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10 CFR 50.55a

RS-20-020

February 28, 2020

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Braidwood Station, Units 1 and 2
Renewed Facility Operating License Nos. NPF-72 and NPF-77
NRC Docket Nos. 50-456 and 50-457

Calvert Cliffs Nuclear Power Plant, Units 1 and 2
Renewed Facility Operating License Nos. DPR-53 and DPR-69
NRC Docket Nos. 50-317 and 50-318

Clinton Power Station, Unit 1
Facility Operating License No. NPF-62
NRC Docket No. 50-461

Limerick Generating Station, Units 1 and 2
Renewed Facility Operating License Nos. NPF-39 and NPF-85
NRC Docket Nos. 50-352 and 50-353

Nine Mile Point Nuclear Station, Units 1 and 2
Renewed Facility Operating License Nos. DPR-63 and NPF-69
NRC Docket Nos. 50-220 and 50-410

Peach Bottom Atomic Power Station, Units 2 and 3
Renewed Facility Operating License Nos. DPR-44 and DPR-56
NRC Docket Nos. 50-277 and 50-278

R.E. Ginna Nuclear Power Plant
Renewed Facility Operating License No. DPR-18
NRC Docket No. 50-244

Subject: Relief Request for Alternative Frequency to Supplemental Indication Requirements of 10 CFR 50.55a(b)(3)(xi)

In accordance with 10 CFR 50.55a, "Codes and standards," paragraph (z)(1), Exelon Generation Company, LLC (EGC), hereby requests NRC approval of the attached relief request associated with the Inservice Testing intervals identified in Section 2 of the Attachment for Braidwood Station (BRW), Units 1 and 2; Calvert Cliffs Nuclear Power Plant (CCNPP), Units 1

and 2; Clinton Power Station (CPS), Unit 1; Limerick Generating Station (LGS), Units 1 and 2; Nine Mile Point Nuclear Station (NMP), Units 1 and 2; Peach Bottom Atomic Power Station (PBAPS), Units 2 and 3; and R.E. Ginna Nuclear Power Plant (GIN). The interval start dates are identified in Section 2 of the Attachment and all sites are, or will be, in compliance with the American Society of Mechanical Engineers (ASME) Code for Operation and Maintenance of Nuclear Power Plants (OM Code) – 2012 Edition.

There are no regulatory commitments contained within this letter.

EGC requests approval of this relief request by February 28, 2021, to support refueling outages at BRW, Unit 1; CCNPP, Unit 2; LGS, Unit 2; and NMP, Unit 1.

Should you have any questions concerning this letter, please contact Ms. Lisa Zurawski at (630) 657-2816.

Sincerely,

Dwi Murray
Sr. Manager – Licensing
Exelon Generation Company, LLC

Attachment:

10 CFR 50.55a Relief Request for Alternative Frequency to Supplemental Indication Requirements of 10 CFR 50.55a(b)(3)(xi)

cc: USNRC Regional Administrators (Region I, Region III)
USNRC Senior Resident Inspectors (BRW, CCNPP, CPS, LGS, NMP, PBAPS, GIN)
USNRC Project Managers (BRW, CCNPP, CPS, LGS, NMP, PBAPS, GIN)
Illinois Emergency Management Agency – Division of Nuclear Safety
Director, Bureau of Radiation Protection – Pennsylvania Department of Environmental Protection
A.L. Peterson, NYSERDA
R.R. Janati, Pennsylvania Bureau of Radiation Protection
D. Tancabel, State of Maryland

Attachment

10 CFR 50.55a Relief Request for Alternative Frequency to Supplemental Indication Requirements of 10 CFR 50.55a(b)(3)(xi)

Proposed Alternative in Accordance with 10 CFR 50.55a(z)(1)

Exelon Generation Company, LLC (EGC) is requesting an alternative in accordance with 10 CFR 50.55a(z)(1) to perform supplemental indication testing that satisfies 10 CFR 50.55a(b)(3)(xi) and ASME OM Code ISTC-3700, "Position Indication Testing," at alternate frequencies based on pre-defined performance driven processes.

1. ASME Code Component(s) Affected

The American Society of Mechanical Engineers (ASME) code components affected by this relief request are valves with remote position indicators.

