

Regulatory Docket File



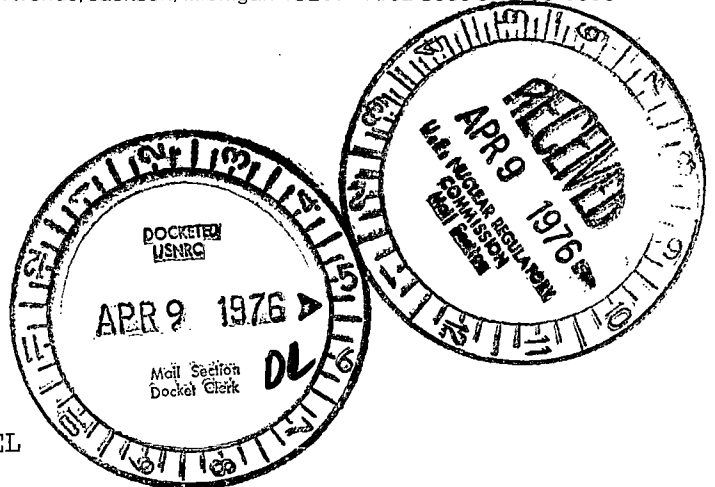
Consumers  
Power  
Company

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April 8, 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 - ADDITIONAL RESPONSE  
TO QUESTION 4.A.4 - CYCLE 2, RELOAD FUEL



This letter is written as a further response to Question 4.A.4 in your list of questions dated March 10, 1976. In our March 20, 1976 response, we indicated that the ECCS analysis (XN-76-4) which had been submitted to you was acceptable although certain inconsistencies were present with regard to steam generator modeling.

As a result of further discussion with your staff, a supplemental analysis which corrects these inconsistencies has been performed by Exxon Nuclear. This analysis examines a 1.0 DES/PD break in Loop 1 with Combustion Engineering Type D fuel. The result of this analysis is a peak-cladding temperature of 2146°F.

Attached is a preliminary summary from Exxon Nuclear which describes the analysis performed and the results obtained. A complete supplement to XN-76-4 will be sent to you when it becomes available.

David A. Bixel  
Assistant Nuclear Licensing Administrator

CC: JGKeppler, USNRC

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## 1.0 INTRODUCTION AND SUMMARY

Approved by/Date: 4-8-76

This report presents the results of a single supplemental LOCA-ECCS analysis requested by NRC and Consumers Power for the Palisades reactor. The LOCA-analytical models employed were the Exxon Nuclear Company WREM-Based Generic PWR ECCS Evaluation Model as detailed in XN-75-41.<sup>(1)</sup> Nodalization diagrams and analytical modeling for the Palisades reactor are as presented in XN-75-64.<sup>(2)</sup> A large break spectrum analysis for ENC fuel was presented in XN-76-4,<sup>(3)</sup> and supplemental analyses were reported in XN-76-4, Supplement 1.<sup>(4)</sup>

The case presented in this report is the 1.0 DES/PD break in Loop 1 with the Combustion Engineering (CE) Type D fuel. Steam generator volumes and flow areas were corrected to conform to the conservatively assumed number of steam generator tubes plugged. Steam generator A in Loop 1 assumed approximately 2,407 tubes plugged, steam generator B at Loop 2 assumed 1,768 tubes plugged for a total of 4,175 tubes plugged. The assumed tube plugging is more than 400 tubes greater than expected to be plugged at the beginning of Cycle 2. Loop 1 flow was determined to be 16,774 lb/s and Loop 2 was 17,670 lb/s for a total of 34,444 lb/s or  $124. \times 10^6$  lb/h. The RELAP4-EM/BLOWDOWN program initializes with small residuals for these values.

The analysis for the 1.0 DES/PD Loop 1 break with Combustion Engineering Type D fuel yielded a peak-cladding temperature of 2146°F. Previous analyses gave a PCT of 2125°F for the 1.0 DES/PD Loop 2 break with CE Type D fuel, and indicated a PCT approximately 14°F higher for Loop 1 breaks compared to Loop 2 breaks with ENC fuel. Hence, the PCT of 2146°F is very close to the value expected when the CE Type D fuel analysis is combined with the adverse Loop 1 break. The results also indicate that the other changes did not significantly affect the calculated results.

The supplemental analysis shows that the 1.0 DES/PD break in Loop 1 for Combustion Engineering Type D fuel remains the worst case with a calculated PCT of 2146°F. The emergency core cooling system is shown to meet the acceptance criteria as presented in 10 CFR 50.46.<sup>(5)</sup> An acceptably conservative number of steam generator tubes plugged has been assumed for the analysis.

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