



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

January 3, 2018

Mr. Bryan C. Hanson  
Senior Vice President  
Exelon Generation Company, LLC  
President and Chief Nuclear Officer  
Exelon Nuclear  
LaSalle County Station  
4300 Winfield Road  
Warrenville, IL 60555

SUBJECT: LASALLE COUNTY STATION, UNITS 1 AND 2 – APPROVAL OF  
ALTERNATIVE TO THE ASME CODE REGARDING INSPECTION OF  
HYDROGEN RECOMBINER SYSTEM PIPING – RELIEF REQUEST I4R-08  
(CAC NOS. MF9772 AND MF9773; EPID L-2017-LLR-0036)

Dear Mr. Hanson:

By letter dated May 30, 2017 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17150A449), Exelon Generation Company, LLC (EGC, the licensee) submitted a request to the U.S. Nuclear Regulatory Commission (NRC) for the use of alternatives to certain American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, requirements at LaSalle County Station (LSCS), Units 1 and 2 for the fourth 10-year inspection interval.

The other alternative requests submitted by letter dated May 30, 2017 (ADAMS Accession No. ML17150A449), will be addressed via separate correspondence.

Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.55a(z)(2), EGC requested to use the alternative on the basis that compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

The NRC staff has reviewed the subject request and concludes, as set forth in the enclosed safety evaluation, that requiring the licensee to perform a Code-required examination would impose an undue hardship or unusual difficulty on the licensee without a compensating increase in the level of quality and safety. Accordingly, the NRC staff concludes that EGC has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(z)(2).

The NRC staff authorizes the use of Relief Request I4R-08 at LSCS, Units 1 and 2, until the end of the fourth 10-year ISI interval, which is scheduled to end on September 30, 2027.

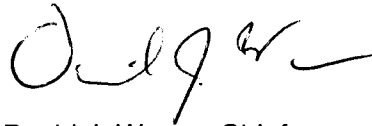
All other ASME Code, Section XI, requirements for which relief was not specifically requested and authorized herein by the NRC staff remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.

B. Hanson

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If you have any questions, please contact the project manager at 301-415-3308 or via e-mail at [Bhaichandra.Vaidya@nrc.gov](mailto:Bhaichandra.Vaidya@nrc.gov).

Sincerely,

A handwritten signature in black ink, appearing to read "D. Wrona", with a horizontal flourish extending to the right.

David J. Wrona, Chief  
Plant Licensing Branch III  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket Nos. 50-373 and 50-374

Enclosure:  
Safety Evaluation

cc: Listserv



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

INSERVICE INSPECTION RELIEF REQUEST I4R-08

FOURTH 10-YEAR INSPECTION 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 May 30, 2017 (Agencywide Documents Management System (ADAMS) Accession No. ML17150A449), Exelon Generation Company, LLC (EGC, the licensee) submitted, for the U.S. Nuclear Regulatory Commission (NRC) approval, inservice inspection (ISI) Relief Request (RR) I4R-08 for LaSalle County Station (LSCS), Units 1 and 2, for the fourth 10-year inspection interval which began on October 1, 2017, and concludes on September 30, 2027.

Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.55a(z)(2), EGC proposed an alternative to certain requirements in the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code) for the system leakage test of the unit cross-tie piping of the hydrogen recombiner, on the basis that compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

2.0 REGULATORY EVALUATION

The ISI of ASME Code Class 1, 2, and 3 components is to be performed in accordance with ASME Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," and applicable editions and addenda as required by 10 CFR 50.55a(g), except where specific written relief has been granted by the NRC.

The regulations in 10 CFR 50.55a(z) state, in part, that alternatives to the requirements of paragraph (g) of 10 CFR 50.55a may be used, when authorized by the NRC, if the licensee demonstrates that (1) the proposed alternative would provide an acceptable level of quality and safety; or (2) compliance with the specified requirements of this section would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Based on the above, and subject to the following technical evaluation, the NRC staff finds that regulatory authority exists for the licensee to request, and the NRC to authorize, the proposed alternative requested by the licensee.

