September 26, 2007

Mr. Christopher M. Crane
President and Chief Nuclear Officer
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: RELIEF REQUESTS FOR THE LASALLE COUNTY STATION, UNITS 1 AND 2 THIRD 10-YEAR PUMP AND VALVE INSERVICE TESTING PROGRAM (TAC NOS. MD5988, MD5989, MD5992, MD5993, MD5994, MD5995)

Dear Mr. Crane:

By letter dated September 29, 2006, Exelon Generating Company, LLC (EGC, the licensee) submitted Relief Requests (RRs) RP-01, RP-02, RV-01, and RV-02 for the third 10-year interval inservice testing (IST) program for LaSalle County Station, Units 1 and 2. EGC requested relief from certain IST requirements of the American Society of Mechanical Engineers Code for Operation and Maintenance of Nuclear Power Plants (OM Code). By letters dated September 7, 2007, and September 11, 2007, the licensee provided additional information related to RR RV-02, and revised RR RV-02. By letter dated September 4, 2007, the licensee withdrew RR RP-02.

The Nuclear Regulatory Commission (NRC) staff has completed its review of the RRs and pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(a)(3)(i), RRs RV-01 and RV-02 are authorized on the basis that the proposed alternatives would provide a acceptable level of quality and safety. Pursuant to 10 CFR 50.55a(f)(6)(i), RR RP-01 is granted and alternative requirements are imposed on the basis that the Code requirements are impractical for the facility. The NRC staff's review of EGC's analysis in support of its requests for relief is documented in the enclosed safety evaluation. The RRs are authorized for the third 10-year IST interval, which is currently scheduled to begin on October 12, 2007.

Sincerely,

/RA/

Russell Gibbs, Chief
Plant Licensing Branch III-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-373 and 50-374

Enclosure:
Safety Evaluation

cc w/encl: See next page

Mr. Christopher M. Crane
President and Chief Nuclear Officer
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

September 26, 2007

SUBJECT: RELIEF REQUESTS FOR THE LASALLE COUNTY STATION, UNITS 1 AND 2 THIRD 10-YEAR PUMP AND VALVE INSERVICE TESTING PROGRAM (TAC NOS. MD5988, MD5989, MD5992, MD5993, MD5994, MD5995)

Dear Mr. Crane:

By letter dated September 29, 2006, Exelon Generating Company, LLC (EGC, the licensee) submitted Relief Requests (RRs) RP-01, RP-02, RV-01, and RV-02 for the third 10-year interval inservice testing (IST) program for LaSalle County Station, Units 1 and 2. EGC requested relief from certain IST requirements of the American Society of Mechanical Engineers Code for Operation and Maintenance of Nuclear Power Plants (OM Code). By letters dated September 7, 2007, and September 11, 2007, the licensee provided additional information related to RR RV-02, and revised RR RV-02. By letter dated September 4, 2007, the licensee withdrew RR RP-02.

The Nuclear Regulatory Commission (NRC) staff has completed its review of the RRs and pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(a)(3)(i), RRs RV-01 and RV-02 are authorized on the basis that the proposed alternatives would provide a acceptable level of quality and safety. Pursuant to 10 CFR 50.55a(f)(6)(i), RR RP-01 is granted and alternative requirements are imposed on the basis that the Code requirements are impractical for the facility. The NRC staff's review of EGC's analysis in support of its requests for relief is documented in the enclosed safety evaluation. The RRs are authorized for the third 10-year IST interval, which is currently scheduled to begin on October 12, 2007.

Sincerely,
/RA/
Russell Gibbs, Chief
Plant Licensing Branch III-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-461
Enclosure: Safety Evaluation

cc w/encl: See next page

DISTRIBUTION:

PUBLIC	LPL3-2 R/F	RidsNrrPMSSands	RidsOgcRp
GHill (4)	RidsNrrDirsItsb	RidsAcrsAcnwMailCenter	RidsRgn3MailCenter
RidsNrrLAEWhitt	RidsNrrDorlDpr	RidsNrrDorlLpl3-2	

Amendment: ML072620373 *see memo dated

OFFICE	LPL3-2/PM	LPL3-2/LA	ADES/DCI/CPTB	OGC	LPL3-2/BC
NAME	SSands	EWhitt	JMcHale *	MSmith	RGibbs
DATE	09/25/2007	09/25/2007	09/ 13 /2007	09/ 24 /2007	09/26/2007

OFFICIAL RECORD COPY

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO THE INSERVICE TESTING PROGRAM, THIRD 10-YEAR INTERVAL

EXELON GENERATION COMPANY, LLC

LASALLE COUNTY STATION UNITS 1 AND 2

DOCKET NOS. 50-373 AND 50-374

1.0 INTRODUCTION

By letter dated September 29, 2006, (Agencywide Access and Document Management System (ADAMS) Accession No. ML062970430) Exelon Generation Company, LLC (EGC), the licensee, submitted relief requests for the third 10-year inservice testing (IST) program interval at the LaSalle County Station, Units 1 and 2 (LSCS). The licensee requested relief from certain IST requirements of the 2001 Edition through 2003 Addenda of the American Society of Mechanical Engineers (ASME) Code for Operation and Maintenance of Nuclear Power Plants (OM Code). In response to the staff's request for additional information (RAI), the licensee submitted additional information related to relief request RV-02, and revised relief request RV-02, in letters to the Nuclear Regulatory Commission (NRC) dated September 7, 2007 (ADAMS Accession No. ML072630596) and September 11, 2007 (ADAMS Accession No. ML072550422), respectively. The licensee also withdrew relief request RP-02 in a letter dated September 4, 2007 (ADAMS Accession No. ML072480229). The NRC evaluation of the relief requests is contained herein. The LaSalle County Station Units 1 and 2 third 10-year IST intervals commence on October 12, 2007.

