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

ENCLOSURE 1

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO THE 120-DAY RESPONSE TO

SUPPLEMENT NO. 1 TO GENERIC LETTER 87-02

FOR H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT 2

DOCKET NO. 50-261

1.0 INTRODUCTION

By letter dated September 19, 1992, Carolina Power and Light Company, the 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 H. B. Robinson Steam Electric Plant, Unit 2 (HBR2). In this supplement, the staff requested that the licensee submit the following information within 120 days of the issue date of the supplement:

1. A statement whether the licensee commits 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-2) for the resolution of USI A-46. In this case, any deviation from GIP-2, as supplemented by the SSER-2, must be identified, justified, and documented. If the licensee does not make such a commitment, the licensee must provide its 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 the licensee is 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-2, unless otherwise justified.

3. The detailed information as to what procedures and criteria were used to generate the in-structure response spectra (IRS) to be used for USI A-46 as requested in the SSER-2. The licensee's IRS 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-2 that the licensee inform the staff in the 120-day response time if it intends to change its licensing basis to reflect a commitment to the USI A-46 (GIP-2) methodology for verifying the seismic adequacy of mechanical and electrical equipment, prior to receipt of the staff's plant-specific safety evaluation resolving USI A-46.

2.0 EVALUATION

With regard to Item 1, the licensee stated that it "...commits to the SQUG commitments set forth in the GIP-2 in their entirety, including the clarifications, interpretations, and exceptions identified in SSER-2 as clarified by the August 21, 1992, SQUG letter responding to SSER-2." The licensee also stated that it "... generally will be guided by the remaining (non-commitment) sections of the GIP-2, i.e., GIP-2 implementation guidance, which comprises suggested methods for implementing the applicable commitments."

The licensee's response is unclear as to whether or not the licensee intends to implement both the SQUG commitments and the implementation guidance. In accepting GIP-2 as a method for resolving USI A-46, it was the staff's understanding that the SQUG members who chose to implement GIP-2 would essentially use the entire procedure, including the SQUG commitments, which contain the general programmatic objectives and goals, and the implementation guidance, which contains the specific criteria and procedures to be used for the resolution of USI A-46. This understanding was the basis for the staff's position, which was stated in SSER-2, that if the licensee commits to use GIP-2 for the implementation of USI A-46, it must commit to both the SQUG commitments and the use of the entire implementation guidance provided in GIP-2, unless otherwise justified to the staff. In order to allow some flexibility in implementing GIP-2, the staff acknowledged in the supplement to GL 87-02 that SQUG members who commit to GIP-2 (both the SQUG commitments and the implementation guidance) may deviate from it provided that such deviations are identified, documented and justified. However, it was also indicated in SSER-2 that if a licensee uses methods that deviate from the criteria and procedures described in the SQUG commitments and in the implementation guidance of GIP-2 without prior NRC approval, the staff may find the use of such methods unacceptable with regard to satisfying the provisions of GL 87-02.

In light of the above, the staff interprets the licensee's response to Supplement No. 1 to GL 87-02 as a commitment to the entire GIP-2 including both the SQUG commitments and the implementation guidance, and therefore considers it acceptable. If the staff's interpretation is incorrect, then in accordance with Supplement No. 1 to GL 87-02, the licensee should provide for staff review, as soon as practicable prior to implementation, its alternative criteria and procedures for responding to GL 87-02.

In addition, Enclosure 2 to our letter transmitting this SE provides the staff's response, dated October 2, 1992, to the August 21, 1992, SQUG letter. The staff does not concur with all of the SQUG's clarifications and positions stated in that letter, and thus, the licensee should not use the August 21, 1992, letter as guidance in responding to Supplement No. 1 to GL 87-02. The licensee should refer to Enclosure 2 for the staff's position on the SQUG letter.

