

May 7, 2008

Mr. Charles G. Pardee
Chief Nuclear Officer
and Senior Vice President
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: LASALLE COUNTY STATION, UNITS 1 AND 2 - REQUEST FOR RELIEF
FROM ASME OM CODE FOR THE THIRD 10-YEAR PUMP AND VALVE
INSERVICE TESTING PROGRAM INTERVAL - RP-02 (TAC NOS. MD6867
AND MD6868)

Dear Mr. Pardee:

By letter to the Nuclear Regulatory Commission (NRC), dated September 28, 2007, Exelon Generation Company LLC (the licensee), submitted Relief Request (RR) RP-02 for the third 10-year inservice testing (IST) program interval at LaSalle County Station (LSCS), Units 1 and 2. The licensee requested relief from certain IST requirements of the American Society of Mechanical Engineers Code for Operation and Maintenance of Nuclear Power Plants. This RR was previously submitted by letter dated September 29, 2006, and was withdrawn by letter dated September 4, 2007.

The NRC staff has completed its review of the RR and is providing the attached safety evaluation. Pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.55(a)(3)(ii), RR RP-02 is authorized on the basis that complying with the specified requirements would result in hardship without a compensating increase in the level of quality and safety. The proposed alternative provides reasonable assurance that the subject pumps are operationally ready.

The LSCS third 10-year IST intervals started on October 12, 2007. The RR is authorized for the third 10-year IST interval, which will end October 11, 2017.

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/encls: See next page

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SUBJECT: LASALLE COUNTY STATION, UNITS 1 AND 2 - REQUEST FOR RELIEF FROM ASME OM CODE FOR THE THIRD 10-YEAR PUMP AND VALVE INSERVICE TESTING PROGRAM INTERVAL - RP-02 (TAC NOS. MD6867 AND MD6868)

Dear Mr. Pardee:

By letter to the Nuclear Regulatory Commission (NRC), dated September 28, 2007, Exelon Generation Company LLC (the licensee), submitted Relief Request (RR) RP-02 for the third 10-year inservice testing (IST) program interval at LaSalle County Station (LSCS), Units 1 and 2. The licensee requested relief from certain IST requirements of the American Society of Mechanical Engineers Code for Operation and Maintenance of Nuclear Power Plants. This RR was previously submitted by letter dated September 29, 2006, and was withdrawn by letter dated September 4, 2007.

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Docket Nos. 50-373 and 50-374

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Safety Evaluation

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LaSalle County Station, Units 1 and 2

cc:

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Via e-mail

LaSalle Distribution
Exelon Generation Company, LLC
Via e-mail

LaSalle Resident Inspector
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Via e-mail

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO THE THIRD 10-YEAR PUMP AND VALVE

INSERVICE TESTING INTERVAL - RP-02

EXELON GENERATION COMPANY, LLC

LASALLE COUNTY STATION, UNITS 1 AND 2

DOCKET NOS. 50-373 AND 50-374

1.0 INTRODUCTION

By letter to the Nuclear Regulatory Commission (NRC) dated September 28, 2007, Agencywide Documents Access Management Systems (ADAMS) Accession No. ML072710656, Exelon Generation Company, LLC (the licensee), submitted a Relief Request (RR) RP-02 for the third 10-year inservice testing (IST) program interval at the LaSalle County Station (LSCS), Units 1 and 2. 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). The licensee previously submitted this RR by letter dated September 29, 2006 (ADAMS No. ML062970430), and withdrew this RR by letter dated September 4, 2007 (ADAMS No. ML072480229). The NRC staff evaluation of the RR is contained herein. The LSCS third 10-year IST intervals commenced on October 12, 2007.

The ASME Code that was in affect during the Second 10-Year IST interval [ASME Boiler and Pressure Vessel Code, Section XI (1989 Edition with no Addenda)] did not require "Comprehensive Pump Testing." As such, LaSalle Station did not have a requirement for comprehensive pump testing, and therefore, there is no previous test date or a previous relief requested for RP-02 during the Second 10-Year IST Interval.

2.0 REGULATORY EVALUATION

Title 10 of the *Code of Federal Regulations* (10 CFR) 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 OM 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 OM Code incorporated by reference in the regulations 12 months prior to the start of each 120-month IST program interval. In accordance with 10 CFR 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.

