

10 CFR 50.55a

RS-19-066

June 28, 2019

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

LaSalle County Station, Units 1 and 2  
Renewed Facility Operating License Nos. NPF-11 and NPF-18  
NRC Docket Nos. 50-373 and 50-374

Subject: Relief Request RV-03 Related to Pressure Isolation Valve Testing Frequency

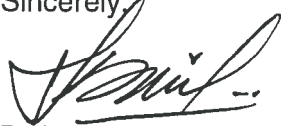
In accordance with 10 CFR 50.55a, "Codes and standards," paragraph (z)(1), Exelon Generation Company, LLC (EGC), hereby requests NRC approval of the attached relief request associated with the fourth inservice testing (IST) interval for LaSalle County Station (LSCS), Units 1 and 2. The fourth 10-year interval of the LSCS, Units 1 and 2, IST Program began on October 12, 2017, and complies with the American Society of Mechanical Engineers (ASME) Code for Operation and Maintenance of Nuclear Power Plants (OM Code) – 2004 Edition with Addenda through OMB-2006.

There are no regulatory commitments contained within this letter.

EGC requests approval of this relief request by January 31, 2020.

Should you have any questions concerning this letter, please contact Mr. Jason Taken at (630) 657-3660.

Sincerely,



Dwi Murray  
Manager – Licensing  
Exelon Generation Company, LLC

Attachments:

1. 10 CFR 50.55a Relief Request RV-03 Related to PIV Testing Frequency
2. Leakage History of LSCS Unit 1 and Unit 2 PIVs

cc: USNRC Region III, Regional Administrator  
USNRC Senior Resident Inspector, LSCS  
USNRC Project Manager, LSCS  
Illinois Emergency Management Agency – Division of Nuclear Safety

## Attachment 1

### 10 CFR 50.55a Relief Request RV-03 Related to PIV Testing Frequency

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

#### 1. ASME Code Component(s) Affected

All Pressure Isolation Valves (PIVs) in the Reactor Coolant System (RCS), as listed in the attached Table, RR-RV-03:

Table RR-RV-03 RCS Pressure Isolation Valve Component List			
Valve Number Units 1 and 2	System	OM Category	ASME Code Class
1(2)E21-F006	Low Pressure Core Spray	A/C	1
1(2)E21-F005	Low Pressure Core Spray	A	1
1(2)E22-F005	High Pressure Core Spray	A/C	1
1(2)E22-F004	High Pressure Core Spray	A	1
1(2)E12-F041A	Residual Heat Removal	A/C	1
1(2)E12-F041B	Residual Heat Removal	A/C	1
1(2)E12-F041C	Residual Heat Removal	A/C	1
1(2)E12-F042A	Residual Heat Removal	A	1
1(2)E12-F042B	Residual Heat Removal	A	1
1(2)E12-F042C	Residual Heat Removal	A	1
1(2)E12-F050A	Residual Heat Removal	A/C	1
1(2)E12-F050B	Residual Heat Removal	A/C	1
1(2)E12-F053A	Residual Heat Removal	A	1
1(2)E12-F053B	Residual Heat Removal	A	1
1(2)E12-F009	Residual Heat Removal	A	1
1(2)E12-F008	Residual Heat Removal	A	1
1(2)E51-F066	Reactor Core Isolation Cooling	A/C	1
1(2)E51-F065	Reactor Core Isolation Cooling	A/C	1

#### 2. Applicable Code Edition and Addenda

The fourth 10-year interval of the LaSalle County Station (LSCS), Units 1 and 2, Inservice Testing (IST) Program is based on the American Society of Mechanical Engineers (ASME) Code for Operation and Maintenance of Nuclear Power Plants (OM Code) – 2004 Edition with Addenda through OMb-2006.

