



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
SUPPORTING AMENDMENT NO. 20 TO FACILITY OPERATION LICENSE NO. DPR-5
CONSUMERS POWER COMPANY
BIG ROCK POINT
DOCKET NO. 50-155

Introduction

By letter dated July 28, 1978, Consumers Power Company (CPCo) submitted an application for a license amendment to modify the Big Rock Point Technical Specifications. The proposed change would increase the interval between control rod withdrawal time tests.

Evaluation

Section 5.2.2 (a) of the current Technical Specifications requires that control rod withdrawal time tests be performed during each major refueling shutdown and at least once every six months during periods of power operation. CPCo requested that the specifications be changed to require control rod withdrawal time tests only during each major refueling.

A previous submittal by CPCo dated November 1, 1974, still under review by the NRC, requested the requirements for control rod withdrawal rate limit testing be eliminated from the Big Rock Point Technical Specifications. Some of the analysis performed in support of the November 1, 1974 submittal is discussed below and is considered in our evaluation of the requested change.

Several tests performed prior to the November 1, 1974 submittal and reported by CPCo, show that some of the control rod drives could be withdrawn faster than the 23 second limit. By letter dated May 1, 1974, CPCo described measures taken at Big Rock Point to reduce the probability of exceeding the 23 second withdrawal limit. As corrective action the control rod withdrawal rates were set as slow as possible in the cold shutdown condition by adjusting the rate set valves. Subsequent tests reported by CPCo show that these corrective measures

8101100767

were only partially successful. Instead of 6 or 7 drives exceeding the 23 second withdrawal limit, these tests show that typically 3 drives exceeded the limit, a reduction factor of about 2. In the tests reported, the fastest withdrawal time measured was 17 seconds.

CPCo then determined, 1) how fast the control rods could be withdrawn in the continuous withdrawal mode and 2) the limiting control rod withdrawal rate. The results of tests performed by CPCo to determine maximum withdrawal rates were reported in their letter dated July 1, 1975. The tests were performed at cold shutdown and hot shutdown conditions. The average time for control rod withdrawal in the cold shutdown condition with the rate valves full open was 18.8 seconds. The fastest time recorded was 16 seconds. In the hot shutdown condition with rate valves full open the average control rod withdrawal time was 15.8 seconds and the fastest time recorded was 13.5 seconds.

The Big Rock Point Technical Specifications limit the reactivity worth of any control rod to 2.5% $\Delta k/k$. The Final Hazards Summary Report analysis of the most limiting accident (hot-standby startup accident) assumes a withdrawal rate of 23 seconds and a total reactivity addition of 4.2% $\Delta k/k$. The most limiting accident was reanalyzed assuming a reactivity worth of 3.0% $\Delta k/k$ for the highest worth control rod. The results reported in their November 1, 1974 letter indicate that no fuel clad damage would occur for control rod withdrawal times shorter than 6.9 seconds. Since tests show that the fastest control rod withdrawal time with the rate valves full open was 13.5 seconds, no fuel clad damage would occur for the continuous withdrawal of the most reactive control rod.

Even though the Technical Specifications and plant procedures require that control rods be operated in the notch mode and the results of the reanalysis of the startup accident shows that fuel damage would not result from the continuous withdrawal of the most reactive rod, CPCo modified the control rod drive system to preclude operating the control rods in the continuous withdrawal mode. This modification involved physical removal of the control wire from the continuous withdrawal terminal and insulation of the wire. Therefore the control rods can not be withdrawn continuously and to perform the required continuous withdrawal test the wire must physically be reconnected to the switch terminal. Since the continuous withdrawal mode is normally disabled during operation, the existing requirement to perform the continuous control rod withdrawal test every six months increases the possibility of having continuous control rod withdrawal capability by forgetting to disconnect the terminal after the test, while at the same time the requirement is unnecessary in light of previous test results and the modification to preclude operation in the continuous mode.