



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
SUPPORTING AMENDMENT NO. 68 TO FACILITY OPERATING LICENSE NO. DPR-40
OMAHA PUBLIC POWER DISTRICT
FORT CALHOUN STATION, UNIT NO. 1
DOCKET NO. 50-285

Introduction

A number of events have occurred over the past several years which directly relate to the practice of containment purging during normal plant operation. These events have raised concerns relative to potential failures affecting the purge penetrations which could lead to degradation in containment integrity, and, for PWRs, a degradation in ECCS performance. By letter dated November 28, 1978, the Commission (NRC) requested all licensees of operating reactors to respond to certain generic concerns about containment purging during normal plant operation.

The generic concerns were twofold:

- (1) Events had occurred where licensees overrode or bypassed the safety actuation isolation signals to the containment isolation valves. These events were determined to be abnormal occurrences and were so characterized in our report to Congress in January 1979.
- (2) Recent licensing reviews have required tests or analyses to show that containment purge valves would shut without degrading containment integrity during the dynamic loads of a design basis loss of coolant accident (DBA-LOCA).

Because of the above concerns, the Omaha Public Power District (the District) requested an amendment to their license on November 3, 1981. The amendment application was updated by letter of April 29, 1982. The amendment request was to add limiting conditions of operation and surveillance requirements for containment purge isolation valves. The following safety evaluation addresses the District's request.

Evaluation

The District's containment purge system consists of a 42-inch intake line and a 42-inch exhaust line. Each line penetrates the containment building. There are two containment purge isolation valves per line, one on each side of the containment. The purge system is a separate part of the containment air cooling and ventilation system, and is designed to provide a means for reducing atmospheric activity (including noble gases) to allow personnel access to the containment.

The District proposes that the containment purge isolation valves be closed unless the reactor is in a cold or refueling shutdown condition (Modes 4 and 5, respectively). The District states that the basis for closing the valves during normal operation is that there is a concern about their ability to close against the differential pressure that could result from a loss of coolant accident or a main steam line break accident. The staff agrees.

Item II.E.4.2(6) of NUREG-0737 requires that containment purge valves that do not satisfy the operability criteria set forth in Branch Technical Position CSB 6-4 or the Staff Interim Position of October 23, 1979 must be sealed closed as defined in SRP 6.2.4, Item II.6.F during modes 1, 2 and 3. Furthermore, these valves must be verified to be closed at least every 31 days. The District has "yellow tagged" each of the four control switches located in the control room to meet the staff's requirement of seal closing these valves. The staff finds this procedure inadequate. To properly meet this requirement, mechanical devices to seal or lock the valve closed or preventing power from being supplied to the valve operator is needed. Key-locked position switches in the control room for the four purge valves, for example, would meet the need for mechanical devices on these valves. This concern has been discussed with the District, and the District has agreed to install keylocked control room switches no later than the end of the refueling outage which is underway. The District's resolution of this concern is acceptable.

To meet the valve position surveillance requirement of II.E.4.2(6), the District proposes to check the position of each valve monthly. This would be accomplished using control room indication. This is acceptable.

The District proposed to leak test the valves prior to bringing the reactor out of each cold or refueling shutdown. If the purge valves are opened during these shutdowns, the leak test shall be performed after the purge valves are closed for the last time. The valves would not be operated during normal plant operation. One reason for leak testing is that leakage may occur due to excessive degradation of the resilient seals as a result of valve operation. Another reason is that leakage may occur due to changes in environmental conditions. Leak testing the valves following valve operation and prior to returning to hot plant conditions will ensure the valves are leak-tight before entering an extended operating period. This, coupled with the requirement to leave the valves undisturbed after leak testing, will provide a high degree of assurance of leak-tightness during operation. Since the valves are required to be left closed after testing, the valves will not be subject to seal wear during plant operation. Also, since the valves

are located inside buildings with a controlled atmosphere, seal deterioration due to temperature extremes will not occur. The District conducted a two year valve testing program to detect degradation of the seals; no degradation was found. Thus, it appears reasonable to believe that the seals are presently sound.

Historically, the Fort Calhoun Station averages two cold shutdowns per year. Therefore, the valves will be tested frequently.

Based on the plant unique considerations discussed above, the staff has relaxed its requirement that these valves be leak tested every 6 months to leak testing the purge valves at each cold or refueling shutdown, but in no case at intervals greater than 9 months.

Regarding leakage limits, the District proposes that if the leakage rate during testing exceeds 18,000 standard cubic centimeters per minute (SCCM), corrective repairs will be initiated immediately to bring the leakage below 18,000 SCCM. The staff agrees.

In addition to the two 42" purge lines, the Fort Calhoun Station is also equipped with a 2" vent line to relieve pressure increases inside containment. The isolation valves in this line receive, in addition to the normal isolation signals, a high radiation isolation signal from radiation monitors that sense primary containment atmosphere. This isolation signal arrangement meets the requirements of NUREG-0737 Item II.E.4.2(7). The 42" purge valves are exempted from meeting this requirement because they are closed at all times in modes 1, 2 or 3. The staff has evaluated the radiological consequences of a severe LOCA while venting through the 2 inch diameter line at power. The dose contribution through the small valve would be a very small percentage of the total dose at either the Exclusion Area Boundary or the Low Population Zone.

Environmental Consideration

We have determined that the amendment does not authorize a change in effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. Having made this determination, we have further concluded that the amendment involves an action which is insignificant from the standpoint of environmental impact and, pursuant to 10 CFR §51.5(d)(4), that an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with the issuance of this amendment.

Conclusion

We have concluded, based on the considerations discussed above, that: (1) because the amendment does not involve a significant increase in the probability or consequences of an accident previously evaluated, does not create the possibility of an accident of a type different from any evaluated previously, and does not involve a significant reduction in a margin of safety, the amendment does not involve a 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, and (3) such activities will be conducted in compliance with the Commission's regulations and the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

Date: February 24, 1983

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