#### 3. Applicable Code Requirement

ISTC-3522, "Category C Check Valves," requires licensees to exercise Category C check valves to verify obturator travel with methods in ISTC-5221 during power operation, during cold shutdown if not practicable during power operation, or during refueling outages if not practicable during power and cold shutdowns.

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#### **Proposed Alternative In Accordance with 10 CFR 50.55a(z)(1)**

ISTC-3630, "Leakage Rate for Other Than Containment Isolation Valves," states that Category A valves with a leakage requirement not based on an Owner's 10 CFR 50, Appendix J program, shall be tested to verify their seat leakages are within acceptable limits. Valve closure before seat leakage testing shall be by using the valve operator with no additional closing force applied.

ISTC-3630(a), "Frequency," requires licensees to conduct these leakage rate tests at least once every two years.

#### **4. Reason for Request**

Pursuant to 10 CFR 50.55a, "Codes and Standards," paragraph (z)(1), relief is requested from the requirements of ASME OM Code ISTC-3630(a) for the subject valves. The basis of the relief request is that the proposed alternative would provide an acceptable level of quality and safety.

ISTC-3630 requires that leakage rate testing for PIVs be performed at least once every two years. Pressure Isolation Valves are not specifically included in the scope for performance-based testing as provided for in 10 CFR 50 Appendix J, "Primary Reactor Containment Leakage Testing for Water-Cooled Power Reactors," Option B, "Performance-Based Requirements." These motor-operated and check valve PIVs are, in some cases, Containment Isolation Valves (CIVs), but are not within the Appendix J scope since the Reactor Shutdown Cooling System valves are considered water-sealed.

The LSCS Technical Specification Section 5.5.13 contains a requirement to establish the leakage rate testing program in accordance with the guidelines contained in NEI 94-01, Revision 3-A, "Industry Guideline for Implementing Performance-Based Option of 10 CFR Part 50, Appendix J," dated July 2012.

The concept behind the Option B alternative for CIVs is that licensees should be allowed to adopt cost effective methods for complying with regulatory requirements. Additionally, NEI 94-01 describes the risk-informed basis for the extended test intervals under Option B. That justification shows that for CIVs which have demonstrated good performance by the successful completion of two consecutive leakage rate tests over two consecutive cycles may increase their test frequencies. Furthermore, it states that if the component does not fail within two operating cycles, further failures appear to be governed by the random failure rate of the component. NEI 94-01 also presents the results of a comprehensive risk analysis, including the conclusion that "the risk impact associated with increasing [leak rate] test intervals is negligible (i.e., less than 0.1 percent of total risk)."

The valves identified in this relief request are all in water applications. Testing is currently performed with water pressurized to pressures between 950 psig and 1050 psig as required by Technical Specification Surveillance Requirement (SR) 3.4.6.1. This relief request is intended to provide for a performance-based scheduling of PIV tests at LSCS. The reason for requesting this relief is to allow for divisional outages to reduce the required resources and dose required for testing.

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NUREG-0933, "Resolution of Generic Safety Issues," Issue 105, "Interfacing Systems LOCA at LWRs," discussed the need for PIV leak rate testing based primarily on three pre-1985 historical failures of applicable valves industry-wide. These failures all involved human errors in either operations or maintenance. None of these failures involved inservice equipment degradation. The performance of PIV leak rate testing provides assurance of acceptable seat leakage with the valve in a closed condition. Typical PIV testing does not identify functional problems which may inhibit the valves ability to reposition from open to closed. For check valves, functional testing is accomplished in accordance with ASME OM Code Section ISTC-3520, "Exercising Requirements," and Section ISTC-3522, "Category C Check Valves." For power-operated valves, testing is full stroke testing in accordance with the ASME OM Code to ensure their functional capabilities. For the Category C Check Valves, the closed functional testing is credited to the PIV leak rate test. Performance of the separate two-year PIV leak rate testing provides assurance that the Category C PIV Check Valves are capable of closing but otherwise does not contribute any additional assurance of functional capability.

