



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

January 23, 2018

Mr. Bryan C. Hanson  
Senior Vice President  
Exelon Generation Company, LLC  
President and Chief Nuclear Officer (CNO)  
Exelon Nuclear  
4300 Winfield Road  
Warrenville, IL 60555

SUBJECT: LASALLE COUNTY STATION, UNITS 1 AND 2, RELIEF FROM THE REQUIREMENTS OF THE ASME CODE AND OM CODE RE: RELIEF REQUESTS I4R-04, PROPOSED ALTERNATIVE TO INSERVICE INSPECTION INTERVAL (ISI) REQUIREMENTS OF THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME CODE), SECTION XI, 2007 EDITION WITH THE 2008 ADDENDA FOR THE FOURTH SUBSEQUENT 10-YEAR ISI INTERVALS (CAC NOS. MF9764 AND MF9765; EPID L-2017-LLR-0034)

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 relief requests (RRs) associated with the fourth Inservice Inspection (ISI) interval for LaSalle County Station (LSCS), Units 1 and 2. The fourth interval of the LSCS ISI program is currently scheduled to begin on October 1, 2017, and end on September 30, 2027, and will comply with the American Society of Mechanical Engineers Boiler and Pressure Vessel (ASME Code), Section XI, 2007 Edition with the 2008 Addenda.

Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(z)(1), the licensee requested the following RR for the LSCS fourth 10-year ISI interval:

Relief Request I4R-04 requests approval of alternative post-tensioning system inspection scheduling requirements for sites with two plants. EGC requested approval of a proposed alternative to the post-tensioning system inspection scheduling requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, IWL-2421, on the basis that the proposed alternative will provide an acceptable level of quality and safety. Relief is requested for the remainder of the current fourth ISI interval, as well as the remaining term of the renewed facility operating licenses (NPF-11 for Unit 1 and NPF-18 for Unit 2), which expire at midnight on April 17, 2042, and at midnight on December 16, 2043, for LSCS, Units 1 and 2, respectively. The fourth ISI interval, as well as the remaining term of the renewed facility operating licenses, refers to the LSCS, Units 1 and 2, current fourth and upcoming fifth and sixth 120-month ISI program intervals.

The other RRs submitted by letter dated May 30, 2017 (ADAMS Accession No. ML17150A449), have been addressed via separate correspondence.

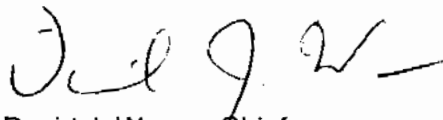
The U.S. Nuclear Regulatory Commission (NRC) staff has reviewed the subject request, and concludes, as set forth in the enclosed safety evaluation (SE) that the alternative proposed by the licensee in the RR I4R-04, to use the modified surveillance schedule of ASME Code, Section XI, IWL-2421(b), based on treating the two primary concrete containment units at LSCS as a "twin containment site" provides an acceptable level of quality and safety. Accordingly, the NRC staff concludes that the licensee has adequately addressed the regulatory requirements set forth in 10 CFR 50.55a(z)(1).

Therefore, the NRC staff authorizes the use of RR I4R-04 at LSCS, Units 1 and 2, for the remainder of the current fourth ISI interval, as well as the remaining term of the renewed facility operating licenses (NPF-11 for Unit 1 and NPF-18 for Unit 2), which expire at midnight on April 17, 2042, and at midnight on December 16, 2043, for LSCS, Units 1 and 2, respectively. The fourth ISI interval, as well as the remaining term of the renewed facility operating licenses, refers to the LSCS, Units 1 and 2, current fourth and upcoming fifth and sixth 120-month ISI program intervals.

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

Please contact the Project Manager, Bhalchandra K. Vaidya at (301)415-3308, if you have any questions.

Sincerely,



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:  
As stated

cc w/enclosure: Listserv



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELIEF REQUEST I4R-04 FOR

POST-TENSIONING SYSTEM INSPECTION SCHEDULING

REQUIREMENTS FOR SITES WITH TWO PLANTS

LASALLE COUNTY STATION, UNITS 1 AND 2

RENEWED FACILITY OPERATING LICENSE NOS. NPF-11 AND NPF-18

DOCKET NOS. 50-373 AND 50-374

1.0 INTRODUCTION

By letter dated May 30, 2017 (Agencywide Document Access and Management System (ADAMS) Accession No. ML17150A449), Exelon Generation Company, LLC (EGC), the licensee of LaSalle County Station (LSCS), Units 1 and 2, requested relief from the requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, Subsection IWL-2421, 2007 Edition with the 2008 Addenda, incorporated by reference in Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a "Codes and Standards."

