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10 CFR 50.55a(z)

RS-16-205

October 17, 2016

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

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

Subject: Relief Requests Associated with the Fourth Interval Inservice Testing Program

In accordance with 10 CFR 50.55a, "Codes and standards," paragraphs (z)(1) and (z)(2), Exelon Generation Company, LLC (EGC), hereby requests NRC approval of the attached relief requests associated with the fourth 10-year interval Inservice Testing (IST) Program for LaSalle County Station (LSCS), Units 1 and 2.

EGC is requesting relief from certain IST requirements of the American Society of Mechanical Engineers (ASME) Code for Operation and Maintenance of Nuclear Power Plants (OM Code) for the LSCS fourth 10-year IST interval:

- Relief Request G-01, Utilization of ASME Code Case OMN-20, "Inservice Test Frequency" – Proposed Alternative In Accordance with 10 CFR 50.55a(z)(2)
- Relief Request RP-01, Water Leg Pump Flow Test – Proposed Alternative In Accordance with 10 CFR 50.55a(z)(2)
- Relief Request RP-02, Water Leg Pump Comprehensive Test – Proposed Alternative In Accordance with 10 CFR 50.55a(z)(2)
- Relief Request RP-03, Utilization of ASME Code Case OMN-21, "Alternative Requirements for Adjusting Hydraulic Parameters to Specified Reference Points" – Proposed Alternative In Accordance with 10 CFR 50.55a(z)(1)
- Relief Request RV-01, Utilization of ASME Code Case OMN-1, "Alternative Rules for Preservice and Inservice Testing of Active Electric Motor-Operated Valve Assemblies in Light-Water Reactor Power Plants" – Proposed Alternative In Accordance with 10 CFR 50.55a(z)(1)
- Relief Request RP-04, Utilization of ASME Code Case OMN-19, "Alternative Upper Limit for the Comprehensive Pump Test" – Proposed Alternative In Accordance with 10 CFR 50.55a(z)(1)

The details and the bases for the 10 CFR 50.55a relief requests are provided in Attachments 1 through 6. Relief requests similar or identical to RP-01, RP-02, and RV-01 have previously been approved for use at LSCS.

EGC requests approval of these requests by October 12, 2017, to support implementation of the LSCS fourth 10-year IST interval, currently scheduled to begin on October 12, 2017. The latest edition and addenda of the OM Code incorporated by reference is ASME OM Code-2004 Edition with Addenda through OMb-2006.

There are no regulatory commitments contained within this letter.

Should you have any questions concerning this letter, please contact Ms. Lisa A. Simpson at (630) 657-2815.

Respectfully,

David M. Gullott
Manager – Licensing
Exelon Generation Company, LLC

Attachments:

1) 10 CFR 50.55a Relief Request G-01, Utilization of ASME Code Case OMN-20, "Inservice Test Frequency"
2) 10 CFR 50.55a Relief Request RP-01, Water Leg Pump Flow Test
3) 10 CFR 50.55a Relief Request RP-02, Water Leg Pump Comprehensive Test
4) 10 CFR 50.55a Relief Request RP-03, Utilization of ASME Code Case OMN-21, "Alternative Requirements for Adjusting Hydraulic Parameters to Specified Reference Points"
5) 10 CFR 50.55a Relief Request RV-01, Utilization of ASME Code Case OMN-1, "Alternative Rules for Preservice and Inservice Testing of Active Electric Motor-Operated Valve Assemblies in Light-Water Reactor Power Plants"
6) 10 CFR 50.55a Relief Request RP-04, Utilization of ASME Code Case OMN-19, "Alternative Upper Limit for the Comprehensive Pump Test"

cc: Regional Administrator – NRC Region III
NRC Senior Resident Inspector – LaSalle County Station

ATTACHMENT 1
10 CFR 50.55a Relief Request G-01
Utilization of ASME Code Case OMN-20, "Inservice Test Frequency"

Proposed Alternative In Accordance with 10 CFR 50.55a(z)(2)

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

All Pumps and Valves contained in the LaSalle County Station (LSCS) Inservice Testing (IST) Program scope.

2. **Applicable Code Edition and Addenda**

The fourth 10-year interval of the 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**

This request applies to the frequency specifications of the ASME OM Code. The frequencies for tests given in the ASME OM Code do not include a tolerance band.

ISTA-3120(a), Inservice Test Interval, 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..."

ISTC-3540, Manual Valves, states, in part, that "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."

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, that "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."

ATTACHMENT 1
10 CFR 50.55a Relief Request G-01
Utilization of ASME Code Case OMN-20, "Inservice Test Frequency"

Proposed Alternative In Accordance with 10 CFR 50.55a(z)(2)

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, that "Class 1 pressure relief valves shall be tested at least once every 5 years..."

Mandatory Appendix I, I-1330, Test Frequency, Class 1 Nonreclosing Pressure Relief Devices, states, in part, that "Class 1 nonreclosing pressure relief devices shall be replaced every 5 years..."

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, that "Classes 2 and 3 pressure relief valves, with the exception of PWR main steam safety valves, shall be tested every 10 years..."

Mandatory Appendix I, I-1360, Test Frequency, Classes 2 and 3 Nonreclosing Pressure Relief Devices, states, in part, that "Classes 2 and 3 nonreclosing pressure relief devices shall be replaced every 5 years..."

Mandatory Appendix I, I-1370, Test Frequency, Classes 2 and 3 Primary Containment Vacuum Relief Valves, (a) states in part, that "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..."

Mandatory Appendix I, I-1380, Test Frequency, Classes 2 and 3 Vacuum Relief Valves Except for Primary Containment Vacuum Relief Valves, states, in part, that "All Classes 2 and 3 vacuum relief valves shall be tested every 2 years..."

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."

Mandatory Appendix II, Check Valve Condition Monitoring Program, II-4000, Condition Monitoring Activities, (a) *Performance Improvement Activities*, (1) states, in part, that "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..."

Appendix II, II-4000(b), *Optimization of Condition Monitoring Activities*, (1)(e) states, in part, that "Interval extensions shall be limited to one fuel cycle per extension. Intervals shall not exceed the maximum intervals shown in Table II-4000-1."

Code Case OMN-1, 3.3.1, Inservice Test Interval, (b) states, in part, that "If insufficient data exist to determine the inservice test interval in accordance with para. 6.4.4, then MOV inservice testing shall be conducted every 2 refueling cycles or 3 years (whichever is longer)..."

Code Case OMN-1, 3.3.1, Inservice Test Interval, (c) states, in part, that "The maximum inservice test interval shall not exceed 10 years."

4. Reason for Request

Pursuant to 10 CFR 50.55a, "Codes and standards," paragraph (z)(2), an alternative is requested from the frequency specifications of the ASME OM Code. The basis of this request is that the Code requirements present an undue hardship without a compensating increase in the level of quality or safety.

The ASME OM Code Section IST establishes the inservice test frequencies for all components within the scope of the Code. The frequencies (e.g., quarterly) have always been interpreted as "nominal" frequencies (generally as defined in Table 3.2, "ASME OM Code Terms for Inservice Testing Activities," of NUREG-1482, Revision 2) and Owners routinely applied the surveillance extension time period (i.e., grace period) contained in the plant Technical Specifications (TS) Surveillance Requirements (SR). The TS 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 the surveillance (SR 3.0.2). However, regulatory issues have been raised concerning the applicability of the TS "Grace Period" to ASME OM Code required inservice test frequencies irrespective of allowances provided under TS Administrative Controls (i.e., TS 5.5.7, "Inservice Testing Program," invokes SR 3.0.2 for various OM Code frequencies of 2 years or less).