#### **5. Proposed Alternative and Basis for Use**

LSCS proposes to perform PIV testing at intervals ranging from every refueling outage to every third refueling outage. The specific interval for each valve would be a function of its performance and would be established in a manner consistent with the CIV process under 10 CFR 50 Appendix J, Option B. A conservative control will be established such that if any valve fails the PIV test, the test interval for the test will be reduced consistent with Appendix J, Option B requirements until good performance is reestablished.

The primary basis for this relief request is the historically good performance of the PIVs.

The functional capability of the check valves is demonstrated by the open and close exercise test. The open testing is separate and distinct from PIV testing and is performed at a refuel outage frequency in accordance with Section ISTC-3522 of the ASME OM Code. The closed testing takes credit for the PIV leak rate testing and will be on the same frequency as the PIV leak rate testing. The fact that the PIVs have had good historical performance shows that the Category C Check Valves are exhibiting the required obturator movement to close and remain closed.

Note that NEI 94-01 is not the sole basis for this relief request, given that NEI 94-01 does not address seat leakage testing with water. This document was cited as an approach that was similar to the requested alternative method.

If the proposed alternative is authorized and the valves exhibit good performance, there is the possibility that the PIV test frequency could be extended so that the test would not be required each refueling outage.

Testing history of the LSCS PIVs for past three outages on each unit has shown that 1E12-F050A and 2E12-F050A failed their leakage test requiring maintenance to correct excessive leakage. All other PIVs had satisfactory leakage of less than 1 gpm.

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The extension of test frequencies will be consistent with the guidance provided for Appendix J, Type C leak rate tests as detailed in NEI 94-01, Revision 3-A, Paragraph 10.2.3.2, "Extended Test Interval," (as approved by letter dated June 8, 2012 (ADAMS Accession No. ML121030286)) which states:

Test intervals for Type C valves may be increased based upon completion of two consecutive periodic as-found Type C tests where the result of each test is within a licensee's allowable administrative limits. Elapsed time between the first and last tests in a series of consecutive passing tests used to determine performance shall be 24 months or the nominal test interval (e.g. refueling cycle) for the valve prior to implementing Option B to Appendix J. Intervals for Type C testing may be increased to a specific value in a range of frequencies from 30 months up to a maximum of 75 months. Test intervals for Type C valves should be determined by the licensee in accordance with Section 11.0.

Additional basis for this relief request is provided below:

- Separate functional testing of motor-operated valve (MOV) PIVs and Check Valve PIVs per the ASME OM Code will continue.
- The low likelihood of valve mispositioning during power operations (e.g., procedures, interlocks).
- Relief valves in the low pressure (LP) piping – these relief valves may not provide Inter-System Loss of Coolant Accident (ISLOCA) mitigation for inadvertent PIV mispositioning but their relief capacity can accommodate conservative PIV seat leakage rates.
- Alarms that identify high pressure (HP) to LP leakage – Operators are highly trained to recognize symptoms of the presence of a ISLOCA and to take appropriate actions.

#### **6. Duration of Proposed Alternative**

Relief is requested for the fourth 10-year IST interval for LSCS, Units 1 and 2, beginning October 12, 2017 and ending October 11, 2027.

#### **7. Precedents**

1. Letter from R. J. Pascarelli (U.S. Nuclear Regulatory Commission) to J. M. Davis (Detroit Edison), "Fermi 2 - Evaluation of In-Service Testing Program Relief Requests VRR-011, VRR-012, and VRR-013 (TAC Nos. ME2558, ME2557, and ME2556)," dated September 28, 2010 (ADAMS Accession No. ML102360570).
2. Letter from J. Wiebe (U.S. Nuclear Regulatory Commission) to M. J. Pacilio (Exelon Nuclear), "Quad Cities Nuclear Power Station, Units 1 and 2 - Safety Evaluation in Support of Request for Relief Associated with the Fifth 10 Year Interval Inservice Testing Program (TAC Nos. ME7981, ME7982, ME7983, ME7984, ME7985, ME7986, ME7987, ME7988, ME7990, ME7991, ME7992, ME7993, ME7994, and ME7995)," dated February 14, 2013 (ADAMS Accession No. ML13042A348).