2.0 REGULATORY EVALUATION

Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Section 50.55a, requires that IST of certain ASME Code Class 1, 2, and 3 pumps and valves be performed at 120-month (10-year) IST program intervals in accordance with the specified ASME Code and applicable addenda incorporated by reference in the regulations, except where alternatives have been authorized or relief has been requested by the licensee and granted by the NRC pursuant to paragraphs (a)(3)(i), (a)(3)(ii), or (f)(6)(i) of 10 CFR 50.55a. In accordance with 10 CFR 50.55a(f)(4)(ii), licensees are required to comply with the requirements of the latest edition and addenda of the ASME Code incorporated by reference in the regulations 12 months prior to the start of each 120-month IST program interval. In accordance with 50.55a(f)(4)(iv), IST of pumps and valves may meet the requirements set forth in subsequent editions and addenda that are incorporated by reference in 10 CFR 50.55a(b), subject to NRC approval. Portions of editions or addenda may be used provided that all related requirements of the respective editions and addenda are met. In proposing alternatives or requesting relief, the licensee must demonstrate that: (1) the proposed alternatives provide an acceptable level of quality and safety; (2) compliance would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety; or (3) conformance is impractical for the facility. Section 50.55a authorizes the NRC to approve alternatives and to grant relief from ASME OM Code (Code) requirements upon making

necessary findings. NRC guidance contained in Generic Letter (GL) 89-04, "Guidance on Developing Acceptable Inservice Testing Programs," provides alternatives to ASME Code requirements which are acceptable. Further guidance is given in GL 89-04, Supplement 1, and NUREG-1482 Revision 1, "Guidance for Inservice Testing at Nuclear Power Plants." The NRC's findings with respect to granting or denying the IST program RRs are given below:

3.0 TECHNICAL EVALUATION

3.1 Pump Relief Request RP-01

3.1.1 Code Requirements

The licensee requested relief from ISTB-5121, "Group A Test Procedure," and Table ISTB-3000-1, "Inservice Test Parameters."

ISTB-5121 requires that Group A tests shall be conducted with the pump operating at a specified reference point. ISTB 5121(b) requires that the resistance of the system shall be varied until the flow rate equals the reference point. The differential pressure shall then be determined and compared to its reference value. Alternatively, the flow rate shall be varied until the differential pressure equals the reference point and the flow rate determined and compared to the reference flow rate value.

Table ISTB-3000-1 specifies the parameters to be measured during IST.

Relief was requested for the following pumps:

Pump	Description	Class	Category	Unit
1E22-C003	High Pressure Core Spray (HPCS) Water Leg Pump	2	Group A	1
1E21-C002	Low Pressure Core Spray (LPCS) Water Leg Pump	2	Group A	1
1E12-C003	Residual Heat Removal (RHR) Water Leg Pump	2	Group A	1
1E51-C003	Reactor Core Isolation Cooling (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

3.1.2 Licensee's Basis for Requesting Relief

The licensee states:

> The primary purpose of these pumps is to maintain the HPCS, LPCS, RCIC, and 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 their discharge lines 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. Even if the water leg pump was capable of developing a head sufficient to inject into the reactor vessel during power operation, the flow measurement instrumentation, which is designed to measure flow developed by either a HPCS (0-8,000 gpm), LPCS (0-10,000 gpm), RHR (0-10,000 gpm), or RCIC (0-700 gpm) pump, 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 does not exist a run of piping long enough that would allow for an accurate measurement. System modifications to provide test measuring locations 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 header.

3.1.3 Licensee's Proposed Alternative Testing

The licensee states:

LSCS 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. These measurements are taken quarterly during normal plant operation, when the supported system's pump is not in operation and reactor coolant system 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 the sensor alarms upon reaching its low setpoint. Station technical specification (TS) surveillance requirements (i.e., TS 3.5.1.1, 3.5.2.3, and 3.5.3.1) also verify operability of the water leg pumps by verifying flow through a high point vent on a monthly basis.

Vibration measurement 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. In addition, LSCS verifies operability of these pumps through continuous monitoring of the HPCS, LPCS, RHR, and RCIC pump discharge line pressures that are monitored in the control room by alarm.

3.1.4 Evaluation

ISTB-5121 requires that each water leg pump be tested by establishing a fixed and repeatable hydraulic reference value of either differential pressure or pump flow, establishing the reference value during quarterly testing, and recording the measured hydraulic value and bearing vibration for comparison with the Code acceptance criteria. The design of the HPCS, LPCS, RHR, and RCIC water leg pumps does not enable IST to be readily performed in accordance with the

Code. The necessary flow instrumentation is not installed in the systems and a plant modification would be required to install flow instrumentation. Temporary ultrasonic flow instrumentation cannot be used because there is not a run of piping long enough to allow for an accurate measurement. The licensee proposes to monitor the pumps for mechanical degradation with vibration monitoring, and for hydraulic degradation by measuring and recording pump inlet pressure and discharge pressure, and calculating differential pressure. Flow will be verified, but not measured, by verifying flow through a high point vent on a monthly basis.

While the proposed IST would not be as complete as it would be if the Code requirements were imposed, 10 CFR 50.55a does include provisions for impracticalities due to design limitations, as the initial imposition of the Code requirements was subsequent to the design and construction of a number of nuclear plants. For the water leg pumps, which are continuously operating pumps, the safety function is to keep the ECCS pump discharge header piping in a filled condition to prevent a water hammer upon ECCS pump start. The actual output and hydraulic performance of the water leg pumps are not critical to the safety function, as long as the pumps are capable of maintaining the piping full of water. Alarms would promptly alert plant operators whenever the water leg pumps do not maintain the piping pressure to a set alarm level. In addition, vibration data will be indicative of levels trending toward unacceptable values and should allow time for the licensee to take corrective actions before the pumps fail. The proposed alternative provides a reasonable assurance of operational readiness of the water leg pumps because (1) differential pressure and bearing vibration are measured and trended, and (2) alarms are present which provide a continuous monitoring of degradation in the pressure of the ECCS discharge lines.

