

RS-17-071

10 CFR 50.55a

May 17, 2017

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

LaSalle County Station, Units 1 and 2
Renewed Facility Operating License Nos. NPF-11 and NPF-18
NRC Docket Nos. 50-373 and 50-374

Subject: Proposed Alternative to Utilize Code Case N-513-4, "Evaluation Criteria for Temporary Acceptance of Flaws in Moderate Energy Class 2 or 3 Piping Section XI, Division 1"

In accordance with 10 CFR 50.55a, "Codes and standards," paragraph (z)(2), Exelon Generation Company, LLC (EGC) is requesting a proposed alternative to the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," on the basis that 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. Specifically, EGC is requesting in Relief Request I4R-10 to apply the evaluation methods of ASME Code Case N-513-4, "Evaluation Criteria for Temporary Acceptance of Flaws in Moderate Energy Class 2 or 3 Piping Section XI, Division 1," to Class 2 and 3 moderate energy piping including elbows, bent pipe, reducers, expanders, and branch tees.

A relief request similar to I4R-10 has previously been approved for use at LSCS for the Third Ten-Year Inservice Inspection (ISI) Interval (Reference ADAMS Accession No. ML16230A237). EGC is requesting NRC approval of Relief Request I4R-10 by September 30, 2017, to support implementation of the LSCS Fourth Ten-Year ISI Interval. 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 ASME Boiler and Pressure Vessel (B&PV) Code, Section XI, 2007 Edition with the 2008 Addenda.

There are no regulatory commitments contained within in this letter. Should you have any questions concerning this letter, please contact Ms. Lisa A. Simpson at (630) 657-2815.

Respectfully,



David M. Gullott
Manager – Licensing
Exelon Generation Company, LLC

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Attachment: 10 CFR 50.55a Relief Request I4R-10 – Proposed Alternative to Utilize
ASME Code Case N-513-4 In Accordance with 10 CFR 50.55a(z)(2)

cc: NRC Regional Administrator, Region III
NRC Senior Resident Inspector, LaSalle County Station

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10 CFR 50.55a Relief Request I4R-10 – Proposed Alternative to Utilize ASME Code Case N-513-4 In Accordance with 10 CFR 50.55a(z)(2) (Page 1 of 5)

1. ASME Code Component(s) Affected

All American Society of Mechanical Engineers (ASME), Section XI, Class 2 and 3 components that meet the operational and configuration limitations of ASME Code Case N-513-4, "Evaluation Criteria for Temporary Acceptance of Flaws in Moderate Energy Class 2 or 3 Piping Section XI, Division 1," paragraphs 1(a), 1(b), 1(c), and 1(d).

2. Applicable Code Edition and Addenda

The Fourth Ten-Year Interval of the LaSalle County Station, Units 1 and 2, Inservice Inspection (ISI) Program is based on the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, Section XI, 2007 Edition with the 2008 Addenda.

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 ASME Boiler and Pressure Vessel (B&PV) Code, Section XI, 2007 Edition with the 2008 Addenda.

3. Applicable Code Requirement

IWC-3120 and IWC-3130 of ASME, Section XI, require that flaws exceeding the defined acceptance criteria be corrected by repair/replacement activities or evaluated and accepted by analytical evaluation. IWD-3120(b) of ASME, Section XI, requires that components exceeding the acceptance standards of IWD-3400 be subject to supplemental examination or to a repair/replacement activity.

4. Reason for Request

In accordance with 10 CFR 50.55a(z)(2), relief is requested 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.

Exelon Generation Company, LLC (EGC) is requesting a proposed alternative from the requirement to perform repair/replacement activities for degraded Class 2 and 3 piping whose maximum operating temperature does not exceed 200°F and whose maximum operating pressure does not exceed 275 psig for LaSalle County Station. Moderately degraded piping could require a plant shutdown within the required action statement timeframes to repair observed degradation. Plant shutdown activities result in additional dose and plant risk that would be inappropriate when a degraded condition is demonstrated to retain adequate margin to complete the component's function. The use of an acceptable alternative analysis method in lieu of immediate action for a degraded condition will allow EGC to perform additional extent of condition examinations on the affected systems while allowing time for safe and orderly long term repair actions if necessary. Actions to remove degraded piping from service could have a detrimental overall risk impact by requiring a plant shutdown, thus requiring use of a system that is in standby during normal operation. Accordingly, compliance with the current code requirements results in a hardship without a compensating increase in the level of quality and safety.

