January 29, 2002

Mr. Oliver D. Kingsley, President
Exelon Nuclear
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: QUAD CITIES NUCLEAR POWER STATION, UNIT 1 - EVALUATION OF REQUEST FOR RELIEF CR-34 FROM ASME SECTION XI REQUIREMENTS FOR THE SAFE SHUTDOWN MAKE-UP PUMP INJECTION LINE (TAC NO. MB1438)

Dear Mr. Kingsley:

By letter dated February 28, 2001, Exelon Generation Company, LLC (EGC, or the licensee) submitted Relief Request CR-34, which requested temporary relief from the requirements of American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code), Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," 1989 Edition, no Addenda, Articles IWA-4000, "Repair Procedures," and IWA-7000, "Replacement." Relief was requested for work that was performed on the safe shutdown make-up pump injection line during Unit 1 refueling outage Q1R16, which ended November 3, 2000. The staff has reviewed EGC's submittal and concludes that for Relief Request CR-34, compliance with the Code requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety, and that the licensee's proposed alternative will provide reasonable assurance of structural integrity. Therefore, the proposed alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) for the remainder of the Unit 1 current operating cycle, which ends October 2002. The relief granted is authorized by law and will not endanger life or property or the common defense and security and is otherwise in the public interest, giving due consideration to the burden on EGC if the requirements were imposed on the facility.

The detailed results of the staff's review are provided in the enclosed safety evaluation. If you have any questions concerning this action, please call Mr. F. Lyon of my staff at (301) 415-2296.

Sincerely,

/RA/

Anthony J. Mendiola, Chief, Section 2
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-254

Enclosure: Safety Evaluation

cc w/encl: See next page

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

REQUEST FOR RELIEF FROM THE REQUIREMENTS OF ASME CODE, SECTION XI

EXELON GENERATION COMPANY, LLC

QUAD CITIES NUCLEAR POWER STATION, UNIT 1

DOCKET NO. 50-254

1.0 INTRODUCTION

10 CFR 50.55a(g) requires nuclear power facility piping and components to meet the applicable requirements of Section XI of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code).

Alternatives to Code requirements may be used by nuclear licensees when authorized by the Nuclear Regulatory Commission (NRC) if the proposed alternatives to the requirements are such that they are shown to provide an acceptable level of quality and safety in lieu of the Code requirements [10 CFR 50.55a(a)(3)(i)], or if compliance with the Code requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety [10 CFR 50.55a(a)(3)(ii)].

2.0 BACKGROUND

By letter dated February 28, 2001, Exelon Generation Company, LLC, the licensee, requested that the NRC staff approve an alternative to the ASME Code, Section XI, requirements. The alternative pertained to three welds located on the safe shutdown makeup pump piping at the Quad Cities Nuclear Power Station, Unit 1. As part of the 10 CFR Part 50 Appendix R program upgrade, Quad Cities rerouted the safe shutdown makeup pump (SSMP) discharge piping downstream of the high-pressure coolant injection system (HPCI) feedwater check valve. The SSMP discharge piping is a 4-inch Class 2 line that connects to the HPCI 14-inch Class 2 injection line, which in turn is connected to B feedwater 18-inch Class 2 line. According to the licensee, the work request (WR) to reroute the line was correctly classified as Code work and the Repair/Replacement requirements were incorporated into the WR. The work was originally scheduled to be performed by on-site personnel in accordance with Exelon's repair and replacement program. However, three welds (3, 4, and 7), of the SSMP 4-inch line (EPN 1-2905-4"- B), were completed at a contractor facility outside the provisions of the ASME Code, Section XI Repair/Replacement Program. Specifically, the following non-conformances were identified by the licensee: (1) the welding for the three welds was not completed in accordance with ASME Code, Section XI, repair and replacement program; (2) the non-destructive examination (NDE), consisting of radiographic testing (RT), was not performed in accordance with the 1992 Edition of the ASME Code, Section III; (3) the welding procedures,

welder qualifications, and weld materials were not in conformance with the Code; and (4) the authorized nuclear inspector (ANI) was not informed when the three welds were completed offsite.