3.1.5 Pump Relief Request RP-01 Conclusion

Based on the above evaluation that determined that compliance with the Code requirements is impractical for the pump testing, and considering the burden on the licensee if the Code requirements are imposed, relief is granted from the Code requirements and the alternative is imposed, pursuant to 10 CFR 50.55a(f)(6)(i). The relief granted is authorized by law and will not endanger the common defense and security and is otherwise in the public interest, giving due consideration to the burden upon the licensee if the Code requirements were imposed on the facility. This alternative is granted for the third 10-year IST program interval.

3.2 Valve Relief Request RV-01

3.2.1 Code Requirements

Paragraph I-3410(d) of Appendix I of the Code requires that each valve that has been maintained or refurbished in place, removed for maintenance and testing, or both, and reinstalled shall be remotely actuated at reduced or normal system pressure to verify open and close capability of the valve before resumption of electric power generation.

The licensee requests relief from the requirements of I-3410(d) for the following main steam line safety/relief valves (S/RVs):

Unit 1 and Unit 2 S/RVs with Automatic Depressurization System (ADS) function:
1(2)B21-F013C, D, E, R, S, U, and V

Unit 1 and Unit 2 S/RVs without ADS function:
1(2)B21-F013F, H, K, L, M, and P

These valves have both a safety mode and a relief mode of operation. The safety mode is the self-actuating function which is necessary to relieve system overpressure. The relief mode is accomplished by an automatic or manual control circuit which applies electric power to solenoids which provide control air to the pneumatic actuator piston.

3.2.2 Licensee's Basis for Requesting Relief

The licensee states:

> Currently, approximately 50 percent of the Main Steam Line S/RVs, with ADS, and approximately 50 percent of the S/RVs, without ADS, are removed from the plant and setpoint tested during each refueling outage. The setpoint testing program includes the manual actuation of the S/RV valves and actuators through the bench-test valve control system. Prior to June 15, 2001, after reinstallation into the plant, each valve was actuated a second time by the plant-installed remote manual actuation equipment per Code requirements.
>
> Prior to June 15, 2001, experience at LSCS, as well as elsewhere in the nuclear industry, had shown that repeated manual actuation of the S/RVs can lead to valve through seat leakage during plant operation. During previous operating cycles for LSCS, approximately 18 percent (i.e., 5 of 28) of the valves that were subjected to a single insitu open/close cycle developed undesirable through seat leakage, whereas, approximately 57 percent (i.e., 12 of 21) of the valves that experienced more than one insitu open/close cycle developed undesirable through seat leakage. During power operation, S/RV through seat leakage is directed to the primary containment suppression pool, resulting in either the need for increased cooling of the suppression pool or a plant shutdown in order to fix the leaking valve.
>
> Since December 13, 2001, when the NRC initially approved the previous RR, LSCS has not had a single instance of through seat leakage that has resulted in the need for immediate corrective actions that involved a loss of operating capacity.

3.2.3 Licensee's Proposed Alternative Testing

The licensee states:

> The remote actuation of the main steam S/RVs, which have previously been removed for maintenance or refurbished and replaced, shall be performed in two separate steps. The manual actuation of each valve by its actuator will be performed by the bench-test valve control system of the setpoint testing program. This will verify the opening and closing of the valve by its actuator. The plant-installed manual actuation equipment will then be

tested after the valve has been installed into the plant, with the valve stem uncoupled from the actuator. This will allow for the testing of the plant-installed manual actuation electrical circuitry, manual actuation solenoid and air control valve, and the actuator without causing the valve to open.

As a result, all the components of the S/RV, both with and without ADS, will continue to be tested.

The uncoupled actuator test will also be performed following any maintenance activity performed on the control circuitry/equipment that could affect the relief mode of the associated S/RV or ADS valves.

S/RVs (with or without ADS) which were either maintained or refurbished in place will continue to be tested per the requirements of I-3410(d).

3.2.4 Evaluation

Appendix I, I-3410(d) of the Code requires that each valve that has been maintained or refurbished in place, removed for maintenance and testing, or both, and reinstalled shall be remotely actuated at reduced or normal system pressure to verify open and close capability of the valve before resumption of electric power generation. The licensee requests relief from certain insitu tests requirements of I-3410(d) for certain main steam S/RVs that are removed for maintenance and testing, and reinstalled into the plant.

In lieu of the Code-required test, the licensee proposes to perform the test in two steps. First, after performing the Code required setpoint testing, stroke testing of the S/RV will be performed by the bench-test valve control system of the setpoint testing program. This test will verify the opening and closing of the valve with the actuator coupled to the valve stem. Second, the plant installed manual actuation equipment will be tested after valve installation in the plant and with the valve stem uncoupled from the actuator. This will allow the testing of the plant installed manual actuation electrical circuitry, solenoid and air control valve, and the actuator without causing the valve to open. The NRC staff finds that this is an acceptable alternative test method, because it provides for stroke testing of the S/RVs at the same frequency as required by Appendix I, I-3410 (d) and provides for stroke testing of the S/RV actuators in the installed position. The NRC staff also finds that the current testing requirements during power operation can result in additional seat leakage of the S/RVs. Such leakage would be directed to the primary containment suppression chamber causing either a need to increase cooling to the suppression pool water or a plant shutdown to fix the leaking valve. Therefore, the NRC staff finds that the licensee's proposed alternative testing to be acceptable.