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 HBR2 by 120 days after the completion of HBR2 refueling outage 15 (scheduled for

completion on November 11, 1993). This submittal date is within the 3-year response period requested by the staff and is therefore acceptable. The licensee indicated that it may change its licensing basis methodology at HBR2, via 10 CFR 50.59, for verifying the seismic adequacy of new and replacement, as well as existing, electrical and mechanical equipment prior to receipt of final plant-specific SERs resolving USI A-46. The staff recognizes that the 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. However, if the licensee does not commit to implement both the SQUG commitments and the implementation guidance, and the licensee has not committed to any acceptable alternative criteria and procedures, then the staff does not believe there is a basis for initiating a 10 CFR 50.59 review.

With regard to Item 3, the NRC has reviewed the licensee's response with a particular objective of assessing the acceptability of the response to items II.4.2.3 and II.4.2.4 (as applicable) of the SSER-2. The staff has reviewed and evaluated the information which can be summarized as follows:

1. The original and current design bases horizontal seismic spectra are 0.10g(OBE) and 0.20g (SSE) Housner spectra. The vertical ground spectra are two-thirds of the horizontal spectra.

2. The structural damping values are equal or smaller than those of R.G. 1.61. In the generation of floor response spectra, damping values of 2 percent and 5 percent are used respectively for OBE and SSE.

3. The seismic analysis models used consisted of stick models with lumped masses.

4. In order to consider the effects of soil-structure interaction, four different foundation models were considered which consisted of fixed base, rotational soil spring with stiffness based on pile test data, rotational and translational springs with stiffness based first on pile test data and then on soil test data only. The case with rotational springs based on pile test data renders the most conservative results.

5. As indicated in item 4 above variation of foundation medium was considered.

6. The horizontal and vertical components of the earthquakes are assumed to be acting simultaneously.

7. For all buildings, modal analyses were performed only for two orthogonal directions, and the vertical response is taken as 2/3 of the horizontal.

8. There is no mention of peak broadening.

9. The time history used in the generation of the floor response spectra is a normalized artificial time history which gave a ground response spectrum enveloping the given design ground response spectrum.

10. The floor response spectra were used in the seismic analysis of the reactor coolant system which consists of the reactor vessel, steam generator, reactor coolant pump, the pipes connecting these components, and the large supports.

The staff believes that 'conservative design' IRS should result from the use of the criteria and procedure, as summarized above, in the generation of in-structure response.

Based on the staff's review of the licensee response and the staff positions delineated in the SSER-2, the staff concludes that the licensee response regarding Item 3 is adequate and acceptable. This conclusion is based on an assumption that the statements made in the submittal, including the procedures used in generation of the floor response spectra, correctly reflect the FSAR and other licensing bases. The staff may audit the process by which the IRS were generated.

3.0 CONCLUSIONS

The NRC interprets the licensee's response to Supplement No. 1 to GL 87-02 as a commitment to the entire GIP-2 including both the SQUG commitments and the implementation guidance, and therefore considers it acceptable. If the licensee does not commit to implement the entire GIP-2, then in accordance with Supplement No. 1 to GL 87-02, the licensee should provide for staff re-review, as soon as practicable prior to implementation, its alternative criteria and procedures for responding to GL 87-02. Additionally, the licensee should not merely follow the August 21, 1992, SQUG letter for implementing GIP-2, but should refer to Enclosure 2 for the staff's response to the SQUG letter.

The implementation schedules proposed by the licensee are within the 3-year response period requested by the staff in Supplement No. 1 to GL 87-02 and are therefore acceptable.

The staff recognizes that the 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. However, if the licensee does not commit to implement both the SQUG commitments and the implementation guidance, and the licensee has not committed to any acceptable alternative criteria and procedures, then the staff does not believe that there is a basis for initiating a 10 CFR 50.59 review.

Based on the staff review of the licensee response and the staff positions delineated in the SSER-2, the NRC concludes that the licensee response is adequate and acceptable, and that the IRS developed by the licensee should be considered as 'conservative design' IRS. This conclusion is based on the assumption that the statements made in the submittal, including the procedures used in generation of the IRS, correctly reflect the FSAR and other licensing basis.

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ENCLOSURE 2

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

OCT 02 [redacted]

Mr. Neil Smith, Chairman
Seismic Qualification Utility Group
c/o EPRI
1019 19th Street, N.W.
Washington, DC 20036

SUBJECT: NRC RESPONSE TO SEISMIC QUALIFICATION UTILITY GROUP (SQUG)

Re: Letter, N. Smith, EPRI, To J. Partlow, NRR, dated August 21, 1992, concerning USI A-46 Issues.