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10 CFR 50.55a Relief Request I4R-10 – Proposed Alternative to Utilize ASME Code Case N-513-4 In Accordance with 10 CFR 50.55a(z)(2) (Page 2 of 5)

ASME Code Case N-513-3 does not allow evaluation of flaws located away from attaching circumferential piping welds that are in elbows, bent pipe, reducers, expanders, and branch tees. ASME Code Case N-513-3 also does not allow evaluation of flaws located in heat exchanger external tubing or piping. ASME Code Case N-513-4 provides guidance for evaluation of flaws in these locations.

5. Proposed Alternative and Basis for Use

EGC is requesting approval to apply the evaluation methods of ASME Code Case N-513-4 to Class 2 and 3 components that meet the operational and configuration limitations of ASME Code Case N-513-4, paragraphs 1(a), 1(b), 1(c), and 1(d) in order to avoid accruing additional personnel radiation exposure and increased plant risk associated with a plant shutdown to comply with the cited Code requirements.

The Nuclear Regulatory Commission (NRC) issued Generic Letter 90-05 (Reference 1), "Guidance for Performing Temporary Non-Code Repair of Class 1, 2, and 3 Piping (Generic Letter 90-05)," to address the acceptability of limited degradation in moderate energy piping. The generic letter defines conditions that would be acceptable to utilize temporary non-code repairs with NRC approval. The ASME recognized that relatively small flaws could remain in service without risk to the structural integrity of a piping system and developed ASME Code Case N-513. NRC approval of ASME Code Case N-513 versions in Regulatory Guide 1.147, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1," allows acceptance of partial through-wall or through-wall leaks for an operating cycle provided all conditions of the Code Case and NRC conditions are met. The Code Case also requires the Owner to demonstrate system operability due to leakage.

The ASME recognized that the limitations in ASME Code Case N-513-3 were preventing needed use in piping components such as elbows, bent pipe, reducers, expanders, and branch tees and external tubing or piping attached to heat exchangers. ASME Code Case N-513-4 was approved by the ASME to expand use on these locations and to revise several other areas of the Code Case. Attachment 2 of the Reference 2 letter provides a marked-up ASME Code Case N-513-3 version of the Code Case to highlight the changes compared to the NRC approved Code Case N-513-3 version. Attachment 3 of the Reference 2 letter provides the ASME approved Code Case N-513-4. The following provides a high level overview of the Code Case N-513-4 changes:

- 1) Revised the maximum allowed time of use from no longer than 26 months to the next scheduled refueling outage.
- 2) Added applicability to piping elbows, bent pipe, reducers, expanders, and branch tees where the flaw is located more than $(R_o t)^{1/2}$ from the centerline of the attaching circumferential piping weld.
- 3) Expanded use to external tubing or piping attached to heat exchangers.
- 4) Revised to limit the use to liquid systems.

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- 5) Revised to clarify treatment of Service Level load combinations.
- 6) Revised to address treatment of flaws in austenitic pipe flux welds.
- 7) Revised to require minimum wall thickness acceptance criteria to consider longitudinal stress in addition to hoop stress.
- 8) Other minor editorial changes to improve the clarity of the Code Case.

Detailed discussion of significant changes in Code Case N-513-4 when compared to NRC approved Code Case N-513-4 is provided in Attachment 4 of the Reference 2 letter.

The design basis is considered for each leak and evaluated using the EGC Operability Evaluation process. The evaluation process must consider requirements or commitments established for the system, continued degradation and potential consequences, operating experience, and engineering judgement. As required by the Code Case, the evaluation process considers but is not limited to system make-up capacity, containment integrity with the leak not isolated, effects on adjacent equipment, and the potential for room flooding.

Leakage rate is not typically a good indicator of overall structural stability in moderate energy systems, where the allowable through-wall flaw sizes are often on the order of inches. The periodic inspection interval defined using paragraph 2(e) of Code Case N-513-4 provides evidence that a leaking flaw continues to meet the flaw acceptance criteria and that the flaw growth rate is such that the flaw will not grow to an unacceptable size.

The effects of leakage may impact the operability determination or the plant flooding analyses specified in paragraph 1(f). For a leaking flaw, the allowable leakage rate will be determined by dividing the critical leakage rate by a safety factor of four. The critical leakage rate is determined as the lowest leakage rate that can be tolerated and may be based on the allowable loss of inventory or the maximum leakage that can be tolerated relative to room flooding, among others. The safety factor of four on leakage is based upon Code Case N-705 (Reference 3), which is accepted without condition in Regulatory Guide 1.147, Revision 17 (Reference 4). Paragraph 2.2(e) of Code Case N-705 requires a safety factor of two on flaw size when estimating the flaw size from the leakage rate. This corresponds to a safety factor of four on leakage for nonplanar flaws. Although the use of a safety factor for determination of an unknown flaw is considered conservative when the actual flaw size is known, this approach is deemed acceptable based upon the precedent of Code Case N-705. Note that the alternative herein does not propose to use any portion of Code Case N-705 and that citation of N-705 is intended only to provide technical basis for the safety factor on leakage.

