UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
801 WARRENVILLE ROAD
LISLE, ILLINOIS 60532-4351

March 12, 1998

EA 97-591

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

SUBJECT: NOTICE OF VIOLATION AND PROPOSED IMPOSITION OF CIVIL PENALTIES - $330,000 (NRC Special Inspection Report Nos. 50-254(265)-97027)

Dear Mr. Kingsley:

This refers to the special inspection conducted November 3 through 7, 1997 at the Commonwealth Edison Company's (ComEd) Quad Cities Nuclear Power Station (Quad Cities). The inspection identified several apparent violations associated with ComEd's performance of an American Society of Mechanical Engineers (ASME) Code Class 1 pressure test while Unit 2 was at power on June 22, 1997 and ASME Code Class 1 and 2 pressure testing activities of both units during previous outages. The NRC discussed these apparent violations with members of the Quad Cities staff at an exit interview on December 4, 1997. The inspection report was issued on December 23, 1997. On January 9, 1998, a predecisional enforcement conference was held in the NRC Region III office to discuss the apparent violations.

Based on the information developed during the inspection and the information provided by ComEd representatives during the conference, the NRC has determined that violations of NRC requirements occurred. These violations are cited in the enclosed Notice of Violation and Proposed Imposition of Civil Penalties (Notice), and the circumstances surrounding them are described in detail in the subject inspection report.

Section A of the Notice addresses the ASME Code leakage test for Unit 2 that was performed after the reactor was made critical. Although in previous outages Quad Cities appropriately performed this test prior to the reactor being made critical, recent changes to the reactor vessel pressure-temperature (P-T) limits triggered the Quad Cities staff's decision to perform this test at power. Although Quad Cities staff recognized that the changes to the P-T limits were going to cause significant operational challenges during the 1997 leakage test, timely proactive steps to address the challenges were not taken. The Quad Cities staff's decisions centered on identifying any regulation that prohibited conducting the leakage test after making the reactor critical and failed to consider the basic reason for conducting this leakage test. The NRC finds this decision process inadequate because the Quad Cities staff's efforts failed to identify the applicable regulation (10 CFR Part 50, Appendix G, "Fracture Toughness Requirements") that

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prohibited this action. Further, ComEd's investigation into this issue revealed that the ComEd organization, as a whole, apparently had no formal process to ensure that changes in regulations are distributed to staff members that must comply with them.

In order to perform the leakage test at power, the Quad Cities staff developed, reviewed, and approved a new procedure. During this process, the Quad Cities staff failed to identify that the procedure was a test not described in the Updated Final Safety Analysis Report (UFSAR) that involved an unreviewed safety question as described in 10 CFR 50.59, "Changes, Tests, and Experiments" because the probability of occurrence or the consequence of an accident may have been increased. The lack of thoroughness in this review and approval process resulted in the failure to identify pertinent portions of the Quad Cities UFSAR that specifically discussed conducting leakage tests in accordance with the ASME Code. Consequently, only an abbreviated screening review of the procedure was performed. Had the pertinent portions of the UFSAR been identified, a full 10 CFR 50.59 safety evaluation of this issue should have concluded that performing the test at power involved an unreviewed safety question, because the reactor coolant system pressure boundary had not been tested prior to power operations. More problematic was the fact that the Quad Cities staff reviewing the leakage test were aware of other applicable ASME Code requirements, which stated the "system leakage test shall be conducted prior to plant startup." The Quad Cities staff elected to interpret the term "plant startup" to involve startup of the turbine, rather than startup of the reactor. Based on this interpretation, the test was accomplished at power. Thus, the NRC is concerned that a full Quad Cities station 10 CFR 50.59 process review in this case would not have been effective at preventing the performance of this test at power.

The performance of the Unit 2 reactor coolant pressure boundary leakage test with the reactor at power demonstrated a significant lack of safety focus and a lack of knowledge and understanding of the bases for the ASME Code test and the applicable regulatory requirements. The Quad Cities staff's decision to allow an "at power" leakage test demonstrated a lack of effective management oversight; a significant failure to comply with 10 CFR Part 50, Appendix G; and the failure of the 10 CFR 50.59 process to conclude that an unreviewed safety question was involved. It was also of significant concern that ComEd was ineffective in communicating known changes in 10 CFR Part 50, Appendix G requirements to its nuclear facilities and that fully trained and qualified ComEd inspectors, who were part of the Quad Cities inspection crew and who are responsible for performing similar visual examinations at the other ComEd nuclear facilities and in the past did not conduct these tests at power, and did not question why the testing was performed at power. Accordingly, the violations are classified in the aggregate, in accordance with NUREG-1600, "General Statement of Policy and Procedure for NRC Enforcement Actions (Enforcement Policy)," as a Severity Level III problem.

