February 4, 2000

Mr. Oliver D. Kingsley, President
Nuclear Generation Group
Commonwealth Edison Company
Executive Towers West III
1400 Opus Place, Suite 500
Downers Grove, IL 60515

SUBJECT: QUAD CITIES - RELIEF REQUESTS FOR FIRST 10-YEAR CONTAINMENT INSERVICE INSPECTION INTERVAL (TAC NOS. MA7844 AND MA7845)

Dear Mr. Kingsley:

By letter dated August 13, 1999, Commonwealth Edison Company (ComEd) submitted eight requests for relief from the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code), Section XI, for Quad Cities Nuclear Power Station, Units 1 and 2 (Quad Cities). Five of the relief requests, CR-25, CR-26, CR-27, CR-30 and PR-12, were identified as being needed for the refueling outage scheduled to start on January 20, 2000. Of these five, CR-25, CR-26 and CR-30 relate to the first 10-year containment ISI interval, and CR-27 and PR-12 relate to the third 10-year inservice inspection (ISI) interval. The other three relief requests, CR-28, PR-11 and PR-13, relate to the third 10-year ISI interval and were identified by ComEd as not being needed to support the refueling outage. By letters dated December 13, 1999, and January 10, 2000, ComEd provided additional information related to CR-25, CR-26 and CR-30.

The staff has reviewed and evaluated the information provided by ComEd concerning requests for relief CR-25, CR-26 and CR-30. These relief requests are granted pursuant to 10 CFR 50.55a(a)(3)(i) because the proposed alternatives would provide an acceptable level of quality and safety. The staff's safety evaluation (SE) is enclosed.

The staff's review of CR-27 and PR-12, related to the third 10-year ISI program, will be provided under a separate cover. The staff's review of CR-28, PR-11 and PR-13 is still ongoing and will be completed after the Quad Cities refueling outage. This completes the staff's activities under TAC Nos. MA7844 and MA7845.

If you have any questions about this review, please contact Stewart Bailey at (301) 415-1321 or by e-mail at snb@nrc.gov.

Sincerely,

/RA/

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

Docket Nos. 50-254 and 50-265

Enclosure: Safety Evaluation

cc: See next page

If you have any questions about this review, please contact Stewart Bailey at (301) 415-1321 or by e-mail at snb@nrc.gov.

Sincerely,

/RA/

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cc: See next page

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*concurrence provided by memo dated January 10, 2000

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO REQUESTS FOR RELIEF FOR

FIRST 10-YEAR CONTAINMENT INSERVICE INSPECTION INTERVAL

COMMONWEALTH EDISON COMPANY

AND

MIDAMERICAN ENERGY COMPANY

QUAD CITIES NUCLEAR POWER STATION, UNITS 1 AND 2

DOCKET NOS. 50-254 AND 50-265

1.0 INTRODUCTION

Inservice inspection (ISI) of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code) Class 1, 2, and 3 components shall be performed in accordance with Section XI of the Code and applicable addenda as required by 10 CFR 50.55a(g), except where specific written relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i). 10 CFR 50.55a(a)(3) states that alternatives to the requirements of paragraph (g) may be used, when authorized by the NRC, if (i) the proposed alternatives would provide an acceptable level of quality and safety, or (ii) compliance with the specified requirements 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)(5), if the licensee determines that conformance with an examination requirement of Section XI of the ASME Code is not practical for its facility, information shall be submitted to the Commission in support of that determination and a request made for relief from the ASME Code requirement. After evaluation of the determination, pursuant to 10 CFR 50.55a(g)(6)(i), the Commission may grant relief and may impose requirements that are determined to be authorized by law, will not endanger life, property, or the common defense and security, and are otherwise in the public interest, giving due consideration to the burden upon the licensee that could result if the requirements were imposed. The containment ISI program for Quad Cities Nuclear Power Station, Units 1 and 2 (Quad Cities), was prepared to meet the requirements of Subsection IWE and IWL of the 1992 Edition, 1992 Addenda, of the ASME Code, Section XI.