During the temporary acceptance period, leaking flaws will be monitored daily as required by paragraph 2(f) of Code Case N-513-4 to confirm the analysis conditions used in the evaluation remain valid. Significant change in the leakage rate is reason to question that the analysis conditions remain valid and would require re-inspection per

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paragraph 2(f) of the Code Case. Any re-inspection must be performed in accordance with paragraph 2(a) of the Code Case.

The leakage limit provides quantitative measurable limits that ensure the operability of the system and early identification of issues that could erode defense-in-depth and lead to adverse consequences.

In summary, EGC will apply ASME Code Case N-513-4 to the evaluation of Class 2 and 3 components that are within the scope of the Code Case. ASME Code Case N-513-4 utilizes technical evaluation approaches that are based on principals that are accepted in other Code documents already acceptable to the NRC. The application of this Code Case will maintain acceptable structural and leakage integrity while minimizing plant risk and personnel exposure by minimizing the number of plant transients that could be incurred if degradation is required to be repaired based on ASME Section XI acceptance criteria only.

6. Duration of Proposed Alternative

The proposed alternative is for use of Code Case N-513-4 for Class 2 and Class 3 components within the scope of the Code Case. A Section XI compliant repair/replacement will be completed prior to exceeding the next refueling outage or allowable flaw size, whichever comes first. Relief is requested for the Fourth ISI Interval for LaSalle County Station, Units 1 and 2 or such time as the NRC approves ASME Code Case N-513-4 in Regulatory Guide 1.147 or other document. If a flaw is evaluated near the end of the interval for LaSalle County Station and the next refueling outage is in the subsequent interval, the flaw may remain in service under this relief request until the next refueling outage.

7. Precedent

LaSalle County Station, Units 1 and 2, Third ISI Interval Relief Request I3R-19 was authorized by NRC Safety Evaluation (SE) dated September 6, 2016 (Reference 5). LaSalle Relief Request I3R-19 was part of an EGC fleet-wide submittal, and the use of ASME Code Case N-513-4 was authorized for various stations whose ISI Program was based on ASME Section XI, 2007 Edition with the 2008 Addenda. Relief Request I4R-10 for the LaSalle County Station, Units 1 and 2, Fourth Ten-Year ISI Interval, utilizes a similar approach to the previously approved relief request.

8. References

- 1) NRC Generic Letter 90-05, "Guidance for Performing Temporary Non-Code Repair of ASME Code Class 1, 2, and 3 Piping (Generic Letter 90-05)," dated June 15, 1990
- 2) Letter from D. T. Gudger (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "Proposed Alternative to Utilize Code Case N-513-4, "Evaluation Criteria for Temporary Acceptance of Flaws in Moderate Energy Class 2 or 3 Piping Section XI, Division 1," dated January 28, 2016

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ASME Code Case N-513-4 In Accordance with 10 CFR 50.55a(z)(2)
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- 3) ASME Boiler and Pressure Vessel Code, Code Case N-705, "Evaluation Criteria for Temporary Acceptance of Degradation in Moderate Energy Class 2 or 3 Vessels and Tanks Section XI, Division 1," dated October 12, 2006
- 4) NRC Regulatory Guide 1.147, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1," Revision 17, dated August 2014
- 5) Letter from G. E. Miller (U.S. Nuclear Regulatory Commission) to B. C. Hanson (Exelon Generation Company, LLC), "Braidwood Station, Units 1 and 2; Byron Station Unit Nos. 1 and 2; Calvert Cliffs Nuclear Power Plant, Units 1 and 2; Clinton Power Station, Unit No. 1; Dresden Nuclear Power Station, Units 2 and 3; LaSalle County Station, Units 1 and 2; Limerick Generating Station, Units 1 and 2; Nine Mile Point Nuclear Station, Units 1 and 2; Oyster Creek Nuclear Generating Station; Peach Bottom Atomic Power Station, Units 2 and 3; Quad Cities Nuclear Power Station, Units 1 and 2; R. E. Ginna Nuclear Power Plant; and Three Mile Island Nuclear Station, Unit 1 – Proposed Alternative to Use ASME Code Case N-513-4 (CAC Nos. MF7301-MF7322)," dated September 6, 2016 (ADAMS Accession No. ML16230A237)