Section B of the Notice addresses the failure to perform adequate ASME Code leakage tests following Unit 1 and Unit 2 refueling outages. The NRC is concerned that trained, qualified and certified VT-2 inspection staff and supervisory personnel performed and accepted the extremely abbreviated June 22,1997, VT-2 examinations as meeting Code requirements. The causes identified by ComEd for these inadequate tests included personnel judgment errors and

ineffective self assessment. However, the NRC considers these causes incomplete, as they do not address the underlying cause for accepting the 1997 Code VT-2 examination performed in one third of the time taken to complete past Code VT-2 examinations. The ComEd staff explanation that environmental conditions (drywell ambient temperature) unduly influenced VT-2 inspection staff judgement, does not justify the failure to properly complete the Code required inspections. Further, this issue was first identified by the NRC in the subject inspection report on November 7, 1997, and the issue was not adequately addressed at the January 9, 1998, enforcement conference. ComEd's completed corrective actions included retraining of VT-2 inspection personnel in accordance with existing procedures and processes without understanding the reasons for these process failures during the 1997 VT-2 examination. Other examples of failure to meet Code requirements included inadequate inspection of the reactor vessel flange and reactor vessel head area, and a missed Code Class 2 pressure test. These additional Code violations indicated a potentially broad lack of understanding on the part of the Quad Cities staff for the importance of adhering to Code requirements essential to the safe operation of Quad Cities Station. Accordingly, the violations are classified in the aggregate, in accordance with NUREG-1600, "General Statement of Policy and Procedure for NRC Enforcement Actions (Enforcement Policy)," as a Severity Level III problem.

The performance and acceptance of the abbreviated inspections for the Code leakage test at power indicates that certified VT-2 inspection staff did not understand the bases of leakage testing requirements which are essential for ensuring that the probability of a loss of coolant accident remains extremely low. Several administrative and managerial control systems failed to ensure that these significant performance deficiencies were identified early such that they could be corrected in a timely manner. The subsequent performance of the leakage test at 12% power without a fully tested pressure boundary was significant because of the corrosion history at Quad Cities and the fact that the recovery from 12% power would be complicated should a loss of coolant accident occur. In precluding the use of nuclear heat to perform the ASME Code test the Commission said in the Statement of Considerations 60 FR 65456 (December 19, 1995) for 10 CFR Part 50, Appendix G that "the use of nuclear heat before the completion of such tests is not consistent with basic defense-in-depth nuclear safety principles for several reasons, including the hindrance of finding leaks with the vessel at such a high temperature and the potential for exacerbating the consequences of a vessel rupture (in the extremely unlikely event that it should occur) by having the core critical."

The NRC does acknowledge that the Quad Cities staff performed a pressure test at 900 psig without nuclear heat. However, this test did not satisfy ASME Code requirements and, as acknowledged by the ComEd representatives at the predecisional enforcement conference, contributed to acceptance of the abbreviated ASME code test that was performed at power. Subsequently, the hydrostatic test performed on Quad Cities Unit 1 in February 1998 revealed a weld leak on the vessel bottom head drain line and leakage in the reactor vessel head seal area as indicated by an alarm condition on the leakage detection system. Because of the inadequate inspection methods revealed during the Unit 2 test, the potential exists that these areas may not have been adequately inspected on either unit during past pressure tests.

In accordance with the Enforcement Policy, a base civil penalty in the amount of $55,000 is considered for each Severity Level III problem. Because the Quad Cities facility has been the subject of escalated enforcement actions within the last 2 years[1] the NRC considered whether credit was warranted for *Identification* and *Corrective Action* in accordance with the civil penalty assessment process in Section VI.B.2 of the Enforcement Policy. *Identification* credit was not warranted for either problem because, although ComEd did identify the Appendix G violation they failed to identify the underlying 10 CFR 50.59 violation that should have prevented the Appendix G violation, and also failed to identify the majority of the violations that constitute the regulatory concern in this case. *Corrective Action* credit was warranted for the violations in Section A of the Notice. These corrective actions included revisions to the method by which new regulations are reviewed by the site staff, enhancements to the review process for new procedures, and training for safety evaluation reviewers. Since no *Identification* credit was warranted and *Corrective Action* was warranted, the civil penalty assessment for the violations in Section A would be $55,000. *Corrective Action* credit was not warranted for the violations in Section B of the Notice. The corrective actions failed to timely identify and address the training deficiencies of the individuals performing the inadequate tests and supervisors responsible for oversight and review of these tests. Since credit was not warranted for *Identification* and *Corrective Action*, the civil penalty assessment for the violations in Section B would be $110,000. The combined civil penalty assessment for Sections A and B would be $165,000.