3.0 LICENSEE'S RELIEF REQUEST

3.1 Component for Which Alternative Examination Will Be Used: (as stated)

COMPONENT IDENTIFICATION

Code Class:	2
References:	IWA-4000 and 7000
Examination Category:	N/A
Item Numbers:	N/A
Description:	Relief from IWA 4000 and 7000 Repair/Replacement requirements for work performed on Safe Shutdown Make-Up Pump (SSMP), line number 1-2905-4"- B, welds 3, 4 and 7.
Component Number:	Line number 1-2905-4"-B, welds 3, 4 and 7

3.2 Code Requirement: (as stated)

IWC-5222, “System Hydrostatic Test,” requires that the system hydrostatic test pressure shall be at least 1.25 times the system pressure for systems with design temperatures above 200 °F. However, Code Case 416-1 permits performing a system leakage test in lieu of a hydrostatic test provided NDE is performed in accordance with the methods and acceptance criteria of the 1992 Edition of ASME Code, Section Ill.

IWA-7320, “Welding,” requires that welding required for installation of an item to be used for replacement shall be performed by welders who are qualified, and by using procedures that are qualified, in accordance with ASME Code, Section IX, and the additional heat treating and impact tests required by IWB-4000 "Repair Procedures."

IWA-4400, “Welding and Welder Qualifications (including Welding Operators),” requires: (a) All welding shall be performed in accordance with Welding Procedure Specifications that have been qualified by the Owner or repair organization in accordance with the requirements of the Codes specified in the Repair Program in accordance with IWA-4120, “Rules and Requirements.”

IWA-7310, “Construction,” requires the construction of an item be in accordance with IWA-7200, “Applicable Requirements,” unless the item is specifically exempted by IWA-7400, “Exemptions,” from the requirements of this article.

IWA-7140, “Inspection,” requires the services of an Authorized Inspection Agency shall be used. The Owner shall notify the Authorized Inspection Agency prior to starting replacement and keep the Inspector informed of the progress so that necessary inspections may be performed.

IWA-4140, “Inspection,” requires the services of an Authorized Inspection Agency shall be used when making a repair by welding, brazing, or metal removal (mechanical or thermal). The

Owner shall notify the Authorized Inspection Agency prior to starting the repair and keep the Inspector informed of the progress of the repair so that necessary inspections may be performed.

3.3 Code Requirements From Which Relief is Requested: (as stated)

The licensee is requesting relief from the requirements of ASME Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components, 1989 Edition, no Addenda, IWA-4000, “Repair Procedures,” and IWA-7000, “Replacement.”

3.4 Basis for Relief: (as stated)

Pursuant to 10 CFR 50.55a(g)(5)(iii), relief is requested on the basis that the proposed alternative would provide an acceptable level of quality and safety.

(A) The Owner's NDE Radiograph Level III Inspector reviewed the vendor's RT results and determined that the techniques used in performing the tests would have met ASME Code Section V, 1992 Edition. Exelon's review of the RT results did not identify any rejectable indications in the welds. The completed radiographs provide sensitivity levels commensurate with Section III, 1992 Edition, which would identify discontinuities, if present. There were no discontinuities identified as detrimental to the structural integrity of the welds. The welds were inspected and found acceptable, during the system leakage test, by certified Exelon Visual examiners to the 1992 Edition of ASME Code, Section XI, as required by Code Case N-416-1.

(B) The issues involving welding procedures, welder qualifications and weld material were resolved by Quad Cities on February 5, 2001. Specifically, the Owner's welding administrator reviewed the vendor's welding procedures, qualifications and materials. Weld materials were sent to Exelon testing laboratories for analysis. Overall, the Owner concluded that the vendor's procedures, qualifications and materials met the requirements of ASME Code, Section IX, as required by Section XI, Paragraph IWA-4512, and Sub Article IWA-7320.

(C) Although the welding was not performed under an ASME Code, Section XI, Repair/Replacement plan, all of the welding performed met the code of construction requirements of USA Standard (USAS) B31.1 and R-4411, “ComEd General Work Specification.”

(D) Although the ANI was not informed of welds being performed offsite, the ANI was notified prior to starting the reroute of the SSMP line. The ANI review of the original work package was completed per site procedures.