Pursuant to 10 CFR 50.55a(g)(6)(ii)(B), for ASME Code Class MC and CC components (including integral attachments of MC and metallic liners of CC components), licensees shall expedite the inservice inspection requirements of Subsection IWE and Subsection IWL of the 1992 Edition with the 1992 Addenda and complete the first inspection by September 9, 2001. 10 CFR 50.55a(g)(6)(ii)(B)(1) states that the inservice examinations specified for the first period

of the first inspection interval in Subsection IWE of the 1992 Edition and addenda as modified in 10 CFR 50.55a(b)(2)(x) shall serve the same purpose for operating plants as the preservice examination. 10 CFR 50.55a(g)(6)(ii)(B)(2) allows licensees to implement the inservice examinations which correspond to the number of years of operation which are specified in Subsection IWL of the 1992 Edition and addenda as modified in 10 CFR 50.55a(b)(2)(ix) and shall serve the same purpose for operating plants as the preservice examination specified for plants not yet in operation.

By letter dated August 13, 1999, Commonwealth Edison Company (ComEd, or the licensee) submitted three relief requests, CR-25, CR-26 and CR-30, describing alternatives to the Section XI requirements for IWE/IWL. By letters dated December 13, 1999, and January 10, 2000, ComEd provided additional information related to CR-25, CR-26 and CR-30. Pursuant to 10 CFR 50.55a(a)(3)(i), the NRC staff has reviewed and evaluated the licensee's proposed relief requests as described below.

2.0 EVALUATION OF RELIEF REQUESTS

A. Relief Request CR-25 for IWE Requirements for Class MC, Subarticle IWE-2200(g), Preservice Examination Requirements of Reapplied Painted or Coated Components

Code Requirement: ASME Section XI, 1992 Edition, 1992 Addenda, Subsection IWE-2200(g) requires that when paint or coatings are reapplied, the condition of the new paint or coating shall be documented in the preservice examination records.

Licensee's Proposed Alternative: In accordance with 10 CFR 50.55a(a)(3), the licensee proposed to examine reapplied paint and coatings as specified by its Maintenance/Modification Work Specification R-4411, and if degradation is identified an evaluation will be conducted to determine if the containment boundary is affected. The licensee stated:

> The re-applied paint and coatings on the containment vessel will be examined as required by Quad Cities Station Specification R-4411, which was developed in accordance with our Quality Assurance Program Requirements. If degradation of the coating is identified, additional measures will be applied to determine if the containment pressure boundary is affected. Repairs to the primary containment boundary, if required, would be conducted in accordance with applicable ASME Section XI Code rules.

Licensee's Basis for Proposed Alternative (as stated):

> In accordance with to [sic] 10 CFR 50.55a(a)(3)(i) and (ii), 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.
>
> In accordance with ASME Section III, NE-2110(b), paint and coatings are not part of the containment pressure boundary under current Code rules because they are not associated with the pressure retaining function of the component.

The interiors of the drywell and suppression chamber are painted to prevent corrosion. Neither paint nor coatings contribute to the structural integrity or leak tightness of the containment. Furthermore the paint and coatings on the containment pressure boundary were not subject to Code rules when they were originally applied and are not subject to ASME Section XI rules for repair or replacement per IWA-4111(b)(5). The process of applying paint or coatings at Quad Cities Station is performed and controlled under existing station work control procedures. Quad Cities Station General Work Maintenance/Modification Work Specification R-4411, Section 993, provides the requirements for safety related paints and coatings applied to any substrate inside the primary containment. Procedures used to apply paint/coating repairs and perform coating inspections are reviewed and approved in accordance with these requirements. Coating applicators are qualified to demonstrate their ability to satisfactorily apply the coatings in accordance with the manufacturer's recommendations. The adequacy of applied coatings is verified through the inspections performed by the qualified coating inspectors.

