



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

SUPPLEMENTAL SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO CONFORMANCE TO REGULATORY GUIDE 1.97

CONSUMERS POWER COMPANY

PALISADES PLANT

DOCKET NO. 50-255

1.0 INTRODUCTION

The staff completed its review of the licensee's conformance to Regulatory Guide (R.G.) 1.97, Revision 3, by providing the staff's safety evaluation to the licensee, on October 20, 1987. The staff found that the licensee's design was acceptable with respect to conformance to R.G. 1.97 with the exception of the variables accumulator tank level and pressure, quench tank temperature and pressure, steam generator pressure, and component cooling water flow to the ESF system. For the variable accumulator tank level and pressure the staff left this issue open because the staff was involved in a generic review of the need for environmental qualification of accumulator tank level and pressure instrumentation. By letter dated January 22, 1988, the licensee requested that the staff reevaluate the quench tank temperature and pressure, steam generator pressure, and cooling water flow to the ESF system.

2.0 EVALUATION

Regulatory Guide 1.97 recommends instrumentation with a temperature range of 50 to 750°F to monitor the quench tank temperature. The licensee had provided instrumentation for this variable with a range of 0 to 300°F. The licensee stated that the tank was provided with a rupture disk to relieve an overpressure condition at the tank design pressure. The licensee further stated that the only event which could result in excessive temperatures would be a stuck open safety relief valve.

The staff found this justification unacceptable. The staff recommended that the licensee install instrumentation that would remain functional and on scale, including the maximum expected saturation temperature, during any accident that lifts the pressurizer safety or relief valves.

In the January 22, 1988 letter, the licensee stated that they will provide instrumentation for monitoring quench tank temperature having a range which extends to the saturation temperature corresponding to the pressure setting of the quench tank rupture disk. This temperature is the maximum expected temperature during any accident that lifts the pressurizer safety or relief valves. Therefore, this instrumentation is acceptable.

Regulatory Guide 1.97 recommends instrumentation with a pressure range of 0 to

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design pressure to monitor the quench tank pressure. The licensee had provided instrumentation for this variable with a range of 0 to 25 psig. The licensee had acknowledged that the tank's design pressure was 100 psig. The licensee stated that the tank was provided with a rupture disk to relieve an overpressure condition at the tank design pressure of 100 psig.

The staff found this justification unacceptable. The staff recommended that the licensee install instrumentation that would remain functional and on scale, during any accident that lifts the pressurizer safety or relief valves.

In the January 22, 1988 letter, the licensee stated that they will provide instrumentation for monitoring quench tank pressure having a range which extends to the value of the rupture disk setpoint. This pressure is the maximum expected during any accident that lifts the pressurizer safety or relief valves. Therefore, this instrumentation is acceptable.

Regulatory Guide 1.97 recommends instrumentation with a range of 0 to 20 percent above the lowest safety valve setting to monitor the steam generator pressure. The licensee had provided instrumentation for this variable with a range of 0 to 1000 psig. The upper value of this range is 1.5 percent above the lowest safety valve setting and less than the highest safety valve setting of 1025 ($\pm 1\%$) psig.

The staff found this justification unacceptable. The staff recommended that the licensee increase the range of the instrumentation for this variable to 20 percent above the lowest safety valve setting.

In the January 22, 1988 letter, the licensee stated that in accordance with the recommendations of R.G. 1.97 they will provide instrumentation for monitoring steam generator pressure having a range which extends to 20 percent above the lowest safety valve setpoint. Therefore, this instrumentation is acceptable.

Regulatory Guide 1.97 recommends instrumentation be provided to monitor the cooling water flow to ESF system. The licensee had not provided instrumentation to monitor this variable. The licensee stated that the proper operation of this system could be monitored by component cooling water pump status and the status of the valves that are required to be open.

The staff found this justification unacceptable. The instrumentation that had been proposed by the licensee would not determine proper system operation should flow blockage or pipe rupture occur. The staff recommended that the licensee provide component cooling water flow to ESF system instrumentation as recommended by R.G. 1.97.

In the January 22, 1988 letter, the licensee proposed to not use flow as a variable to monitor the component cooling water system performance. Instead, the licensee proposes to monitor component cooling water pump discharge pressure, component cooling water pump current, component cooling water surge tank level, component cooling water shutdown cooling heat exchanger inlet temperature, and component cooling water shutdown cooling heat exchanger outlet temperature. The licensee states that these variables adequately inform the operator of changes in the operation of the component cooling water system, such as flow

blockage and pipe ruptures. The licensee further states that the instrumentation to monitor these variables either meet the Category 2 recommendations or will be upgraded to meet the Category 2 recommendations.

The staff finds that the proposed instrumentation together is an adequate replacement for the flow parameter. Changes in pump current, output pressure and the surge tank level will function to show changes in flow due to blockage or pipe rupture. The shutdown cooling heat exchanger inlet and outlet temperatures will also reflect changes in increase or decrease in differential temperature indicating flow changes. Therefore, the above combination of instrumentation is acceptable.

3.0 CONCLUSION

Based on the staff's review of the licensee's submittal, we find that the Palisades Plant design for quench tank temperature, quench tank pressure, steam generator pressure, and component cooling water flow to ESF system, is acceptable with respect to conformance to R.G. 1.97, Revision 3.

The acceptability of instrumentation for accumulator tank level and pressure will remain open pending the outcome of the staff's generic review of the need for environmentally qualified Category 2 instrumentation to monitor this variable. We will therefore report on the acceptability of this issue when the generic review is complete.

Date:

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