3.2.5 Valve Relief Request RV-01 Conclusion

Based on the above evaluation, the NRC staff concludes that, pursuant to 10 CFR 50.55a (a)(3)(i), the licensee's proposed alternative to the Code requirements for testing S/RVs is authorized for the third 10-year IST interval for LSCS on the basis that the alternative testing provides an acceptable level of quality and safety. This alternative is authorized for the third 10-year IST program interval.

3.3 Valve Relief Request RV-02

3.3.1 Code Requirements

The 2001 Edition through the 2003 Addenda of the Code, requires that IST of motor operated valves (MOVs) be performed as required by Subsection ISTC.

For all ASME Class 1, 2 and 3 MOVs scoped into the LSCS IST program subject to diagnostic testing per GL 96-05, "Periodic Verification of Design Basis Capability of Safety-Related Power-Operated Valves," which cannot be classified as skid mounted, the licensee proposes to use the requirements Code Case OMN-1 for stroke time testing and position indication testing (PIT) as described below.

3.3.2 Licensee's Basis for Requesting Relief

In the 2006 issuance of 10 CFR 50.55a, 10 CFR 50.55(a)(b) states in part, that Regulatory Guide (RG) 1.192, "Operating and Maintenance Code Case Acceptability, ASME OM Code," (June 2003), has been approved for incorporation by reference by the Director of the Office 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 Revision 0, 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 valve must be evaluated and adjusted as necessary, but not later than five years or three refueling outages (whichever is longer) from initial implementation of ASME Code Case 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 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 the 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 [light-water reactor] Power Plants," with the conditions discussed in this RG 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 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 2000 Addenda of the ASME OM Code.

LSCS proposes to use the requirements of Code Case OMN-1 for MOV stroke time testing and PIT.

The LSCS MOV testing program has been developed utilizing GL 89-10, "Safety Related Motor Operated Valve Testing and Surveillance," and GL 96-05, "Periodic Verification of Design Basis

Capability of Safety Related Motor Operated Valves." The continued implementation of 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 LSCS's 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. This program is described in Topical Report MPR-1807, Revision 2 and was endorsed by the NRC in an October 1997 Safety Evaluation.

3.3.3 Licensee's Proposed Alternative Testing

The licensee proposes to apply ASME Code Case OMN-1, with some exceptions, as part of the IST Program for MOVs at LaSalle County Station Units 1 and 2. The licensee notes that NRC has approved the use of Code Case OMN-1 with certain conditions. The licensee described its compliance with those conditions as follows:

1. The MOV test frequencies identified in the IST Program at LSCS does not exceed three refueling cycles (i.e., a nominal six years). Therefore, the licensee states that the expectation that frequency of testing be evaluated and adjusted within five years or three refuel outages, whichever is longer, will be satisfied.

2. The licensee will exercise medium and low safety significant MOVs at least once every refuel cycle as required in Paragraph 3.6.1 of Code Case OMN-1. Initially, the licensee commits to continue to test high risk MOVs quarterly. Where it is not practicable to exercise a valve during plant operations, the licensee states that the valve will be exercised in cold shutdown or in refuel outages per Paragraph 3.6.3 of OMN-1. After sufficient performance data have been obtained and evaluated for medium and low safety significant MOVs exercised at least once every refuel cycle, the licensee states that the data will be used in evaluating the same exercise frequency for high-risk MOVs. When extending the exercise test intervals for high-risk MOVs beyond a quarterly frequency, the licensee states that it will ensure that the potential increase in core damage frequency and risk associated with the extension is small and consistent with the intent of the Commission's Safety Goal Policy Statement. Upon extension of these frequencies, the licensee states that the IST Program at LSCS will be appropriately revised.

3. With respect to the caution regarding the benefits and potential adverse effects of MOV dynamic testing, the licensee reports that it performed practicability reviews for differential pressure testing as part of its GL 89-10 program that evaluated the benefits of performing a particular test against the potential adverse effects placed on the valves or systems caused by the testing. The evaluation was said to include 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, the licensee states that some MOVs are not subject to differential pressure testing, but are justified for design basis performance by analysis.

The licensee requests relief from the following OMN-1 provisions:

1. Paragraph 3.3(b) of OMN-1 requires IST to be conducted in the as-found condition.

2. Paragraph 3.4 of OMN-1, "Effect of MOV Replacement, Repair, or Maintenance," requires deviation between the previous and new IST values to be identified and analyzed.

3. Paragraph 6.3 of OMN-1, "Evaluation of Data," requires evaluations to determine the amount of degradation in functional margin that occurred over time.

4. While comparing the GL 96-05 program to the IST program at LSCS, the licensee has identified a number of MOVs that have IST requirements, but are not subject to diagnostic testing in accordance with OMN-1. The licensee will continue to perform stoke-time testing and PIT for these identified MOVs in accordance with ISTC requirements.

In lieu of these OMN-1 provisions, the licensee proposes to perform sample as-found testing of its MOVs, rather than as-found testing in all situations. The licensee asserts that as-found testing is not necessary in every instance because of the manner in which it determines MOV functional margin and test interval. Unlike the example in Paragraph 6.4.4 of OMN-1, "Determination of MOV Test Interval," the licensee states that it uses a process which is less dependent on as-found testing. When preservice testing is performed, the licensee applies a degradation factor to extrapolate the appropriate test frequency based on a calculated decline in functional margin over time. The licensee randomly selects valves for as-found testing, and uses the test results to validate degradation assumptions in accordance with JOG Program guidelines. The licensee then applies the results of the sample as-found testing in calculational methods to ensure that functional margin is adequate over the testing interval. Therefore, the licensee requests relief from the OMN-1 provision to perform as-found testing in each instance, and states that it will follow its commitments to GL 96-05 to perform as-found tests on a sample basis.