Specifically, pursuant to 10 CFR 50.55a(z)(1), EGC requested approval of a proposed alternative to post-tensioning system inspection scheduling requirements of IWL-2421. The requested approval was for the remainder of the current fourth inservice inspection (ISI) program interval (third 10-year containment inservice inspection (CISI) program interval) and for the remaining 10-year inspection intervals of the LSCS renewed facility operating licenses (NPF-11 for Unit 1, expiring at midnight on April 17, 2042; and NPF-18 for Unit 2, expiring at midnight on December 16, 2043), on the basis that the proposed alternative provides an acceptable level of quality and safety.

2.0 REGULATORY EVALUATION

Regulation 10 CFR 50.55a(g)(4) requires that throughout the service life of boiling- or pressurized-water-cooled nuclear power facilities, ISIs, repairs, and replacements of ASME Code Class CC pressure retaining components and their integral attachments must meet ASME Code, Section XI, and addenda requirements as incorporated by reference in 10 CFR 50.55a and subject to specified conditions and limitations. Subsection IWL of the ASME Code, Section XI, provides rules for CISI and repair/replacement activities of the reinforced concrete and post tensioning systems of Class CC components. The regulation in 10 CFR 50.55a(z)(1) states that alternatives to the requirements of paragraphs (b) through (h) of 10 CFR 50.55a, "Codes and Standards," or portions thereof, may

be used when authorized by the Director of the Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission (NRC) provided that the licensee proposed alternative demonstrates an acceptable level of quality and safety. By this relief request (RR), EGC has proposed an alternative to the requirements of 10 CFR 50.55a(g)(4) for Subsection IWL-2421 regarding scheduling of ISI and testing of identical post-tensioning systems for sites with multiple plants.

In paragraph IWL-2421(a) of the ASME Code, Section XI, 2007 Edition, 2008 Addenda, in the current code of record (COR), as well as of the previous applicable COR, states that the test schedule for the unbonded post-tensioning tendon system of concrete primary containments for sites with multiple plants may be modified as specified in IWL-2421(b) provided the following are met:

1. Both primary containments utilize the same pre-stressing system and are essentially identical in design;
2. Post-tensioning operations for the two primary containments were completed not more than 2 years apart; and
3. Both containments are similarly exposed to or protected from the outside environment.

For unbonded post-tensioning systems, paragraph IWL-2421(b) specifies that when the conditions of IWL-2421(a) are met, the inspection dates and examination requirements may be as follows:

1. For the containment with the first structural integrity test (SIT), all examinations required by IWL-2500 shall be performed at 1, 3, and 10 years and every 10 years thereafter. Only the examinations required by IWL-2524 and IWL-2525 need be performed at 5 and 15 years and every 10 years thereafter; and
2. For each subsequent containment constructed at the site, all examinations required by IWL-2500 shall be performed at 1, 5, and 15 years and every 10 years thereafter. Only the examinations required by IWL-2524 and IWL-2525 need be performed at 3 and 10 years and every 10 years thereafter.

### 3.0 TECHNICAL EVALUATION

#### 3.1 RR I4R-04

The licensee is requesting relief pursuant 10 CFR 50.55a(z)(1) from the post-tensioning system inspection scheduling requirements in IWL-2421 for sites with two plants, on the basis that the proposed alternative will provide an acceptable level of quality and safety.

##### 3.1.1 Applicable ASME Code Requirements and Components Affected

The licensee is requesting relief as part of eight RRs related to the fourth 10-year Inservice Inspection (ISI) Program interval. EGC is requesting relief from the ASME Code, Section XI, 2007 Edition, 2008 Addenda, concrete containment post-tensioning system testing and examination scheduling requirements recognizing the two LSCS primary containments as "twin containments."

### 3.1.2 Proposed Alternative and Basis for Request

In this request, the licensee discusses how the modified test schedule of IWL-2421(b) currently in use through past NRC approvals will continue to be used for reinforced concrete (Class CC concrete containment components) pursuant to ASME Code, Section XI, Table IWL-2500-1, Examination Category L-B, "Unbonded Post-tensioning System," Examination Category L2.10, "Tendon," tests, and Examination Category L2.20, (tendon) "Wires or Strands," examinations for sites with multiple plants.

The licensee previously stated the IWL-2421(a) requirements for identification of unbonded post-tensioned concrete containments for sites with two plants as "twins containments," noting that code requirements (i) and (iii) are satisfied because LSCS, Units 1 and 2, primary containments utilize the same prestressing system, are essentially identical in design, and both primary containments are similarly exposed to or protected from the outside environment. However for code requirement (ii), the licensee notes the post-tensioning operations for the two plants were 29 months apart or 5 more months than the ASME Code allowance of 2 years.

