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

SAFETY EVUALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 62 TO FACILITY OPERATING LICENSE NO. NPF-62

ILLINOIS POWER COMPANY, ET AL.

CLINTON POWER STATION, UNIT NO. 1

DOCKET NO. 50-461

1.0 INTRODUCTION

By letter dated December 23, 1991, the licensee requested a permanent exemption from the local leak rate testing requirements of Appendix J to 10 CFR Part 50 as they apply to the Reactor Core Isolation Cooling (RCIC) vacuum breaker line associated with containment penetration 1MC-44 and to the packing and body-to-bonnet seal of test boundary valve 1E51-F374. The licensee also proposed an amendment to the facility operating license and changes to the Technical Specifications (TS) to implement the exemption. The subject valve is normally a containment isolation valve and is expected to remain open during an accident; therefore, leakage through the valve (past the valve seat and disc) is not a safety concern and there is no requirement to measure it. However, due to the valve's position in the piping relative to the containment isolation valves (described in detail in section 2.0 below), the valve's body is part of the containment boundary. Because of this, leakage out of the valve past the stem packing or body-to-bonnet seal would be leakage out of the containment and must be measured as local leakage, in accordance with the requirements of Appendix J. Unfortunately, this requirement was not well-understood when the plant was designed and built, and the available testing arrangements (i.e., block valves and test, vent, and drain lines) are insufficient to make the required testing possible. The licensee has developed a make-shift method to perform the test, but it is awkward and has considerable attendant costs in terms of time, resources, and radiation exposure.

The licensee submits that the safety benefit to be derived from performing the required testing does not justify the costs. The licensee has therefore requested an exemption from the Appendix J local leak rate testing requirement and proposes an alternate test as described below.

2.0 EVALUATION

Valve 1E51-F374 is associated with containment penetration 1MC-44, the Reactor Core Isolation Cooling (RCIC) vacuum breaker line. The containment isolation valves for this penetration are outside of containment; there are no valves in the line inside containment, where the line simply ends, open to the containment atmosphere. Valve 1E51-F374 is located in the line outside containment, between the containment wall and the first containment isolation valve. It is a block valve which is closed during the local leak rate testing of the adjacent

containment isolation valve, allowing that valve to be tested in the "forward" direction; that is, with pressure applied in the same direction as that which would exist if the valve were required to perform its safety function (outward from containment). The position of valve 1E51-F374, outside containment but before the first containment isolation valve, makes the valve's body part of the containment boundary, and leakage through it to the environment (such as through the packing or body-to-bonnet seal) is containment leakage that must be measured and maintained within limits.

Valve 1E51-F374 is a gate valve. Because this valve is normally in the open position, the valve's packing and body-to-bonnet seal are normally exposed to the containment atmosphere. These potential leakage pathways are therefore required to be included in the local leak rate test boundary per Appendix J. However, because of the gate valve design, it cannot be confirmed that the valve's packing and body-to-bonnet seal are exposed to the test pressure when the valve is in the closed position (i.e., during the performance of local leak rate tests). As a result, the requirements of Appendix J would require this valve to be in the open (i.e., post-accident) position during local leak rate testing.

As identified in LER 90-018, several alternatives were evaluated to correct this testing deficiency. One alternative consisted of identifying alternate testing configurations. Another alternative consisted of modifying the valve to allow the body-to-bonnet seal and valve packing to be pressurized during local leak rate testing. Modification of the valve was determined by the licensee to be inappropriate as such a modification would degrade the valve's sealing capability (valve-to-seat), making it more difficult to successfully pass the Type C tests on the adjacent isolation valves. Further, performance of such a modification would result in radiation exposure during implementation (the valve is located in the Residual Heat Removal heat exchanger room).

Alternate testing configurations that were evaluated consisted of installing a plug inside containment in the end of this line and/or connecting the leak rate testing rig to the pipe end. As this line terminates over and approximately 10 feet above the suppression pool, a temporary scaffold would have to be erected to gain access to the pipe end. The licensee estimates that erecting and disassembling a temporary scaffold in this area would take approximately 80 man-hours and result in approximately 100 mrem radiation exposure each refueling outage. (It should be noted that this estimate is based on current plant conditions with no known leaking fuel and no significant safety/relief valve leakage. As a result, background radiation levels for performing these activities would likely increase over plant life). In addition, erecting a temporary scaffold would create additional radioactive waste and would increase the potential for foreign objects to be introduced into the suppression pool.

The licensee has evaluated each of these alternatives and determined that the additional radiation exposure and resource expenses far outweigh the benefits to be gained by including the valve packing and body-to-bonnet seal of valve 1E51-F374 in the local leak rate test boundary. This valve is located in a nominal 3-inch line and is exercised each refueling outage solely for the performance of the Type C test for this containment penetration's associated isolation valves. This line normally contains air at containment pressure and temperature. As a

result, the valve packing and body-to-bonnet seal are not subjected to degradation due to large thermal or hydraulic transients. Further, any air leakage through these pathways would be filtered by the standby gas treatment system prior to release to the environment. For these reasons, the licensee believes that leakage through these potential leakage pathways would not be significant, and therefore, inclusion of these pathways in the local leak rate test boundary is not necessary. In addition, these potential leakage pathways are included in the Integrated Leak Rate Test (ILRT) boundary, and thus, any leakage through these pathways will be included in the total leakage rate measured during an ILRT. To provide added assurance that these pathways do not constitute a significant leakage source and to provide additional indication when repairs are necessary, the body-to-bonnet seal and valve packing of valve 1E51-F374 will be leak tested with a soap solution during each ILRT.

The staff finds that the additional assurance of leak-tight integrity of the subject leakage pathways provided by local leak rate testing, when compared to the proposed alternate soap solution test during each ILRT, is not great enough to justify the costs associated with local leak rate testing, described above. The small size and mild environment of the valve makes it unlikely that the packing or body-to-bonnet seals will degrade quickly and experience a leak that would add significantly to the radiological consequences of a LOCA, considering also the action of the standby gas treatment system. The local leak rate test, performed at every refueling outage (but at least every 2 years), would be replaced by the roughly equivalent ILRT-with-soap-solution test performed approximately every 3-1/3 years (typically every other refueling outage). This increase in test interval is acceptable, considering the likely stable nature of the leakage pathways, as discussed above.

Based on the above evaluation, the staff finds the proposed exemption from the local leak rate testing requirements of Appendix J for the packing and body-to-bonnet seal of valve 1E51-F374, and the associated facility operating license and TS changes, to be acceptable, providing the purposed alternate testing (soap solution test during each ILRT) is performed.

3.0 STATE CONSULTATION

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

4.0 ENVIRONMENTAL CONSIDERATION

This amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 or changes a surveillance requirement. 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 has previously issued a proposed finding that the amendment involves no significant hazards consideration and there has

been no public comment on such finding (57 FR 9445). Accordingly, the 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 or environmental assessment need be prepared in connection with the issuance of the amendment.

5.0 CONCLUSION

The staff 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 amendment will not be inimical to the common defense and security or to the health and safety of the public.

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Date: April 24, 1992