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

December 7, 2017

Mr. Bryan C. Hanson
President and Chief Nuclear Officer
Exelon Nuclear
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: PEACH BOTTOM ATOMIC POWER STATION, UNITS 2 AND 3 – SAFETY EVALUATION OF RELIEF REQUEST 01A-VRR-4 REGARDING THE FIFTH 10-YEAR INTERVAL OF THE INSERVICE TESTING PROGRAM (EPID L-2017-LLR-0097)

Dear Mr. Hanson:

By letter dated September 29, 2017, Exelon Generation Company, LLC (Exelon, the licensee) submitted relief requests GVRR-2, 01A-VRR-2, 01A-VRR-3, and 01A-VRR-4, to the U.S. Nuclear Regulatory Commission (NRC). In these relief requests, Exelon proposed alternatives to certain inservice testing (IST) requirements of the American Society of Mechanical Engineers (ASME) Code for Operation and Maintenance of Nuclear Power Plants (OM Code) for Peach Bottom Atomic Power Station (PBAPS), Units 2 and 3. The subject relief requests are for the fifth 10-year interval of the IST program at PBAPS, Units 2 and 3, which will begin on August 15, 2018.

The purpose of this letter is to provide the results of the U.S. Nuclear Regulatory Commission (NRC) staff's review of relief request 01A-VRR-4, as documented in the enclosed safety evaluation. In this relief request, Exelon proposed an alternative to certain IST requirements of the OM Code for testing of the main steam isolation valves. Our safety evaluation concludes that the proposed alternative will provide an acceptable level of quality and safety. Accordingly, the NRC staff concludes that the licensee has adequately addressed all of the regulatory requirements set forth in Title 10 of the *Code of Federal Regulations* Section 50.55a(z)(1). Therefore, the NRC staff authorizes the proposed alternative for the fifth 10-year IST interval at PBAPS, Units 2 and 3.

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

By letter dated October 13, 2017 (Agencywide Documents Access and Management System Accession No. ML17286A083), Exelon withdrew relief request 01A-VRR-2. The NRC staff will provide separate correspondence regarding the review of relief requests GVRR-2 and 01A-VRR-3.

If you have any questions concerning this matter, please contact the PBAPS Project Manager, Mr. Richard Ennis, at (301) 415-1420 or Rick.Ennis@nrc.gov.

Sincerely,

James G. Danna, Chief
Plant Licensing Branch 1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-277 and 50-278

Enclosure:
Safety Evaluation

cc: Distribution via Listserv

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO RELIEF REQUEST 01A-VRR-4 FOR THE

FIFTH 10-YEAR INTERVAL OF THE INSERVICE TESTING PROGRAM

EXELON GENERATION COMPANY, LLC

PEACH BOTTOM ATOMIC POWER STATION, UNITS 2 AND 3

DOCKET NOS. 50-277 AND 50-278

1.0 INTRODUCTION

By letter dated September 29, 2017 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17275A061), Exelon Generation Company, LLC (Exelon, the licensee) submitted relief requests GVRR-2, 01A-VRR-2, 01A-VRR-3, and 01A-VRR-4, to the U.S. Nuclear Regulatory Commission (NRC or the Commission). In these relief requests, Exelon proposed alternatives to certain inservice testing (IST) requirements of the American Society of Mechanical Engineers (ASME) Code for Operation and Maintenance of Nuclear Power Plants (OM Code) for Peach Bottom Atomic Power Station (PBAPS), Units 2 and 3. The subject relief requests are for the fifth 10-year interval of the IST program at PBAPS, Units 2 and 3, which will begin on August 15, 2018.

The purpose of this safety evaluation is to provide the results of the U.S. Nuclear Regulatory Commission (NRC or the Commission) staff's review of relief request 01A-VRR-4. In this relief request, Exelon proposed an alternative to certain IST requirements of the OM Code for testing of the main steam isolation valves (MSIVs). The relief request was submitted pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.55a(z)(1) on the basis that the proposed alternative provides an acceptable level of quality and safety.

By letter dated October 13, 2017 (ADAMS Accession No. ML17286A083), Exelon withdrew relief request 01A-VRR-2. The NRC staff's review of relief requests GVRR-2 and 01A-VRR-3 will be documented in separate safety evaluations.