The licensee provides the following clarifications for its compliance with Code Case OMN-1 at LSCS:

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

2. Paragraph 3.2 of OMN-1, "Preservice Test," specifies that each MOV be tested during the preservice test period or before implementing IST. The licensee intends to utilize the testing performed under GL 89-10 to satisfy this OMN-1 provision at LSCS. The licensee will perform a new preservice test when an MOV at LSCS undergoes maintenance or modification that could affect its performance.

3. Paragraph 3.3(b) of OMN-1, states that maintenance activities, such as stem lubrication, shall not be conducted if they might invalidate the as-found condition for IST. At LSCS, the licensee states that the frequency of stem lubrication and periodic MOV verification testing differ considerably, and the times at which these activities are optimally performed often do not coincide. As part of the GL 96-05 program at LSCS, the licensee states that as-found data are being collected for a sample population of MOVs under various lubrication conditions. The licensee used the as-found data to create stem factor variability assumptions to estimate the effect of lubrication on stem performance over the

entire lubrication cycle. Based on this information, the licensee does not consider that stem lubrication invalidates the as-found condition of an MOV at LSCS.

4. Paragraph 3.3(c) of OMN-1 specifies that the IST program include a mix of static and dynamic MOV performance testing. The licensee will utilize the JOG Program's dynamic MOV performance testing to satisfy this OMN-1 provision. Additionally, the licensee will utilize the existing engineering standards to conduct evaluations to alter the mix of required MOV performance testing.

5. Paragraph 3.3.1(b) of OMN-1 specifies that MOV IST be conducted every two refueling cycles or 3 years (whichever is longer), if insufficient data exist to determine IST frequencies. The licensee states that LSCS has sufficient MOV testing data to justify the current testing frequencies.

6. Paragraph 6.4.4 of OMN-1, "Determination of MOV Test Interval," specifies that calculations for determining MOV functional margin be evaluated to account for anticipated time-related changes in performance. The licensee will utilize the JOG process for setting test frequencies which is based on margin and safety significance to meet this OMN-1 provision at LSCS.

7. RG 1.192 specifies the conditional use of Code case OMN-1. The licensee states that testing that is described within ISTC that will need to continue to be performed with the adoption of OMN-1 is that of leakage testing as described by ISTC-3600. Therefore, PIT as described by ISTC-3700 need not be specifically identified or performed per the requirements of ISTC. However, LSCS will continue to perform PIT at a frequency consistent with JOG guidelines during MOV diagnostic testing. The licensee has stated in Reference 4.2 that their response to RAI dated September 20, 2002 (Reference 4.5) is also applicable to this relief request.

3.3.4 Evaluation

The current Code of record for third 10-year IST interval at LSCS is the 2001 Edition through the 2003 Addenda of the Code, which requires that IST of MOVs be performed as required by Subsection ISTC.

The Code, Subsection ISTC, specifies the performance of stroke-time testing of MOVs at quarterly intervals as part of the requirements for IST programs established under 10 CFR 50.55a. In response to concerns regarding MOV performance in nuclear power plants, the NRC staff issued GL 89-10, "Safety-Related Motor-Operated Valve Testing and Surveillance," to request that licensees verify the design basis capability of their safety-related MOVs by reviewing MOV design bases, verifying MOV switch settings initially and periodically, testing MOVs under design basis conditions where practicable, improving evaluations of MOV failures and necessary corrective action, and trending MOV problems.

With recognition of the weakness in information provided by quarterly MOV stroke-time testing, the ASME developed Code Case OMN-1, "Alternative Rules for Preservice and Inservice Testing of Certain Electric Motor-Operated Valve Assemblies in Light-Water Reactor Power Plants" as an acceptable alternative program of exercising and diagnostic testing to provide continuing assurance of the capability of MOVs to perform their safety functions. In particular, Code Case OMN-1 specifies exercising of MOVs at least once a year or every refueling cycle (whichever is longer) to verify electrical continuity and to provide internal lubrication. Further,

Code Case OMN-1 specifies periodic diagnostic testing of MOVs (including a mix of static and dynamic tests) to obtain sufficient information to determine the rate of degradation of MOV performance in terms of the potential increase in required thrust and torque (as applicable), and the potential decrease in actuator output.

The licensee proposes to use the Code Case OMN-1 in lieu of the MOV stroke-time testing provision of Subsection ISTC of the Code at LSCS for its third 10-year interval IST program.

The licensee states that a similar RR to use Code Case OMN-1 in lieu of Subsection ISTC of the Code had been previously been authorized for the second 10-year IST interval for MOVs at LSCS. The staff notes that the update of the Code of record at LSCS for MOV IST to the ASME OM 2001 Edition through the 2003 Addenda, including Code Case OMN-1, requires the licensee to satisfy the applicable limitations and modifications specified as part of its incorporation by reference in 10 CFR 50.55a of the NRC regulations.

The NRC accepted the use of Code Case OMN-1, with certain conditions, in the regulation and RG 1.192, as an alternative to the stroke-time testing provision of the Code for MOVs as specified in NUREG-1482. The acceptance of OMN-1 in RG 1.192 is based on Subsection ISTC of the 1995 Edition up to and including 2000 Addenda of the Code. The current 10 CFR 50.55a endorses the use of the 2001 Edition of the Code through the 2003 Addenda. Therefore, the use of the later Code edition is acceptable for the use of OMN-1, because there are no technical changes for MOV testing.