2. Applicable Code Edition and Addenda

The 10-year intervals and the ASME Code for Operation and Maintenance of Nuclear Power Plants (OM Code) that the Inservice Testing (IST) Program is based on are identified in the table below for Braidwood Station (BRW), Units 1 and 2; Calvert Cliffs Nuclear Power Plant (CCNPP), Units 1 and 2; Clinton Power Station (CPS), Unit 1; Limerick Generating Station (LGS), Units 1 and 2; Nine Mile Point Nuclear Station (NMP), Units 1 and 2; Peach Bottom Atomic Power Station (PBAPS), Units 2 and 3; and R.E. Ginna Nuclear Power Plant (GIN).

PLANT	INTERVAL	OM EDITION	START	END
BRW, Units 1 and 2	Fourth	2012 Edition	July 29, 2018	July 28, 2028
CCNPP, Units 1 and 2	Fifth	2012 Edition	July 1, 2018	June 30, 2028
CPS, Unit 1	Fourth	2012 Edition	July 1, 2020	June 30, 2030
LGS, Units 1 and 2	Fourth	2012 Edition	January 8, 2020	January 7, 2030
NMP, Units 1 and 2	Fifth – Unit 1 Fourth – Unit 2	2012 Edition	January 1, 2019	December 31, 2028
PBAPS, Units 2 and 3	Fifth	2012 Edition	November 16, 2018	August 14, 2028
GIN	Sixth	2012 Edition	January 1, 2020	December 31, 2029

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10 CFR 50.55a Relief Request for Alternative Frequency to Supplemental Indication Requirements of 10 CFR 50.55a(b)(3)(xi)

Proposed Alternative in Accordance with 10 CFR 50.55a(z)(1)

3. Applicable Code Requirement

The alternative applies to:

> The two-year frequency established for supplemental indication in accordance with 10 CFR 50.55a(b)(3)(xi) and ASME OM Code, 2012 Edition, subsection ISTC-3700 (Reference 1).

10 CFR 50.55a(b)(3)(xi) states:

> *OM condition: Valve Position Indication.* When implementing ASME OM Code, 2012 Edition, Subsection ISTC-3700, "Position Verification Testing," licensees shall verify that valve operation is accurately indicated by supplementing valve position indicating lights with other indications, such as flow meters or other suitable instrumentation, to provide assurance of proper obturator position.

Subsection ISTC-3700 of ASME OM Code, 2012 Edition, states:

> Valves with remote position indicators shall be observed locally at least once every 2 years to verify that valve operation is accurately indicated. Where practicable, this local observation should be supplemented by other indications such as use of flow meters or other suitable instrumentation to verify obturator position. These observations need not be concurrent. Where local observation is not possible, other indications shall be used for verification of valve operation. Position verification for active MOVs shall be tested in accordance with Mandatory Appendix III of this Division.

4. Reason for Request

In accordance with 10 CFR 50.55a, Codes and standards, paragraph (z)(1), an alternative is proposed to 10 CFR 50.55a(b)(3)(xi) and ASME OM Code, 2012 Edition, subsection ISTC-3700. The basis of the relief request is that the proposed alternative Supplemental Position Indication (SPI) frequencies provide an acceptable level of quality and safety.

The current regulation does not allow the test frequency to be altered or adjusted based on existing NRC approved testing, past test performance results, likelihood of failure nor consequence of failure. The proposed relief will allow the performance of supplemental valve position indication to credit existing Code and NRC approved test methodologies and frequencies and be commensurate with the valve's risk ranking. Testing frequencies will only be relaxed if alternate approved methodologies are applied or the combination of consequence of failure and susceptibility to failure are acceptably low. This will allow testing efforts to be focused on the most critical components, reduce the potential to create undue risk to the plant, components and personnel and preserve divisional outage strategy.

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5. Proposed Alternative and Basis for Use

EGC's proposed alternative is an approach based on the following categories:

- Active Motor Operated Valves (MOV) within the scope of the Appendix III program will have SPI testing performed on the MOV inservice testing frequency as currently allowed in accordance with 10 CFR 50.55(a) and ISTC-3700.
- Check Valves with remote position indication within the scope of the Appendix II Check Valve Condition Monitoring Program will have SPI testing credit the Condition Monitoring activity at the code specified frequency.
- Valves that are leak tested via 10 CFR 50, Appendix J or have a current site approved relief request for alternate seat leakage testing methodology and frequency in accordance with ISTC-3630 will have SPI adopt the test frequency and requirements associated with the approved methodology.
- All other valves will utilize the proposed SPI Risk Ranking approach with testing frequency methodology detailed below.