2.0 REGULATORY EVALUATION

Section 50.55a(f), "Inservice testing requirements," of 10 CFR requires, in part, that IST of certain ASME Boiler and Pressure Vessel Code (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 paragraphs (z)(1) or (z)(2) of 10 CFR 50.55a.

In proposing alternatives, a licensee must demonstrate that the alternatives provide an acceptable level of quality and safety in accordance with 10 CFR 50.55a(z)(1), or that compliance would result in hardship or unusual difficulty, without a compensating increase in the level of quality and safety in accordance with 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 Commission to authorize, the alternative requested by the licensee.

3.0 TECHNICAL EVALUATION

3.1 Licensee's Relief Request 01A-VRR-4

Applicable Code Edition/Addenda

The applicable ASME OM Code edition and addenda for PBAPS, Units 2 and 3, is the 2012 Edition of the Code with no addenda.

Applicable Code Requirements

ASME OM Code, Paragraph ISTC-3520, "Exercising Requirements," Subparagraph ISTC-3521, "Category A and Category B Valves," states, in part that:

> (b) if full-stroke exercising during operation at power is not practicable, it may be limited to part-stroke during operation at power and full-stroke during cold shutdowns.
>
> (c) if exercising is not practicable during operation at power, it may be limited to full-stroke exercising during cold shutdowns.

Components Affected

Alternative testing is requested for the following valves:

Table 1

MSIV No.	ASME Code Class	ASME OM Code Group
AO-2(3)-01A-080A	1	A
AO-2(3)-01A-080B	1	A
AO-2(3)-01A-080C	1	A
AO-2(3)-01A-080D	1	A
AO-2(3)-01A-086A	1	A
AO-2(3)-01A-086B	1	A
AO-2(3)-01A-086C	1	A
AO-2(3)-01A-086D	1	A

Licensee's Proposed Alternative

The licensee's relief request stated, in part, that:

> Pursuant to 10 CFR 50.55a, "Codes and standards," paragraph (z)(1), an alternative is proposed to the requirements of ASME OM Code ISTC-3521(b).

The basis of the relief request is the proposed alternative would provide an acceptable level of quality and safety.

An existing PBAPS Inservice Testing (IST) Program Cold Shutdown Justification (CSJ) CSJ 01A-VCS-2, for full stroke testing, under ISTC-3521(c), will be modified to remove the existing quarterly partial stroke exercise testing of the Main Steam Isolation Valves (MSIVs), under ISTC-3521(b). This will be done to address the potential for the valves to fully close inadvertently during the quarterly exercise testing. Full closure of the valves, at power, will cause a reactivity event and potential loss of power production of the affected unit. Challenges like these, and their potential consequence(s), have also been recognized in NUREG-1482, Revision 2 ["Guidelines for Inservice Testing at Nuclear Power Plants" (ADAMS Accession No. ML13295A020)]. NUREG-1482, Section 2.4.5, Deferring Valve Testing to Cold Shutdown or Refueling Outages, discusses activities generating these challenges and states they should be considered impracticable, thereby supporting the CSJ principal arguments.

In PBAPS Technical Specification (TS) 3.3.1.1 - Reactor Protection System (RPS) Instrumentation, Surveillance Requirement (SR) 3.3.1.1.9 – Channel Functional Test (CFT), the frequency of testing is stated as "In accordance with the Surveillance Frequency Control Program." The only practical method to perform the RPS CFT for the MSIV position switch input into the RPS logic is to actually stroke the MSIV. There are no other TS-compliant methods available without reducing reactor power and entering the normally inerted primary containment. This would result in unwarranted power reductions and personnel radiation exposures.

PBAPS has elected, due to recent documentation describing MSIV industry test failures, to utilize the SFCP for the CFT to extend the test frequency of the CFT in increments over a period of time up to 2 years. A two-year test frequency would coincide with refueling outages and eliminate stroking of MSIVs during power operation of the units.

In order to utilize the SFCP for this MSIV testing, the valves will have to be partial stroke exercised at power, for a number of years, to achieve the final goal of stroking at a two-year frequency. This methodology will allow for a progressively longer test interval until the final biennial testing interval is achieved. This test frequency change cannot be done with the CSJ in the IST program, as the stroking of the valves in accordance with the SFCP would be in contradiction with the CSJ, which would not permit stroking of the valves during normal power operation (except for emergent issues such as post maintenance testing).

