



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

December 2, 2010

Mr. Michael J. Pacilio  
President and Chief Nuclear Officer  
Exelon Nuclear  
4300 Winfield Road  
Warrenville, IL 60555

SUBJECT: LIMERICK GENERATING STATION, UNITS 1 AND 2 – PROPOSED RELIEF  
REQUEST I3R-13, PRESSURE TESTING OF PRIMARY CONTAINMENT  
INSTRUMENT GAS PIPING (TAC NOS. ME3141 AND ME3142)

Dear Mr. Pacilio:

By letter dated January 22, 2010 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML100261546), as supplemented by letters dated July 27 and October 13, 2010 (ADAMS Accession Nos. ML102090135 and ML102870065, respectively), Exelon Generation Company, LLC (the licensee), submitted a request proposing alternative testing for Limerick Generating Station (LGS), Units 1 and 2. The request proposes an alternative to the requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," which requires a system leakage test with a VT-2 [visual] examination for the Primary Containment Instrument Gas (PCIG) piping. Specifically, the licensee requested that as an alternative to the requirements of Table IWD-2500-1 of the ASME Code, Section XI, 2001 Edition with 2003 Addenda, LGS Units 1 and 2 will perform pressure decay testing on the PCIG piping. The request applies to the third 10-year Inservice Inspection (ISI) interval at LGS, Units 1 and 2, which began on February 1, 2007, and ends on January 31, 2017.

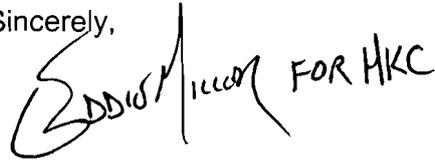
The U.S. Nuclear Regulatory Commission (NRC) staff has completed its review of relief request I3R-13 and has concluded that the proposed alternative to perform pressure decay testing for the PCIG piping every inspection period in lieu of the ASME Code-required system leakage test with an associated VT-2 visual examination, would provide an acceptable level of quality and safety as documented in the enclosed Safety Evaluation. Therefore, the proposed alternative is authorized pursuant to Title 10 of the *Code of Federal Regulations*, paragraph 50.55a(a)(3)(i), for LGS Units 1 and 2, for the third 10-year ISI interval. All other requirements of the ASME Code, Section XI, for which relief has not been specifically requested remain applicable, including third party review by the Authorized Nuclear Inservice Inspector.

M. Pacilio

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If you have any questions, please contact the LGS Project Manager, Mr. Peter J. Bamford, at 301-415-2833.

Sincerely,

A handwritten signature in black ink that reads "Harold K. Chernoff FOR HKC". The signature is stylized and written in a cursive-like font.

Harold K. Chernoff, Chief  
Plant Licensing Branch I-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket Nos. 50-352 and 50-353

Enclosure:  
As stated

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UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

PROPOSED ALTERNATIVE RELIEF REQUEST I3R-13 REGARDING

LEAKAGE TESTING FOR PRIMARY CONTAINMENT INSTRUMENT GAS PIPING

EXELON GENERATION COMPANY, LLC

LIMERICK GENERATING STATION, UNITS 1 AND 2

DOCKET NUMBERS 50-352 AND 50-353

1.0 INTRODUCTION

By letter dated January 22, 2010 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML100261546), supplemented by letters dated July 27 and October 13, 2010 (ADAMS Accession Nos. ML102090135 and ML102870065 respectively), Exelon Generation Company, LLC (the licensee) requested approval of an alternative to the requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," in regard to pressure testing of Class 3 Primary Containment Instrument Gas (PCIG) piping for Limerick Generating Station (LGS), Units 1 and 2. As an alternative to the system leakage test and VT-2 [visual] examination requirements of the ASME Code, Section XI, the licensee proposed to perform a pressure decay test of the PCIG piping, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(a)(3)(i), on the basis that the alternative provides an acceptable level of quality and safety.

2.0 REGULATORY REQUIREMENTS

Paragraph 50.55a(g) of 10 CFR requires that Inservice Inspection (ISI) of ASME Code Class 1, 2, and 3 components be performed in accordance with Section XI of the ASME Code and applicable addenda, except where specific written relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i). According to 10 CFR 50.55a(a)(3), alternatives to the requirements of paragraph 50.55a(g) may be used, when authorized by the U.S. Nuclear Regulatory Commission (NRC, or Commission), if an applicant demonstrates that the proposed alternatives would provide an acceptable level of quality and safety or if the specified requirement would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Pursuant to 10 CFR 50.55a(g)(4), ASME Code Class 1, 2, and 3 components including supports shall meet the requirements, except the design and access provisions and the preservice examination requirements, set forth in the ASME Code, Section XI, to the extent practical within the limitations of design, geometry, and materials of construction of the components. The regulations require that inservice inspection (ISI) of components and system pressure tests conducted during the first 10-year interval and subsequent intervals comply with the requirements in the latest edition and addenda of Section XI of the ASME Code incorporated by reference in 10 CFR 50.55a(b) 12 months prior to the start of the 120-month interval, subject to the limitations

Enclosure

and modifications listed therein. The ISI Code of Record for LGS, Units 1 and 2, in the third 10-year ISI interval, is the 2001 Edition of the ASME Code, Section XI, through the 2003 Addenda. The LGS, Units 1 and 2, third 10-year ISI interval began on February 1, 2007, and ends on January 31, 2017.