Pursuant to 10 CFR 50.55a(a)(3), the NRC may authorize alternatives to the relevant ASME OM Code requirements if the licensee demonstrates that: (1) the proposed alternatives provide an acceptable level of quality and safety; or (2) compliance would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. NRC guidance contained in Generic Letter (GL) 89-04, "Guidance on Developing Acceptable Inservice Testing Programs," describes certain acceptable alternatives to ASME Code requirements. 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 relief requests are given below:

3.0 TECHNICAL EVALUATION

3.1 Pump Relief Request RP-02

3.1.1 Code Requirements

The licensee requested relief from ISTB-5123, "Comprehensive Test Procedure."

ISTB-5123 requires that comprehensive tests be conducted with the pump operating at a specified reference point, and that the test parameters shown in Table ISTB-3000-1 be determined and recorded. Table ISTB-3000-1 includes the measurement of flow.

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:

ISTB-5123 requires performance of comprehensive pump testing of the parameters listed in Table ISTB-3000-1. Table ISTB-3000-1 includes the measurement of flow, and there are no existing flow instruments associated with these pumps. Installation of flow

instruments would be a hardship or unusual difficulty without a compensating increase in the level of quality and safety.

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.

The quarterly group A testing as modified by LaSalle pump relief request RP-01 will continue to be performed during the stipulated conditions that the RCS pressure is greater than the discharge of the associated water leg pump, and that the supported system pump is not in operation during the testing of the associated water leg pump.

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

The remaining differences between comprehensive pump testing and group A testing is the accuracy of the instruments used in measuring the differential pressure (Table ISTB-3500-1) as well as the acceptance criteria associated with the pump's differential pressure (Table ISTB-5100-1).

These water leg pumps are tested quarterly by isolating them from their support system piping and measuring their pressure and vibration parameters as they flow through their minimum flow line, through a minimum flow orifice. 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 hardship without a compensating increase in the level of quality or safety.

3.1.3 Licensee's Proposed Alternative Testing

The licensee states:

LaSalle County Station Units 1 and 2 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 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 alarms upon reaching their low setpoints. Technical specification surveillance requirements (SR) (i.e., SR 3.5.1.1, SR 3.5.2.3, and SR 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) (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, LaSalle County Station Units 1 and 2 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.

Comprehensive testing is not applicable as these pumps do not provide a safety-related function beyond providing for the readiness of their supported system's pump and thus have no acceptance criteria for a comprehensive test.

3.1.4 Evaluation

ISTB-5123 requires that each water leg pump be comprehensively tested by operating the pump at a specified reference point and recording the measured flow, differential pressure, and bearing vibration for comparison with the ASME OM Code acceptance criteria. The design of the HPCS, LPCS, RHR, and RCIC water leg pumps does not enable a comprehensive test to be readily performed in accordance with the ASME OM Code. The necessary flow instrumentation is not installed in the systems and a plant modification would be necessary to install the flow instrumentation, which would be a hardship to the licensee. 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. The vibration and differential pressure data will be trended as directed by ISTB-5121 (Group A Test Procedure) as amended by RR RP-01. Also, the operability of the water leg pumps will be ensured by verifying flow (but not measuring flow) through a high point vent on the ECCS pump discharge header piping on a monthly basis.

While the proposed IST would not be as complete as it would be if the ASME OM Code requirements for a comprehensive pump test were imposed, 10 CFR 50.55a does include provisions for hardships due to design limitations, as the initial imposition of the ASME OM Code requirements was subsequent to the design and construction of a number of nuclear plants, including LSCS. 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 water hammer upon the start of the main ECCS pump. 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. Each ECCS pump discharge header piping has a low pressure sensor. An alarm 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, (2) alarms are present which provide a continuous monitoring of degradation in the pressure of the ECCS pump discharge header piping, and (3) flow is verified monthly by opening a vent on the main header piping to observe discharge. Accordingly, after reviewing the licensee's proposed alternative, the NRC staff concludes that requiring compliance with the specified ASME OM Code requirement at LSCS would not result in a compensating increase in the level of quality and safety.

4.0 CONCLUSION

The NRC staff concludes that requiring the licensee to comply with the specified ASME OM Code requirements would result in hardship without a compensating increase in the level of quality and safety. Accordingly, the licensee's proposed alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) for the third 10-year IST intervals at LSCS.

Principal Contributor: R. Wolfgang, NRR

Date: May 7, 2008