The lack of a tolerance band on the ASME OM Code IST frequencies restricts operational flexibility. There may be a conflict where a surveillance test is required (i.e., its frequency could expire), but where it is not possible or not desired that the test be performed until sometime after a plant condition or associated Limiting Condition for Operation (LCO) is within its applicability. Therefore, to avoid this conflict, the surveillance test should be performed when plant conditions allow.

The NRC recognized this potential issue in the TS 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.

Thus, 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. This assures operational flexibility when scheduling surveillance tests that would minimize the conflicts between the need to complete the surveillance and plant conditions.

5. Proposed Alternative and Basis for Use

Exelon Generation Company, LLC (EGC) proposes the use of the allowance of grace as stipulated in ASME OM Code Case OMN-20, "Inservice Test Frequency," for flexibility in IST scheduling for code requirements noted in "Applicable Code Requirements" above at LSCS.

The ASME OM Code establishes component test frequencies that are 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 OM Code Section IST with a specified time period between tests as shown in Table 1. The specified time period between tests may be reduced or extended as follows:

1. For periods specified as fewer than 2 years, the period may be extended by up to 25% for any given test.

2. For periods specified as greater than or equal to 2 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).

Table 1: Specified Test Frequencies

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

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 fewer than two-year test frequencies not specified in Table 1.

Period extensions may not be applied to the test frequency requirements specified in 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 (e.g., cold shutdown, refueling outage, upon detection of a sample failure, following maintenance, etc.) may not have their period between tests extended except as allowed by the ASME OM Code.

This alternative is requested, citing the above guidance found in ASME-approved Code Case OMN-20 for determining acceptable tolerances for pump and valve test frequencies. The ASME OM Code Standards Committee approved this Code Case in February 2012. Code Case OMN-20 was subsequently published in conjunction with the ASME OM Code, 2012 Edition.

In conclusion, as currently written, the ASME OM Code requirements do not allow testing period extensions that provide an allowance for operational flexibility for the performance of ASME OM Code testing. As a result, this places a hardship on the ability for LSCS to schedule and perform ASME OM Code testing without a compensating increase in level of quality and safety. Using the provisions of this request as an alternative to the specific frequency requirements of the OM Code identified above will provide operational flexibility and still continue to provide an acceptable level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(z)(2), EGC requests approval of the alternative, which is consistent with ASME-approved Code Case OMN-20, to the specific ASME OM Code frequency requirements identified in this request.

6. Duration of Proposed Alternative

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

7. Precedents

1. Letter from J. C. Poole (NRC) to B. C. Hanson (Exelon Generation Company, LLC), "Byron Station, Unit Nos. 1 and 2 - Relief from the Requirements of the ASME Code (CAC Nos. MF6432 and MF6433)," dated February 26, 2016 (ADAMS Accession No. ML16022A135)

2. Letter from R. J. Pascarelli (NRC) to S. M. Marik (Omaha Public Power District), "Fort Calhoun Station, Unit No. 1 - Requests for Relief G-1, P-1, and P-2 for the Fifth Inservice Testing Interval (CAC Nos. MF6651, MF6652, and MF6653)," dated February 19, 2016 (ADAMS Accession No. ML16041A308)

3. Letter from B. G. Beasley (NRC) to G. H. Gellrich (Calvert Cliffs Nuclear Power Plant, LLC), "Calvert Cliffs Nuclear Power Plant, Unit Nos. 1 and 2 – Relief Request IST-RR-01 Regarding the Frequency of Inservice Testing Requirements of the Pumps and Valves (TAC Nos. MF3066 and MF3067)," dated September 24, 2014 (ADAMS Accession No. ML14247A555)

4. Letter from M. T. Markley (NRC) to F. Diya (Union Electric Company), "Callaway Plant, Unit 1 - Requests For Relief PR-01 Through PR-06, Alternatives to ASME OM Code Requirements for Inservice Testing for the Fourth Program Interval (TAC Nos. MF2784, MF2785, MF2786, MF2787, MF2788, and MF2789)," dated July 15, 2014 (ADAMS Accession No. ML14178A769)

5. Letter from T. L Tate (NRC) to M. J. Pacilio (Exelon Generation Company, LLC), "Dresden Nuclear Power Station, Units 2 and 3 - Safety Evaluation in Support of Request for Reliefs Associated with the Fifth 10-Year Interval Inservice Testing Program (TAC Nos. ME9865, ME9866, ME9869, ME9870, ME9871, and ME9872)," dated October 31, 2013 (ADAMS Accession No. ML13297A515)

6. Letter from V. Rodriguez (NRC) to M. J. Pacilio (Exelon Nuclear), "Three Mile Island Nuclear Station, Unit 1 - Relief Requests PR-01, PR-02, and VR-02, Associated with the Fifth 10-Year Inservice Test Interval (TAC Nos. MF0046, MF0047 and MF0048)," dated August 15, 2013 (ADAMS Accession No. ML13227A024)

8. References

1. NRC Regulatory Issue Summary 2012-10, "NRC Staff Position on Applying Surveillance Requirements 3.0.2 and 3.0.3 to Administrative Controls Program Tests," dated August 23, 2012

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

3. Federal Register Vol. 80, No. 181, Proposed 10 CFR 50.55a Rulemaking, dated September 18, 2015 (Pages 56839-56840)

4. LSCS Technical Specifications

5. NUREG-1482, Revision 2, "Guidelines for Inservice Testing at Nuclear Power Plants: Inservice Testing of Pumps and Valves and Inservice Examination and Testing of Dynamic Restraints (Snubbers) at Nuclear Power Plants – Final Report," dated October 2013 (ADAMS Accession No. ML13295A020)

ATTACHMENT 2
10 CFR 50.55a Relief Request RP-01
Water Leg Pump Flow Test

Proposed Alternative In Accordance with 10 CFR 50.55a(z)(2)

1. ASME Code Component(s) Affected

Table RP-01: Affected Pumps for LSCS RP-01

Pump	Description	Class	Category	Unit
1E22-C003	HPCS Water Leg Pump	2	Group A	1
1E21-C002	LPCS Water Leg Pump	2	Group A	1
1E12-C003	RHR Water Leg Pump	2	Group A	1
1E51-C003	RCIC Water Leg Pump	2	Group A	1
2E22-C003	HPCS Water Leg Pump	2	Group A	2
2E21-C002	LPCS Water Leg Pump	2	Group A	2
2E12-C003	RHR Water Leg Pump	2	Group A	2
2E51-C003	RCIC Water Leg Pump	2	Group A	2

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

ISTB-3000, General Testing Requirements, Table ISTB-3000-1, Inservice Test Parameters, specifies the parameters to be measured during inservice testing (i.e., Flow Rate, *Q*).

ISTB-5121, Group A Test Procedure, paragraph ISTB-5121(c) states, "Where it is not practical to vary system resistance, flow rate and pressure shall be determined and compared to their respective reference values."

4. Reason for Request

Pursuant to 10 CFR 50.55a, "Codes and Standards," paragraph (z)(2), an alternative is proposed to the requirement to measure flow rate as defined in the ASME OM Code. The basis of the request is that the requirement to measure the flow rate provides a hardship without a compensating increase in the level of quality and safety. Specifically, this request is for the pumps listed in Table RP-01: Affected Pumps for LSCS RP-01.

The primary purpose of the pumps listed in Table RP-01 is to maintain the High Pressure Core Spray (HPCS), Low Pressure Core Spray (LPCS), Reactor Core Isolation Cooling (RCIC), and Residual Heat Removal (RHR) pump discharge lines filled to limit the potential for water hammer upon associated pump initiation. Once the supported pump (e.g., HPCS, RHR, etc.) is in operation, the associated water leg pump serves no further safety related function. The amount of flow delivered by each water leg pump is dependent upon each supported system's leakage rate. Each water leg pump is capable

of delivering approximately 50 gallons per minute (gpm). None of the listed water leg pumps have instrumentation installed in the discharge line for measuring flow rates.