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3. Letter from T. L. Tate (U.S. Nuclear Regulatory Commission) to B. Hanson (Exelon Generation, LLC), "Dresden Nuclear Power Station, Units 2 and 3 – Relief Request to Use An Alternative from the American Society of Mechanical Engineers Code Requirements (CAC Nos. MF5089 AND MF5090)," dated October 27, 2015 (ADAMS Accession No. ML15174A303).
4. Letter from D. A. Broaddus (U.S. Nuclear Regulatory Commission) to B. Hanson (Exelon Generation, LLC), "Peach Bottom Atomic Power Station, Units 2 and 3 - Safety Evaluation of Relief Request GVRP-2 Regarding the Fourth 10-Year Interval of the Inservice Testing Program (CAC Nos. MF7630 and MF7631)," dated September 21, 2016 (ADAMS Accession No. ML16235A340).
5. Letter from J. G. Danna (U.S. Nuclear Regulatory Commission) to B. Hanson (Exelon Generation, LLC), "Nine Mile Point Nuclear Station, Units 1 and 2 – Re: Alternative to the Requirements of the American Society of Mechanical Engineers Code for Operation and Maintenance of Nuclear Power Plants (CAC Nos. MF9073 and MF9074)," dated May 30, 2017 (ADAMS Accession No. ML17136A112).

## Attachment 2

### Leakage History of LSCS Unit 1 and Unit 2 PIVs

#### Historical PIV Leakage

The tables below show the leakage history for LSCS Unit 1 and Unit 2 PIVs for the last three tests. Tables 1 through 4 have the PIV leakage history for Unit 1 and Tables 5 through 8 have the PIV leakage history for Unit 2.

The PIV leakage of some valves were derived by using Air-to-Water correlations that were based on the results of the Appendix J Type C Local Leak Rate Tests (LLRTs) which is allowed by ASME OM Code, Section ISTC-3630(b)(4). However, all the subject valves have been removed from the Appendix J Program as part of the Appendix J Scope Reduction.

**Table 1:** Unit 1 Historical Leak Rate Test Performance for Low Pressure Core Spray (System E21) PIVs

Component	Date of Test	Measured Value (gpm)	Required Action Limit (gpm)	Comments
1E21-F006	2/16/2014	< 1	5	
	2/18/2016	< 1	5	
	2/23/2018	< 1	5	
1E21-F005	2/16/2014	< 1	5	
	2/18/2016	< 1	5	
	2/23/2018	< 1	5	

**Table 2:** Unit 1 Historical Leak Rate Test Performance for High Pressure Core Spray (System E22) PIVs

Component	Date of Test	Measured Value (gpm)	Required Action Limit (gpm)	Comments
1E22-F005	2/12/2014	< 1	5	
	3/1/2016	< 1	5	
	2/20/2018	< 1	5	
1E22-F004	2/12/2014	< 1	5	
	6/26/2017	< 1	5	
	2/20/2018	< 1	5	

**Table 3:** Unit 1 Historical Leak Rate Test Performance for Residual Heat Removal (System E12) PIVs

Component	Date of Test	Measured Value (gpm)	Required Action Limit (gpm)	Comments
1E12-F041A	2/16/2014	< 1	5	
	3/3/2016	< 1	5	
	2/23/2018	< 1	5	
1E12-F041B	2/21/2014	< 1	5	
	2/25/2016	< 1	5	
	2/26/2018	< 1	5	