It is impractical to rework or perform additional testing at this time since the feedwater system would have to be out of service, which requires the Unit to be shutdown.

3.5 Proposed Alternative Examination: (as stated)

Although ASME Code, Section XI, non-conformances exist, continued operation until the end of the current fuel cycle is warranted. The basis is that Exelon's review of the RT did not find any rejectable indications on the weld. The required visual examinations were performed and no leakage was detected during the required system leakage test. The vendor's welding

qualifications and procedures meet Section IX requirements for the subject welds. The weld material used met ASME Code, Section IX, specifications. Thus, it has been determined that the piping has structural integrity and is able to perform its design function.

During refueling outage Q1R17 (October 2002), Quad Cities Nuclear Power Station will cut out the existing SSMP Line number 1-2905-4" - B, welds 3, 4, and 7, and re-perform them in accordance with the Owner's ASME Code, Section XI, Repair/Replacement Program.

3.6 Applicable Time Period: (as stated)

Relief is requested for the remainder of the Unit 1 current operating cycle, which is October 2002.

4.0 STAFF EVALUATION AND CONCLUSION

The licensee requested relief from the requirements of the ASME Code, Section XI, 1989 Edition, subsections IWA-4000, “Repair Procedures,” and IWA-7000, “Replacement.” Specifically, the following non-conformances were identified: (1) the welding for the three welds was not completed in accordance with ASME Code, Section XI, repair and replacement program; (2) the NDE was not performed in accordance with the 1992 Edition of the ASME Code, Section III; (3) the welding procedures, welder qualifications and weld materials were not in conformance with the Code; and (4) the ANI was not informed when the three welds were completed offsite.

The licensee’ s review of the RT results determined that the techniques used in performing the tests met the ASME Code, Section V, 1992 Edition. The RT review results did not identify any rejectable indications in the welds. The completed radiographs provided sensitivity levels commensurate to Section III, 1992 Edition, which would identify discontinuities, if present. There were no discontinuities identified that might affect the structural integrity of the welds. The welds were inspected and found acceptable during the system leakage test and were certified by Exelon’s visual examiners to meet the 1992 Edition of ASME Code, Section XI, requirements. The licensee also reviewed the vendor's welding procedures, qualifications and materials. Weld materials were sent to Exelon testing laboratories for analysis. The licensee concluded that the vendor's procedures, qualifications and materials met the requirements of ASME Code, Section IX, as required by Section XI, Paragraph IWA-4512 and Sub Article IWA-7320. In addition, all of the welding performed met the requirements of the code of construction USAS B31.1 and R-4411, “ComEd General Work Specification.” These standards require that the welders are qualified in accordance with the ASME Code, Section IX, and that the NDE meets the requirements of ASME Code, Section I. The ANI was notified prior to starting the reroute of the SSMP line. The ANI review of the original work package was completed per site procedures. The licensee proposed that the welds be left in place until the next refueling outage, because it is impractical to rework (or perform additional testing) at this time since the feedwater system would have to be out of service, which requires the Unit to be shutdown.

The NRC staff reviewed the licensee’s request to use an alternative to the ASME Code, Section XI, at its Quad Cities Nuclear Power Station, Unit 1. Based upon its review of the information provided by the licensee in support of its request for relief, the staff concludes that for Relief Request CR-34, compliance with the Code requirements would result in hardship or

unusual difficulty without a compensating increase in the level of quality and safety, and that the licensee's proposed alternative will provide reasonable assurance of structural integrity. The NRC staff concludes that the licensee has provided an acceptable alternative to the requirements of the ASME Code, Section XI. The staff also concludes that authorization of the licensee's proposed alternative would provide an acceptable level of quality and safety, is authorized by law and will not endanger life or property or common defense and security, and is otherwise in the public interest, giving due consideration to the burden upon the licensee and facility that could result if the Code requirements were imposed on the facility. Pursuant to 10 CFR 50.55a(a)(3)(ii), the alternative is authorized for the remainder of the Unit 1 current operating cycle, which is October 2002.

Principal Contributor: G. Georgiev

Date: January 29, 2002