While flow measurement instrumentation is provided downstream of the water leg pump's branch connection to its associated support system, during power operation, the water leg pump is unable to generate sufficient pressure to flow through the associated flow element into the reactor vessel. Additionally, the flow measurement instrumentation associated with these lines, which is designed to measure flow developed by the HPCS (0-8000 gpm), LPCS (0-10,000 gpm), RHR (0-10,000 gpm), or RCIC (0-700 gpm), is not capable of measuring such small flows developed by the water leg pump (i.e., approximately 50 gpm).

The application of temporary flow instrumentation (ultrasonic) cannot be utilized as there is not a run of piping long enough to allow for an accurate measurement. System modifications to provide for test measuring locations for flow instrumentation places undue burden on the licensee without demonstrating any increase in the level of plant safety. These pumps are in continuous operation and pump performance is continuously monitored by a low-pressure alarm on each HPCS, LPCS, RHR, and RCIC pump discharge header.

5. Proposed Alternative and Basis for Use

Exelon Generation Company, LLC (EGC) will continue to monitor the subject LSCS pumps for degradation by measuring and recording pump inlet pressure, discharge pressure (from which differential pressure is calculated), and vibration. These measurements are taken quarterly, during normal plant operation, when the supported system's pump is not in operation and RCS pressure is greater than the water leg pump's discharge pressure. Measurement and trending of these parameters under these stated conditions will provide satisfactory indication of operational readiness as well as the ability to detect potential degradation. In addition, the main emergency core cooling system (ECCS) pump headers, each has a low pressure sensor, which continuously monitors the operability of the respective water leg pump and alarms upon reaching its low set-point. The LSCS Technical Specifications (TS) Surveillance Requirements (SR) (i.e., TS SR 3.5.1.1, TS SR 3.5.2.3, and TS SR 3.5.3.1) also verify operability of the water leg pumps by verifying the associated system is sufficiently filled with water.

Vibration measurements will continue to be obtained under normal operating conditions and evaluated in accordance with ISTB-5121(d) and ISTB-5121(e). The differential pressure across the pump will also continue to be determined quarterly through plant procedures utilizing each pump's minimum flow line in accordance with ISTB-5121(c) and ISTB-5121(e). Differential Pressure and vibration will continue to be trended. Vibration data will be indicative of levels trending toward unacceptable values and should allow time for LSCS to take adequate corrective actions before the pumps fail. In addition, LSCS verifies operability of these pumps through the continuous monitoring of the HPCS, LPCS, RHR, and RCIC pump discharge line pressures that are monitored in the control room by alarm.

6. Duration of Proposed Alternative

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

7. Precedents

This relief request was previously approved for the third 10-year interval at LSCS, Units 1 and 2, via Relief Request RP-01, as documented in NRC Safety Evaluation dated September 26, 2007 (ADAMS Accession No. ML072620373).

ATTACHMENT 3
10 CFR 50.55a Relief Request RP-02
Water Leg Pump Comprehensive Test

Proposed Alternative In Accordance with 10 CFR 50.55a(z)(2)

1. ASME Code Component(s) Affected

Table RP-02: Affected Pumps for LSCS RP-02

Pump	Description	Class	Category	Unit
1E22-C003	HPCS Water Leg Pump	2	Group A	1
1E21-C002	LPCS Water Leg Pump	2	Group A	1
1E12-C003	RHR Water Leg Pump	2	Group A	1
1E51-C003	RCIC Water Leg Pump	2	Group A	1
2E22-C003	HPCS Water Leg Pump	2	Group A	2
2E21-C002	LPCS Water Leg Pump	2	Group A	2
2E12-C003	RHR Water Leg Pump	2	Group A	2
2E51-C003	RCIC Water Leg Pump	2	Group A	2

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

ISTB-3000, General Testing Requirements; Table ISTB-3000-1, Inservice Test Parameters, specifies the parameters to be measured during inservice testing (i.e., Flow Rate, *Q*).

ISTB-3510, General, (a) *Accuracy*, states, in part, "Instrument accuracy shall be within the limits of Table ISTB-3510-1…"

Table ISTB-3510-1, Required Instrument Accuracy, specifies the required instrument accuracies for the Comprehensive and Preservice Tests (%), for various test parameters (e.g., ½% for differential pressure, 2% for flow rate).

ISTB-3300, Reference Values, paragraph (e) states, "Reference values shall be established in a region(s) of relatively stable pump flow." Subparagraph (e)(1) states, "Reference values shall be established within ±20% of pump design flow rate for the comprehensive test."

ISTB-5123, Comprehensive Test Procedure, paragraph (e) states, in part, "All deviations from the reference values shall be compared with the ranges of Table ISTB-5121-1…"

ISTB-5110, Preservice Testing, paragraph (a) states, in part, "In systems where resistance can be varied, flow rate and differential pressure shall be measured at a minimum of five points…"

Table ISTB-5121-1, Centrifugal Pump Test Acceptance Criteria, specifies the centrifugal pump test acceptance criteria (e.g., acceptable, alert and required action ranges) for the various pump test parameters (i.e., flow rate, differential pressure and vibration) during the comprehensive pump test.

4. Reason for Request

Pursuant to 10 CFR 50.55a, "Codes and standards," paragraph (z)(2), an alternative is proposed to the following requirements as defined in the ASME OM Code: 1) To measure flow during comprehensive and preservice testing; 2) for the instrument accuracy required in comprehensive and preservice tests; 3) to test within ±20% of the pump design flow for comprehensive tests; and 4) the comprehensive pump test acceptance criteria. The basis of the request is that these requirements present a hardship without a compensating increase in the level of quality and safety. Specifically, this request is for the pumps listed in Table RP-02: Affected Pumps for LSCS RP-02.

The primary purpose of the pumps listed in Table RP-02 is to maintain the High Pressure Core Spray (HPCS), Low Pressure Core Spray (LPCS), Reactor Core Isolation Cooling (RCIC), and Residual Heat Removal (RHR) pump discharge lines filled to limit the potential for water hammer upon associated pump initiation. Once the supported pump (e.g., HPCS, RHR, etc.) is in operation, the associated water leg pump serves no further safety related function. The amount of flow delivered by each water leg pump is dependent upon each supported system's leakage rate. Each water leg pump is capable of delivering approximately 50 gallons per minute (gpm). None of the listed water leg pumps have instrumentation installed in the discharge line for measuring flow rates.

While flow measurement instrumentation is provided downstream of the water leg pump's branch connection to its associated support system, during power operation, the water leg pump is unable to generate sufficient pressure to flow through the associated flow element into the reactor vessel. Additionally, the flow measurement instrumentation associated with these lines, which is designed to measure flow developed by the HPCS (0-8000 gpm), LPCS (0-10,000 gpm), RHR (0-10,000 gpm), or RCIC (0-700 gpm), is not capable of measuring such small flows developed by a water leg pump (i.e., approximately 50 gpm).

The application of temporary flow instrumentation (ultrasonic) cannot be utilized, as there is not a run of piping long enough to allow for an accurate measurement. System modifications to provide for test measuring locations for flow instrumentation places undue burden on LSCS without demonstrating any increase in the level of plant safety. These pumps are in continuous operation and pump performance is continuously monitored by a low-pressure alarm on each HPCS, LPCS, RHR, and RCIC pump discharge header.

Quarterly Group A testing, as modified by LSCS pump relief request RP-01, will continue to be performed during the stipulated conditions that: 1) the RCS pressure is greater than the discharge pressure of the associated water leg pump; and 2) the supported system pump is not in operation during the testing of the associated water leg pump.