The licensee discussed past NRC RR approvals that identified the LSCS primary containments as "twin containments." In a letter dated June 3, 1994, the NRC in Amendments No. 100 for LSCS, Unit 1, and No. 84 for LSCS, Unit 2, approved the use of the guidance contained in Regulatory Guide (RG) 1.35, "Inservice Inspection of Ungrouted Tendons in Prestressed Concrete Containments, Revision 3," and the use of the provisions of surveillance requirement (SR) 3.0.2, in addition to the treatment of both LSCS primary containments as "twin containments." The licensee's request notes that the 2-year period was also specified in RG 1.35 but was based on the performance of SITs which for the two LSCS primary containments were 55 months apart, and that assessment of deflections obtained from multiple SITs at several locations lead NRC to conclude the designation of the two primary containments as "twin containments" was acceptable. The licensee's request further notes that it is similar in approach to the previously approved RR 13R-05 associated with the second 10-year CISI program interval approved by the NRC on January 15, 2008.

The licensee further stated that for the continued treatment of the two LSCS primary containments during the Third CISI 10-year Program interval as "twin containments," IWL surveillances demonstrated that the 29 months apart completion of post-tensioning operations between the two LSCS primary containments is not a factor affecting the performance of the containments or contributing to unique conditions that may subject either of the two primary containments to a different potential structural or tendon deterioration.

The current RR states that to date both LSCS primary containments have met the required post-tensioning system surveillance acceptance criteria, or ASME Code, Section XI, repair and replacement activities have been completed to return them to acceptable condition. The request also states that the initiation of the IWL-2400 rolling 5 year schedule was based on the previous inspection dates under the station tendon surveillance program prior to Subsection IWL being endorsed. The licensee further states that the modified inspection and examination schedule of IWL-2421(b) will continue to be used for LSCS, Units 1 and 2, tendon tests and wire/strand examinations throughout the requested relief intervals. To date, completed post-tensioned system inspections include years 1, 3, 5, 10, 15, 20, 25, 30, 35 for LSCS, Unit 1; and for years 1, 3, 5, 10, 15, 20, 25, and 30 for LSCS, Unit 2, with the tendon and wire/strand tests being-completed every other 5 year period.

### 3.1.3 Duration of Proposed Alternative

The licensee requested that the duration of the proposed alternative is for the fourth ISI and third CISI 10-year program intervals as well as for the remaining term of the renewed LSCS facility operating licenses. The applicable ISIs are the fourth and upcoming fifth and sixth 10-year ISI program intervals.

### 3.2 Staff Evaluation

The NRC staff reviewed the approvals of previous RRs (as discussed below) that considered the two LSCS primary containments as "twin containments" based on Subsection IWL-2421(a) and the modified tendon testing and wire/strand examination schedule of IWL-2421(b) which establish precedence for this RR.

In a letter dated June 3, 1994 (ADAMS Accession No. ML021130097), the NRC approved the licensee's request to delete technical specifications Section 3/4.6.1.5, "Primary Containment Structural Integrity," and the associated SRs and replace them with the "Inservice Inspection Program for Post-Tensioning Tendons." The program based on RG 1.35, Revision 3, recognized the two containments as "twin containments" not on the RG 1.35 recommended guidance of 24 months but on their 55 months apart SITs.

The NRC staff also approved Amendment No. 148 for Unit 1 and Amendment No. 134 for Unit 2, dated August 16, 2001 (ADAMS Accession No. ML012060445), which reauthorized treatment of the two LSCS primary containments as "twin containments." The amendments changed the RG 1.35, Revision 3, referenced in the "Inservice Inspection Program for Post-Tensioning Tendons" with the newly established regulatory requirement of 10 CFR 50.55a incorporating by reference Subsection IWL of the ASME Code Section XI, 1998 Edition. The ASME Code, Subsection IWL-2421(a), requirements to which the licensee referenced at the time of submittal recognizing the two primary containments as "twin containments" are identical to the COR the licensee is using for this request for the third 10-year CISI program interval. Concurrently, the NRC also approved RR CR-32 (ADAMS Accession No. ML012050221), in which the staff concluded that the structural behavior of the two LSCS primary containments and their post-tensioning systems are similar, allowing them to be considered as "twin containments" for scheduling their tendon surveillance intervals.

On January 15, 2008, the NRC approved for the second 10-year CISI program interval RR I3R-05 (ADAMS Accession No. ML073521568), which authorized LSCS to continue treatment of its two primary containments as "twin containments" and allowed the modified test schedule of IWL-2421(b). In RR I3R-05, the licensee used the same approach as in RR CR-32.

