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

SAFETY EVALUTION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 40 TO FACILITY OPERATING LICENSE NO. DPR-59

POWER AUTHORITY OF THE STATE OF NEW YORK

JAMES A. FITZPATRICK NUCLEAR POWER PLANT

DOCKET NO. 50-333

Introduction

By its letters dated February 23, 1976, July 5, 1978 and August 1, 1978, the Power Authority of the State of New York and tne Niagara Mohawk Power Corporation proposed changes to the Technical Specifications for the FitzPatrick Nuclear Power Plant. These changes involve the use of motor operated valves instead of check valves for containment isolation in the High Pressure Coolant Injection (HPCI), Reactor Core Isolation Cooling (RCIC), Low Pressure Coolant Injection (LPCI) and Core Spray Systems.

In the HPCI and RCIC systems, containment isolation is presently accomplished by the use of one check valve inside the containment and one check valve outside the containment. There is also a motor operated valve outside containment upstream of the check valve and within ten feet of the containment penetration. This change in the Technical Specifications would delete the containment leak rate testing requirements for the check valve outside of containment and would impose those same leak rate requirements previously assigned to the latter check valve on the motor operated valve outside of containment. This change would also establish the frequency for testing the check valve inside containment.

In the LPCI and Core Spray systems, containment isolation is presently accomplished by the use of one check valve inside the containment and two motor operated valves outside of the containment. This change in the Technical Specifications would permit an increase in the leakage allowed through the check valve inside containment. It would also establish a new leak rate requirement and a testing frequency for the check valve inside containment. The allowable containment leakage rate would not be changed.

The licensee has indicated that this change in Technical Specifications will result in a significant reduction in radiation exposure to plant personnel. The check valve now used for containment isolation requires frequent repair and testing in order to meet the containment leakage requirements. The motor operated valves require less repair, are more accessible, and involve lower radiation levels. Therefore, by using the motor operated valves, less manpower and radiation exposure would be required to achieve the leaktightness necessary for a successful containment leak rate test.

Evaluation

General Design Criterion (GDC) 55 requires that systems which are part of the reactor coolant pressure boundary and penetrate the primary containment shall be provided with one automatic or locked closed isolation valve inside containment and one automatic or locked closed isolation valve outside containment. Check valves may be used as the automatic isolation valve inside containment, but shall not be used as the automatic isolation valve outside containment. These provisions apply, unless it can be demonstrated that the containment isolation provisions for a specific class of lines are acceptable on some other defined basis. Containment isolation valves are required on lines which communicate directly with the primary system in order to restrict the consequences of a postulated loss-of-coolant accident (LOCA) and to prevent the uncontrolled release of the primary system coolant to the environment in the event of a rupture in the system piping outside containment.

In the HPCI and RCIC systems, a motor operated valve outside containment will replace the check valve outside of containment for the purpose of containment isolation. There will be no change regarding the check valve inside containment. This is an improvement in the containment isolation system since the new system will conform to GDC 55 and the normally closed motor operated valve will more easily and reliably meet the present containment leakage requirements. This change will not affect the reliability of operation of the HPCI or RCIC system.

In the event of a pipe rupture in the HPIC or RCIC system outside containment, isolation would be provided by the check valve inside containment. In addition, the functional testing of the check valve outside containment will be continued. This valve will provide additional protection against gross leakage. Pipe rupture is detected by pump discharge header flow and pressure indication in the main control room. The operator will also be alerted to any significant leaks in the piping system outside the containment by a control room alarm indicating high level in the floor drain

sump. There are twenty-two radiation monitors installed in the Reactor Building (four process monitors and eighteen area radiation monitors). These radiation monitors would transmit audible and visual alarms to the Control Room, should radiation level near the radiation detector exceed the preset values of the monitors. The operator will manually close the motor operated valve if it is determined that the line is ruptured in the HPCI or RCIC system.

We have concluded that the modified containment isolation system will operate satisfactorily under accident conditions and that the operation of the HPCI and RCIC systems will not be affected by this change.

For each of the redundant pipe lines penetrating containment for the LPCI and Core Spray systems, there is one check valve inside containment in series with two motor operated valves outside containment. One of the motor operated valves outside containment will be normally closed. This change in technical specifications will require the use of all three valves for the purpose of containment isolation and for complying with GDC 55. The operation of the LPCI and Core Spray systems will not be affected.

The two motor operated valves outside containment will each meet all present requirements with regard to containment leak rate and testing of these valves. The check valve inside containment will be allowed a higher leak rate based on the small radiation dose that would result if the reactor coolant were released to the reactor building at the specified rate. Ten gallons per minute (gpm) leakage of reactor coolant containing radioisotopes at the maximum allowable concentration, as specified in technical specification 3.6.C.1 was determined to be an acceptable leak rate.

The licensee will test the check valve inside containment with the same frequency and in a manner similar to that used for other isolation valves. We have determined that the maximum leak rate of 10 gpm of reactor coolant at operating pressure may be verified by a test which shows no more leakage than ten standard cubic feet per minute of air with a differential pressure of 45 pounds per square inch across the valve. This test requirement will be made part of the technical specifications. Testing to meet this less stringent requirement will result in a substantial reduction in repair time and radiation exposure to plant personnel.

In the event of a pipe rupture outside of containment gross leakage would be prevented by the check valve inside containment. The operator would be alerted to any significant leaks in the piping outside the containment by a control room alarm indicating high level in the floor drain sump and by the KEEP FULL SYSTEM low level alarm in the Control Room. Pipe rupture is also detected by pressure and flow instruments which provide remote indications in the control room.

In addition, there are twenty-two radiation monitors installed in the Reactor Building (four process monitors and eighteen area radiation monitors). These radiation monitors would transmit audible and visual alarms to the Control Room, should radiation level near the radiation detector exceed the preset values of the monitors. The operator will take action to close the motor operated valves outside containment when required.

Environmental Considerations

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 Section 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 accidents previously considered and does not involve a significant decrease in a safety margin, 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.

Dated: November 9, 1978