Appendix III – Preservice and Inservice Testing of Active Electric Motor Operated Valve Assemblies in Light-Water Reactor Power Plants

As stated in NUREG-1482, Revision 2, Section 4.2.5 - Due to weakness in stroke-time testing for assessing the operational readiness of Power-Operated Valves (POVs), ASME developed alternatives to the Code provisions for stroke-time testing of POVs. As an alternative to MOV stroke-time testing, ASME developed Code Case OMN-1, which provides periodic exercising and diagnostic testing for use in assessing the operational readiness of MOVs. In Code Case OMN-11, ASME provides additional guidance for use with Code Case OMN-1 to emphasize the testing provisions for MOVs in the IST program that are determined to have high safety significance, while allowing less precise testing for MOVs that are determined to have lower safety significance. ASME has incorporated these code cases into Appendix III to the 2012 Edition of the ASME OM Code to replace quarterly MOV stroke-time testing with periodic exercising and diagnostic testing. Linking the frequency of SPI testing to the testing of MOVs under Appendix III aligns with the original intent of OMN-1 to improve valve performance and optimize testing, examination, and preventive maintenance activities in order to maintain acceptable MOV performance.

10 CFR 50.55a(b)(3)(xi) does not indicate a testing frequency nor place a condition on the Position Verification Testing frequency specified in ISTC-3700. ISTC-3700 states that position verification for Active MOVs shall be tested in accordance with Mandatory Appendix III of this Division. Appendix III, paragraph III-3300(e) states that remote position indication shall be verified locally during inservice testing or maintenance activities. Therefore, the 10 CFR 50.55a condition for performing SPI will be performed on the MOV Inservice Test frequency as specified in Appendix III.

Appendix II – Check Valve Condition Monitoring Program

As documented in ISTC-5222, the purpose of the Check Valve Condition Monitoring Program is to improve valve performance and to optimize testing, examination, and preventative maintenance activities in order to maintain the continued acceptable

performance of a select group of check valves. The program is designed to evaluate potential degradation mechanisms and identify types of analysis that will be performed to assess check valve condition. From analysis activities, trendable parameters and performance intervals will be determined. Linking the frequency of SPI testing to the Check Valve Condition Monitoring Program aligns with the original intent of the Check Valve Condition Monitoring Program, to improve valve performance and optimize testing, examination, and preventive maintenance activities in order to maintain acceptable check valve performance.

Leak Tested Valves - 10 CFR 50 Appendix J or Approved Relief Request

Performing SPI at frequencies controlled by the 10 CFR 50, Appendix J Program or other NRC approved frequencies via a current relief request, provides an acceptable level of quality and safety for the components regulated by these requirements. Regulation 10 CFR 50, Appendix J, describes an NRC required testing program which is more rigorous than that applied for supplemental indication, since 10 CFR 50, Appendix J also applies leak rate requirements to valves. Therefore, SPI at a test interval longer (less frequent) than the frequencies specified in ASME OM Code, 2012 Edition, subsection ISTC-3700, controlled by 10 CFR 50, Appendix J, provides an acceptable level of quality and safety.

10 CFR 50, Appendix J, states:

> The purposes of the tests are to assure that (a) leakage through the primary reactor containment and systems and components penetrating primary containment shall not exceed allowable leakage rate values as specified in the technical specifications or associated bases; and (b) periodic surveillance of reactor containment penetrations and isolation valves is performed so that proper maintenance and repairs are made during the service life of the containment, and systems and components penetrating primary containment.

This statement documents the 10 CFR 50, Appendix J purpose in validating a component's ability to perform as designed. Valves are subject to strict leakage requirements to assure performance of the overall containment structure. Valves that do not perform acceptably receive maintenance to restore performance. Performance is validated with follow-up leakage testing to provide assurance that maintenance is effective and valve performance is satisfactory. These requirements necessitate licensees to demonstrate they are effectively protecting the public health and safety by maintaining plant equipment to the specifications established by plant design and the technical specifications. EGC conforms to the requirements of 10 CFR 50, Appendix J, as described in Exelon Corporate Procedure ER-AA-380, Primary Containment Leakrate Testing Program (Reference 2). The procedure documents EGC's conformance with Option B, Performance-Based Requirements, of 10 CFR 50, Appendix J and NEI 94-01, Industry Guideline for Implementing Performance-Based Option of 10 CFR Part 50, Appendix J (Reference 3). NRC has endorsed NEI 94-01 Revision 0 as providing an acceptable level of quality and safety under Regulatory Guide 1.163, Performance-Based Containment Leak-Test Program (Reference 4) and NEI 94-01 Revision 3-A (Reference 6), and the limitations and conditions specified in NEI 94-01 Revision 2-A (Reference 7).