The NRC considered whether discretion was warranted to escalate the enforcement sanction in accordance with Section VII.A of the Enforcement Policy. After reviewing the merits of this enforcement action, the NRC has determined that discretion is warranted to double the civil penalty due to particularly poor performance as manifested in the poor management oversight of these plant activities. Therefore, to emphasize the importance of effective management oversight of plant activities and the significant failure to comply with regulations, I have been authorized, after consultation with the Director, Office of Enforcement, and the Deputy Executive Director for Regulatory Effectiveness, to issue the enclosed Notice of Violation and Proposed Imposition of Civil Penalties (Notice) in the amount of $330,000.

ComEd is required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response. In developing your response, you should address actions planned or taken, if any: (1) to emphasize a questioning attitude for workers, especially those that work at different ComEd sites such that unusual or different conditions or practices are questioned, (2) to determine the adequacy of the ASME code leakage tests at other ComEd facilities, and (3) to assure that such testing is properly performed in accordance with Appendix G requirements. The NRC will use the ComEd response, in part, to determine

whether further enforcement action is necessary to ensure compliance with regulatory requirements. In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and ComEd response will be placed in the NRC Public Document Room (PDR).

Sincerely,

A. Bill Beach
Regional Administrator

Docket Nos. 50-254; 265
License Nos. DPR-29; DPR-30

Enclosure: Notice of Violation and Proposed Imposition of Civil Penalties

cc w/encl: M. Wallace, Nuclear Services Senior Vice President
G. Stanley, PWR Vice President
J. Perry, BWR Vice President
D. Farrar, Regulatory Services Manager
I. Johnson, Licensing Director
DCD - Licensing
E. Kraft, Jr., Site Vice President
D. Cook, Quad Cities Station Manager
C. C. Peterson, Regulatory Affairs Manager
Richard Hubbard
Nathan Schloss, Economist Office of the Attorney General
State Liaison Officer
Chairman, Illinois Commerce Commission
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RPulsifer, NRR
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LTremper, OC
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NOTICE OF VIOLATION
AND
PROPOSED IMPOSITION OF CIVIL PENALTIES

Commonwealth Edison Company
Quad Cities, Units 1 and 2

Docket Nos. 50-254; 265
License Nos. DPR-29; DPR-30
EA 97-591

During an NRC inspection completed on December 4, 1997 violations of NRC requirements were identified. In accordance with the NUREG-1600, "General Statement of Policy and Procedure for NRC Enforcement Actions," the NRC proposes to impose civil penalties pursuant to Section 234 of the Atomic Energy Act of 1954, as amended (Act), 42 U.S.C. 2282, and 10 CFR 2.205. The particular violation(s) and associated civil penalties are set forth below:

A. Inadequate Test Conditions

1. 10 CFR 50.60, "Acceptance criteria for fracture prevention measures to light water nuclear power reactors for normal operation," requires, in part, that all light-water reactor plants must meet the fracture toughness requirements for the reactor coolant pressure boundary as set forth in Appendix G, "Fracture Toughness Requirements."

   10 CFR Part 50, Appendix G, IV.2(d), "Pressure-Temperature Limits and Minimum Temperature Requirements," requires, in part, that pressure tests and leak tests of the reactor vessel that are required by Section XI, "Rules for Inspection of Nuclear Power Plant Components," of the American Society for Mechanical Engineers (ASME) Code must be completed before the core is critical.

   ASME Code Section XI (1989 Edition, no Addenda), Table IWB-2500-1, "Examination Category B-P, All Pressure Retaining Components," at item B15.10 requires a system leakage test (IWB-5221) and visual VT-2 examination of the pressure retaining boundary of the reactor vessel each refueling outage.

   Contrary to the above, the licensee failed to perform the required ASME Code Section XI leakage test and visual examination of the Unit 2 pressure retaining boundary of reactor vessel during the Unit 2 refueling outage and prior to core criticality on June 22, 1997. (01013)

2. 10 CFR 50.59 (a)(1), "Changes, tests, and experiments" states, in part, that a licensee may conduct tests not described in the safety analysis report, without prior Commission approval, unless the test involves an unreviewed safety question.