PBAPS proposes to continue partial stroke exercising the MSIVs for the sole purpose of supporting the requirements of the SFCP testing intervals that would require progressively longer surveillance intervals until the final biennial testing frequency is achieved. The CSJ would restrict any other stroking of the MSIVs, except for emergent issues such as post maintenance testing. Both the CSJ and the SFCP are needed together to address the removal of the challenges of partial stroke exercising, as defined in the CSJ, to support safer and more reliable continued operation of the units.

Duration of Proposed Alternative

The proposed alternative would apply to the fifth 10-year IST interval at PBAPS, Units 2 and 3, which is currently scheduled to start on August 15, 2018, and end on August 14, 2028.

3.2 NRC Staff Evaluation

The licensee proposed an alternative to the requirements found in the 2012 Edition of the ASME OM Code for the MSIVs listed in Table 1 above. The valves listed in Table 1 above have been determined to be active Category A type. ASME OM Code Paragraph ISTC-3510, "Exercising Test Frequency," states in part that "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." The licensee has been testing these valves in accordance with ISTC-3521(b), which states, "If full-stroke exercising during operation at power is not practicable, it may be limited to part-stroke during operation at power and full-stroke during cold shutdowns."

Due to recent operating experience concerning partial stroking of MSIVs causing plant transients and/or plant trips, the licensee changed its IST program plan for the fourth interval, which began on August 15, 2008, to exercise the MSIVs in accordance with ISTC-3521(c), which states, in part, "If exercising is not practicable during operation at power, it may be limited to full-stroke exercising during cold shutdowns." The licensee's justification for deferring the MSIV exercise test to cold shutdowns is in accordance with NRC staff guidance detailed in NUREG-1482, Revision 2, Section 2.4.5, "Deferring Valve Testing to Cold Shutdown or Refueling Outages." However, as stated by the licensee, the MSIVs continue to be partially stroked quarterly in order to meet a TS surveillance. The TS surveillance is governed by the licensee's SFCP.

As noted in PBAPS, Units 2 and 3, TS Section 5.5.14, the SFCP allows changes to surveillance frequencies in accordance with Nuclear Energy Institute (NEI) topical report NEI 04-10, "Risk-Informed Technical Specifications Initiative 5b, Risk-Informed Method for Control of Surveillance Frequencies, Industry Guidance Document," Revision 1 (ADAMS Accession No. ML071360456). NEI 04-10 is a risk-informed method to change surveillance frequencies by using probabilistic risk assessment methods in combination with plant performance data and other considerations. This topical report was written in accordance with the guidance provided in Regulatory Guides (RG) 1.174, "An Approach for Using Probabilistic Risk Assessment In Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," and RG 1.177, "An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications." The NRC staff completed a final safety evaluation of NEI 04-10, Revision 1, on September 19, 2007 (ADAMS Accession No. ML072570267) and determined that the methodology in NEI 04-10, Revision 1, is acceptable, with conditions.

The licensee proposes to initiate the SFCP process to change the frequency of the MSIV exercise to be in alignment with the desired IST requirement of deferring the valve exercise to a cold shutdown interval. The SFCP process incrementally steps out the exercise interval until there is enough data to support the new frequency. The SFCP process also requires performance monitoring and feedback of the components to assure that the change in test frequency has not resulted in degradation of the equipment performance and operational safety. The monitoring and feedback includes consideration of Maintenance Rule monitoring of equipment performance. The proposed alternative was previously authorized for use at PBAPS, Units 2 and 3, for the fourth 10-year IST program interval in a safety evaluation dated

April 28, 2017 (ADAMS Accession No. ML17108A762). There have been no significant changes since the last request authorization. The NRC staff finds that the proposed alternative provides an acceptable level of quality and safety.

4.0 CONCLUSION

As set forth above, the NRC staff determined that the proposed alternative 01A-VRR-4 provides an acceptable level of quality and safety for the valves listed in Table 1 above. Accordingly, the NRC staff concludes that the licensee has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(z)(1). Therefore, on the basis of the above determinations, the NRC authorizes the licensee to use the alternative as proposed in relief request 01A-VRR-4 for the fifth 10-year IST interval at PBAPS, Units 2 and 3, which is scheduled to start on August 15, 2018.

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

Principal Contributor: Michael Farnan

Date: December 7, 2017

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