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Palisades Nuclear Plant
Operated by Nuclear Management Company, LLC

December 8, 2004 10 CFR 50.46

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Palisades Nuclear Plant
Docket 50-255
License No. DPR-20

Annual Report of Changes in Emergency Core Cooling System Models

Nuclear Management Company, LLC, is submitting the annual report of changes in the emergency core cooling system (ECCS) models for the Palisades Nuclear Plant. The report is submitted in accordance with 10 CFR 50.46(a)(3)(ii). The report contains both the small break loss-of-coolant accident ECCS evaluation summary and the large break loss-of-coolant accident evaluation summary. This report covers the period from December 12, 2003, through December 8, 2004.

Summary of Commitments

This letter contains no new commitments and no revisions to existing commitments.

W. Shamblin for DJ Malone

Daniel J. Malone
Site Vice President, Palisades Nuclear Plant
Nuclear Management Company, LLC

Enclosure (1)

CC Administrator, Region III, USNRC
Project Manager, Palisades, USNRC
Resident Inspector, Palisades, USNRC

A001

27780 Blue Star Memorial Highway • Covert, Michigan 49043-9530
Telephone: 269.764.2000

ENCLOSURE 1
ANNUAL REPORT OF CHANGES IN EMERGENCY CORE COOLING MODELS

1.0 CHANGES AND ERRORS IN SMALL BREAK LOSS-OF-COOLANT ACCIDENT (SBLOCA) EMERGENCY CORE COOLING (ECCS) EVALUATION MODEL

Framatome Advanced Nuclear Power, Inc. (FANP) performed the SBLOCA analysis for fuel cycles 17 and 18 for the Palisades Nuclear Plant. The peak cladding temperature (PCT) of 1465°F for cycle 17 was reported to the NRC in Reference 1. The peak cladding temperature (PCT) of 1465°F for cycle 18 was reported to Palisades in Reference 2.

FANP has reported the following error since the Reference 1 report.

Choked Flow Error with Non-Condensables Present (FANP Condition Report 10594)

An error was discovered in Subroutine JCHOKE in S-RELAP5, Realistic Large Break Loss of Coolant Accident (RLBLOCA) version UMARO2 and SBLOCA version USEPO2. In these and previous versions of S-RELAP5, the choked flow model incorrectly allowed the flow to not choke, but only under specific conditions. The error occurred after the accumulators had completely discharged their liquid, and nitrogen was injected into the primary system. The affected calculations are the smaller breaks in the RLBLOCA methodology and the larger breaks in the SBLOCA methodology. The analysis documented for Palisades used the same or earlier version of the code identified as affected by this error. Review of the analysis indicates that the safety injection tanks (i.e., accumulators) did not completely empty by the time of PCT so the error did not have an effect. The estimated 10 CFR 50.46 impact due to correcting the subject error is 0°F for Palisades SBLOCA analyses.

The resulting PCT, as applicable for the current fuel cycle 18, is 1465°F.

2.0 CHANGES AND ERRORS IN LARGE BREAK LOSS-OF-COOLANT ACCIDENT (LBLOCA) ECCS EVALUATION MODEL

FANP evaluates the LBLOCA for the Palisades Nuclear Plant with the SEM/PWR-98 methodology. The PCT of 1961°F for fuel cycle 17 was reported in Reference 1. FANP has reported the following error since the Reference 1 report.

Inconsistent Loss Coefficients (FANP Condition Report 9317)

Review of the Palisades LBLOCA analysis input revealed that there is one loss coefficient mismatch between RELAP4 and RFPAC/REFLEX of the type specified in CR 9317. The mismatch is that not all of the downcomer, lower plenum and lower head loss coefficients in RELAP4 were included in the downcomer node loss coefficient in the RFPAC/REFLEX input. For this

evaluation, the limiting break spectrum case (single-ended cold leg split break with a 1.0 discharge coefficient, end-of-cycle axial power shape, middle-of-cycle stored energy, and the loss of one diesel generator) was used as the base for evaluating the change in PCT. This evaluation also used 6% Gadolinia rod analysis input for Cycle 17. Comparing the results of the new calculation with the results from the base case value shows that reportable PCT is unchanged at 1945°F. Therefore, the results of the calculation shows that the 10 CFR 50.46 impact of CR 9317 is 0°F for Palisades.

The resulting PCT, as applicable for the current fuel cycle 18, is 1961°F.

3.0 REFERENCES

1. Letter, Douglas E. Cooper (Nuclear Management Company) to Document Control Desk (NRC), "Annual Report of Changes in ECCS Models per 10 CFR 50.46," dated December 11, 2003.
2. EMF-3097, Revision 0, Palisades Cycle 18 Safety Analysis Report, June 2004.