10 CFR 50.59 (b)(1) requires, in part, that the licensee shall maintain records of tests pursuant to paragraph (a) of this section. These records must include a written safety evaluation which provides the bases for the determination that the test does not involve an unreviewed safety question.

Contrary to the above, the licensee performed a system leakage test of the Unit 2 reactor vessel pressure boundary on June 22, 1997 at power operations, a test not described in the UFSAR. The safety evaluation for the system leakage test was inadequate because it failed to identify that IWB-5000, the testing methodology described in the UFSAR, Section 5.2.4.7, requires that the system leakage test of the reactor vessel pressure boundary be performed prior to plant startup. The licensee implemented IWB 5000 through Procedure QCOS 0201-10, Reactor Vessel and Class One Piping Leak Test at Power Operation." Revision 1 (dated June 6, 1997 to QCOS 0201-10) allowed system leakage test of the reactor vessel pressure boundary to be performed after plant startup contrary to the UFSAR. The performance of the test at power constituted an unreviewed safety question since the probability of occurrence or the consequences of an accident (loss of coolant accident) had been increased because the licensee allowed the reactor to be in an operational condition prior to successful completion of tests that are intended to ensure that the reactor vessel meets leakage and pressure requirements. (01023)

These violations represent a Severity Level III Problem (Supplement I). Civil Penalty - $110,000.

B. Inadequate Tests

Quad Cities Unit 1 and 2 Technical Specification 4.0.E, "Surveillance Requirements" requires, in part, implementation of ASME Code Section XI inservice inspection and testing requirements for Code Class 1 and 2 components.

1. ASME Code Section XI (1989 Edition, no Addenda), IWB-5210(b), "System Test Requirements - Test," states, in part, that system pressure tests and visual examinations shall be conducted in accordance with IWA-5000 "System Pressure Tests."

   a. IWA-5242(a), "Insulated Components," states, in part, visual examination VT-2 may be conducted without the removal of insulation by examining the accessible and exposed surfaces and joints of the insulation. Essentially vertical surfaces of insulation need only be examined at the lowest elevation where leakage may be detectable.

IWA-5242(b) states, in part, that when examining insulated components, the examination of surrounding area (including floor areas or equipment surfaces located underneath the components) for evidence of leakage, or other areas to which such leakage may be channeled, shall be required.

i. Contrary to the above, on June 22, 1997 the licensee failed to perform an adequate VT-2 inspection of the reactor vessel head area during the ASME Code Section XI pressure test of the Code Class 1 systems for Unit 2. Specifically, the VT-2 examination failed to include the floor areas of the refueling cavity at radial locations along the lower edge of the vertical insulation wall surrounding the reactor vessel head. Further, the licensee failed to utilize an inspection port in this vertical head insulation to perform direct VT-2 inspections of the vessel head. (02013)

ii. Contrary to the above, on June 22, 1997 the licensee failed to perform an adequate VT-2 inspection of portions of the Code Class 1 system boundary within the drywell during the ASME Code Section XI leakage test. Specifically, the licensee concluded (after a January 3, 1998 re-enactment of the June 22, 1997 VT-2 inspection) that Class 1 system boundary leakage (if present) for portions of the system boundary located within the drywell would not have been detected. (02023)

b. IWA-5243, "Components With Leakage Collection Systems," states that where leakages from components are normally expected and collected (such as valve stems, pump seals, or vessel flange gaskets) the visual examination VT-2 shall be conducted by verifying that the leakage collection system is operative.

i. Contrary to the above, on June 22, 1997 the licensee failed to perform an adequate VT-2 examination of the reactor vessel head flange joint leakage collection system during the Unit 2 ASME Code Section XI Class 1 system leakage test. Specifically, the VT-2 examination failed to verify that this system was operative. (02033)

ii. Contrary to the above, on May 3, 1996 the licensee failed to perform an adequate VT-2 examination of the reactor vessel head flange joint leakage collection system during the Unit 1 ASME Code Section XI Class 1 system leakage test. Specifically, the VT-2 examination failed to verify that this system was operative. (02043)

2. ASME Code Section XI (1989 Edition, no Addenda), IWC-5210(a), "System Test Requirements - Test," states, in part, that system pressure tests will be as there specified and visual examinations will be in accordance with the method specified in Table IWC-2500-1, "Examination Category C-H."

