

September 13, 2000

Mr. Oliver D. Kingsley, President  
Nuclear Generation Group  
Commonwealth Edison Company  
Executive Towers West III  
1400 Opus Place, Suite 500  
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SUBJECT: RELIEF REQUEST FOR THE THIRD TEN-YEAR PUMP AND VALVE  
INSERVICE TESTING PROGRAM FOR QUAD CITIES NUCLEAR POWER  
STATION, UNITS 1 AND 2 (TAC NOS. MA8373 AND MA8374)

Dear Mr. Kingsley:

By letter dated February 18, 2000, the Commonwealth Edison Company (ComEd) submitted relief request RP-14A for Quad Cities Nuclear Power Station, Units 1 and 2 (Quad Cities), requesting relief from certain inservice testing (IST) requirements of ASME Code Section XI. The staff has reviewed the information provided by ComEd related to relief request RP-14A. The staff finds that the proposed alternatives of trending vibration and differential pressure data, the low pressure alarms in the main Emergency Core Cooling System discharge headers, and monthly verification of flow through high point vents provide reasonable assurance of operational readiness of the affected pumps. Therefore, pursuant to 10 CFR 50.55a(a)(3)(ii), the relief request RP-14A is authorized on the basis that compliance with the Code requirements would result in hardship without a compensating increase in the level of quality and safety. The staff's safety evaluation is enclosed.

In the same submittal, ComEd proposed minor revisions to certain relief requests that were previously approved for Revision 5 of the third 10-year IST program for Quad Cities. ComEd indicated that the minor revisions were made to reflect the changes of scope and components covered by corresponding relief requests. The staff finds that the changes are minor and acceptable. However, the associated changes in the scope of the Quad Cities IST program have not been reviewed in detail and are subject to NRC inspection.

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

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\* concur by memo

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO REQUEST FOR RELIEF FOR

THIRD TEN-YEAR PUMP AND VALVE INSERVICE TESTING PROGRAM

COMMONWEALTH EDISON COMPANY

AND

MIDAMERICAN ENERGY COMPANY

QUAD CITIES NUCLEAR POWER STATION, UNITS 1 AND 2

DOCKET NUMBERS: 50-254 AND 50-265

1.0 INTRODUCTION

The *Code of Federal Regulations*, (10 CFR) Section 50.55a, requires that inservice testing (IST) of certain American Society of Mechanical Engineers (ASME) Code Class 1, 2, and 3 pumps and valves are performed in accordance with Section XI of the ASME *Boiler and Pressure Vessel Code* (the Code) and applicable addenda, except where alternatives have been authorized or relief has been requested by the licensee and granted by the Commission pursuant to Sections (a)(3)(i), (a)(3)(ii), or (f)(6)(i) of 10 CFR 50.55a. In proposing alternatives or requesting relief, the licensee must demonstrate that: (1) the proposed alternatives provide an acceptable level of quality and safety; (2) compliance would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety; or (3) conformance is impractical for its facility. Section 50.55a authorizes the Commission to approve alternatives and to grant relief from ASME Code requirements upon making the necessary findings. Guidance related to the development and implementation of IST programs is given in Generic Letter (GL) 89-04, "Guidance on Developing Acceptable Inservice Testing Programs," issued April 3, 1989, and its Supplement 1 issued April 4, 1995. Also see NUREG-1482, "Guidelines for Inservice Testing at Nuclear Power Plants," and NUREG/CR-6396, "Examples, Clarifications, and Guidance on Preparing Requests for Relief from Pump and Valve Inservice Testing Requirements."

The 1989 Edition of the ASME Code is the applicable Code of record for the third 10-year interval IST program at the Quad Cities Nuclear Power Station, Units 1 and 2 (Quad Cities). Subsection IWV of the 1989 Edition, which gives the requirements for IST of valves, references Part 10 of the American National Standards Institute/ASME *Operations and Maintenance Standards* (OM)-10 as the rules for IST of valves. OM-10 replaces specific requirements in previous editions of Section XI, Subsection IWV, of the ASME Code. Subsection IWP of the 1989 Edition, which gives the requirements for IST of pumps, references Part 6 of the American National Standards Institute/ASME OM-6 as the rules for IST of pumps. OM-6 replaces specific requirements in previous editions of Section XI, Subsection IWP, of the ASME Code.

