



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 192 TO FACILITY OPERATING LICENSE NO. DPR-29
AND AMENDMENT NO. 188 TO FACILITY OPERATING LICENSE NO. DPR-30

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

In a letter dated July 16, 1999, Commonwealth Edison Company (ComEd, the licensee) requested an amendment to their Technical Specifications (TSs) for Quad Cities Nuclear Power Station, Units 1 and 2. The proposed amendment would change TS Section 3/4.7.D and the associated Bases to eliminate the individual leakage limits for each main steam isolation valve (MSIV). The removed limits would be replaced with a total limit for all four main steam lines combined. The current leakage limit is 11.5 standard cubic feet per hour (scfh) per valve. The proposed amendment would change the limit to 46 scfh for all four main steam lines combined. The value chosen for the new total limit is equivalent to the sum of the current individual limits.

2.0 BACKGROUND

Compliance with the *Code of Federal Regulations*, Title 10, Part 50, Appendix J (10 CFR Part 50, Appendix J) provides assurance that the primary containment, including those systems and components that penetrate the primary containment, do not exceed the allowable leakage rate values specified in the TSs and their bases. The allowable leakage rate is determined so that the leakage assumed in the safety analyses is not exceeded.

The Quad Cities primary containment system consists of a drywell, which encloses the reactor vessel and recirculation pumps, a pressure suppression chamber which stores a large amount of water, a connecting vent system between the drywell and the suppression chamber, and isolation valves. The four main steam lines that penetrate the primary containment boundary each have two 20-inch diameter isolation valves installed in series for a total of eight valves. Type C leak rate testing of the MSIVs is performed in accordance with the requirements of 10 CFR Part 50, Appendix J (as modified by an approved exemption). The purpose of the Type C testing is to verify that any leakage through the isolation valves would be within acceptable limits. Appendix J requires that the combined leakage of all containment penetrations and valves that are subject to Type B and C tests shall be less than 0.6 times the maximum allowable containment leak rate (L_a). For Quad Cities, L_a is 0.5 percent (by volume)

of the containment air per day at the calculated peak containment internal pressure (P_a) for a design-basis loss-of-coolant accident. P_a is 48 pounds per square inch gage (psig) for Quad Cities. The MSIVs are tested at a lower test pressure (P_t) of 25 psig per a previous exemption. The allowable leakage through all main steam lines at P_t is 46 scfh. Furthermore, boiling-water reactor plants generally have additional leakage limits placed specifically on the MSIVs, in recognition of their large size and historical tendency to leak excessively. In the case of Quad Cities, the total leakage limit is 11.5 scfh per valve.

ComEd stated in their letter of July 16, 1999, that use of the proposed combined steam line leakage rate would reduce unnecessary repair of the isolation valves. Quad Cities reviewed their last three refueling outages and concluded that, had the proposed limits been in effect, three MSIV overhauls could have been avoided while still maintaining the equivalent maximum leak rate. From this review, it can also be inferred that worker radiation exposure would have been reduced.

The Boiling Water Reactor Owners' Group (BWROG) issued a topical report on MSIV leakage limits, entitled NEDC-31858P, Revision 2, "BWROG Report for Increasing MSIV Leakage Rate Limits and Elimination of Leakage Control Systems," dated September 1993. In their report, the BWROG states that MSIV leakage could increase in excess of 200 scfh per valve without reducing the valve's ability to perform its safety function. Based on this, it can be seen that Quad Cities's current 11.5 scfh leakage limit doesn't provide indication that the valve's safety capability is reduced. The 11.5 scfh limit, therefore, causes Quad Cities to often perform unnecessary maintenance on the valves simply to maintain the low leakage rate. These unnecessary maintenance activities can reduce the valve life and lead to repeated failures and premature major repairs or valve replacements.

In a safety evaluation dated March 3, 1999, the NRC accepted the report for direct reference in future individual plant submittals on the MSIV leakage issue, subject to certain conditions. In the safety evaluation, the staff concurred with the conclusions stated in the paragraph above.

3.0 EVALUATION

ComEd is proposing to change TS 3/4.7.D and the associated Bases to allow a combined maximum flow path leakage for all MSIVs of less than or equal to 46 scfh when tested at 25 psig. For Quad Cities, the MSIV leak rates are included in the Type B and C test totals for the plant, which are used for demonstrating compliance with the $0.6 L_a$ leakage limit. Therefore, the proposed amendment does not affect the total leakage through containment valves and penetrations subject to Type B and C test requirements.

The effect of the proposed amendment would be to allow an individual MSIV to have a maximum leakage rate of up to 46 scfh (four times higher than previously), provided that the other three lines had no leakage. The original 11.5 scfh leakage limit value for the MSIV does not represent a limit which indicates significant valve degradation. As such, it does not indicate that the valve has degraded to the point where its ability to perform its safety function is reduced. Based on the BWROG report cited above, Quad Cities's proposed 46 scfh limit would not reduce the valve's ability to perform its safety function. As a result, the new limit would not reduce overall plant safety.

Based on our review, we conclude that the proposed amendment does not increase Quad Cities's overall allowable leakage limit or reduce the ability of the MSIVs to perform their intended safety functions. The proposed amendment would also reduce worker radiation exposure which is consistent with the Commission's policy of keeping exposures as low as reasonably achievable. Accordingly, we conclude that the proposed amendment is acceptable.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Illinois State official was notified of the proposed issuance of the amendments. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendments change a surveillance requirement. The NRC staff has determined that the amendments involve 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 has previously issued a proposed finding that the amendments involve no significant hazards consideration, and there has been no public comment on such finding (64 FR 46429). Accordingly, the amendments meet 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 or environmental assessment need be prepared in connection with the issuance of the amendments.

6.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

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Dated: December 21, 1999