

UNITED STATES NUCLEAR REGULATORY COMMISSION WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO NRC BULLETIN 96-03

PUBLIC SERVICE ELECTRIC & GAS COMPANY

ATLANTIC CITY ELECTRIC COMPANY

HOPE CREEK GENERATING STATION

DOCKET NO. 50-354

1.0 INTRODUCTION

By letters dated November 4, 1996, and May 20, 1997, Public Service Electric and Gas Company (the licensee) submitted their response to NRC Bulletin (NRCB) 96-03, "Potential Plugging of Emergency Core Cooling Suction Strainers by Debris in Boiling Water Reactors" (NRCB 96-03), for Hope Creek Generating Station. In a letter dated July 18, 1997, the licensee submitted a supplemental response providing licensee responses to staff questions. The purpose of the May 20, 1997, submittal was to provide the NRC staff with the sizing criteria the licensee intends to use for sizing their new emergency core cooling system (ECCS) suction strainers (specifically, the low pressure coolant injection (LPCI) and the low pressure core spray (CS) systems) being installed in response to NRCB 96-03. The May 20, 1997, letter requested NRC staff review and approval of the licensee's sizing criteria. This Safety Evaluation provides the NRC staff's evaluation of the licensee's criteria for sizing the new LPCI and CS suction strainers.

2.0 DISCUSSION

The NRC staff's contractor, Science and Engineering Associates, Inc. (SEA), performed a technical evaluation of the licensee's submittals and their responses to the NRC staff's requests for additional information. The contractor's evaluation results are documented in the attached Technical Evaluation Report (TER). The staff has evaluated the contractor's findings and agrees with the conclusions in the TER.

3.0 CONCLUSIONS

Based on the NRC staff's evaluation of the licensee's submittals, the contractor's TER, and all other relevant information, the staff concludes the following:

1. In performing its plant-specific analysis, the licensee calculated the strainer debris loadings based upon pipe break locations specified in Section 3.6.2 of the Hope Creek Updated Final Safety Analysis Report

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(UFSAR). This led to some break locations being screened out of the analysis because they were non-credible. This analysis is not acceptable to the staff unless the licensee performs an analysis which demonstrates that the "non-credible" breaks which they initially screened out of their plant-specific evaluation would not be more limiting in terms of head loss across the strainer than the breaks included in the initial evaluation by the licensee. The licensee committed to performing this evaluation in their response of July 18. 1997. The staff notes that NRCB 96-03 was sent to licensees to ensure compliance with the ECCS rule, 10 CFR Part 50, Section 50.46, not Genera! Design Criterion 4 (GDC 4) of Appendix A to 10 CFR Part 50. The licensing basis that the licensee refers to in Section 3.6.2 of their UFSAR is for demonstrating compliance with GDC 4, not 10 CFR 50.46. GDC 4 requires that licensees protect equipment important to safety from the dynamic and environmental effects of a postulated pipe rupture. Hope Creek's licensing basis for GDC 4 described in Section 3.6 of the UFSAR does not discuss compliance with 10 CFR 50.46, nor does the Hope Creek Safety Evaluation Report (NUREG-1048, October 1984) indicate that Section 3.6 of the UFSAR is adequate for compliance with 10 CFR 50.46. The requirements of 10 CFR 50.46 do not provide guidance which allows screening out of "non-credible" breaks. The rule states that a licensee must evaluate "a number of postulated loss-of-coolant accidents of different sizes, locations, and other properties sufficient to provide assurance that the most severe postulated loss-of-coolant accidents are calculated." Hope Creek's licensing basis for compliance with 10 CFR 50.46 is clearly stated on page 6.3-1 of their UFSAR. The UFSAR states, "Protection is provided for any RCPB [Reactor Coolant Pressure Boundary] line failure up to, and including, the guillotine failure of the largest line." The licensee's current analysis as described in their May 20, 1997, submittal may not be sufficient in scope to meet the intent of 10 CFR 50.46.

Insufficient data and calculations were provided by the licensee for the 2. staff to determine the adequacy of the strainer design to handle the calculated debris loadings. Specifically, the head loss across the new strainers with the calculated debris loadings, the basis for the estimated head loss across the new strainers (e.g., the head loss correlation, supporting test data, head loss calculations, and test data scaling analysis), and the calculated net positive suction head (NPSH) margin with the new strainers were not made available for staff review. As a result, the staff is unable to draw any specific conclusions as to the adequacy of the strainer design to perform its function with the calculated debris loadings. However, the staff believes that the new strainers will result in an improvement in NPSH margin due to the increase in strainer size, and the corresponding decrease in strainer pressure drop. Since the licensee is conducting this modification under 10 CFR 50.59, the staff will evaluate the adequacy of their design during a post-implementation inspection.

- 3. The staff also notes that adding additional margin for potential foreign material in the suppression pool is a conservative practice and will assist the licensee in minimizing potential operability concerns should they find foreign material in the suppression pool. The staff also believes allowing margin for potentially degraded or improperly applied coatings to be transported to the strainers would also be prudent. The staff notes that the licensee chose not to allow margin for foreign material or degraded coatings. However, the staff wants to make it clear that increasing the margin in the strainer size does not in any way reduce the licensee's responsibility to maintain an effective foreign material exclusion program, and to take all steps necessary to minimize the amount of material that can accumulate in the suppression pool, vent pipes, vent header, downcomers, drywell and in any other system or component that communicates with the torus.
- 4. The issue of whether or not Technical Specification Surveillances are needed will be addressed generically with the Boiling Water Reactor Owners' Group. The strainer/suppression pool maintenance and inspection program will be evaluated during the staff's post-implementation program.

Base upon the above, the NRC staff concludes that insufficient information was available for the staff to perform any detailed evaluation of the adequacy of the licensee's new strainer design.

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Attachment: TER

Date: October 31, 1997