

RECEIVED JUNE 1 1976



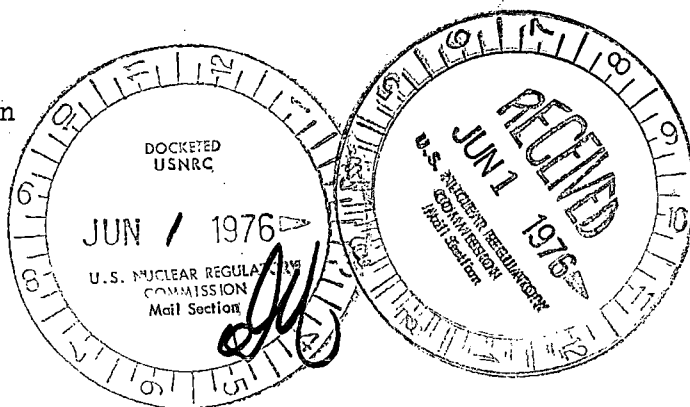
**Consumers  
Power  
Company**

General Offices: 212 West Michigan Avenue, Jackson, Michigan 49201 • Area Code 517 788-0550

May 27, 1976

Director of Nuclear Reactor Regulation  
Att: Mr Robert A. Purple, Chief  
Operating Reactor Branch No 1  
US Nuclear Regulatory Commission  
Washington, DC 20555

DOCKET 50-255, LICENSE DPR-20 -  
PALISADES PLANT - POSTULATED  
CIRCULATING WATER SYSTEM LEAK



By letter dated February 16, 1976 we responded to a request for information concerning the possibility of loss of the service water pumps as a result of flooding. We also indicated that we were continuing our review of the possible effects on other safety-related systems. This letter reports the results of that review.

A break in the expansion joint at the circulating water inlet to the condenser has been postulated. Adjoining elevation 590'0" of the turbine building are safety-related systems whose functioning could be adversely affected by a water rise above this elevation. This study determined the amount of water rise for several different situations of functioning and malfunctioning of circulating water equipment whose proper functioning would minimize the amount of water lost through the break.

The analysis was made on the following basic assumptions:

1. The rupture of only one expansion joint is postulated at any one time.
2. The rupture of the expansion joint was limited to half the circumference of the expansion joint and to a height of 4 inches. A flow rate of 140 ft<sup>3</sup>/s was calculated and used for this break opening size.
3. Operator action to stop the flow will not take place prior to the first 2-1/2 minutes following onset of the break. At this time, the areas below elevation 590'0" will be filled.
4. Water leakage from the turbine building is assumed not to occur.

Situation A

Siphon breakers are opened.  
Cooling tower water pumps are stopped by operator action.  
Condenser inlet valves fail to close.

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Siphon breaking is effected in one second. The source of water for flooding is that remaining in the hot-water basin (top of cooling tower) and the volume of water in the cold-water basin above the invert of the highest portion of the circulating waterline to the condenser.

The water rise above 590'0" for Situation A is approximately 5.25 inches.

#### Situation B

Siphon breakers fail to open.

Cooling tower water pumps are stopped by operator action.

Condenser inlet valves fail to close.

Siphon breaking is effected when water is drawn down to the level in the circulating waterlines where air from the cooling tower and will be admitted. The source of water for flooding includes the contents of the hot-water basin (top of the cooling tower), the contents of the cold-water basin, and the contents in the downward sloping section of circulating waterline leaving the cooling tower.

The water rise above 590'0" for Situation B is approximately 2.2 feet and will occur about 6.7 minutes after the onset of the break.

#### Situation C

Siphon breaker fails to open.

Cooling tower water pumps are not stopped by operator action but by the low level trip in the cooling tower pump basin.

Condenser inlet valves fail to close.

The source of water is that assumed for Situation B and that resulting from circulating water flow until the cooling tower pump stops.

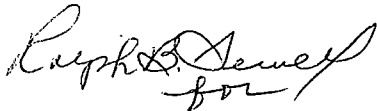
The water rise above 590'0" for Situation C is approximately 2.56 feet and will occur about 7.8 minutes after the onset of the break.

In addition to the service water system discussed in our February 2, 1976 letter, two safety-related systems were reviewed with respect to possible effects due to flooding. These systems were the component cooling water system and the auxiliary feed-water system. This review concluded that these systems were protected from flooding up to the 594'8" level. (See also answer to Question 2.4, Amendment 18.) The pipeline penetrations into the auxiliary feed pump room were inspected. A number of penetrations had seals that may be improved. These seals are to be reviewed and, if required, modifications will be made by August 1, 1976.

Our letter to R. A. Purple dated April 4, 1975 indicated that water level alarms (for flooding) would be installed in the condensate pump area. These alarms have been installed and will alert the operator to possible flooding problems.

In addition, an alarm response procedure has been incorporated into the plant operating procedure. This procedure instructs the operator with respect to the action to be taken relating to the cooling tower pumps, vacuum breaker, etc.

Based on the review performed, we have concluded that Palisades Plant safety-related equipment will not be adversely affected by flooding.

A handwritten signature in cursive script, appearing to read "David A. Bixel".

David A. Bixel  
Assistant Nuclear Licensing Administrator

CC: JGKeppler, USNRC