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Proposed Alternative in Accordance with 10 CFR 50.55a(z)(1)

Regulation 10 CFR 50, Appendix J, requires more rigorous acceptance criterion than 10 CFR 50.55a(b)(3)(xi). EGC site testing procedures require valve seat leakage to be accurately measured and limited to a specific leakage value to be eligible for extended frequency testing. Regulation 10 CFR 50.55a(b)(3)(xi) requires verification of indications that "provide assurance of proper obturator position and drives licensees to obtain evidence of gross flow or closure." A valve could provide indication of proper obturator position yet leak without detection. This condition is precluded by 10 CFR 50, Appendix J test requirements which specifically quantifies valve leakage. The requirements of 10 CFR 50, Appendix J seat leakage testing are rigorous and, therefore, satisfy the closed verifications requirement of 10 CFR 50.55a(b)(3)(xi).

Regulation 10 CFR 50, Appendix J (Reference 5), test periods are performance-based. Valves with consistent, acceptable performance qualify for period extension up to 75 months. Valves must pass three consecutive as-found leakage tests to qualify for a 75-month test period. A valve passes its test when it exhibits leakage below the assigned administrative limit.

Performing SPI at frequencies controlled by the 10 CFR 50, Appendix J Program aligns with the original intent of Option B, Performance Based leakage testing, which has proven to provide a reasonable approach to containment integrity testing.

Several sites also have current relief requests for ISTC-3630 – Leakage Rate for Other Than Containment Isolation Valves (see table below). The basis for these relief requests follows the Appendix J model for performance-based test frequency extensions. Therefore, the seat leakage testing frequency for these valves can only be extended if acceptable performance is demonstrated. Seat leakage testing requires a more rigorous acceptance criterion, therefore satisfies the requirements of SPI verification. Based on the additional rigor associated with seat leakage testing and methodologies approved by the NRC in previous relief requests, SPI testing will be extended to align with seat leakage testing frequencies.

Site	Relief Request Number	Relief Request Title
LGS	GVRR-8, Rev 1	Pressure Isolation Valve Leakage Test Frequency
PBAPS	GVRR-2, Approved 05/30/2018	Perform Pressure Isolation Valve Leakage Testing at frequencies consistent with 10 CFR 50, Appendix J, "Primary Reactor Containment Leakage Testing for Water- Cooled Power Reactors," Option B, "Performance-Based Requirements."
NMP	GV-RR-03, Approved 11/13/2018	Elapsed Time Between Successive Openings of PIVs
GIN	GR-01, Approved 08/05/2019	Reactor Coolant Pressure Boundary Isolation Valve – Leak Testing

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10 CFR 50.55a Relief Request for Alternative Frequency to Supplemental Indication Requirements of 10 CFR 50.55a(b)(3)(xi)

Proposed Alternative in Accordance with 10 CFR 50.55a(z)(1)

Seat Leakage Testing performed in accordance with 10 CFR 50, Appendix J or approved relief requests for ISTC-3630 also apply an acceptable level of quality and safety for a non-Code or non-containment isolation valve relied upon to perform seat leak rate testing. Seat leakage rate tests are often performed by pressurizing a volume between the tested valve and a boundary valve (which may not be credited as a leak tested valve). The leakage rate test cannot distinguish between leakage through the tested and the boundary valve. The total leakage measured is conservatively assigned to the tested valve and compared to that valve's acceptance criterion. Successful performance of the leakage test provides supplemental indication for the boundary valves as well. Boundary valves that are associated with valve seat leakage testing which is on extended frequency will have SPI testing extended to that 10 CFR 50, Appendix J or NRC approved relief request governed frequency.

Supplemental Position Indication – Risk Ranking

The proposed SPI methodology is a Risk Ranking approach based on the valve's failure consequence combined with the valve's susceptibility to failure. This methodology provides an acceptable level of quality and safety.

Establish Verification Categorization

Each valve will be Risk Ranked. The ranking will be a combination of the valve's consequence of failure and its susceptibility to stem-disc connection failure.