Dear Mr. Smith:

This is to acknowledge the receipt of the SQUG response to Supplement No. 1 to Generic Letter (GL) 87-02, and Supplemental Safety Evaluation (SSER) No. 2, on the SQUG Generic Implementation Procedure for Seismic Verification of Nuclear Plant Equipment, Revision 2, as corrected February 14, 1992 (GIP-2). The NRC staff believes that successful implementation of the entire GIP-2, supplemented by the staff's SSER No. 2, by each SQUG licensee will result in cost-effective plant safety enhancement for their USI A-46 plants.

The staff also believes that the positions delineated in Supplement No. 1 to GL 87-02 and SSER No. 2 are clear and correct, and should not be misinterpreted. The staff's comments on SQUG's August 21, 1992, letter and attachment are provided in the enclosure to this letter. If you need further clarification concerning our response, please contact Mr. James Norberg at 504-3288.

Sincerely,

James G. Partlow
Associate Director for Projects
Office of Nuclear Reactor Regulation

Enclosure:
As stated

ENCLOSURE

I. NRC's Comments on the SQUG Letter of August 21, 1992:

1. In regard to the issue of seismic qualification, the staff reiterates the position stated in the SSER No. 2, in that the GIP-2 methodology is not considered to be a seismic qualification method, rather, it is an acceptable evaluation method, for USI A-46 plants only, to verify the seismic adequacy of the safe-shutdown equipment and to ensure that the pertinent equipment seismic requirements of General Design Criterion 2 and the purpose of the NRC regulations relevant to equipment seismic adequacy including 10 CFR Part 100 are satisfied.

2. The second paragraph on page 2 of your letter addressed the issue of timing of staff response to additional information requested from a licensee. Although you are correct in your statement regarding the sixty-day period for response to initial submittal of in-structure response spectra (ISRS) information, we do not agree that the same concept applies to a licensee's submittal of additional information received following a rejection or a question from the staff. To eliminate any potential misunderstanding in this regard, the staff has determined that it will respond to any submittal of additional information received from a licensee within 60 days. However, in this response, the staff will either state its approval (or rejection) of the information provided, or indicate the time duration needed for the review of such information, prior to transmitting a follow-up response of acceptance (or rejection) to the licensee. This time duration will vary depending on the complexity of the submittal.

3. Regarding the EBAC and ANCHOR computer codes, the staff's evaluations and concerns stated in the SSER No. 2 are correct and valid. The ANCHOR code does not consider the effects of base plate flexibility on the anchorage capacity.

4. With respect to transfer of knowledge regarding major problems identified, and lessons learned, in the USI A-46 plant walkdowns and third-party reviews, we request that you include the NRC in the distribution of written communications to all member utilities in this regard, and inform the NRC staff of any planned workshops on A-46 implementation for possible staff participation.

II. NRC's Comments on the Procedure for Reviewing the GIP

1. The staff supports SQUG's establishment of a Peer Review Panel composed of seismic experts since it should serve to enhance the review process of substantive changes to the technical requirements in the GIP, prior to its submittal to NRC for approval. However, since the NRC no longer intends to help finance a Peer Review Panel, the staff does not believe it

is appropriate to participate in the selection of the Peer Review members, who will be financed by SQUG/EPRI. We would like to emphasize that staff's review of a proposed GIP change will receive thorough independent NRC evaluation and will be assessed on its merits.

2. With respect to the NRC review and approval of the changes to the GIP (Item 5, page 3 of the procedure), the staff's position on the issue of its response timing is identical to that delineated in the response to a licensee submittal of additional information (refer to item 2 of NRC's Comments on the SQUG letter in this enclosure). This comment also applies to the section "LICENSING CONSIDERATIONS" on page 5 of the Attachment to the SQUG letter.

3. With respect to item 4, "Additional Restrictions," the text should be expanded to reflect that new information which indicates that existing GIP criteria and guidelines may be unconservative should be evaluated for potential 10 CFR Part 21 implications.