### 3.0 TECHNICAL EVALUATION

#### 3.1 Licensee's Request for Alternative

##### 3.1.1 Components for Which Relief is Requested:

|                       |  |
|-----------------------|--|
| Code Class:           | 2  |
| Reference:            | IWC-2500, Table IWC-2500-1   |
| Examination Category: | C-H  |
| Item Number:          | C7.10  |
| Description:          | Hydrogen Recombiner System Piping  |
| Component Number:     | HG Unit Cross-Tie Piping<br>From check valve 1HG007 to check valve 2HG016<br>From check valve 1HG016 to check valve 2HG007<br>From check valve 1HG009 to check valve 2HG006B<br>From check valve 1HG006B to check valve 2HG009 |

##### 3.1.2 Applicable ASME Code Edition and Addenda

The ISI program is based on the ASME Code, Section XI, 2007 Edition through the 2008 Addenda.

##### 3.1.3 Applicable ASME Code Requirements

The ASME Code, Section XI, Table IWC-2500-1, Examination Category C-H, Item Number C7.10, requires all Class 2 pressure retaining components be subject to a system leakage test with a VT-2 visual examination in accordance with IWC-5220. This pressure test is to be conducted once each inspection period.

The ASME Code, Section XI, IWC-5210(b)(2), requires the test procedure to include methods for detection and location of through-wall leakage from the components of the system tested when the pressurizing medium is gas.

##### 3.1.4 Licensee's Proposed Alternative

A pressure test will be performed on the unit cross-tie piping welds, at peak accident pressure, once each inspection interval.

Necessary scaffolding will be erected and leak detection solution will be applied to the surface of the unit cross-tie piping to the extent required by the ASME Code, Section XI, IWC-5210(b)(2), if:

- Through wall leakage is detected during pressure testing of accessible components and associated piping (for the remainder of piping system for which no relief is requested).

OR

- Through wall leakage is detected during pressure testing of unit cross-tie piping welds.

### 3.1.5 Licensee's Technical Basis

Relief is requested from the system pressure test requirements of the ASME Code, Section XI, IWC-5221, and the periodicity requirements of Table IWC-2500-1, as well as the requirements of IWC-5210(b)(2) as applied to the cross-tie piping of the hydrogen recombiner system. Air is used as the pressurizing medium for the hydrogen recombiner system because the system contains air during normal operation. The application of a leak detection solution (e.g., soap bubble solution) to the surface of the piping would be necessary per IWC-5210(b)(2) in order to allow for the detection and location of potential through-wall air leakage. To access the surface of the cross-tie piping, scaffolding is required because there are long runs of piping located approximately 30 feet overhead. EGC estimated an accumulated dose of 1.44 rem (roentgen equivalent man) would be required to perform a leakage test of cross-tie piping. Furthermore, a significant amount of scaffolding would have to be erected around several sensitive instrument racks and systems on both units that, if jarred, could result in a unit trip or other challenges to the operators.

Alternatively, LSCS will challenge the unit cross-tie piping to provide assurance of its structural integrity by performing pressure test at peak accident pressure and applying a soap bubble solution to all pipe welds once per Inspection Interval. Necessary scaffolding will be erected and leak detection solution will be applied to the surface of the unit cross-tie piping to the extent required by the ASME Code, Section XI, IWC-5210(b)(2), if through-wall leakage is detected during pressure testing of accessible components and associated piping, which is performed once every inspection period, or if through-wall leakage is detected during pressure testing unit cross-tie piping welds. The condition of the accessible components as determined by pressure testing of the accessible components once every inspection period in accordance with the Section XI rules would be indicative of that of the inaccessible components. Both the accessible and inaccessible components are designed/constructed to the same requirements and are subject to similar operating conditions. Additionally, the hydrogen recombiners, including the unit cross-tie piping, are functionally tested every refuel outage to verify system temperature, pressure, and flow requirements to further ensure system operability and structural integrity.

Based on the above discussion, reasonable assurance of the unit cross-tie piping structural integrity is achieved by the performance of the alternate pressure test of piping welds once every ISI interval.

### 3.1.6 Duration of Proposed Alternative

Relief is requested for the fourth 10-year ISI interval at LSCS, which began on October 1, 2017, and concludes on September 30, 2027.