Consequence of Failure

The valve's consequence of failure will be based on a documented risk ranking methodology. When quantitative means such as PRA or 10 CFR 50.69 evaluations are not available for a valve, a qualitative means such as a Maintenance Rule Expert Panel will be utilized. Valves will be categorized as either High or Low Safety Significant Component (HSSC or LSSC).

Susceptibility

Each valve will be evaluated for susceptibility to stem-disc connection failure based on design, application and operating experience. Valves will be categorized either Susceptible or Non-Susceptible. Factors that contribute to a valve's susceptibility determination may include but are not limited to:

- 10 CFR Part 21 reports and actions taken to address the condition
- Failures as identified via industry or site operating experience
- Site review of valve performance and history
- Valve design: stem-to-disc connection method with applicable failure modes
- Operating conditions for which the valve is not designed

Valve susceptibility will be initially determined during the implementation of this methodology but will be re-evaluated for changes to susceptibility as new information becomes available (such as industry operating experience).

The valve's Risk Ranking and basis for consequence and susceptibility will be documented in the Site's IST program documentation.

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10 CFR 50.55a Relief Request for Alternative Frequency to Supplemental Indication Requirements of 10 CFR 50.55a(b)(3)(xi)

Proposed Alternative in Accordance with 10 CFR 50.55a(z)(1)

HSSC & Susceptible Valve Testing Requirements
Valves that have been determined to be a HSSC AND Susceptible to stem-disc connection failure shall have SPI performed once every two years.

HSSC & Non-Susceptible and LSSC & Susceptible Valve Testing Requirements
Valves that have been determined to be a HSSC AND Non-Susceptible to stem-disc connection failure and valves that have been determined to be a LSSC AND Susceptible to stem-disc connection failure shall have SPI performed based on one of the following methodologies:

a. Valves shall have SPI performed every six years.
b. Valves within this category can be grouped together based on similar design, application and service conditions. Grouped valves shall have SPI performed on 50% of the valve group every 4 years. Previously tested valves in the valve group shall not be selected at the next test interval until all other valves in the group have been tested. Where any valve of the group fails the SPI test, the failure shall be entered into the Station's Corrective Action Program to drive timely inspection of the remaining valves within the group.

LSSC & Non-Susceptible Valve Testing Requirements
Valves that have been determined to be a LSSC AND Non-Susceptible to stem-disc connection failure shall have SPI performed based on one of the following methodologies:

a. Valves shall have SPI performed every 12 years.
b. Valves within this category can be grouped together based on similar design, application and service conditions. Grouped valves shall have SPI performed on 20% of the valve group every 12 years. Previously tested valves in the valve group shall not be selected at the next test interval until all other valves in the group have been tested. Where any valve of the group fails the SPI test, the failure shall be entered into the Station's Corrective Action Program to drive timely inspection of the remaining valves within the group.

SPI Testing Failures
Any SPI test failure shall be entered into the Station's Corrective Action Program. The valve failure shall be evaluated with appropriate corrective actions and extent of condition investigation. The failed valve along with any similar valves shall be re-assess per the SPI risk ranking process to determine the new SPI test frequency.

6. Duration of Proposed Alternative

Relief is requested for the 10-year IST intervals identified for each plant in Section 2.

7. Precedents

1. Palo Verde, Docket Nos. STN 50-528, 50-529 and 50-530. Submittal ML19263F875 dated September 20, 2019. SE ML19310F679 dated November 13, 2019.

8. References

1. ASME OM-2012, Operation and Maintenance of Nuclear Power Plants, April 8, 2013.
2. EGC Procedure ER-AA-380, Primary Containment Leakrate Testing Program, Revision 13.
3. NEI 94-01, Industry Guideline for Implementing Performance-Based Option of 10 CFR Part 50, Appendix J, Revision 0, July 1995.
4. Regulatory Guide 1.163, Performance-Based Containment Leak-Test Program, September 1995.
5. 10 CFR 50, Appendix J, Primary Containment Leakage Testing for Water Cooled Power Reactors.
6. NEI 94-01, Industry Guideline for Implementing Performance-Based Option of 10 CFR Part 50, Appendix J, Revision 3-A, July 2012.
7. NEI 94-01, Industry Guideline for Implementing Performance-Based Option of 10 CFR Part 50, Appendix J, Revision 2-A, October 2008.
8. NUREG-1482, Guidelines for Inservice Testing at Nuclear Power Plants, Revision 2, October 2013