## Attachment 2

### Leakage History of LSCS Unit 1 and Unit 2 PIVs

Component	Date of Test	Measured Value (gpm)	Required Action Limit (gpm)	Comments
1E12-F041C	2/21/2014	< 1	5	
	2/23/2016	< 1	5	
	2/27/2018	< 1	5	
1E12-F042A	2/16/2014	< 1	5	
	3/3/2016	< 1	5	
	2/23/2018	< 1	5	
1E12-F042B	2/21/2014	< 1	5	Leakage based on Air-to-Water Correlation as allowed by the 2001 Edition with 2003 Addenda of the ASME OM Code, Subsection ISTC-3630(b)(4).
	2/25/2016	< 1	5	
	2/26/2018	< 1	5	
1E12-F042C	2/21/2014	< 1	5	
	2/23/2016	< 1	5	
	2/27/2018	< 1	5	
1E12-F050A	2/16/2014	< 1	5	
	3/4/2016	< 1	5	Valve failed to pressurize during initial test. Valve was rebuilt and tested SAT.
	2/22/2018	< 1	5	
1E12-F050B	2/20/2014	< 1	5	
	2/25/2016	< 1	5	
	2/21/2018	< 1	5	
1E12-F053A	2/13/2014	< 1	5	Leakage based on Air-to-Water Correlation as allowed by the 2001 Edition with 2003 Addenda of the ASME OM Code, Subsection ISTC-3630(b)(4).

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### Leakage History of LSCS Unit 1 and Unit 2 PIVs

Component	Date of Test	Measured Value (gpm)	Required Action Limit (gpm)	Comments
	3/3/2016	< 1	5	
	2/22/2018	< 1	5	
1E12-F053B	2/22/2014	< 1	5	Leakage based on Air-to-Water Correlation as allowed by the 2001 Edition with 2003 Addenda of the ASME OM Code, Subsection ISTC-3630(b)(4).
	2/25/2016	< 1	5	
	2/21/2018	< 1	5	
1E12-F009	2/21/2014	< 1	5	
	2/27/2016	< 1	5	
	2/22/2018	< 1	5	
1E12-F008	2/22/2014	< 1	5	Leakage based on Air-to-Water Correlation as allowed by the 2001 Edition with 2003 Addenda of the ASME OM Code, Subsection ISTC-3630(b)(4).
	2/27/2016	< 1	5	
	2/22/2018	< 1	5	

**Table 4:** Unit 1 Historical Leak Rate Test Performance for Reactor Core Isolation Cooling (System E51) PIVs

Component	Date of Test	Measured Value (gpm)	Required Action Limit (gpm)	Comments
1E51-F066	2/13/2014	< 1	3	
	2/21/2016	< 1	3	
	3/5/2018	< 1	3	
1E51-F065	2/13/2014	< 1	3	
	2/22/2016	< 1	3	
	3/5/2018	< 1	3	

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### Leakage History of LSCS Unit 1 and Unit 2 PIVs

**Table 5:** Unit 2 Historical Leak Rate Test Performance for Low Pressure Core Spray (System E21) PIVs

Component	Date of Test	Measured Value (gpm)	Required Action Limit (gpm)	Comments
2E21-F006	2/15/2015	< 1	5	
	2/11/2017	< 1	5	
	3/3/2019	< 1	5	
2E21-F005	2/14/2015	< 1	5	Leakage based on Air-to-Water Correlation as allowed by the 2001 Edition with 2003 Addenda of the ASME OM Code, Subsection ISTC-3630(b)(4).
	2/11/2017	< 1	5	
	3/3/2019	< 1	5	

**Table 6:** Unit 2 Historical Leak Rate Test Performance for High Pressure Core Spray (System E22) PIVs

Component	Date of Test	Measured Value (gpm)	Required Action Limit (gpm)	Comments
2E22-F005	2/7/2015	< 1	5	
	2/8/2017	< 1	5	
	2/18/2019	< 1	5	
2E22-F004	2/4/2015	< 1	5	Leakage based on Air-to-Water Correlation as allowed by the 2001 Edition with 2003 Addenda of the ASME OM Code, Subsection ISTC-3630(b)(4).
	2/8/2017	< 1	5	
	2/18/2019	< 1	5	

