



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

Enclosure

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

ENERGY OPERATIONS, INC.

CYCLE 6 RELOAD ANALYSIS

WATERFORD STEAM ELECTRIC STATION, UNIT 3

DOCKET NO. 50-382

1.0 INTRODUCTION

By letter dated April 24, 1992, the Entergy Operations, Inc. (the licensee), submitted the Cycle 6 reload report, with the request to review potentially unreviewed safety issues. The results of two of the Cycle 6 unanticipated operational occurrences were not bounded by the reference cycle results, as documented in the current Waterford final safety analysis report (FSAR). However, the reload analysis results remained within 10 CFR 50.46 acceptance criteria.

The staff reviewed the Waterford Cycle 6 reload report for potentially unreviewed safety issues using the 10 CFR 50.59 criteria. The staff's evaluation follows.

2.0 EVALUATION

The staff reviewed the reload submittal focusing on the licensee's analysis of the large-break loss-of-coolant accident (LOCA) and the excessive main steam flow with loss of offsite power events. The licensee identified that the results for these events were outside the reference case in the FSAR. The codes and methodologies used in the analysis have been approved and are the same as those used in the analysis of the reference case. However, these codes do not include a number of refinements which would lessen the conservatism built into the codes used in the analysis.

2.1 Large-Break LOCA

The peak clad temperature (PCT) for the Cycle 6 was calculated to be 2173^oF versus 2150^oF for the reference value. The newly calculated PCT remained below the 10 CFR 50.46 limit of 2200^oF. The 2173^oF value includes a 3^oF penalty for debris resistant fuel design. Similarly, the maximum clad oxidation for Cycle 6 is 8.4 percent compared to 7.93 percent of the reference design, but less than the required limit of 17 percent of the total cladding thickness.

2.2 Excessive Main Steam Flow with Loss of Offsite Power

The percent of fuel predicted to experience departure from nucleate boiling (DNB) for the Cycle 6 excessive main steam flow with loss of offsite power event is about 3 percent, compared to 0.83 percent calculated in the reference case. For this postulated event, the Cycle 6 minimum DNB ratio is calculated to be 1.076 versus 1.096 for the reference case. Thus, more pins are calculated to experience DNB. However, even if all of the pins experiencing DNB were to fail, a coolable geometry would be maintained and the consequences remain a small part (less than 10 percent) of 10 CFR Part 100 limits.

2.3 10 CFR 50.59 Criteria

The 10 CFR 50.59 criteria for a change deemed to involve an unreviewed safety issue are:

- (i) if the probability of occurrence of an accident...may be increased,
- (ii) if a possibility of a...different type of accident is created, and
- (iii) if the margin of safety as defined in the basis of any technical specification is reduced.

The above criteria are satisfied for the analysis results of paragraphs 2.1 and 2.2 above because: (1) the probability of occurrence of an accident is not increased nor has the possibility of a new accident been created, (2) no technical specification (TS) changes are required for Cycle 6 operation, and (3) the estimated DNB value is not part of any TS or TS bases.

3.0 CONCLUSION

While the Waterford 3 Cycle 6 reload licensing calculations for the large-break LOCA and the excessive main steam flow with offsite loss of power events are not bounded by the current FSAR analysis, the results are within the 10 CFR 50.46 limits and satisfy the 10 CFR 50.59 criteria. Thus, the staff finds the reload analysis acceptable.

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Date: September 15, 1992