The licensee describes the aspects of its MOV program that satisfy the conditions specified by the NRC for application of ASME Code Case OMN-1 as follows:

1. The licensee states that the MOV test frequencies identified in the IST Program at LSCS do not exceed three refueling outages (i.e., nominal 6 years). This aspect of the MOV program at LSCS satisfies the condition that the frequency of testing be evaluated and adjusted within 5 years or three refueling outages, whichever is longer.

2. The license states that LSCS will exercise medium and low safety significant MOVs at least once every refueling cycle as required by Paragraph 3.6.1 of Code Case OMN-1. The licensee commits to initially continue to test high-risk MOVs quarterly where practicable. For MOVs that cannot practicably be exercised during plant operations, the licensee states that those MOVs will be exercised in cold shutdown or in refuel outages in accordance with Paragraph 3.6.3 of Code Case OMN-1. If the licensee subsequently considers extension of the exercise test intervals for high-risk MOVs beyond a quarterly frequency, the licensee commits to ensure that the potential increase in core damage frequency and risk associated with the extension is small and consistent with the intent of the Commission's Safety Goal Policy Statement.

These two commitments in the IST Program at LSCS satisfy the conditions placed on the application of Code Case OMN-1 by the NRC.

The licensee addresses the caution regarding the consideration of the benefits and potential adverse effects of dynamic testing of MOVs. In particular, the licensee has performed practicability reviews for differential pressure testing conducted under GL 89-10 that evaluated the benefits of performing a particular test against the potential adverse effects placed on the valves or systems caused by this testing. Where differential pressure testing is not conducted for specific MOVs, the licensee justifies the design basis performance of those MOVs by

analysis. The licensee's consideration of the benefits and potential adverse effects of MOV dynamic testing satisfies the caution in this area provided by the NRC.

The licensee proposes an alternative to specific provisions of paragraphs of 3.3(b), 3.4 and 6.3 in Code Case OMN-1. The NRC staff's evaluation of those alternatives is discussed below:

1. Paragraph 3.3(b) of OMN-1 states that maintenance activities, such as stem lubrication, shall not be conducted if they might invalidate the as-found condition for IST. At LSCS, the licensee states that the frequency of stem lubrication and periodic MOV verification testing differ considerably, and the times at which these activities are optimally performed often do not coincide. As part of the GL 96-05 program at LSCS, the licensee states that as-found data are being collected for a sample population of MOVs under various lubrication conditions. The licensee used the as-found data to create stem factor variability assumptions to estimate the effect of lubrication on stem performance over the entire lubrication cycle. Based on this information, the licensee does not consider that stem lubrication invalidates the as-found condition of an MOV at LSCS. In Section 3.6 of NUREG-1482, the NRC staff noted that the ASME Code does not specifically require testing to be performed for components in the as-found condition, except in special cases. However, the NRC staff also indicated that the as-found condition is generally considered to be the condition of a valve without pre-stroking or maintenance. In recognition that as-found testing is not always practicable and that pre-stroking or maintenance is not to be conducted to influence test results, the NRC staff considers the licensee's approach to conduct sample as-found testing to validate its degradation assumptions for MOV performance at LSCS to be consistent with the licensee's GL 96-05 program as accepted by the NRC staff.

2. Paragraph 3.4, "Effect of MOV Replacement, Repair, or Maintenance," Code Case OMN-1 specifies that deviations between the previous and new IST are to be identified and analyzed. In its RAI response submittal to the NRC (Reference 5), the licensee states that its reference to paragraph 3.4 was intended to address any as-found testing provisions that might be implied in that paragraph. The licensee explains that it will not analyze performance directly prior to maintenance and directly after maintenance because as-found testing will not be performed in every instance prior to MOV replacement, repair, or maintenance. However, the licensee indicates that deviations between previous and new IST values will be identified and analyzed after MOV maintenance, repair, or replacement. The NRC staff considers the licensee's plans for identifying and analyzing deviations between previous and new IST for MOV replacement, repair, or maintenance to be acceptable and consistent with its approach for as-found testing.

3. Paragraph 6.3, "Evaluation of Data," in Code Case OMN-1 specifies that evaluations are to be conducted to determine the amount of degradation in functional margin of MOV capability that occurred over time. In its RAI response submittal to the NRC (Reference 5), the licensee explains that it uses proceduralized methods to evaluate MOV test data that include analyzing data from a sample of as-found tests to determine rates of degradation, and applying those degradation factors to other MOVs to determine margin and allowable test interval. In satisfying paragraph 6.3, the licensee will evaluate degradation in functional margin of MOV capability over time for those instances where as-found testing is performed. Where as-found testing is not performed, the licensee will use previously determined degradation factors to calculate an appropriate frequency of operation until future maintenance and testing is necessary. The NRC staff considers

the licensee's method of determining degradation in MOV functional margin to be acceptable and consistent with its approach for as-found testing.

4. The licensee states that comparison of the GL 96-05 program to the IST program has identified a number of LSCS MOVs that have IST requirements but are not subject to diagnostic testing. LSCS will continue to stroke-time test and PIT these identified MOVs in accordance with ISTC requirements. The licensee submitted a RAI response dated September 7, 2007, in which the licensee states that the MOVs subject to IST requirements but not subject to diagnostic testing are similar to those that were identified previously in the second 10-year IST program at LSCS. The following are five categories of MOVs in the IST Program at LSCS that are not currently diagnostically tested.