Recording the condition of reapplied coating in the preservice record does not substantiate the containment structural integrity. Should deterioration of the coating in the re-applied area occur, the area will require additional evaluation regardless of the preservice record. Recording the condition of the new paint or coating in the preservice records does not increase the level of quality and safety of the containment. The requirement to perform a preservice examination when paint or coatings are re-applied has been removed from Subsection IWE of ASME Section XI, 1998 Edition.

Staff Evaluation: The licensee has proposed to perform paint and coating examinations in accordance with existing plant requirements rather than documenting the condition of the new paint or coating on the preservice examination record as required by IWE-2200(g).

The licensee stated that the processes of applying paint or coatings are controlled under existing station work control procedures. However, the submittal did not provide sufficient information to allow the staff to evaluate if the plant specific programs met the applicable criteria of 10 CFR Part 50, Appendix B, as well as other guidance used for paint and coatings. The licensee provided clarifying information to the staff in its letter dated December 13, 1999, which indicated that the plant specific programs met the requirements of 10 CFR Part 50, Appendix B, which was consistent with their response to Generic Letter (GL) 98-04 concerning Service Level 1 protective coatings inside containment. Therefore, the licensee's existing programs for reapplying paint or coatings, which is inspected in accordance with the quality assurance program that meets the requirements of 10 CFR Part 50, Appendix B, verifies the adequacy of the applied paint and coatings. Further, degraded coatings in the reapplied area would require additional evaluation regardless of the preservice record and its subsequent documentation in the preservice record does not increase the level of quality and safety of the containment.

The licensee's existing program, which meets the requirements of 10 CFR Part 50, Appendix B, provides a conservative approach to the inspection and documentation of new coatings. The staff finds the proposed alternative adequate for protecting the inside steel surfaces of the

containment. Therefore, the licensee's relief request may be granted pursuant to 10 CFR 50.55a(a)(3)(i) on the basis that the proposed alternative provides an acceptable level of quality and safety.

B. Relief Request CR-26 for IWE-2500, Examination and Pressure Test Requirements, IWE-2500(b), Visual Examination of Paint and Coatings Prior to Removal

Code Requirement: ASME Code, 1992 Edition, 1992 Addenda, Subarticle IWE-2500(b), requires that when paint or coatings are to be removed, the paint or coatings shall be visually examined in accordance with Table IWE-2500-1 prior to removal.

Licensee's Proposed Alternative: In accordance with 10 CFR 50.55a(a)(3) the licensee proposed to use its existing Station General Work Maintenance/Modification Work Specification R-4111, Section 993 for visual examination of paint or coatings. The licensee stated:

> The paint and coatings in the containment will be examined as required by Quad Cities Station Specification R-4111, which was developed in accordance with our Quality Assurance Program requirements. If degradation of the coating is identified, additional measures will be applied to determine if the containment pressure boundary is affected. Repairs to the primary containment boundary, if required, would be conducted in accordance with ASME Section XI Code rules.

Licensee's Basis for Proposed Alternative (as stated):

> In accordance with to [sic] 10 CFR 50.55a(a)(3)(i) and (ii), 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.
>
> Paint and coatings are not part of the containment pressure boundary under current Code rules (ASME Section III, NE-2110(b)) because they are not associated with the pressure retaining function of the component. The interiors of the drywell and suppression chamber are painted to prevent corrosion. Neither paint nor coatings contribute to the structural integrity or leak tightness of the containment. Furthermore, the paint and coatings on the containment pressure boundary were not subject to Code rules when they were originally applied and are not subject to ASME Section XI rules for the repair or replacement per IWA-4111(b)(5). The process of applying paint or coatings at Quad Cities Station is performed and controlled under existing station work control procedures. Quad Cities Station General Work Maintenance/Modification Work Specification R-4411, Section 993, provides the requirements for safety related paints and coatings applied to any substrate inside the primary containment. Procedures used to apply coating/coating repairs and perform coating inspections are reviewed and approved in accordance with these requirements. Coating applicators are qualified to demonstrate their ability to satisfactorily apply the coatings in accordance with the manufacturer's

recommendations. The adequacy of applied coatings is verified through the inspections performed by qualified coating inspectors.

