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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 38 TO FACILITY OPERATING LICENSE NO. DPR-6

CONSUMERS POWER COMPANY

BIG ROCK POINT PLANT

DOCKET NO. 50-155

1.0 INTRODUCTION

By letter dated December 3, 1980, Consumers Power Company (the licensee) requested that the implementation date of the February 21, 1980 NRC Confirmatory Order which has previously amended the license to require the installation of a recirculation pump trip, be extended from December 31, 1980 until April 1, 1981.

2.0 DISCUSSION

Over the past eleven years the subject of anticipated transients without scram (ATWS) events and the manner in which they should be considered in the design of nuclear power plants has been discussed extensively between the Nuclear Regulatory Commission (NRC) Staff and the nuclear industry.

In April 1978, the Staff published a report on "Anticipated Transients Without Scram for Light-Water Reactors," NUREG-0460, Volumes 1 and 2, which summarized technical considerations related to ATWS and made recommendations.

Following additional investigations by the Staff and by the ACRS, the Staff issued Volume 3 of NUREG-0460, in December 1978.

Although final determination of all the design changes to nuclear power plants which may be necessary to respond to ATWS events has not yet been reached, the Staff concluded that the addition of a Recirculation Pump Trip (RPT) in boiling water reactors (BWRs) would significantly limit the immediate consequences of an ATWS event. Therefore, letters dated January 9, 1979 were sent to the BWR licensees who did not have installed RPTs. These letters:

- described the reasons for requiring an RPT at this time,
- described two alternative ways to provide an acceptable RPT, and
- requested that licensees provide an RPT implementation schedule which would provide for installation within two years.

Because the NRC staff concluded that an RPT provides considerable additional assurance that a BWR can safely respond to an ATWS event, we determined that installation of an RPT by BWR licensees should be completed as soon as practicable and in no event later than December 31, 1980. In response to the letter of January 9, 1979, and additional discussions with the staff, the licensee committed, by letter dated February 5, 1980, to installation of an RPT before reactor operation during calendar year 1981. The NRC determined that this commitment should be formalized by Order requiring the RPT installation be completed no later than December 31, 1980; accordingly, on February 21, 1980, a Confirmatory Order was issued by the Commission. This Order requires the licensee to install a recirculation pump trip by December 31, 1980, or in the alternative, place and maintain its facility in a cold shutdown or refueling mode of operation.

The licensee initiated work to implement the addition of the RPT to the Big Rock Point facility. During a meeting on November 13, 1980, and by letter dated December 3, 1980, the licensee informed the NRC staff of new preliminary information from an overall Probabilistic Risk Assessment (PRA) being conducted by the licensee for the Big Rock Point Plant. The licensee stated that although the PRA study is not totally complete, they have learned that for ATWS events, the installation of an RPT at Big Rock Point does not provide "considerable additional assurance" that the plant can safely respond to an ATWS event. The December 3, 1980 letter further states that some other modifications may reduce the consequence of ATWS events at Big Rock Point. Based on the preliminary results of the PRA and the additional costs for completing the RPT modification, the licensee has requested that an extension until April 1, 1981 be provided for the February 21, 1980 Confirmatory Order. The purpose of this extension would be to allow Consumers Power Company to complete the total PRA study and determine what modifications provide the greatest improvements to safety for the Big Rock Point Plant, including ATWS events. The licensee stated in the December 3, 1980 letter that they will be prepared to submit the results of the PRA to the NRC in March 1981.

3.0 EVALUATION

There are a number of basic design differences between Big Rock Point and more modern BWR plants. For example, Big Rock Point is a BWR/1 design with an operating power (240 MW_t) less than 1/10 that of recent designs. External recirculation pumps and a steam drum are used instead of jet pumps and steam separation within the reactor vessel. The combined capacity of the six steam drum safety valves is about 200% of normal steam flow to the turbines, rather than the 80% relief capacity for more recent designs. There is no high pressure injection system other than the feedwater and control rod drive system. There is no low pressure coolant injection system such as those of current BWRs; however, the plant does have an automatic reactor depressurization system and low pressure core spray system similar to current BWRs. Nitrogen bottles and a syphoning system are used for liquid poison injection instead of positive displacement pumps. Finally, dry containment is used instead of the pressure-suppression design characteristic of recent plants.

One of the concerns with ATWS events for BWR 4/5/6 designs is the early (few seconds) excessive calculated pressures of the reactor coolant pressure boundary. The effect of the automatic pump trip to limit the calculated pressure to an acceptable level led the staff to require implementation of the RPT. Because of the large steam relief capacity of Big Rock Point, the licensee has found that primary system design pressure is not exceeded even for an ATWS event without recirculation pump trip. Thus, the Big Rock Point Plant currently meets the objective of limiting the calculated pressure of the reactor coolant pressure boundary to an acceptable level which requires RPT in more modern BWR plants. Some benefit in terms of mitigating containment overpressurization and increasing the time available for liquid poison injection would be obtained from an early pump trip. However for this design, the RPT could be manually actuated (in minutes) to obtain this nominal improvement. The licensee's emergency operating procedure for mitigating the effects of an ATWS event includes manual tripping of the recirculation pumps. The licensee has also stated that, in view of the unique design features and operating characteristics of Big Rock Point, there are other modifications involving the feedwater system and reliability which could have a greater effect on risk reduction for ATWS events than an automatic pump trip. In addition, there have been only a relatively small number of transients that have occurred at Big Rock Point which would result in an automatic trip of the recirculation pumps. Figure 2 of the licensee's December 3, 1980 submittal shows that there have been approximately 1.4 transients per year in this category which is a factor of three to five lower than that for an average operating BWR.

The licensee has not completed the probabilistic risk assessment for Big Rock Point. However, the information currently available indicates that the potential benefits of modifications besides automatic pump trip warrant NRC staff review of the completed PRA before deciding on a staff position for Big Rock Point. This conclusion is further supported by our judgement that a delay in implementing features to quickly reduce core power, such as the automatic RPT would not significantly impact risk for Big Rock Point.

The licensee requested an extension until April 1, 1981 in the effective implementation date of the February 21, 1980 Confirmatory Order. Based on the licensee's submittal date of March 1981 of those portions of the PRA applicable to RPT, the staff concludes that there will not be adequate time for it to conduct its required review. Accordingly, we have modified the requested extension until the NRC staff has completed its review of the licensee's submittal.

Because of the design differences of the Big Rock Point Plant compaired to more modern BWR plants and in view of the ongoing PRA being conducted by Consumers Power Company for the Big Rock Point Plant, we conclude that there is reasonable assurance that a delay in the implementation date in the February 21, 1980 Confirmatory Order will not cause undue risk to the health and safety of the public while this matter is under review by the NRC staff and is therefore acceptable.

4.0 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 environmnetal 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.

5.0 CONCLUSIONS

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, th- 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: January 15, 1981