

NUCLEAR SYSTEMS SAFETY PROGRAM

81-SS-183

November 18, 1981

Mr. R. M. Kenneally, Project Manager
 Division of Engineering Technology
 Office of Nuclear Regulatory Research
 U. S. Nuclear Regulatory Commission
 Washington, D. C. 20555

SUBJECT: Monthly Management Letter No. 6, Progress for the
 Month of October 1981, NRC FIN A0362, SONGS-1
 AFWS Project, Seismic Safety Margins Research
 Program

REFERENCE: (1) "SSMRP Progress Report No. 11," P. D. Smith,
 et al., NUREG/CR-1120, Vol. 7, June 30, 1981.
 (2) LLNL Letter No. 81-SS-180, T.Y. Chuang to
 R.M. Kenneally, November 12, 1981.

Dear Roger:

A presentation of the status and future plan for the project was given in the Ninth Water Reactor Safety Research Information Meeting on October 26, 1981 at Gaithersburg, Maryland. Significant progress has been made on the fixed-base model benchmarking of the reactor buildings during this month and the first week of November. After further telephone discussions with SCE/Bechtel, the boundary of structure and foundation was revised to be the same as Bechtel's model. The fundamental frequency of reactor building now compares very well with Bechtel's (within 15%). No further benchmarking effort on reactor building model is required.

The revised schedules for this project were transmitted to you on November 12, 1981 (Reference 2). The total YTD/Mo. cost is \$499K/\$88K.

The accomplishments for the month of October are as follows:

1. Seismic Input: Work continues on refining the zonation at the SONGS site. Preliminary values for the sliprate of the important faults have been developed.

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2. SSI: The final impedance and scattering matrices for the partial spherical foundation of the containment sphere/reactor building are nearing completion. These final results have a finer soil discretization and frequency interval than our preliminary results. Development of techniques to treat the multi-foundation aspects of the turbine building/fuel storage building is proceeding.
3. Major Structure Response: The accomplishments for major structure response are as follows:
 - o Sphere Enclosure Building and Containment Sphere/Reactor Building - Benchmarking the reactor building model with SCE/Bechtel results continued through the month. The following comparisons were made:
 - a. The crane gantry and the operating deck extension were removed from the LLNL model to match the SCE/Bechtel model. Removal of the gantry and deck extension eliminated several local modes that do not appear in SCE/Bechtel results. Gross structural modes were not affected.
 - b. Rotational inertia of the reactor building foundation was not included in the SCE/Bechtel flexible base analysis. Removing the foundation inertia from the LLNL model gave a much better agreement between the models' rocking modes. This effort is not pursued any further because the fixed-base analysis is a much better way to benchmark the reactor building model.
 - o Turbine Building - Latest modifications to the north and south turbine extensions and the west feedwater platform have been incorporated into the respective models. However, additional modifications are anticipated, and modal analyses will not be performed until final changes have been received and incorporated.
4. Subsystem Response: The following dynamic piping models have been coded and debugged:
 - o Discharge piping between containment penetration (C-3B) and steam generator (E-1C).

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- o Discharge piping between two intermediate anchors.

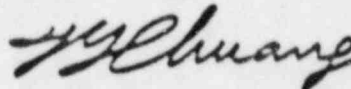
Ten piping models had been coded and debugged by the end of October.

5. Fragilities: Effort continued on structural fragility evaluations. Preliminary structure capacities of the turbine pedestal and the fuel storage building were developed. The pipe fitting load scale factors (beta factors) were also calculated. The tables of these factors for stainless steel and carbon steel pipes with the following parameters were generated:
- o butt weld
 - o elbow
 - o reinforced and unreinforced branches
 - o pipe size 0.5 to 24.0 in.
 - o pipe schedule 10, 40, 60, 80, 120, 160
 - o temperature (°F) 100, 300, 500

The Task I.5.2 (beta factor development) in Reference 1 has been completed during this month.

6. Systems Analysis: The subcontractor (SAI) report covering San Onofre-1 AFWS fault tree, electrical power and water supply required for AFWS, and the modified version of the Zion AFWS has been received. The review of this report has been initiated.

Sincerely,



T. Y. Chuang, Project Manager
SONGS-1 AFWS Project
Seismic Safety Margins
Research Program

TYC/sa

cc: D. J. Guzy