Comprehensive pump testing requires that the pump parameters be measured while the pump is operating at a flow rate within 20% of the pumps design flow. These water leg pumps do not have a safety related design flow rate. These water leg pumps operate in a "keep ready" mode, maintaining the support system piping pressurized with water, which is dependent upon each individual system's leakage rate.

The remaining differences between the comprehensive pump or preservice pump testing and Group A testing is the accuracy of the instruments used in measuring the differential pressure (Table ISTB-3510-1, 2% for Group A tests versus ½% for comprehensive and preservice tests) as well as the acceptance criteria associated with the pump's differential pressure (Table ISTB-5121-1, 0.90 to 1.10ΔP_r for Group A tests versus 0.90 to 1.03ΔP_r for comprehensive tests, with 0.93% alert limit).

These water leg pumps are tested quarterly by isolating them from their support system piping and measuring their pressure and vibration parameters as they pump system fluid through a minimum flow orifice in the minimum flow line. As there is no flow measurement taken as a result of the system configuration, variation of the system resistance is not used.

The utilization of more accurate test instrumentation and acceptance criteria under these conditions would result in a hardship without a compensating increase in the level of quality and safety.

5. Proposed Alternative and Basis for Use

Exelon Generation Company, LLC (EGC) will continue to monitor the subject pumps for degradation by measuring and recording pump inlet pressure, discharge pressure, (from which differential pressure is calculated), and vibration. The differential pressure and vibration data will be trended as directed by ISTB-5121, Group A Test Procedure, as amended by Relief Request RP-01. These measurements are taken quarterly, during normal plant operation, when the supported system's pump is not in operation and RCS pressure is greater than the water leg pump's discharge pressure. Measurement and trending of these parameters under these stated conditions will provide satisfactory indication of operational readiness as well as the ability to detect potential degradation. In addition, the main emergency core cooling system (ECCS) pump headers each have a low pressure sensor, which continuously monitors the operability of the respective water leg pump and alarms upon reaching its low set-point. The LSCS Technical Specification (TS) Surveillance Requirements (i.e., TS SR 3.5.1.1, TS SR 3.5.2.3, and TS SR 3.5.3.1) also verify operability of the water leg pumps by verifying the associated system is sufficiently filled with water.

Vibration measurements will continue to be obtained under normal operating conditions and evaluated in accordance with ISTB-5121(d) and ISTB-5121(e), Group A testing. The differential pressure across the pump will also continue to be determined quarterly through plant procedures utilizing each pump's minimum flow line in accordance with ISTB-5121(c) and ISTB-5121(e). Differential Pressure and vibration will continue to be trended. In addition, operability of these pumps is verified through the continuous monitoring of the HPCS, LPCS, RHR, and RCIC pump discharge line pressures that are monitored in the control room by alarm.

In conclusion, on the basis that complying with the specified requirements would result in undue hardship without a compensating increase in the level of quality and safety, and the proposed alternative continues to provide reasonable assurance of operational readiness of the water leg pumps, EGC requests approval of the proposed alternative pursuant to 10 CFR 50.55a(z)(2).

6. Duration of Proposed Alternative

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

7. Precedents

This relief request was previously approved for the third 10-year interval at LSCS, Units 1 and 2, via Relief Request RP-02, as documented in NRC Safety Evaluation dated May 7, 2008 (ADAMS Accession No. ML080930122)

ATTACHMENT 4
10 CFR 50.55a Relief Request RP-03
Utilization of ASME Code Case OMN-21, "Alternative Requirements for Adjusting Hydraulic Parameters to Specified Reference Points"

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

1. ASME Code Component(s) Affected

Table RP-03: Pumps Affected by Alternative Request RP-03

Pump Groups (Units 1 & 2)	Description	Pump Type	Code Class	OM Code Category
0DG01P 1DG01P 2DG01P	Diesel Generator Cooling Water Pumps	Centrifugal	3	Group A
1FC03PA 1FC03PB 2FC03PA 2FC03PB	Fuel Pool Emergency Make-Up Pumps	Centrifugal	3	Group B
1E22-C001 2E22-C001	High Pressure Core Spray (HPCS) Pumps	Vertical Line Shaft Centrifugal	2	Group B
1E22-C002 2E22-C002	HPCS Diesel Generator Cooling Water Pumps	Centrifugal	3	Group A
1E21-C001 2E21-C001	Low Pressure Core Spray Pumps	Vertical Line Shaft Centrifugal	2	Group B
1E12-C002A 1E12-C002B 2E12-C002A 2E12-C002B	Residual Heat Removal (RHR) Pumps	Vertical Line Shaft Centrifugal	2	Group A
1E12-C002C 2E12-C002C	RHR (LPCI) Pumps	Vertical Line Shaft Centrifugal	2	Group B
1E12-C300A 1E12-C300B 1E12-C300C 1E12-C300D 2E12-C300A 2E12-C300B 2E12-C300C 2E12-C300D	RHR Service Water Pumps	Centrifugal	3	Group A
1E51-C001 2E51-C001	Reactor Core Isolation Cooling Pumps	Centrifugal	2	Group B
1C41-C001A 1C41-C001B 2C41-C001A 2C41-C001B	Standby Liquid Control Pumps	Reciprocating Positive Displacement	2	Group B

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 Requirements

ISTB-5121, Group A Test Procedure, paragraph ISTB-5121(b) states, in part, that "The resistance of the system shall be varied until the flow rate equals the reference point. ...Alternatively, the flow rate shall be varied until the differential pressure equals the reference point..."

ISTB-5122, Group B Test Procedure, paragraph ISTB-5122(c) states, "System resistance may be varied as necessary to achieve the reference point."

ISTB-5123, Comprehensive Test Procedure, paragraph ISTB-5123(b) states, in part, that "The resistance of the system shall be varied until the flow rate equals the reference point. ...Alternatively, the flow rate shall be varied until the differential pressure equals the reference point."

ISTB-5221, Group A Test Procedure, paragraph ISTB-5221(b) states, in part, that "The resistance of the system shall be varied until the flow rate equals the reference point. ...Alternatively, the flow rate shall be varied until the differential pressure equals the reference point."

ISTB-5222, Group B Test Procedure, paragraph ISTB-5222(c) states, "System resistance may be varied as necessary to achieve the reference point."

ISTB-5223, Comprehensive Test Procedure, paragraph ISTB-5123(b) states, in part, that "The resistance of the system shall be varied until the flow rate equals the reference point. ...Alternatively, the flow rate shall be varied until the differential pressure equals the reference point..."

ISTB-5322, Group B Test Procedure, paragraph ISTB-5322(c) states, "System resistance may be varied as necessary to achieve the reference point."

ISTB-5323, Comprehensive Test Procedure, paragraph ISTB-5323(b) states, "The resistance of the system shall be varied until the discharge pressure equals the reference point. The flow rate shall then be determined and compared to its reference value."

4. Reason for the Request

Pursuant to 10 CFR 50.55a, "Codes and standards," paragraph (z)(1), an alternative is proposed to the pump testing reference value requirements of the ASME OM Code. The basis of the request is that the proposed alternative would provide an acceptable level of quality and safety. Specifically, this alternative is requested for all inservice testing of IST Program pumps for LSCS, Units 1 and 2, as listed in Table RP-03: Pumps Affected by Alternative Request RP-03.

For pump testing, there is difficulty adjusting system throttle valves with sufficient precision to achieve an exact flow rate, differential pressure, or discharge pressure during subsequent IST tests. Section ISTB of the ASME OM Code does not allow for variance from a fixed reference value for pump testing. However, NUREG-1482, Revision 2, Section 5.3, acknowledges that certain pump system designs do not allow for the licensee to set the flow at an exact value because of limitations in the instruments and controls for maintaining steady flow.