**Table 7:** Unit 2 Historical Leak Rate Test Performance for Residual Heat Removal (System E12) PIVs

Component	Date of Test	Measured Value (gpm)	Required Action Limit (gpm)	Comments
2E12-F041A	2/13/2015	< 1	5	
	2/18/2017	< 1	5	

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Component	Date of Test	Measured Value (gpm)	Required Action Limit (gpm)	Comments
	2/22/2019	< 1	5	
2E12-F041B	2/12/2015	< 1	5	
	2/10/2017	< 1	5	
	2/22/2019	< 1	5	
2E12-F041C	2/10/2015	< 1	5	
	2/11/2017	< 1	5	
	2/22/2019	< 1	5	
2E12-F042A	2/8/2015	< 1	5	Leakage based on Air-to-Water Correlation as allowed by the 2001 Edition with 2003 Addenda of the ASME OM Code, Subsection ISTC-3630(b)(4)
	2/18/2017	< 1	5	
	3/2/2019	< 1	5	
2E12-F042B	2/7/2015	< 1	5	Leakage based on Air-to-Water Correlation as allowed by the 2001 Edition with 2003 Addenda of the ASME OM Code, Subsection ISTC-3630(b)(4)
	2/10/2017	< 1	5	
	2/22/2019	< 1	5	
2E12-F042C	2/10/2015	< 1	5	
	2/11/2017	< 1	5	
	2/22/2019	< 1	5	
2E12-F050A	2/12/2015	< 1	5	
	2/22/2017	< 1	5	Valve failed to pressurize during initial test. Valve was rebuilt and tested SAT.
	2/20/2019	< 1	5	

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Component	Date of Test	Measured Value (gpm)	Required Action Limit (gpm)	Comments
2E12-F050B	2/6/2015	< 1	5	
	2/9/2017	< 1	5	
	2/20/2019	< 1	5	
2E12-F053A	2/8/2015	< 1	5	Leakage based on Air-to-Water Correlation as allowed by the 2001 Edition with 2003 Addenda of the ASME OM Code, Subsection ISTC-3630(b)(4)
	2/19/2017	< 1	5	
	2/20/2019	< 1	5	
2E12-F053B	2/5/2015	< 1	5	Leakage based on Air-to-Water Correlation as allowed by the 2001 Edition with 2003 Addenda of the ASME OM Code, Subsection ISTC-3630(b)(4)
	2/9/2017	< 1	5	
	2/20/2019	< 1	5	
2E12-F009	2/7/2015	< 1	5	Leakage based on Air-to-Water Correlation as allowed by the 2001 Edition with 2003 Addenda of the ASME OM Code, Subsection ISTC-3630(b)(4)
	2/9/2017	< 1	5	
	2/21/2019	< 1	5	
2E12-F008	2/7/2015	< 1	5	Leakage based on Air-to-Water Correlation as allowed by the 2001 Edition with 2003 Addenda of the ASME OM Code,

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### Leakage History of LSCS Unit 1 and Unit 2 PIVs

Component	Date of Test	Measured Value (gpm)	Required Action Limit (gpm)	Comments
				Subsection ISTC-3630(b)(4)
	2/9/2017	< 1	5	
	2/21/2019	< 1	5	

**Table 8:** Unit 2 Historical Leak Rate Test Performance for Reactor Core Isolation Cooling (System E51) PIVs

Component	Date of Test	Measured Value (gpm)	Required Action Limit (gpm)	Comments
2E51-F066	2/7/2015	< 1	3	
	2/16/2017	< 1	3	
	2/21/2019	< 1	3	
2E51-F065	2/7/2015	< 1	3	
	2/16/2017	< 1	3	
	2/21/2019	< 1	3	