The current and fourth I4R-04 RR seeks once again the recognition of the two LSCS containments as "twin containments" that would allow the modified schedule for the third 10-year CISI program interval and for the remaining term of its renewed facility operating licenses. As previously stated, the RR was initiated pursuant 10 CFR 50.55a(g)(4)(ii) that requires the applicable "[i]nservice examination of components and system pressure tests conducted during successive 120-month inspection intervals ...[to]... comply with the requirements of the latest edition and addenda of the ASME Code incorporated by reference in paragraph [50.55](a) ... 12 months before the start of the 120-month inspection interval," which at the time of submittal was ASME Code, Section XI, 2007 Edition, 2008 Addenda.



As noted above, in the review of past RR approvals, IWL-2421 for ASME Code, Section XI, 2007 Edition, 2008 Addenda, reads the same as in the previous editions. However, during the approval of RR IR3-05, even though there were identical assessments of IWL-2421 in past relief considerations, the NRC staff expressed concerns when deliberated on the structural integrity evaluation of one unit when ISIs SRs performed in the other ("twin") unit yielded questionable sampled tendon prestress forces or degraded tendons. The licensee in response to a relevant request for additional information, stated that inspections and testing of the post-tensioning system follow a plant procedure to evaluate the same condition(s) at the other site unit in the event of failed acceptance criteria in one unit. Furthermore, the licensee considers the identified unacceptable condition(s) in the Corrective Action Program for appropriate resolution, leading the NRC staff to conclude of the existence of "a sound procedure and rationale approach" to address tendon integrity issues.

In 2016, the NRC also performed a comprehensive review of the "twin containments" and of the identical tendon prestressing systems at both LSCS primary containment units as documented in NUREG-2205, "Safety Evaluation Report Related to the License Renewal of LaSalle County Station, Units 1 and 2, Docket Nos. 50-373 and 50-374, Exelon Generation Company" (ADAMS Accession No. ML16271A039). During its review, the staff verified that the licensee periodically evaluates the condition of the "twin containments" and their unbonded post-tensioning systems through measurements and trending of sampled tendon prestressing forces consistent with the ASME Code, Section XI, Subsection IWL, based concrete containment tendon prestress program and the guidance in RG 1.35.1 (ADAMS Accession No. ML003740040).

Consideration was also given in this RR to extend the IWL-2421(b) modified test schedule based on the recognition that the two LSCS primary containments remain as "twin containments" per IWL-2421(a) discussed above for the remaining term of LSCS renewed facility operating licenses. On June 11, 2010, the NRC granted an RR to Southern Nuclear Operating Company (ADAMS Accession No. ML100900129), that also involved a relief from the requirements of IWL-2400 for concrete and unbonded post-tensioning system of twin units for the remaining term of the then ISI interval and for all subsequent ISI intervals provided the requirements in Subsection IWL-2400 of applicable ASME Code COR for these subsequent intervals remains the same as for the one being approved, and that all applicable ASME Code, Section XI, Editions and Addenda for subsequent 120-month inspection intervals are in accordance with 10 CFR 50.55a(g)(4)(ii).

Based on past NRC approvals considering the LSCS, Units 1 and 2, as a "twin containment site" for continuity of inspections, and supplemental reviews and the approvals noted above, the staff finds that the EGC's proposed alternative in RR I4R-04, with regard to SRs of the post-tensioning systems of LSCS, Units 1 and 2, would continue to provide acceptable level of quality and safety for the fourth 10-Year ISI (third 10-year CISI) program intervals and for subsequent ISI and CISI intervals, including the requirements of IWL-2421, "Sites with Multiple Plants" for the applicable ASME COR for these subsequent intervals, including third-party review by the Authorized Nuclear Inservice Inspector.

#### 4.0 CONCLUSION

The NRC staff has reviewed the subject request, and concludes, as set forth above, that the alternative proposed by the licensee in the relief request I4R-04, to use the modified surveillance schedule of ASME Code, Section XI, IWL-2421(b), based on treating the two primary concrete containment units at LSCS as a "twin containment site," provides an

acceptable level of quality and safety. Accordingly, the NRC staff concludes that the licensee has adequately addressed the regulatory requirements set forth in 10 CFR 50.55a(z)(1).

Therefore, the NRC staff authorizes the use of RR I4R-04 at LSCS, Units 1 and 2, for the remainder of the current fourth ISI interval, as well as the remaining term of the renewed facility operating licenses (NPF-11 for Unit 1 and NPF-18 for Unit 2), which expire at midnight on April 17, 2042, and at midnight on December 16, 2043, for LSCS, Units 1 and 2, respectively. The fourth ISI interval, as well as the remaining term of the renewed facility operating licenses, refers to the LSCS, Units 1 and 2, current fourth and upcoming fifth and sixth 120-month ISI program intervals.

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

Principal Contributor: A. Prinaris, NRR/ESEB

Date of issuance: January 23, 2018



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**ADAMS Accession No.: ML18011B111**

(\*) No Substantial change from SE Input Memorandum and email

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