ASME OM Code Case OMN-21, "Alternative Requirements for Adjusting Hydraulic Parameters to Specified Reference Points," provides guidance for adjusting reference flow, differential pressure (ΔP), or discharge pressure to within a specified tolerance during pump inservice testing. The Code Case states that:

> "It is the opinion of the Committee that when it is impractical to operate a pump at a specified reference point and adjust the resistance of the system to a specified reference point for either flow rate, differential pressure or discharge pressure, the pump may be operated as close as practical to the specified reference point with the following requirements. The Owner shall adjust the system resistance to as close as practical to the specified reference point where the variance from the reference point does not exceed + 2% or - 1% of the reference point when the reference point is flow rate, or + 1% or – 2% of the reference point when the reference point is differential pressure or discharge pressure."

The NRC also discusses this ASME Code change in NUREG-1482, Revision 2, Section 5.3.

5. Proposed Alternative and Basis for Use

Exelon Generation Company, LLC (EGC) seeks to perform future inservice pump testing in a manner consistent with the requirements as stated in ASME OM Code Case OMN-21. Specifically, testing of all pumps identified in Table RP-03 will be performed such that the flow rate is adjusted as close as practical to the reference value and within proceduralized limits of +2% / -1% of the reference flow rate or alternatively the differential pressure or discharge pressure is adjusted as close as practical to the reference value and within proceduralized limits of +1% / -2% of the reference discharge pressure or differential pressure.

LSCS plant operators will continue to strive to achieve the exact test reference values (flow, differential pressure, or discharge pressure) during testing. Typical test guidance will be to adjust the reference parameter (i.e., flow, differential pressure, or discharge pressure) to the specific reference value with additional guidance that if the reference value cannot be achieved with reasonable effort the test will be considered valid if the steady state flow rate is within the proceduralized limits of +2% / -1% of the reference value or the steady state discharge pressure or differential pressure is within the proceduralized limits of +1% / -2% of the reference value.

Using the provisions of this request as an alternative to the specific requirements of ISTB-5121, ISTB-5122, ISTB-5123, ISTB-5221, ISTB-5222, ISTB-5322, ISTB-5323, and ISTB-5223, as described above, will provide adequate indication of pump performance and continue to provide an acceptable level of quality and safety.

Based on the determination that the use of controlled reference value ranges provides an acceptable level of quality and safety, this proposed alternative is being requested pursuant to 10 CFR 50.55a(z)(1).

6. Duration of Proposed Alternative

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

7. Precedents

1. Letter from M. T. Markley (NRC) to F. Diya (Union Electric Company), "Callaway Plant, Unit 1 – Requests for Relief PR-01 through PR-06, Alternatives to ASME OM Code Requirements for Inservice Testing for the Fourth Program Interval (TAC Nos. MF2784, MF2785, MF2786, MF2787, MF2788, and MF2789)," dated July 15, 2014 (ADAMS Accession No. ML14178A769)

2. Letter from M. T. Markley (NRC) to A. C. Heflin (Wolf Creek Nuclear Operating Corporation), "Wolf Creek Generating Station –Request for Relief Nos. 4PR-01, 4PR-02, and 4VR-02 for the Fourth 10-Year Inservice Testing Program Interval (TAC No. MF4992, MF4993, and MF4994)," dated May 15, 2015 (ADAMS Accession No. ML15134A002)

8. References

1. ASME Code Case OMN-21, "Alternate Requirements for Adjusting Hydraulic Parameters to Specified Reference Points"

2. NUREG-1482, Revision 2, "Guidelines for Inservice Testing at Nuclear Power Plants: Inservice Testing of Pumps and Valves and Inservice Examination and Testing of Dynamic Restraints (Snubbers) at Nuclear Power Plants – Final Report." dated October 2013 (ADAMS Accession No. ML13295A020)

ATTACHMENT 5
10 CFR 50.55a Relief Request RV-01
Utilization of ASME Code Case OMN-1, "Alternative Rules for Preservice and Inservice Testing of Active Motor-Operated Valve Assemblies in Light-Water Reactor Power Plants"

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

1. ASME Code Component(s) Affected

All active ASME Class 1, 2, and 3 Motor Operated Valves (MOVs) scoped into the LaSalle County Station (LSCS) Inservice Testing (IST) Program subject to diagnostic testing per Generic Letter (GL) 96-05, "Periodic Verification of Design-Basis Capability of Safety-Related Motor-Operated Valves," and cannot be classified as Skid Mounted.

2. Applicable Code Edition and Addenda

The fourth 10-year interval of the 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 Requirements

ISTC-3100, Preservice Testing, paragraph (a) states "Any valve that has undergone maintenance that could affect its performance after the preservice test shall be tested in accordance with ISTC-3310."

ISTC-3310, Effects of Valve Repair, Replacement, or Maintenance on Reference Values, states, in part, "When a valve or its control system has been replaced, repaired, or has undergone maintenance…that could affect the valve's performance, a new reference value shall be determined or the previous value reconfirmed by an inservice test…"

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…"

ISTC-3520, Exercise Testing, ISTC-3521, Category A and Category B Valves, specifies that Category A and Category B valves shall be tested as provided in subparagraphs (a) through (h). ISTC-3521(a) through (h) specify that Category A and B MOVs shall be full-stroke exercised during operation at power to the position(s) required to fulfill its functions(s); the MOVs shall be exercised during cold shutdowns if it is not practicable to exercise the valves at power; or that the MOVs shall be exercised during refueling outages if it is not practicable to exercise the valves during cold shutdowns.

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

ISTC-5120, Motor-Operated Valves, in paragraphs ISTC-5121, Valve Stroke Testing, ISTC-5122, Stroke Test Acceptance Criteria, and ISTC-5123, Stroke Test Corrective Action, specifies requirements for stroke time testing MOVs when exercised in accordance with ISTC-3510.

Code Case OMN-1, Section 3.3, Inservice Test, paragraph (b), states, in part, that "Inservice tests shall be conducted in the as-found condition."

Code Case OMN-1, Section 3.4, Effect of MOV Replacement, Repair, or Maintenance, states, in part, that "Deviations between the previous and new inservice test values shall be identified and analyzed."

Code Case OMN-1, Section 6.3, Evaluation of Data, states, in part, that "Evaluations shall determine the amount of degradation in functional margin that occurred over time."

Code Case OMN-1, Section 6.4, Determination of MOV Functional Margin, requires testing or analytical methods to ensure adequate margin exists between valve-operating requirements and the available actuator output capability to satisfy the acceptance criteria for MOV operational readiness (only requested for the Quarter-Turn MOVs specified by Equipment Part Number in Section 5 of this Relief Request).

4. Reason for the Request

Pursuant to 10 CFR 50.55a, "Codes and Standards," paragraph (z)(1), an alternative is proposed to the requirement to perform quarterly stroke time testing (ISTC-5120) and biennial position verification testing (ISTC-3700) as defined in the ASME OM Code. An additional alternative is proposed to the Code Case OMN-1 requirements in: 1) Section 3.3(b) for testing in the as-found condition; 2) Section 3.4 to analyze deviations between previous and new inservice tests; 3) Section 6.3 to determine the amount of degradation in functional margin over time; and 4) Section 6.4 to determine the MOV functional margin for the specified quarter-turn valves. The basis of the request is that the alternative testing would provide an acceptable level of quality and safety. Specifically, this request is for all active ASME Class 1, 2, and 3 MOVs scoped into the LSCS IST Program subject to diagnostic testing per GL 96-05, and cannot be classified as Skid Mounted.