Category 1: The first category includes reactor head and RHR heat exchanger vent valves that are classified as "passive" and are not stroke-time tested by the licensee under the ASME Code. PIT will continue as part of ISTC. These MOVs are as follows:

1(2)B21-F001	Reactor Head Vent Upstream Valve
1(2)B21-F002	Reactor Head Vent Downstream Valve
1(2)E12-F073A/B	RHR Heat Exchanger Shell Side Downstream Vent Valve
1(2)E12-F074A/B	RHR Heat Exchanger Shell Side Upstream Vent Valve

Category 2: The second category includes several backwash strainer valves that have motor operators with no electrical safety function and are manually operated. These valves actuators are classified as non-safety related and not included in the GL 89-10/96-05 program. Manual verification of valve operation is performed by existing surveillance. These MOVs are as follows:

0DG009	Diesel Generator Cooling Water Backwash Strainer Valve
1(2)DG011	Diesel Generator Cooling Water Backwash Strainer Valve
1(2)E22-F319	High Pressure Core Spray Diesel Generator Cooling Water Backwash Strainer Valve
1(2)E12-F336A/B	RHR Service Water Backwash Strainer Valve

Category 3: The third category includes several MOVs that do not have a safety function, but have stroke-time test commitments as part of the alternate leakage treatment path associated with the removal of the main steam isolation valve leakage control system. These valves will continue to be stroke-time tested and PIT per ISTC. These MOVs are as follows:

1(2)B21-F020	Main Steam Equalizing Header Upstream Stop Valve
1(2)B21-F021	Inboard Main Steam Line Header Orifice Bypass Valve
1(2)B21-F070	Main Steam Line Drain Upstream Orifice Bypass Valve
1(2)B21-F071	Main Steam Line Drain Upstream Orifice Inlet Valve
1(2)B21-F072	Main Steam Line Drain Downstream Orifice Bypass Valve
1(2)B21-F073	Main Steam Line Drain Downstream Orifice Inlet Valve
1(2)B21-F418A/B	Main Steam Auxiliary Supply Steam Stop

Category 4: The fourth category includes valves used for RHR heat exchanger steam condensing suppression pool return isolation with a passive closed safety function.

These valves will not be seat leakage test as documented in a LSCS Engineering Change 363056. These MOVs are as follows:

1(2)E12-F011A/B	RHR Heat Exchanger Steam Condensing Suppression Pool Return Isolation

Category 5: The fifth category includes several quarter-turn MOVs that operate under low differential pressure conditions, such as air dampers and isolation valves. In closure of GL 89-10, these quarter-turn valves were accepted without diagnostic testing based on analytical methods. These valves operate under low differential pressures 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 (DW) Cooler Inlet Inboard Isolation Valve
1(2)VP114A/B	DW Cooler Outlet Inboard Isolation Valve

Based on the information provided by the licensee, the NRC staff finds that the licensee's diagnostic testing practices are acceptable and consistent with their GL 96-05 program.

The licensee provides several technical positions (clarifications) regarding its application of specific provisions of ASME Code Case OMN-1. The NRC staff has reviewed those clarifications and considers them to be consistent with the intent of the code case as discussed below.

1. Paragraph 3.1, “Design Basis Verification Test,” of Code Case OMN-1 allows the use of testing that was conducted prior to the implementation of Code Case OMN-1 if it meets the provisions of the Code Case. The NRC staff considers the licensee’s plan to apply the results of tests performed in response to GL 89-10 to satisfy the provision in paragraph 3.1 for a one-time test to verify the design basis capability of MOVs within the scope of the LSCS IST Program.

2. Paragraph 3.2, “Preservice Test,” of Code Case OMN-1 specifies that each MOV be tested during the preservice test period or before implementing IST. The NRC staff considers the licensee’s plan to use testing performed in response to GL 89-10 to satisfy this provision. The NRC staff agrees with the licensee’s plan to perform a new preservice test when an MOV undergoes maintenance or modification that could affect its performance.

3. Paragraph 3.3(b) of Code Case OMN-1 states that maintenance activities, such as stem lubrication, shall not be conducted if they might invalidate the as-found condition for IST. At LSCS, the licensee states that the frequency of stem lubrication and periodic MOV verification testing differ considerably, and the times at which these activities are optimally performed often do not coincide. As part of the GL 96-05 program at

LSCS, the licensee states that as-found data are being collected for a sample population of MOVs under various lubrication conditions. The licensee used the as-found data to create stem factor variability assumptions to estimate the effect of lubrication on stem performance over the entire lubrication cycle. Based on this information, the licensee does not consider that stem lubrication invalidates the as-found condition of an MOV at LSCS. In its RAI response submittal to the NRC (Reference 5), the licensee notes that the adequacy of the MOV stem lubrication degradation assumptions will be observed through MOV performance monitoring and trending. The licensee will adjust stem lubrication and test intervals as necessary from this information. The NRC staff does not consider sufficient data to be available to make a generic determination that stem lubrication will not affect the as-found condition for MOV IST. Therefore, the NRC staff agrees with the licensee's plan to continue its commitment in response to GL 96-05 to perform sample as-found testing to evaluate stem lubricant degradation.

4. Paragraph 3.3(c) of Code Case OMN-1 specifies that the IST program will include a mix of static and dynamic MOV performance testing. The NRC staff agrees that the licensee may use the JOG Program's MOV dynamic performance testing to help satisfy this OMN-1 provision for those valves within the scope of the JOG Program. The NRC staff considers it acceptable to apply the JOG Program results in the determination of test intervals in Code Case OMN-1 for MOVs within the scope of the JOG Program. The licensee will need to determine appropriate test intervals, including satisfying paragraph 3.3(c) of Code Case OMN-1, for those valves outside the scope of the JOG Program. The NRC staff agrees with the licensee that the mix of static and dynamic testing at LSCS may be adjusted with additional experience. The NRC staff notes that the licensee may need to modify its approach based on its commitment to the JOG Program.