### 3.0 TECHNICAL EVALUATION

#### 3.1 Licensee Evaluation

The licensee identified the following ASME Code requirements to which the proposed alternative would be applicable:

[The 2001 Edition of the ASME Code, Section XI, through the 2003 Addenda] Table IWD-2500-1, Examination Category D-B, Item Number D2.10 requires all Class 3 pressure retaining components be subject to a system leakage test with a VT-2 visual examination in accordance with Paragraph IWD-5210. This pressure test is to be conducted once each inspection period.

Specifically, the proposed alternative would eliminate the requirement to perform the system leakage tests and associated VT-2 visual examination requirements specified in Table IWD-2500-1 for the ASME Code, Class 3 PCIG piping, while substituting an alternative pressure decay test.

The licensee's reason for requesting relief is stated as follows:

The PCIG system is pneumatic; therefore, the Code-required VT-2 visual examination would require the application of a leak detection solution to the subject piping and components. Much of this piping is 20 to 30 feet above floor level and is inaccessible as a result of it being routed through walls, in close proximity to sensitive plant equipment and other equipment obstructions, resulting in an inability to perform a complete VT-2 visual examination of the pressurized piping. A system leakage test and VT-2 visual examination of the Unit 2 PCIG piping, which includes approximately 500 feet of small bore piping, was performed on December 17, 2009. Approximately 39 [percent]% of the "A" loop and 68% of the "B" loop piping was inaccessible for inspection. No scaffolding was used for this inspection; however, even with scaffolding, 100% inspection could not be performed. No indications were identified during the VT-2 visual examinations. A walkdown performed on the Unit 1 piping determined that the inaccessible piping configuration for Unit 1 is similar to that of Unit 2.

The licensee's proposed alternative is:

As an alternative to the examination requirements of Table IWD-2500-1, LGS Units 1 and 2 will perform pressure decay testing once per inspection period, which is equivalent to the Code-required frequency.

The pressure decay test is performed by isolating and pressurizing the associated piping to the nominal operating pressure. The decay in pressure is then monitored through calibrated pressure instrumentation. If the acceptable pressure decay criterion is exceeded, additional investigation will be performed to locate the leak.

The licensee's basis for the acceptability of the pressure decay test is that it will, "...ensure an acceptable level of system reliability and structural integrity, which is the intent of the Code-required VT-2 pressure test."

### 3.2 NRC Staff Evaluation

The licensee has proposed an alternative in lieu of the VT-2 visual examination and leakage test for the PCIG piping, involving the use of a pressure decay test. During the review of this proposed alternative, the NRC staff requested that the licensee provide the specific parameters and test criteria of the pressure decay test. The licensee provided the appropriate test parameters and leakage acceptance criteria. Any pressure decay in excess of the value outlined in the licensee's testing criteria would initiate leak detection and necessary corrective actions.

The NRC staff notes that the pressure decay method is allowed for buried piping where a VT-2 visual examination cannot be performed in accordance with the ASME Code, Section XI, paragraph IWA-5244. This ASME Code specification has been endorsed by the NRC as specified in 10 CFR 50.55a(b)(2). In this case, when using the pressure decay test the ASME Code requires the owner (the licensee) to specify the test parameters.

By its previous approval of the ASME Code that allows the pressure decay test under conditions where a VT-2 visual examination cannot reasonably be performed, such as is specified in IWA-5244, the NRC staff has agreed that the pressure decay test method provides a reasonable alternative to a system leakage test with associated VT-2 examination, in those cases. In these cases, the ASME code requires the licensee to specify the test acceptance criteria, which the licensee has done for this application. Further, through its review of the test parameters and acceptance criteria, the NRC staff concurs with the licensee that for the PCIG piping, the pressure decay test will identify leakage in the PCIG piping similar to what would have been provided in the ASME Code-required system leakage test with VT-2 examination. The timing requirements for performing the pressure decay test will be same as it would have been with the ASME Code-required system leakage test and associated VT-2 examination (once per ISI interval period), providing the same frequency of evaluation. Therefore, based on these factors, the staff has determined that the licensee's proposed alternative would provide an acceptable level of quality and safety.

### 4.0 CONCLUSION

As set forth above, the NRC staff concludes that the licensee's proposed alternative to perform pressure decay test for the PCIG piping every inspection period in lieu of the ASME Code-required system pressure test with VT-2 visual examination provides an acceptable level of quality and safety. Accordingly, the NRC staff concludes that the licensee has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(a)(3)(i). Therefore, the proposed alternative described in relief request I3R-13 is authorized pursuant to 10 CFR 50.55a(a)(3)(i) for LGS, Units 1 and 2, for the third 10-year inservice inspection interval, which ends on January 31, 2017. All other requirements of the ASME Code, Section XI, for which relief has not been specifically requested remain applicable, including a third party review by the Authorized Nuclear Inservice Inspector.

Principal Contributor: P. Patnaik

Date: December 2, 2010

M. Pacilio

- 2 -

If you have any questions, please contact the LGS Project Manager, Mr. Peter J. Bamford, at 301-415-2833.

Sincerely,

*/ra/ (GMiller for)*

Harold K. Chernoff, Chief  
Plant Licensing Branch I-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket Nos. 50-352 and 50-353

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OFFICE	LPLI-2/PM	LPLI-2/PM	LPLI-2/LA	DCI/CSGB	LPLI-2/BC
NAME	JWhited	PBamford	ABaxter	RTaylor*	HChernoff (GMiller for)
DATE	11/30/2010	11/30/2010	12/2/2010	11/2/2010	12/2/2010

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