Enclosure

By letter dated February 18, 2000, the Commonwealth Edison Company (ComEd) submitted one pump relief request (RP-14A) requesting relief from certain IST requirements of ASME Code Section XI. In the same submittal, minor revisions were also proposed to certain relief requests previously approved for Revision 5 of the third 10-year IST program for Quad Cities. The staff has completed its review of the relief request RP-14A and is providing the following evaluation.

## 2.0 PUMP RELIEF REQUEST RP-14A

Relief is requested for the Emergency Core Cooling System (ECCS) keep fill pumps (1-1402-57 and 2-1402-57) from the testing requirements of flow measurements as required by Paragraph 5.2 of OM-6. The licensee proposed to measure vibration in accordance with OM-6, trend differential pressure and vibration, and verify that the ECCS pump discharge lines are within allowable pressure limits.

### 2.1 Licensee's Basis for The Relief Request

The licensee states:

Instrumentation is not installed for measuring flow rates. Pump flow varies with system operation and system leakages; therefore, establishing flow rates for testing purposes is not practical. The primary purpose of these pumps is to maintain the Core Spray and LPCI [low pressure coolant injection] pump discharge lines filled to limit the potential for water hammer upon initiation. System modification to provide test-measuring locations places undue burden on the utility without demonstrating any increase in the level of plant safety. These pumps are in continuous operation and the main ECCS pump discharge headers each have a low-pressure alarm, which continuously monitor the operability of the respective ECCS keep fill pump. Station Technical Specifications also verify operability of the ECCS keep fill system pumps by verifying flow through a high point vent on a monthly basis.

### 2.2 Proposed Alternate Testing

The licensee states:

Vibration measurement will be obtained under normal operating conditions and evaluated in accordance with OMA-1988, Part 6. Quad Cities Nuclear Power Station verifies operability of these pumps by pressure maintenance of the ECCS pump discharge lines within allowable pressure limits. In addition, Quad Cities Nuclear Power Station monitors the subject pumps for degradation by measuring and recording pump inlet pressure, discharge pressure, differential pressure, and vibration with the differential pressure and vibration data trended. These measurements are taken quarterly and provide satisfactory indication of operational readiness as well as the ability to detect potential degradation.

## 2.3 Evaluation and Conclusion

Paragraph 5.2 of OM-6 requires that an inservice test be conducted with the pump operating at specific reference conditions. The resistance of the system shall be varied until the flow rate equals the reference value. The pressure shall then be determined and compared to its reference value. Alternatively, the flow rate can be varied until the pressure equals the reference value and the flow rate shall be determined and compared to the reference flow rate value.

At Quad Cities, instrumentation is not installed in the keep fill system for directly measuring the flow rate. Imposing the Code requirements would result in a hardship for the licensee because it would require system modification and installation of on-line flow devices. In lieu of a Code required hydraulic test and flow measurement, the licensee proposes to perform vibration measurement under normal operating condition. The results will be evaluated in accordance with OM-6. In addition, ComEd will monitor the affected pumps for degradation by measuring and recording pump inlet pressure, discharge pressure, differential pressure, and vibration with the differential pressure and vibration data trended.

The safety function of the keep-fill pumps is to keep the ECCS pump discharge header piping in a filled condition to prevent a water hammer upon a pump start. The actual output and hydraulic performance of the pumps are not critical to the safety function, as long as the pumps are capable of maintaining the piping full. These pumps are in continuous operation and the main ECCS pump discharge headers have low pressure alarms. Alarms would promptly alert plant operators whenever the pumps do not maintain the piping pressure to a set alarm level. The Quad Cities Technical Specifications also require a verification of flow through a high point vent to assure that the piping is full of water. This is performed on a monthly basis which is more frequent than specified by OM-6. The staff finds that the proposed alternatives of trending vibration and differential pressure data, the low pressure alarms in main ECCS discharge headers, and monthly verification of flow through high point vents should allow time for ComEd to take corrective actions before the pumps fail, and therefore, provide reasonable assurance of operational readiness of the affected pump. Pursuant to 10 CFR 50.55a(a)(3)(ii), the relief request RP-14A is authorized on the basis that compliance with the Code requirements would result in hardship without a compensating increase in the level of quality and safety.

Principal Contributor: Y. S. Huang

Date: September 13, 2000