Degradation or discoloration of the paint or coating materials on containment would be an indicator of potential degradation of the containment pressure boundary. Additional measures would have to be employed to determine the nature and extent of any degradation, if present. The application of ASME Section XI rules for removal of paint or coatings, when unrelated to an ASME Section XI repair or replacement activity, is a burden without a compensating increase in quality or safety. The requirement to perform a visual examination prior to removal when paint or coatings are reapplied has been removed from Subsection IWE of ASME Section XI, 1998.

Staff Evaluation: The licensee proposes to examine existing painted or coated components as required by Quad Cities existing plant procedures, which were developed in accordance with its quality assurance program requirements. In addition, the licensee indicated that paint and coatings were not part of the Code rules when they were originally applied and are not subject to ASME Section XI rules for repair or replacement in accordance with IWA-4111(b)(5). However, if degradation of the coating is identified, the licensee has committed to implementing additional measures to determine if the degradation will have an effect on the containment pressure boundary.

The submittal did not provide sufficient information to allow the staff to evaluate if the plant specific programs met the applicable criteria of 10 CFR Part 50, Appendix B, as well as other guidance used for paint and coatings. The licensee provided clarifying information to the staff in its letter dated December 13, 1999, which indicated that the plant specific programs met the requirements of 10 CFR Part 50, Appendix B, which was consistent with their response to GL 98-04 concerning Service Level 1 protective coatings inside containment. Based upon the licensee's supplemental information dated December 13, 1999, and the implementation of additional measures to determine if degraded paint or coatings will affect the containment pressure boundary, the staff considers the proposed alternative adequate for protecting the containment pressure boundary, and will provide an acceptable level of quality and safety. Therefore, the licensee's relief request may be granted to 10 CFR 50.55a(a)(3)(i) on the basis that the proposed alternative provides an acceptable level of quality and safety.

C. Relief Request CR-30 for IWE-2500, Table IWE-2500-1, Examination Category E-G, Item E8.10, VT-1 Examination of 100% of Each Bolted Connection

Code Requirement: Table IWE-2500-1, Examination Category E-G, Item E8.10 requires that once each inspection interval that 100% of the bolted connections be VT-1 visually examined.

Licensee's Proposed Alternative: In accordance with 10 CFR 50.55a(a)(3) the licensee proposed to conduct a general visual examination of the bolted connections once each period and a detailed visual examination if the general visual examination determines the bolted connection to be suspect. Bolting may be removed to support the detailed visual examination. The licensee stated:

During the first containment Inspection Interval, we will perform a general visual examination each pressure retaining bolted connection once per Inspection Period. The bolted connection will be examined in their "as-found" condition and will not be disassembled for the sole purpose of performing the general visual examination. If an area is determined to be suspect during the general visual examination, we will perform a detailed visual examination to determine the magnitude and extent of the suspect areas. If required, we will disassemble the bolted connection to support the performance of the detailed visual examination.

Licensee's Basis for Proposed Alternative (as stated):

In accordance with 10 CFR 50.55a(a)(3)(i) and (ii), 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.

This proposed alternative examination method and frequency has been evaluated and we have determined that the implementation of the alternative requirement will provide an acceptable level of quality and safety for the following reasons:

1. A general visual examination of each pressure retaining bolted connection, including its bolts, studs, nuts, washers, etc., will be performed once each Inspection Period (i.e., three examinations in a ten year period). Performing the general visual examination at this frequency would detect and correct potential degradation prior to failure and is considered an enhancement to the current ASME Code, Section XI requirement. The ASME Code, Section XI only requires a visual examination to be performed once during this same time period.

