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DOCKET 50-255 - LICENSE DPR-20 - PALISADES PLANT
EVALUATION OF 10 CFR PART 21 REPORT REGARDING IMPACT OF RELAP4 EXCESSIVE VARIABILITY ON PALISADES LARGE BREAK LOCA ECCS RESULTS

In accordance with 10 CFR 50.46(a)(3)(ii), a report is required to be submitted within 30 days of discovery of a significant change or error in an Emergency Core Cooling (ECCS) analysis. The purpose of this letter is to report a significant change in the calculated peak cladding temperature (PCT) values as a result of an error in the Palisades large break loss of coolant accident (LBLOCA) ECCS evaluation model.

On January 15, 1998, per 10 CFR Part 21, the NRC was informed of a deviation in the Seimans Power Corporation (SPC) EXEM/PWR LBLOCA evaluation model related to RELAP4 excessive variability. During a presentation to the NRC on March 10, 1998, Palisades agreed to report the results of the evaluation of this deviation based on the corrected model for both fuel Cycles 13 and 14. That report is provided in the attachment.

Based on the currently approved and the corrected LBLOCA evaluation model, the change in the PCT during Cycle 14 from that during Cycle 13 is not significant. However, the evaluation of the corrected model has shown that a significant (per 10 CFR 50.46) change in the PCT values for both fuel Cycles 13 and 14 will result from the error correction.

IE19

SUMMARY OF COMMITMENTS

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

Nathan L. Haskell
Director, Licensing

CC Administrator, Region III, USNRC
Project Manager, NRR, USNRC
NRC Resident Inspector - Palisades

Attachment

ATTACHMENT

CONSUMERS ENERGY COMPANY
PALISADES PLANT
DOCKET 50-255

EVALUATION OF 10 CFR PART 21 REPORT REGARDING IMPACT OF RELAP4 EXCESSIVE VARIABILITY ON PALISADES LARGE BREAK LOCA ECCS RESULTS

3 Pages

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REFERENCES

1. Letter, JSHolm (SPC) to Document Control Desk (NRC), "Interim Report of Evaluation of a Deviation Pursuant to 10 CFR 21.21(a)(2)", NRC:98:001, January 15, 1998.

2. Letter, JFMallay (SPC) to Document Control Desk (NRC), "RELAP4 Excessive Variability", NRC:98:016, March 17, 1998.

3. Letter, JFMallay (SPC) to Document Control Desk (NRC), "Interim Report of Evaluation of a Deviation Pursuant to 10 CFR 21.21(a)(2)", NRC:98:020, April 1, 1998.

4. Letter, JFMallay (SPC) to Document Control Desk (NRC), "10 CFR Part 21 evaluation and Notification for RELAP4 Excessive Variability", NRC:98:026, May 1, 1998.

5. Letter, TCBordine (Consumers Energy) to Document Control Desk (NRC), "Notification Under 10 CFR 50.46 of Change in ECCS Calculation Results", dated April 30, 1997.

6. Letter, TCBordine (Consumers Energy) to Document Control Desk (NRC), "Annual Report of Changes in ECCS Models per 10CFR50.46", dated November 26, 1997.

BACKGROUND

In a letter dated January 15, 1998, NRC was informed of a deviation in the SPC EXEM/PWR LBLOCA evaluation model related to RELAP4 excessive variability (Reference 1). The nature of the deviation was that small changes in the input to RELAP4 can result in large changes in the calculated peak cladding temperature during a LBLOCA. At that time, SPC informed Consumers Energy that there was no indication that the RELAP4 excessive variability problem, after correction, would result in a PCT that would violate 10 CFR 50.46 limits for the Palisades LBLOCA analysis.

On March 10, 1998, SPC made a presentation to the NRC regarding the status of the RELAP4 excessive variability evaluation. In response to a request by NRC, SPC provided a summary of the meeting presentation and documented the future actions proposed (Reference 2). It was agreed that SPC would continue to use the currently approved EXEM/PWR LBLOCA model, modified by the interim fuel cooling testing facility (FCTF) correlation, to perform plant analyses in the near term. In the longer term, SPC would correct the current model for excessive variability and submit a topical

report to NRC for review. Additionally, in an effort to ensure that Palisades LBLOCA calculations based on the current RELAP4 model continue to be conservative with respect to the excessive variability, SPC agreed to perform confirmatory calculations with a corrected model for comparison purposes. Palisades agreed to report the results of the 10 CFR Part 21 evaluation based on the corrected model for both fuel Cycles 13 and 14.

A modification to the original (Reference 1) 10 CFR Part 21 evaluation schedule was transmitted to NRC by SPC on April 1, 1998, (Reference 3), indicating that the evaluation would be completed on May 1, 1998, rather than April 3, 1998. In a letter dated May 1, 1998, (Reference 4), SPC transmitted the results of their 10 CFR Part 21 evaluation. A summary of the evaluation results, with respect to the Palisades LBLOCA analyses follows.

IMPACT OF RELAP4 EXCESSIVE VARIABILITY ON PALISADES CYCLE 13 LBLOCA ANALYSIS

In letters dated April 30, 1997, and November 26, 1997, (References 5 & 6), Consumers Energy reported that the PCT predicted by the LBLOCA analysis for fuel Cycle 13 was 1892°F. The Cycle 13 analysis and resultant PCT were based on the currently approved SPC RELAP4 LBLOCA model. The results of confirmatory calculations indicate that when the RELAP4 model is corrected for excessive variability, the predicted PCT will be lower by about 113°F. Therefore, the deviation identified in Reference 1 and further identified as a reportable error in Reference 4 is significant per 10 CFR 50.46. This deviation is considered conservative for the Palisades Cycle 13 LBLOCA analysis.

IMPACT OF RELAP4 EXCESSIVE VARIABILITY ON PALISADES CYCLE 14 LBLOCA ANALYSIS

Re-analysis of the LBLOCA event based on the current RELAP4 model has recently been completed by SPC for Palisades fuel Cycle 14, resulting in a PCT of 1869°F. This result constitutes a 23°F drop in calculated PCT from fuel cycle 13 to fuel cycle 14. The change in PCT between Cycle 13 and Cycle 14 was due primarily to revised core fuel design (pellet diameter and clad thickness) and neutronics values (radial peaking factors) which were used to reflect the Cycle 14 core design and reload "R" fuel. The change in PCT between Cycle 13 and Cycle 14 does not constitute a significant change per 10 CFR 50.46.

EVALUATION OF 10 CFR PART 21 REPORT REGARDING IMPACT OF RELAP4 EXCESSIVE VARIABILITY ON PALISADES LARGE BREAK LOCA ECCS RESULTS

The results of confirmatory calculations for Cycle 14 indicate that when the RELAP4 model is corrected for excessive variability, the predicted PCT will be lower by about 70°F. Therefore, the deviation identified in Reference 1 and further identified as a reportable error in Reference 4 is significant per 10 CFR 50.46. This deviation is considered conservative for the Palisades Cycle 14 LBLOCA analysis.

CONCLUSION

The Palisades Cycle 13 and 14 LBLOCA analyses demonstrate that the acceptance criteria of 10 CFR 50.46 continue to be satisfied based on calculations performed with both the currently approved EXEM/PWR LBLOCA model, modified by the interim FCTF correlation, and the EXEM/PWR LBLOCA model corrected for excessive variability. Confirmatory calculations performed indicate that PCT will drop by greater than 50°F when the current model is corrected for excessive variability, which constitutes a significant change per 10 CFR 50.46. However, the resulting changes in the PCT for fuel Cycles 13 and 14 will be in the conservative direction.