## 3.2 NRC Staff Evaluation

EGC requested relief from certain ASME Code requirements in performing the system pressure (leakage) test of the unit cross-tie piping, of the hydrogen recombiner system, at LSCS, in accordance with 10 CFR 50.55a(z)(2) on the basis that compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

The system pressure test uses air as the pressurizing medium and a soap solution for detection and location of leak. The proposed alternative consists of two parts, one of which pertains to a limited VT-2 (visual) examination of the cross-tie piping as the ASME Code requires that 100 percent of the pressure boundary surface be visually examined to detect and locate potential leakage. An alternative to the required 100 percent VT-2 examination of the piping surface is needed because several hundred feet of cross-tie piping are located 30 feet overhead and are inaccessible for examination. To meet the ASME Code requirements, considerable amount of scaffolding is required to be erected in a radiation area, surrounded by several sensitive instrument racks and systems. The licensee estimated that the examinations would require approximately 1.44 rem. Therefore, the NRC staff concludes that the performance of the ASME Code required inspections, including erecting of the scaffolding for performing a leakage examination over the entire cross-tie piping surface, would impose undue hardship or unusual difficulties on the licensee.

The second part of the proposed alternative pertains to the frequency of the examination required by the ASME Code for this piping. The licensee proposed to perform the pressure test at peak accident pressure once per inspection interval and limit the inspection to all pipe welds with the application of soap solution, rather than performing the system pressure test once per inspection period as required by the ASME Code. The licensee will continue to perform a VT-2 visual examination of the accessible portion of this piping that need no scaffolding during each inspection period in accordance with the ASME Code. In addition, the boundary of the surface examination will be extended to cover the inaccessible portion of this piping as required by the ASME Code, Section XI, IWC-5210(b)(2), if through-wall leakage is detected during the system pressure testing of the accessible and inaccessible components and associated piping.

The NRC staff finds that the licensee's proposed alternative provides reasonable assurance of structural integrity of the unit cross-tie piping. This is based on the following considerations:

- (1) The accessible and inaccessible portions of the piping are made of identical material and size, and are exposed to similar service conditions in terms of stress and temperature. Therefore, the examination of accessible piping would provide a reasonable indication regarding the condition of the inaccessible portion of the piping.
- (2) The welds in a piping system are considered to be the weakest links in the piping system. Therefore, leakage at weld locations is more likely to occur than leakage in the piping base material. Hence, examinations of the piping welds after the system pressure test would provide reasonable assurance of the leak-tight integrity of the entire cross-tie piping.
- (3) The pressure in the referenced piping system during most of the plant life is very low. Furthermore, the piping contains ambient air and the potential for developing any environmentally-assisted cracking is expected to be negligible. Therefore, any gross rupture of the piping due to large undetected cracks is highly unlikely.
- (4) The proposed system pressure test for this piping is going to be performed at the peak accident pressure (39.9 pounds per square inch gauge, psig) which is more conservative than that required by the ASME Code (atmosphere pressure). Therefore, the results of the proposed system pressure test will provide reasonable assurance in demonstrating the structural integrity of the piping.

Therefore, given the licensee's identified hardship of at least 1.44 rem to perform compliant examinations and the compensating level of quality and safety of the licensee's proposed alternative which provides reasonable assurance of structural integrity, the NRC staff finds the licensee has provided sufficient technical basis to authorize the proposed alternative in accordance with 10 CFR 50.55a(z)(2).

#### 4.0 CONCLUSION

As set forth above, the NRC staff determines that requiring the licensee to perform a Code-required examination would impose an undue hardship or unusual difficulty on the licensee without a compensating increase in the 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(z)(2). Therefore, the NRC staff authorizes the use of alternative proposed in Relief Request I4R-08 at LSCS, Units 1 and 2, until the end of the fourth 10-year ISI interval which concludes on September 30, 2027.

All other ASME Code, Section XI, requirements for which relief was not specifically requested and authorized herein by the NRC staff remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.

Principal Contributor: J. Collins, NRR

Date of issuance: January 3, 2018

SUBJECT: LASALLE COUNTY STATION, UNITS 1 AND 2 – APPROVAL OF ALTERNATIVE TO THE ASME CODE REGARDING INSPECTION OF HYDROGEN RECOMBINER SYSTEM PIPING – RELIEF REQUEST I4R-08 (CAC NOS. MF9772 AND MF9773; EPID L-2017-LLR-0036) DATED JANUARY 3, 2018

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**ADAMS Accession No. ML17354A854**

\*by email

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