5. Paragraph 3.3.1(b) of Code Case OMN-1 specifies that MOV IST is to be conducted every two refueling cycles or 3 years (whichever is longer), if insufficient data exist to determine IST frequencies. Based on the extensive MOV testing conducted in response to GL 89-10 and GL 96-05, including the licensee's participation in the JOG Program, the NRC staff accepts the licensee's determination that sufficient MOV test data are available at LSCS to justify the current MOV test frequencies.

6. Paragraph 6.4.4, "Determination of MOV Test Interval," of Code Case OMN-1 specifies that calculations for determining MOV functional margin be evaluated to account for anticipated time-related changes in performance. The licensee states that the JOG process for setting test frequencies based on margin and safety significance will be used to meet this OMN-1 provision. The NRC staff considers the licensee's reliance on its commitment to implement the JOG Program to be acceptable and to meet the intent of Code Case OMN-1.

7. The licensee states that according to RG 1.192, the only testing that is described within ISTC that will need to continue to be performed with the

adoption of OMN-1 is that of leakage testing as described by ISTC-3600. Therefore, PIT as described by ISTC-3700 need not be specifically identified or performed in accordance with ASME Code Case OMN-1. However, the licensee indicates that PIT will be performed during MOV diagnostic testing at a frequency consistent with the JOG guidelines. The NRC staff considers the activities conducted as part of the implementation of Code Case OMN-1 will achieve valve position verification as intended in ISTC-3700. In its submittal dated September 7, 2007, the licensee states that valves 1(2)E12-F011A/B will not require a seat leakage test in accordance with the Appendix J Program as documented in LSCS Engineering Change (EC) 363056. This safety evaluation does not provide any validation of the licensee's Appendix J Program.

3.3.4 Valve Relief Request RV-02 Conclusion

Based on the above evaluation, the NRC staff concludes that implementing ASME Code Case OMN-1 as an alternative to the requirements for MOV testing in Subsection ISTC of Code 2001 Edition through 2003 Addenda, provides an acceptable level of quality and safety, and is authorized pursuant to 10 CFR 50.55a(a)(3)(i), consistent with the commitments specified by the licensee and discussed in this safety evaluation. This alternative is authorized for the third 10-year IST program interval.

The licensee will be expected to satisfy its commitments related to the implementation of Code Case OMN-1 discussed in RR RV-02, in its submittals dated September 29, 2006, September 7, 2007, and September 11, 2007, for the third 10-year IST interval program associated with MOV testing at LSCS.

4.0 REFERENCES

1. Letter from Susan Landahl (EGC), LaSalle County Station Units 1 and 2, to NRC, "Proposed Third 10-Year Interval Inservice Relief Requests," dated September 29, 2006 (ADAMS Accession No. ML062970430).

2. Letter from Susan Landahl (EGC), LaSalle County Station Units 1 and 2 to NRC, "Response to Request for Additional Information Relief Request RV-02," dated September 7, 2007.

3. Letter from George P. Barnes (EGC), LaSalle County Station, Units 1 and 2, to NRC, "Request to Implement the 1995 Edition and 1996 Addenda of the American Society of Mechanical Engineers *Code for Operation and Maintenance of Nuclear Power Plants,*" dated June 14, 2002 (ADAMS Accession No. ML021720423).

4. Letter from W. A. Macon, Jr. (NRC) to J. L. Skolds (EGC), "LaSalle County Station Units 1 and 2 - Request for Additional Information," dated August 15, 2002 (ADAMS Accession No. ML022170131).

5. Letter from George P. Barnes (EGC), LaSalle County Station Units 1 and 2 to NRC, "Response to Request for Additional Information Relief Request RV-14," dated September 20, 2002 (ADAMS Accession No. ML022670132).

6. Letter from A. J. Mendiola (NRC) to J. L. Skolds (EGC), "LaSalle County Station, Units 1 and 2 – Relief Request RV-14 (TAC Nos. MB5529 and MB5530), dated November 21, 2002 (ADAMS Accession No. ML023160039).

7. Letter from Patrick R. Simpson (EGC), LaSalle County Station Units 1 and 2, to NRC, "Supplemental Information to Support the Request for Relief from ASME OM Code for the Third 10-Year Inservice Testing Interval," dated September 11, 2007.

Principal Contributor: G. Bedi, NRR

Date: September 26, 2007

LaSalle County Station, Units 1 and 2

cc:

Site Vice President - LaSalle County Station
via e-mail

Plant Manager - LaSalle County Station
via e-mail

Manager Regulatory Assurance - LaSalle
via e-mail

LaSalle Senior Resident Inspector
U.S. Nuclear Regulatory Commission
via e-mail

Phillip P. Steptoe, Esquire
Sidley and Austin
One First National Plaza
Chicago, IL 60603

Assistant Attorney General
100 W. Randolph St. Suite 12
Chicago, IL 60601

Chairman
LaSalle County Board
707 Etna Road
Ottawa, IL 61350

Attorney General
500 S. Second Street
Springfield, IL 62701

Senior Vice President - Midwest Operations
via e-mail

Chairman
Illinois Commerce Commission
527 E. Capitol Avenue, Leland Building
Springfield, IL 62706

Robert Cushing, Chief, Public Utilities Division
Illinois Attorney General's Office
100 W. Randolph Street
Chicago, IL 60601

Illinois Emergency Management Agency
Division of Disaster Assistance & Preparedness
via e-mail

Document Control Desk - Licensing
via e-mail

Senior Vice President - Operations Support
via e-mail

Director - Licensing and Regulatory Affairs
via e-mail

Vice President - Regulatory Affairs
via e-mail

Associate General Counsel
via e-mail

Manager Licensing - Braidwood, Byron, and LaSalle
via e-mail