5. Proposed Alternative and Basis for Use

10 CFR 50.55a(a) states, in part, that Regulatory Guide (RG) 1.192, Revision 1, "Operation and Maintenance Code Case Acceptability, ASME OM Code," dated August 2014, has been approved for incorporation by reference by the Director of the Federal Register pursuant to 5 U.S.C. 552(a) and 1 CFR part 51.

In RG 1.192, it states within Table 2, "Conditionally Acceptable OM Code Cases," that the alternative rules of ASME Code Case OMN-1, Alternative Rules for Preservice and Inservice Testing of Active Electric Motor-Operated Valve Assemblies in Light-Water Reactor Power Plants, 2006 Addenda, when applied in conjunction with the provisions for leakage rate testing in ISTC-3600, may be applied with the following provisions:

1. The adequacy of the diagnostic test interval for each MOV must be evaluated and adjusted as necessary, but not later than 5 years or three refueling outages (whichever is longer) from initial implementation of OMN-1.

2. When extending exercise test intervals for high risk MOVs beyond a quarterly frequency, licensees must ensure that the potential increase in core damage frequency (CDF) and risk associated with the extension is small and consistent with the intent of the Commission's Safety Goal Policy Statement.

3. When applying risk insights as part of the implementation of OMN-1, licensees must categorize MOVs according to their safety significance using the methodology described in Code Case OMN-3, "Requirements for Safety Significance Categorization of Components Using Risk Insights for Inservice Testing of LWR Power Plants," with the conditions discussed in RG 1.192 or use other MOV risk ranking methodologies accepted by the NRC on a plant- specific or industry-wide basis with the conditions in the applicable safety evaluations.

This conditional acceptance of Code Case OMN-1 per RG 1.192 is applicable in lieu of the provisions for stroke-time testing in subsection ISTC of the 1995 Edition up to and including the 2006 Addenda of the ASME OM Code.

Compliance with RG 1.192 Conditions

Exelon Generation Company, LLC (EGC) proposes to use the requirements of Code Case OMN-1 for MOV stroke time and position verification testing.

The LSCS MOV testing program was developed utilizing GL 89-10, "Safety-Related Motor-Operated Valve Testing and Surveillance," and GL 96-05. The continued implementation of Code Case OMN-1 will continue to reconcile and consolidate testing within the IST program and eliminate unnecessary testing that provides minimal information about MOV operational readiness.

As part of the LSCS commitment on MOV Periodic Verification Testing made in response to GL 96-05, LSCS is participating in the Joint Owners' Group (JOG) Program for MOV Periodic Verification. The JOG Program is described in Topical Report (TR) MPR-1807, Revision 2, and was accepted by the NRC in an October 1997 safety evaluation (SE) as an industry-wide response to GL 96-05 with certain conditions and limitations.

LSCS implementation and compliance with the above-identified provisions (Items 1, 2, and 3) of Code Case OMN-1 are detailed below:

1. LSCS MOV testing frequencies identified in the IST program do not exceed three refueling cycles (i.e., a nominal 6 years). Therefore, the expectation that the frequency of testing be evaluated and adjusted within five years or three refueling outages, whichever is longer, of Code Case OMN-1 implementation will be satisfied.

2. LSCS will exercise medium and low safety significance MOVs at least once every refueling cycle as required in Code Case OMN-1, Section 3.6.1. LSCS continues to test high risk MOVs quarterly (where it is not practical to exercise a valve during plant operations, the valve will be exercised in cold shutdown or refueling outages per Code Case OMN-1, Section 3.6.1). When extending the exercise test frequency intervals for high risk MOVs beyond a quarterly frequency, LSCS shall ensure that any potential increase in the CDF and risk associated with the extension is small and consistent with the intent of the Commissions Safety Goal Policy Statement. Upon extension of these frequencies, the IST Program will be appropriately revised.

3. LSCS has performed differential pressure testing practicability reviews for GL 89-10 that evaluated the benefits of performing a particular test against the potential adverse effects placed on valves or systems caused by this testing. The evaluation included an assessment of potential component (valve or pump) damage or system availability concerns that may outweigh the benefits of dynamic testing for some MOVs. As a result, some MOVs are not subject to differential pressure testing, but are justified for design basis performance by analysis. This alternate methodology to meet the condition specified in RG 1.192 has been previously accepted by the NRC in their approval of LSCS's Code Case OMN-1 Relief Request RV-02 for the third interval on September 26, 2007.

Alternatives to Code Case OMN-1

With LSCS compliance with the above provisions as stipulated in RG 1.192, EGC requests relief from the following OMN-1 sections and proposes the following alternatives for LSCS.

- OMN-1, Section 3.3, Inservice Test, paragraph (b), requires inservice testing to be conducted in the as-found condition.
- OMN-1, Section 3.4, Effect of MOV Replacement, Repair, or Maintenance, requires deviations between the previous and new inservice tests values shall be identified and analyzed.
- OMN-1, Section 6.3, Evaluation of Data, requires evaluations to determine the amount of degradation in functional margin that occurred over time.
- OMN-1, Section 6.4, Determination of MOV Functional Margin, for the quarter-turn valves specified.

Alternative to Code Case OMN-1, Section 3.3(b)

EGC proposes not to perform as-found testing in all situations at LSCS. Not performing as-found testing is justified by the manner in which LSCS determines MOV functional margin and test interval. Unlike the example for determining test interval given in Code Case OMN-1, Section 6.4.4, LSCS uses a process, which is less dependent on as-found testing. When pre-service testing is performed, a degradation factor is applied to extrapolate the appropriate test frequency based upon a calculated decline in functional

margin over time. Random selections of valves are as-found tested and test results are used to validate degradation assumptions per JOG guidelines. This sample as-found testing is applied to computational methods to ensure that the functional margin is adequate over the testing interval. Therefore, EGC requests relief from the requirement of Code Case OMN-1 Section 3.3(b) for always performing as-found testing.

Alternative to Code Case OMN-1, Section 3.4

Section 3.4 requires identifying and analyzing deviations between previous and new test values. As described above, LCSC uses a process that is less dependent on as-found testing. Specifically, as-found testing is applied to computational methods to ensure that the functional margin is adequate over the testing interval. Therefore, a specific analysis addressing the deviations between the previous and new tests is not required. Therefore, EGC requests relief from the requirement of Code Case OMN-1 Section 3.4 for always identifying and analyzing deviations between previous and new test values.

Alternative to Code Case OMN-1, Section 6.3

Section 6.3 requires performing evaluations to determine the amount of degradation in functional margin over time. When pre-service testing is performed, a degradation factor is applied to extrapolate the appropriate test frequency based upon a calculated decline in functional margin over time. Random selections of valves are as-found tested and test results are used to validate degradation assumptions per JOG guidelines. This sample as-found testing is applied to computational methods to ensure that the functional margin is adequate over the testing interval. Therefore, EGC requests relief from the requirement of Code Case OMN-1 Section 6.3 for performing evaluations to determine the amount of degradation in functional margin over time.

Alternative to Code Case OMN-1, Section 6.4

Section 6.4, Determination of MOV Functional Margin, requires, in part, that the Owner shall demonstrate that adequate margin exists between valve-operating requirements and the available actuator output capability to satisfy the acceptance criteria for MOV operational readiness. LSCS has identified several quarter-turn MOVs that operate under low differential pressure conditions, such as air dampers and isolation valves. In closure of GL 89-10 at LSCS, these quarter-turn valves were accepted without diagnostic testing based on analytical methods. These valves operate under low differential pressure and have significant margin. These valves are as follows:

1(2)VG001	Standby Gas Treatment Equipment Train Inlet Damper
1(2)VG003	Standby Gas Treatment Equipment Train Outlet Damper
1(2)VQ037	Primary Containment Purge Air Filter Unit Upstream Isolation Valve
1(2)VQ038	Primary Containment Purge Air Filter Unit Downstream Isolation Valve
1(2)VP113A/B	Drywell Cooler Inlet Inboard Isolation Valve
1(2)VP114A/B	Drywell Cooler Outlet Inboard Isolation Valve

These MOVs will continue to be stroke time and position verification tested in accordance with ASME OM Code subsection ISTC requirements. These valves will also undergo actuator inspections and motor current signature traces from the motor control center to ensure proper operation. The motor current signature traces provide the ability to detect degradation of the valve. These testing requirements will provide assurance that the valves will be capable of performing their safety functions. Therefore, EGC requests relief from the requirements of OMN-1 Section 6.4 for determination of the MOV functional margin for the quarter-turn MOVs identified above.

