UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 123 TO FACILITY OPERATING LICENSE NO. DPR-29

COMMONWEALTH EDISON COMPANY

AND

IOWA-ILLINOIS GAS AND ELECTRIC COMPANY

QUAD CITIES NUCLEAR POWER STATION, UNIT 1

DOCKET NO. 50-254

1.0 INTRODUCTION

During the Quad Cities Unit 1 outage, two (2) modifications were performed. These modifications removed the head spray and control rod drive (CRD) return lines as part of the Intergranular Stress Corrosion Cracking (IGSCC) mitigation program. Commonwealth Edison Company (CECo) notified the NRC of their intent to perform these modifications in the Unit 1 IGSCC Inspection Plan submitted on June 9, 1989. However, the station failed to recognize the necessity of applying for a Technical Specification (TS) change prior to startup. Once this omission was identified to station management, CECo promptly submitted a letter dated November 16, 1989 to change the Technical Specifications and request a temporary waiver of compliance to allow for Unit 1 startup. The NRC staff approved CECo's waiver request on November 20, 1989.

2.0 EVALUATION

Current Technical Specification 3.7.D.2 requires that all containment isolation valves contained in Table 3.7-1 shall be operable during reactor power operation. Table 3.7-1 contains a description and associated requirements for operating position and operating time for reactor head spray valves MO-1001-60 and M-1001-63. In addition to TS 3.7.D.2, Table 3.7-2 in TS lists the Primary Containment Leakage Test Penetrations - this list includes penetrations for the reactor vessel head spray and CRD return lines.

The proposed changes to Technical Specifications would delete references to the reactor vessel head spray and CRD return lines from Tables 3.7-1 and 3.7-2 as a result of modifications that removed these lines.

Modifications to the reactor vessel head spray and CRD return lines were performed as part of the Station's Integranular Stress Corrosion Cracking mitigation program, as put forth in the response to Generic Letter 88-01. The piping was determined to be unnecessary and highly susceptible to IGSCC.

The head spray system provided a means to augment reactor cooldown and reduction of pressure following a shutdown. The head spray system is part of the Residual Heat Removal System and allows water to be diverted to a spray nozzle in the steam dome of the vessel. Operation of the head spray system during

reactor shutdown is optional. This system is not used to mitigate accidents, nor during normal or transient reactor operation.

The CRD return line was previously removed from service to prevent thermal stresses on the reactor vessel due to temperature differentials caused by the return of cooler CRD water. The CRD return line provided a return flowpath to the reactor vessel following CRD movement. The current return flowpath is reverse flow through the exhaust header and return to the vessel through the CRD seals. Since the return line was capped, this piping is no longer utilized.

As a result of removing the head spray piping, valves MO-1001-60 and MO-1001-63 were eliminated. These valves provided for isolation of primary containment and were normally closed. Once the reactor head spray line was removed, the necessity for this containment isolation feature was eliminated. The remaining head spray piping (reactor side) was blanked with a blind flange which ensures integrity of the reactor coolant pressure boundary.

Removal of the CRD return line and head spray piping resulted in the closure of two drywell penetrations which were listed on Table 3-7.2. This table delineates the penetrations which require Type C local leak rate testing. The integrity of the closed penetration will continue to be tested during containment integrated leak rate tests. Closure of these penetrations eliminated possible leakage paths from containment. Welded caps over the penetrations (inside primary containment) were designed to be consistent with containment design pressures and temperature.

Since the aforementioned modifications do not adversely affect integrity of the primary containment or reactor coolant pressure boundary, the proposed amendment to revise Technical Specifications is considered acceptable to the staff.

3.0 FINDINGS OF EMERGENCY WARRANTING AN AMENDMENT WITHOUT NOTICE

Licensee acted promptly once the need for the TS change was identified, and provided a summary of the events leading to the necessity for requesting an expedited amendment. The NRC staff concurs that CECo's initial oversight in failing to identify the necessity of revising Technical Specifications could not have been predicted.

Furthermore, the staff finds that failure to grant the proposed changes in a timely manner would have increased the outage time of Quad Cities Unit 1 by delaying restart. We also find that CECo responded in a prompt manner once their inadvertent omission was discovered, and did not delay their application to take advantage of the Emergency License Amendment provisions of 10 CFR 50.91. Accordingly, the staff concludes that the licensee has satisfied the requirements of 10 CFR 50.91(a)(5), and that a valid emergency exists.

4.0 FINAL NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

NRC staff reviewed the licensee's amendment application and determined, in accordance with the criteria of 50.92(c), that operation of Quad Cities, Unit 1, according to the proposed amendment:

(1) Does not involve a significant increase in the probability or consequences of an accident previously evaluated because the probability of a reactor coolant pipe leak and/or break due to intergranular stress corrosion cracking (IGSCC) is mitigated by the removal of the head spray and control rod drive return lines. The removal of the head spray line reduces the consequences of a loss-of-coolant accident (LOCA) due to the elimination of a vessel leakage path. The hydrostatic test of the vessel, performed each cycle, will assure the integrity of the installed blind flange. The probability of an accident is not affected by the closure of the associated penetrations. The consequences of an accident are reduced since the closed penetrations will not be available as a possible Primary Containment leakage path. The leak tightness of the penetrations will be verified by the periodic containment integrated leak rate test (CILRT). The penetration cap is designed to withstand containment design pressures and temperatures. Finally, neither the CRD return line nor the head spray system are utilized to mitigate any accident scenario and elimination of these lines does not adversely affect the integrity of primary containment or reactor coolant system.

(2) Does not create the possibility of a new or different kind of accident from any accident previously evaluated because no new interfaces with safety-related equipment, systems or structures or any new systems subject to failure or malfunction have been introduced. The proposed change does not introduce any new operational modes. The head spray system and CRD return line were not required for accident mitigation, normal operation, or shutdown (use of Head Spray during a shutdown is optional). Consequently, their removal will not result in the use of other systems in new or unanalyzed methods.

(3) Does not involve a significant reduction in the margin of safety because the margin of safety is unaffected by the removal of these possible pathways for leakage. The possibility of failure due to IGSCC in the removed piping systems is eliminated as is the possibility of leakage through the head spray containment isolation valves. The current configuration of the blind flange (reactor side) and pipe cap (RHR side) provides for an adequate isolation of the piping. Reactor vessel hydrostatic testing will ensure integrity of the current configuration. Closing the penetrations in the drywell also reduces the possibility of primary containment leakage through these paths. Penetration closure integrity is verified using CILRT.

Accordingly, the Commission has determined that this request does not involve a significant hazards consideration.

5.0 STATE CONSULTATION

The State of Illinois was informed by telephone on November 28, 1989, of the staff's final no significant hazards consideration determination and intent to issue a license amendment. The State contact had no comment.

6.0 ENVIRONMENTAL CONSIDERATION

This amendment involves changes to facility components located within the restricted area as defined by 10 CFR Part 20. The staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission made a final determination that this amendment does not involve a significant hazards consideration. Accordingly, this amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement nor environmental assessment need be prepared in connection with the issuance of this amendment.

7.0 CONCLUSION

The staff has concluded, based on the considerations discussed above, that: (1) the amendment does not (a) significantly increase the probability or consequences of an accident previously evaluated, (b) create the possibility of a new or different kind of accident from any previously evaluated or (c) significantly reduces a safety margin and, therefore, the amendment does not involve significant hazards consideration; (2) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner; (3) such activities will be conducted in compliance with the Commission's regulations; and (4) the issuance of this amendment will not be inimical to the common defense and security, or to the health and safety of the public.

Principal Contributor: Thierry Ross

Dated: December 4, 1989