



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

EVALUATION OF DUKE POWER COMPANY'S

OCONEE NUCLEAR STATION, UNITS 1, 2, AND 3

RESPONSE TO SUPPLEMENT NO. 1

TO GENERIC LETTER 87-02

DOCKET NOS. 50-269, 50-270, AND 50-287

INTRODUCTION

By letter dated September 21, 1992, the Duke Power Company (DPC or licensee) submitted its response to Supplement No. 1 to Generic Letter (GL) 87-02, "Verification of Seismic Adequacy of Mechanical and Electrical Equipment in Operating Reactors, Unresolved Safety Issue (USI) A-46," dated May 22, 1992, for the Oconee Nuclear Station, Units 1, 2, and 3. In this supplement, the staff requested that affected licensees submit the following information within 120 days of the issue date of the supplement:

1. A statement whether you commit to use both the Seismic Qualification Utility Group (SQUG) commitments and the implementation guidance provided in the Generic Implementation Procedure, Revision 2 (GIP-2) as supplemented by the staff's Supplemental Safety Evaluation Report No. 2 (SSER No. 2) for the resolution of USI A-46. In this case, any deviation from GIP-2, as supplemented by the SSER No. 2, must be identified, justified, and documented. If you do not make such a commitment, you must provide your alternative for responding to GL 87-02.
2. A plant-specific schedule for the implementation of the GIP and submission of a report to the staff that summarizes the results of the USI A-46 review, if you are committing to implement GIP-2. This schedule shall be such that each affected plant will complete its implementation and submit the summary report within 3 years after the issuance of the SSER No. 2, unless otherwise justified.
3. The detailed information as to what procedures and criteria were used to generate the in-structure response spectra to be used for USI A-46 as requested in the SSER No. 2. The licensee's in-structure response spectra are considered acceptable for USI A-46 unless the staff indicates otherwise during a 60-day review period.

In addition, the staff requested in SSER No. 2 that the licensee inform the staff, in the 120-day response, if it intends to change its licensing basis to reflect a commitment to the USI A-46 (GIP-2) methodology for verifying the

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seismic adequacy of mechanical and electrical equipment, prior to receipt of the staff's plant-specific safety evaluation resolving USI A-46.

In a letter dated November 19, 1992, the staff requested additional information clarifying the DPC commitment to GIP-2 and requested specific information on the in-structure response spectra to be used in the DPC implementation program. DPC responded to this request in letters dated January 15, 1993, and March 3, 1993.

EVALUATION

The DPC letter dated January 15, 1993, provided a clarification of the DPC commitment to GIP-2. This commitment was further clarified in the DPC letter dated March 3, 1993. In these letters, the licensee stated that it commits to implement both the SQUG commitments and the implementation guidance sections of GIP-2, as corrected on February 14, 1992, and as accepted by the staff in SSER No. 2. The staff finds the licensee's response acceptable.

With regard to Item 2, the licensee stated that it will submit a summary report to the NRC summarizing the results of the USI A-46 program at Oconee Nuclear Station, Units 1, 2, and 3, by December 31, 1995. Although this submittal date slightly exceeds the 3-year response period requested by the staff, the licensee provided adequate justification for its schedule. The staff finds the licensee's schedule acceptable.

The licensee provided the following information concerning in-structure response spectra in response to the NRC request:

1. DPC used the 1940 N-S El Centro earthquake time history with a peak ground acceleration of 0.1g as an input motion for development of the design basis in-structure response spectra. DPC illustrated that a 5% damped ground response spectrum obtained from the El Centro time history enveloped the 5% damped licensing basis spectrum.
2. No soil-structure interaction was considered since the reactor buildings, turbine buildings and auxiliary buildings are founded on bedrock.
3. Lumped mass stick models were used in generating the in-structure response spectra. Modal analyses for the lumped mass systems were performed. Using the mode shapes and frequencies together with the 1940 N-S El Centro earthquake time history, the horizontal acceleration time histories of the lumped mass systems were obtained. The 0.1g ground acceleration response spectrum was used as the vertical acceleration. An absolute sum of the horizontal and vertical accelerations was used to determine the overall acceleration of the equipment and subsystems.
4. No torsional effects in the dynamic analysis were considered.

5. No specific criterion was used for the purpose of peak broadening of the in-structure response spectra. However, the in-structure response spectra enveloped all the acceleration data points.

Based on our review of the licensee response and the staff positions delineated in the SSER No. 2, we conclude that the procedure used to generate the in-structure response spectra is adequate and acceptable. However, the in-structure response spectra presented in the submittal should be treated as "median-centered" response spectra due to the lack of considerations in the dynamic analysis of factors, such as, the effects of three statistically independent earthquake components (two horizontal and one vertical), torsional effects, peak broadening, and use of the rigid vertical response assumption.

Additionally, as stated in Section I.2.3.1 of the SSER No. 2, the staff recognizes that a licensee may revise its licensing basis in accordance with 10 CFR 50.59 to reflect the acceptability of the USI A-46 (GIP) methodology for verifying the seismic adequacy of electrical and mechanical equipment covered by the GIP.

CONCLUSION

The staff finds that the licensee has committed to the entire GIP-2 including both the SQUG commitments and the implementation guidance. The procedure regarding in-structure response spectra is adequate and acceptable. However, the in-structure response spectra should be treated as "median-centered" rather than "conservative, design." The implementation schedule proposed by the licensee is within the 3-year response period requested by the staff in Supplement No. 1 to GL 87-02, and is acceptable. Therefore, the staff finds the licensee response to GL 87-02 to be acceptable.

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Date: April 5, 1993