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

JUN 13 1975

Docket Nos. 50-416/417

R. C. DeYoung, Assistant Director for Light Water Reactors, Group 1, RL

GRAND GULF 1 & 2 - EVALUATION OF POOL DYNAMIC LOADS (TAR-1579)

Plant Name: Grand Gulf 1 & 2
Docket Nos.: 50-416/417
Licensing Stage: Post-CP
Project Manager: E. Butcher
Requested Completion Date: June 9, 1975
Technical Review By: Containment Systems Branch
Description of Task: Evaluate Submittal by MP&L
Review Status: Awaiting Additional Information on Pool Dynamic Loads

In response to your Technical Assistance Request of April 29, 1975 the Containment Systems Branch has reviewed the applicant's submittal of April 25, 1975 regarding pool dynamic loads for the Grand Gulf plant. We have also met with the applicant, Bechtel, and General Electric on June 3 and 4, 1975 to further discuss this area of concern. Based on our review we have established the following preliminary positions:

1. There is insufficient pool dynamic loading data available to justify the design of the main steam line pipe tunnel at its current location. We therefore recommend that the pipe tunnel be relocated such that the bottom of the tunnel base slab is at an elevation of about 20 feet above the pool. The pool swell impact load specified for the HCU floor (15 psi) will also be acceptable for the tunnel base slab at this elevation.

2. The TIP station, equipment hatch, and personnel hatch, which are located below 20 feet, should be modified so that they do not experience impact loads. We recommend that structures which are partially immersed in the suppression pool be designed for coincident air bubble and drag loads.

3. Structures like gratings may be designed for drag loads per GE recommendation.

4. Additional one-third scale pool dynamic tests should be performed by GE to confirm pool motion characteristics. The nature of these tests were discussed with GE and the applicant on June 4, 1975, and included both air and steam blowdowns. The specifics of these tests are being discussed with GE as well as the test schedule to be consistent with current licensing schedules. Until such data becomes available we have established a load profile that we would find acceptable for small structures. This

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information was given to the applicant and GE.

5. As indicated in our letter to the General Electric Company (GE) on June 12, 1975 (R. Tedesco to I. Stuart) we find that the relief valve vent clearing loads as proposed by GE are acceptable at this time based on our review of GE's model. However, to provide additional confirmation of these loads we will also require in-plant testing of relief valves during startup testing. Prototype testing of each class of plants and relief valve configuration is acceptable. As further indicated in our letter, should a steam quencher design currently being tested at Moss Landing substantially reduce relief valve vent clearing loads, we believe that the modified discharge system should be incorporated into the Mark III containment to provide additional margin in the containment design.

We will also need the enclosed additional information to complete our review.

RLTedesco

Robert L. Tedesco, Assistant Director
for Containment Safety
Division of Technical

Enclosure:
Request for Additional Information

cc: S. Hanauer
F. Schroeder
D. Eisenhut
E. Butcher
W. Butler
G. Lainas
J. Kudrick
J. Shapaker
J. Glynn
E. Jacobs
R. Cudlin
A. Giambusso (w/o encl.)
W. McDonald (w/o encl.)

REQUEST FOR ADDITIONAL INFORMATION
GRAND GULF NUCLEAR STATION, UNITS 1 & 2
DOCKET NOS. 50-416/417

1. In a meeting on June 4, 1975 in Bethesda with the NRC, Bechtel, and General Electric, Mississippi Power & Light (MP&L) proposed a number of containment design modifications in response to staff concerns related to pool dynamic loads. These were related to the TIP station floor, the personnel hatch, the equipment hatch, and the main steam pipe tunnel. Provide appropriate documentation of these modifications including revised drawings and pool dynamic load specifications for each of the affected structures.

2. Provide clarification and justification of your pool dynamic load specifications for pipes, I-beams, gratings, and other small structures as a function of elevation above the suppression pool surface. We understand that additional tests and available data will be included in your programs. Appropriate data should be provided as soon as available.

3. In a number of instances, your submittal of April 25, 1975 provides generalized methodologies and guidelines for specifying pool dynamic loads (e.g., pgs. 6-3, 6-4, 4-3, 8-1 and Figures 6.6, 10.3, 10.4 and 10.5). The extent to which this is applicable to the Grand Gulf Nuclear Station should be clarified by supplementing the general information with a description of the particular structures which are affected, their pertinent design parameters, and the resulting pool dynamic loads.

4. Item #6 of our March 3, 1975 letter requested that you provide an evaluation of the type and magnitude of possible asymmetric containment loads. Your submittal of April 25, 1975 does not provide an adequate response to this concern. Therefore, provide the requested information including, for example, consideration of seismically induced pool motion which could lead to locally variable vent submergences, the worst (with respect to asymmetric loading) combination of coincident relief valve actuation, random vent chugging, and variable (circumferentially) bubble pressures.

5. Item #9 of our March 3, 1975 letter requested that you describe your program for responding to the concerns of the ACRS as outlined in the question. Your response indicated that no specific investigation of pressure oscillations due to either high steam mass flux condensation or vent chugging was planned. The NRC believes that the development of analytical models to evaluate this phenomena is required to meet the concern of the ACRS.

6. The load determination for RV's either in single or multiple valve operation is determined analytically. The method for determining the pressure amplitude at a specific location on the suppression pool wall due to multiple valve openings is given in Figure A.2. The procedure accounts for a pressure contribution from each ramshead vent exit of the simultaneously actuating RV's. Since the procedure for calculating the loads is based on a phenomenological approach of vent clearing, bubble pressure, etc., explain why in Figure A.2 there is not assumed to be a bubble at each side of the ramshead?

7. No loads on submerged components (i.e., RHR return lines, suction strainers, etc.) due to RV actuation are given (i.e., RHR return lines, suction strainers, etc.). Explain the method used for determining such loads on the various components and the magnitude of these loads.

8. In Figure A.2, the hold-down loads on the ramshead vent exits are schematically shown in the three orthagonal directions. The only value given for this load is 160 KIP along the vent axis. Explain the method used to determine this load. Explain further what force magnitude was assigned to F_y to account for unequal clearing of the two sides of the ramshead.

9. The loading on the pool perimeter for several RV opening modes are presented in Figure A.7. The dynamic behavior of the load for each valve opening is shown in Figure A.10. For a complete specification of this loading and its severity on the drywell and containment structure, including pool components, the design capability for the number of load cycles over the life of the plant should be presented. Also, provide a tabulation of the anticipated number of valve opening events during the life of the plant and indicate how such operating aspects are included in the plant design.