in ASME OM Code Subsection ISTD, "Preservice and Inservice Examination and Testing of Dynamic Restraints (Snubbers) in Light-water Reactor Nuclear Power Plants," as Subsection ISTD contains its own rules for period extensions.

(b) Components whose test frequencies are based on the occurrence of plant conditions or events may not have their period between tests extended except as allowed by the ASME OM Code.

A similar alternative request was authorized for Grand Gulf Nuclear Station, Unit 1, by the NRC staff in a letter dated June 16, 2016 (ADAMS Accession No. ML16160A092).

3.1.6 NRC Staff Evaluation

Historically, licensees have applied, and the NRC staff has accepted, the standard TS definitions for IST interval, including allowable interval, extensions to ASME OM Code-required testing, as discussed in NUREG-1482, Revision 2, Section 3.1.3. Recently, the NRC staff reconsidered the allowance of the TS testing intervals and interval extensions for IST not associated with TS SRs. As noted in RIS 2012-10, the NRC determined that programmatic test frequencies cannot be extended in accordance with TS SR 3.0.2. This includes all IST described in the ASME OM Code not specifically required by the TS SRs.

The lack of a tolerance band on the ASME OM Code IST frequency restricts operational flexibility. The NRC staff recognized that, just as with TS-required surveillance testing, some tolerance is needed to allow adjusting ASME OM Code testing intervals to suit the plant conditions and other maintenance and testing activities. To provide operational flexibility when scheduling IST that minimizes the conflicts between the need to complete the testing and plant conditions, the NRC staff sponsored and co-authored an ASME OM Code inquiry and Code Case to modify the ASME OM Code to include TS-like test interval definitions and interval extension criteria. The resultant ASME-approved Code Case OMN-20, as shown above, was approved by the ASME Operation and Maintenance Standards Committee on February 15, 2012, with the NRC representative voting in the affirmative. Code Case OMN-20 was subsequently published in conjunction with the 2012 Edition through 2015 Edition of the ASME OM Code.

Requiring the licensee to meet the ASME OM Code requirements, without an allowance for defined frequency and frequency extensions for IST of pumps and valves, results in a hardship, without a compensating increase in the level of quality and safety. Based on the licensee's proposal to adopt the ASME-approved Code Case OMN-20 in its entirety, and prior acceptance of the similar TS test interval definitions and interval extension criteria, the NRC staff finds that implementation of the ASME-approved OM Code Case OMN-20 provides reasonable assurance of operational readiness of pumps and valves, subject to the IST requirements of the ASME OM Code.

## 4.0 CONCLUSION

As set forth above, the NRC staff also determines that for Request Nos. PR1 and VR1 (use Code Case OMN-20), the proposed alternative provides reasonable assurance that the affected components are operationally ready, and complying with the ASME OM Code requirements would result in hardship or unusual difficulty, without a compensating increase in the level of quality and safety. Accordingly, the NRC staff concludes that the licensee has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(z)(2).

Therefore, the NRC staff authorizes Alternative Requests PR1 and VR1 for the BVPS-1 and BVPS-2 current and future 10-year IST program intervals until Code Case OMN-20 is incorporated in 10 CFR 50.55a. All other ASME OM Code requirements for which relief was not specifically requested and approved in the subject request remain applicable.

Principal Contributor: G. Bedi

Date: March 2, 2017

SUBJECT: BEAVER VALLEY POWER STATION, UNIT NOS. 1 AND 2 – RELIEF FROM THE REQUIREMENTS OF THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS CODE (CAC NOS. MF8330 AND MF8331) DATED MARCH 2, 2017

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