Technical Positions

The following positions describe how LSCS interprets and complies with the various Code Case OMN-1 requirements:

1. Code Case OMN-1, Section 3.1, Design Basis Verification Test, allows the use of testing that was conducted prior to the implementation of Code Case OMN-1 if it meets the requirements of the code case. LSCS intends to utilize the testing performed under GL 89-10 to satisfy the requirement for a one-time test to verify the capacity of each MOV to meet its safety-related design requirements.

2. Code Case OMN-1, Section 3.2, Preservice Test, requires that each MOV be tested during the preservice test period or before implementing inservice testing. LSCS intends to utilize the testing performed under GL 89-10 to satisfy the requirement. LSCS will perform a new preservice test when an MOV undergoes maintenance or modification that could affect its performance.

3. Code Case OMN-1, Section 3.3, Inservice Test, paragraph (b), states, in part, that "Inservice tests shall be conducted in the as-found condition." Maintenance activities, such as stem lubrication, shall not be conducted if they might invalidate the inservice test results. At LSCS, the frequency of stem lubrication and periodic MOV verification testing differ considerably, and the times at which these activities are optimally performed do not coincide. As part of the GL 96-05 program, as-found data has been collected for a sample population of MOVs under various lubrication conditions. The results from this as-found data were used to create stem factor variability assumptions that are used to estimate the effect of stem lubrication on stem performance over the entire lubrication cycle. As described above, relief has been requested from Code Case OMN-1, Section 3.3(b) as it applies to inservice testing being conducted in the as-found condition. With this relief, if testing were to occur directly following maintenance such as a stem lube, test results would not be invalidated as methods used to analyze the test results take into consideration testing under these circumstances. Therefore, the intent of Code Case OMN-1, Section 3.3(b), that testing is performed under conditions that will not hinder the ability to determine applicable functional margins and determine operational readiness is maintained utilizing methods previously described.

4. Code Case OMN-1, Section 3.3(c) requires the IST Program to include a mix of static and dynamic MOV performance testing. LSCS will utilize the JOG program's mix of static and dynamic MOV performance testing to satisfy this requirement. Additionally, LSCS will utilize the existing engineering standards, which are consistent with the JOG standards, to conduct evaluations to alter the mix of required MOV performance testing, when applicable, in order to meet this requirement.

5. Code Case OMN-1, Section 3.3.1, Inservice Test Interval, paragraph (b), requires MOV inservice testing to be conducted every two refueling cycles or three years (whichever is longer) until sufficient data exists, from an applicable MOV or MOV group, to justify a longer test interval. LSCS has sufficient MOV testing data to justify its current testing frequencies, and therefore meets this requirement.

6. Code Case OMN-1, Section 6.4.4, Determination of MOV Test Interval, requires that calculations for determining MOV functional margin be evaluated to account for anticipated time related changes in performance (i.e., account for potential performance-related degradation). LSCS will utilize the JOG process for setting test frequencies, which is based on margin and safety significance to meet this requirement.

7. According to Table 2 of RG 1.192, the only testing that is described within ISTC that will need to continue to be performed with the adoption of Code Case OMN-1 is that of leakage testing as described by ISTC-3600. Therefore, position verification testing as described in ISTC-3700 need not be performed per the frequency requirements of ISTC. However, LSCS will continue to perform position verification testing at a frequency consistent with JOG guidelines during MOV diagnostic testing.

6. Duration of Proposed Alternative

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

7. Precedents

This relief request was previously approved for the third 10-year interval at LSCS, Units 1 and 2, as Relief Request RV-02, as documented in NRC Safety Evaluation dated September 26, 2007 (ADAMS Accession No. ML072620373).

8. References

1. Regulatory Guide 1.192, "Operation and Maintenance Code Case Acceptability, ASME OM Code," Revision 1, dated August 2014 (ADAMS Accession No. ML13340A034)

2. ASME OM Code Case OMN-1, "Alternative Rules for Preservice and Inservice Testing of Active Electric Motor-Operated Valve Assemblies in Light-Water Reactor Power Plants"

3. Generic Letter 89-10, "Safety-Related Motor-Operated Valve Testing and Surveillance," dated June 28, 1989

4. Generic Letter 96-05, "Periodic Verification of Design-Basis Capability of Safety-Related Motor-Operated Valves," dated September 18, 1996

5. TR MPR-1807, Revision 2, Motor-Operated Valve Periodic Verification, dated July 1997

ATTACHMENT 6
10 CFR 50.55a Relief Request RP-04
Utilization of ASME Code Case OMN-19, "Alternative Upper Limit for the Comprehensive Pump Test"

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

1. ASME Code Component(s) Affected

Table RP-04, IST Program Pumps Affected by Alternative Request RP-04

Pump UNID (Units 1 & 2)	Description	Pump Type	Code Class	ASME OM Code Category	Design Basis Accident Flow Rate (gpm)	IST Comp. Pump Test Flow Rate (gpm)[1]	Pump Periodic Verification Test (PPVT) Required (Yes/No)
0DG01P	Diesel Generator Cooling Water Pumps	Centrifugal	3	Group A	1491	1775	No
1DG01P	Diesel Generator Cooling Water Pumps	Centrifugal	3	Group A	1052	1205	No
2DG01P	Diesel Generator Cooling Water Pumps	Centrifugal	3	Group A	1052	1190	No
1FC03PA 1FC03PB 2FC03PA 2FC03PB	Fuel Pool Emergency Make-Up Pumps	Centrifugal	3	Group B	300	300	No
1E22-C001	High Pressure Core Spray (HPCS) Pumps	Vertical Line Shaft Centrifugal	2	Group B	6250	6300	No
2E22-C001	HPCS Pumps	Vertical Line Shaft Centrifugal	2	Group B	6200	6200	No
1E22-C002 2E22-C002	HPCS Diesel Generator Cooling Water Pumps	Centrifugal	3	Group A	993	1010	No
1E21-C001 2E21-C001	Low Pressure Core Spray Pumps	Vertical Line Shaft Centrifugal	2	Group B	6350	6350	No
1E12-C002A 1E12-C002B 2E12-C002A 2E12-C002B	Residual Heat Removal (RHR) Pumps	Vertical Line Shaft Centrifugal	2	Group A	7200	7200	No
1E12-C002C 2E12-C002C	RHR (LPCI) Pumps	Vertical Line Shaft Centrifugal	2	Group B	7200	7200	No
1E12-C300A 1E12-C300B 1E12-C300C 1E12-C300D 2E12-C300A 2E12-C300B 2E12-C300C 2E12-C300D	RHR Service Water Pumps	Centrifugal	3	Group A	4185	4000	Yes
1E51-C001 2E51-C001	Reactor Core Isolation Cooling Pumps	Centrifugal	2	Group B	600	600[2]	No
1C41-C001A 1C41-C001B 2C41-C001A 2C41-C001B	Standby Liquid Control Pumps	Reciprocating Positive Displacement	2	Group B	41.2	≥41.2	No

Note 1: The IST component pump test flow rates provided in Table RP-04 are the current test flow rates as of the time of the submittal.