2. The general visual examination is an acceptable method for detecting potential degradation of pressure retaining bolting. The general visual examination is not a cursory look at the pressure retaining bolting, but a thorough examination of the exposed surface areas and is performed by qualified and properly trained examiners. If an area is determined to be suspect, a more detailed visual examination to determine the magnitude and extent of the suspect areas will be performed.

3. Both the general and/or detailed visual examination will be performed in accordance with procedures that will delineate the controls for ensuring sufficient illumination and resolution for detecting degradation are maintained.

4. The examiners will also be required to successfully complete approved training on the proper techniques for examining Code Class MC items. This level of qualification will ensure the capability and visual acuity of the examiners is sufficient to detect evidence of potential degradation of the pressure retaining bolting.

5. The level of quality and safety will not be decreased by performance of the general visual examination of the accessible surface areas in place of the VT-1 visual examination. As clarified in paragraph IWA-2211, VT-1 visual examinations are conducted to detect discontinuities and imperfections on the surface of components, including such conditions as cracks, wear, corrosion, and erosion. The VT-1 visual examination requirements were primarily written for the examination of components and items within the reactor coolant pressure boundary (a VT-1 examination is not required for Class 2 and 3 components). The bolted connections associated with primary containment are not subject to the same service conditions (e.g., pressure, temperature, loading) as the bolting within the reactor coolant pressure boundary. These bolted connections, along with their bolting, are also not subject to conditions that could cause accelerated degradation or aging. For these reasons, a VT-1 examination is not warranted.

6. The level of quality and safety will not be decreased by not disassembling the bolted connection and performing the general visual examination of the accessible surface areas. The bolted connections associated with primary containment are also subject to testing in accordance with 10 CFR 50, Appendix J, "Primary Reactor Containment Leakage Testing for Water-Cooled Power Reactors." Appendix J requires that each of these bolted connections be tested on a routine basis. The purpose of the Appendix J test is to ensure the leak-tight integrity of the primary containment structure. Thus, the visual examination only needs to be performed to evaluate any inservice environmental effects that could adversely affect the performance of the bolted connection that have been adequately assembled and tested. For these reasons, the bolted connection need not be disassembled for the purpose of examination, and only those portions of bolting that are exposed to environmental conditions require examination.

7. The ASME Main Committee and the Board of Nuclear Codes and Standards have also determined that the VT-1 examination of pressure retaining bolting was not appropriate and have approved the rewrite of Subsection IWE which eliminated this requirement. This rewrite of Subsection IWE was published in the 1998 Edition of the ASME Code, Section XI. The alternative examination method and frequency proposed is consistent with the approved rewrite of Subsection IWE.

Staff Evaluation: The licensee has committed to conduct a thorough examination of the pressure-retaining bolting by qualified and properly trained examiners. The general and/or detailed visual examination will be performed in accordance with a procedure that will specify sufficient illumination and resolution for detecting degradation. As stated in the licensee's January 10, 2000, letter, the procedure outlining these controls will be reviewed and approved by a Registered Professional Engineer. Furthermore, personnel performing these visual examinations will be trained in the proper techniques for examining Code Class MC items. Therefore, the licensee's request for relief may be granted pursuant to 10 CFR 50.55a(a)(3)(i) on the basis that the proposed alternative provides an acceptable level of quality and safety.

3.0 CONCLUSION

The staff has evaluated the licensee's submittal for Quad Cities, Units 1 and 2. The authorizing of alternatives or granting of relief is based upon fulfillment of any commitments made by the licensee in its basis for each relief request and the alternatives proposed. The implementation of the ISI program and relief requests is subject to inspection by the NRC.

Relief requests CR-25, CR-26, and CR-30 may be granted for the first 10-year ISI containment interval pursuant to 10 CFR 50.55a(a)(3)(i) on the basis that the proposed alternatives provide an acceptable level of quality and safety.

Principal Contributor: G. Hatchet

Date: February 4, 2000