   Table IWC-2500-1, requires a pressure test (IWC-5221) and VT-2 examination of pressure retaining boundaries of Code Class 2 systems during each inspection period. The Unit 1 inspection period was February 18, 1993 to February 18, 1996. The Unit 2 inspection period was March 10, 1993 to March 10, 1996.

   a. Contrary to the above, as of February 18, 1996 the end of the Unit 1 inspection period, the licensee failed to perform a VT-2 examination of the Unit 1 reactor pressure vessel head flange seal leak detection system, a Code Class 2 system, within the required code inspection period. (02053)

   b. Contrary to the above, as of March 10, 1996 the end of the Unit 2 inspection period, the licensee failed to perform a VT-2 examination of the Unit 2 reactor pressure vessel head flange seal leak detection system, a Code Class 2 system, required within the required code inspection period. (02063)

These violations represent a Severity Level III Problem (Supplement I). Civil Penalty - $220,000.

Pursuant to the provisions of 10 CFR 2.201, Commonwealth Edison Company (Licensee) is hereby required to submit a written statement or explanation to the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, within 30 days of the date of this Notice of Violation and Proposed Imposition of Civil Penalties (Notice). This reply should be clearly marked as a "Reply to a Notice of Violation" and should include for each alleged violation: (1) admission or denial of the alleged violation, (2) the reasons for the violation if admitted, and if denied, the reasons why, (3) the corrective steps that have been taken and the results achieved, (4) the corrective steps that will be taken to avoid further violations, and (5) the date when full compliance will be achieved. If an adequate reply is not received within the time specified in this Notice, an order or a Demand for Information may be issued as to why the license should not be modified, suspended, or revoked or why such other action as may be proper should not be taken. Consideration may be given to extending the response time for good cause shown. Under the authority of Section 182 of the Act, 42 U.S.C. 2232, this response shall be submitted under oath or affirmation.

penalty is proposed, or may protest imposition of the civil penalties in whole or in part, by a written answer addressed to the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission. Should the Licensee fail to answer within the time specified, an order imposing the civil penalties will be issued. Should the Licensee elect to file an answer in accordance with 10 CFR 2.205 protesting the civil penalties, in whole or in part, such answer should be clearly marked as an "Answer to a Notice of Violation" and may: (1) deny the violation(s) listed in this Notice, in whole or in part, (2) demonstrate extenuating circumstances, (3) show error in this Notice, or (4) show other reasons why the penalties should not be imposed. In addition to protesting the civil penalties in whole or in part, such answers may request remission or mitigation of the penalties.

In requesting mitigation of the proposed penalties, the factors addressed in Section VI.B.2 of the Enforcement Policy should be addressed. Any written answer in accordance with 10 CFR 2.205 should be set forth separately from the statement or explanation in reply pursuant to 10 CFR 2.201, but may incorporate parts of the 10 CFR 2.201 reply by specific reference (e.g., citing page and paragraph numbers) to avoid repetition. The attention of the Licensee is directed to the other provisions of 10 CFR 2.205, regarding the procedure for imposing civil penalties.

Upon failure to pay any civil penalties due which subsequently has been determined in accordance with the applicable provisions of 10 CFR 2.205, this matter may be referred to the Attorney General, and the penalties, unless compromised, remitted, or mitigated, may be collected by civil action pursuant to Section 234c of the Act, 42 U.S.C. 2282c.

The response noted above (Reply to Notice of Violation, letter with payment of civil penalties, and Answer to a Notice of Violation) should be addressed to: Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, One White Flint North, 11555 Rockville Pike, Rockville, MD 20852-2738, with a copy to the Regional Administrator, U.S. Nuclear Regulatory Commission, Region III and a copy to the NRC Resident Inspector.

Because your response will be placed in the NRC Public Document Room (PDR), to the extent possible, it should not include any personal privacy, proprietary, or safeguards information so that it can be placed in the PDR without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request withholding of such material, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.790(b) to support a request for withholding confidential commercial or financial information). If safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21.

Dated at Lisle, Illinois
this 12th day of March 1998

March 6, 1998

Docket No. 030-29785 License No. 37-27963-01

David J. Danis
Laboratory Director
Microbac Laboratories, Inc.
Pittsburgh Division
100 Marshall Drive
Warrendale, PA 15086-1686

SUBJECT: INSPECTION NO. 030-29785/97-001

Dear Mr. Danis:

This letter refers to your January 27, 1998 correspondence, in response to our January 8, 1998 letter. Thank you for informing us of the corrective and preventive actions documented in your letter. These actions will be examined during a future inspection of your licensed program.

Your cooperation with us is appreciated.

Sincerely,

Original signed by John D. Kinneman

John D. Kinneman, Chief
Nuclear Materials Safety Branch 2
Division of Nuclear Materials Safety

cc:
Steven A. Krynak, Radiation Safety Officer
Commonwealth of Pennsylvania

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D. Danis
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