Note 2: The IST measured value of 600 gpm for the RCIC pumps is taken downstream of the unmeasured (~25 gpm) flow to the RCIC lube oil cooler. The design requirement of 600 gpm includes that unmeasured value. Therefore, the test confirms that the 600 gpm that is the measured flow to the reactor is the maximum required flow after the pump has also provided the additional flow (~25 gpm) to the RCIC lube oil cooler. No additional Pump Periodic Verification Test is required for the RCIC pumps.

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 Requirements

ISTB-5123, Comprehensive Test Procedure, paragraph ISTB-5123(e), refers to Table ISTB-5121-1, Centrifugal Pump Test Acceptance Criteria, which specifies a multiplier of 1.03 times the established reference value for the measured hydraulic value of differential pressure or flow rate for the upper limits for "Acceptable Range" and "Required Action Range, High" criteria for the comprehensive pump test (CPT).

ISTB-5223, Comprehensive Test Procedure, paragraph ISTB-5223(e), refers to Table ISTB-5221-1, Vertical Line Shaft Centrifugal Pump Test Acceptance Criteria, which specifies a multiplier of 1.03 times the reference value for the measured hydraulic value of differential pressure or flow rate for the upper limits for "Acceptable Range" and "Required Action Range, High" criteria for the CPT.

ISTB-5323, Comprehensive Test Procedure, paragraph ISTB-5323(e) refers to Table ISTB-5321-2, Reciprocating Positive Displacement Pump Test Acceptance Criteria which specifies a multiplier of 1.03 times the reference value for the measured hydraulic value of discharge pressure or flow rate for the upper limits for "Acceptable Range" and "Required Action Range, High" criteria for the CPT.

4. Reason for the Request

Pursuant to 10 CFR 50.55a, "Codes and standards," paragraph (z)(1), an alternative is proposed to the requirement for a multiplier of 1.03 times the reference value for the CPT's upper "Acceptable Range" and "Required Action Range, High" criteria, referenced in Tables ISTB-5121-1, ISTB-5221-1, and ISTB-5321-2. The proposed alternative would provide an acceptable level of quality and safety. Specifically, this alternative is requested for all inservice testing of IST Program pumps as listed in Table RP-04, IST Program Pumps Affected by Alternative Request RP-04.

Occasionally, LSCS has had some difficulty with implementing the high required action range limit of 1.03 above the established hydraulic parameter reference value due to normal data scatter. This could result in the plant entering (or remaining in) an applicable Technical Specification (TS) Limiting Condition for Operation (LCO) for reasons other than a pump degradation issue.

Based on the similar difficulties experienced by other Owners, ASME OM Code Case OMN-19, "Alternative Upper Limit for the Comprehensive Pump Test," was developed and has been published in the 2011 Addenda of the ASME OM Code. The ASME white paper for this code case discussed the impact of instrument inaccuracies, human factors involved with setting and measuring test parameters, readability of gauges, and other miscellaneous factors on the ability to meet the 1.03 acceptance criteria. Industry operating experience is also discussed in this white paper.

Code Case OMN-19 has not yet been approved for use in Regulatory Guide (RG) 1.192, Operation and Maintenance Code Case Acceptability, ASME OM Code.

5. Proposed Alternative and Basis for Use

Exelon Generation Company, LLC (EGC) proposes to use ASME OM Code Case OMN-19 as published in the 2011 Addenda of the ASME OM Code for the fourth 10-year interval IST Program. Code Case OMN-19 allows for the use of a multiplier of 1.06 times the reference value in lieu of the 1.03 multiplier for the comprehensive pump test's (CPT's) upper "Acceptable Range" criteria and "Required Action Range High" criteria referenced in the applicable test acceptance criteria Tables ISTB-5121-1, ISTB-5221-1, and ISTB-5321-2.

The bases for the approval of Code Case OMN-19, as discussed in the ASME white paper, are summarized below:

1. Instrument inaccuracies of measured hydraulic values
2. Instrument inaccuracies of set value and its effect on measured value
3. Instrument inaccuracies and allowed tolerance for speed
4. Human factors involved with setting and measuring flow, D/P, and speed
5. Readability of gauges based on the smallest gauge increment, and
6. Miscellaneous factors

The inaccuracies summarized above associated with obtaining the CPT hydraulic data may cause the measured value to exceed the existing Code-allowed CPT upper "Acceptable Range" criteria and/or the "Required Action Range, High" criteria of 103% (i.e., 1.03 multiplier). The new upper limit of 106% (i.e., 1.06 multiplier), as approved in Code Case OMN-19, will eliminate declaring the pump inoperable and entering an unplanned TS LCO, or will eliminate the extension of an existing LCO.

As a condition for using Code Case OMN-19, LSCS will implement a pump periodic verification test (PPVT) program to verify that a pump can meet the required differential (or discharge) pressure, as applicable, at its highest design basis accident flow, as discussed in ASME Mandatory Appendix V, which was published in the 2012 Edition of the ASME OM Code. LSCS will not be required to perform a PPVT if the design basis accident flow rate is bounded by the CPT or Group A test. Also, if the pump does not have a design basis accident flow rate, then a PPVT is not required. Therefore, any IST pump that utilizes the 1.06 multiplier for the CPT will meet the condition described above.

Using the upper limit of 1.06 times the reference value in lieu of the 1.03 multiplier for the CPT's upper "Acceptable Range" and "Required Action Range, High" criteria referenced in the applicable ISTB test acceptance criteria tables will provide adequate indication of pump performance and continue to provide an acceptable level of quality and safety.

Using the provisions of this request as an alternative to the specific requirements of Tables ISTB-5121-1, ISTB-5221-1, and ISTB-5321-2, as described above, will continue to provide an acceptable level of quality and safety. Therefore, this proposed alternative is requested pursuant to 10 CFR 50.55a(z)(1).

6. Duration of Proposed Alternative

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

7. Precedents

1. Letter from M. K. Khanna to O. A. Limpias, "Cooper Nuclear Station – Requests for Relief RP-01 through RP-09, RV-01 through RV-05, and RG-01 Alternatives to ASME OM Code Requirements for Inservice Testing for the Fifth 10-Year Program Interval (CAC Nos. MF5911, MF5913, MF5914, MF5915, MF5916, MF5917, MF5918, MF5919, MF5920, MF5921, MF5922, MF5923, MF5924, MF5925, and MF5926)," dated February 12, 2016 (ADAMS Accession No. ML16014A174)

2. Letter from E. R. Oesterle to M. E. Reddeman, "Columbia Generating Station – Requests for Relief Nos. RG01, RP01, RP02, RP03, RP04, RP05, RP06, RV01, RV02, RV03, and RV04 for the Fourth 10-Year Inservice Testing Interval (TAC Nos. MF3847, MF3848, MF3849, MF3851, MF3852, MF3853, MF3854, MF3855, MF3856, MF3857, and MF3858)," dated December 9, 2014 (ADAMS Accession No. ML14337A449) and Correction to Safety Evaluation Pages dated February 9, 2015 (ADAMS Accession No. ML15030A232)

8. References

1. ASME OM Code Case OMN-19, "Alternative Upper Limit for the Comprehensive Pump Test"

2. Regulatory Guide 1.192, "Operation and Maintenance Code Case Acceptability, ASME OM Code," Revision 1, dated August 2014 (ADAMS Accession No. ML13340A034)

3. ASME OM Code, 2012 Edition, Division 1, Mandatory Appendix V, Pump Periodic Verification Test Program, issued April 6, 2013

4. White Paper for ISTB Code Change, [Standards Committee Ballot 09-610, Record 09-657] Change C, *A relaxation of the high required action range for the Comprehensive Pump Test Hydraulic Parameters (1.03 to 1.06)*, dated December 2007