REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:8309080152 DOC.DATE: 83/08/30 NOTARIZED: NO DOCKET #
FACIL:50-275 Diablo Canyon Nuclear Power Plant, Unit 1, Pacific Ga 05000275
AUTH.NAME AUTHOR AFFILIATION
SCHUYLER,J.O. Pacific Gas & Electric Co.
RECIP.NAME RECIPIENT AFFILIATION
EISENHUT,D.G. Division of Licensing

SUBJECT: Forwards responses to unresolved items identified in SSER 18.Seismic analyses of auxiliary bldg using stick models consistant w/FSAR & Hosgri rept.

DISTRIBUTION CODE: D013S COPIES RECEIVED:LTR 1 ENCL 1 SIZE: 50
TITLE: Diablo Canyon (50-275) Independent Design Verification Program

NOTES:J Hanchett 1cy PDR Documents. 05000275

	RECIPIENT ID CODE/NAME		COPIES LTTR	COPIES ENCL	RECIPIENT ID CODE/NAME		COPIES LTTR	COPIES ENCL
	NRR LB3 BC		1	0	NRR LB3 LA		1	1
	SCHIERLING,H	06	1	1				
INTERNAL:	ELD/HDS2		1	0	IE/DEPER DIR		1	1
	IE/DEPER/EPB	11	1	1	IE/DQASIP DIR		1	1
	NRR SCHIERLING		1	1	NRR/DE/CEB	12	1	1
	NRR/DE/EQB	13	1	1	NRR/DE/GB	14	1	1
	NRR/DE/MEB	15	2	2	NRR/DE/QAB	16	1	1
	NRR/DE/SGEB		1	1	NRR/DSI/ASB	18	1	1
	NRR/DSI/ICSB		1	1	NRR/DSI/PSB		1	1
	REG FILE	04	1	1	RGN5	08	2	2
	RM/DDAMI/MIB		1	0				
EXTERNAL:	ACRS	19	16	16	LPDR	03	2	2
	NRC PDR	02	1	1	NSIC	05	1	1
	NTIS		1	1				
NOTES:			1	1				

TOTAL NUMBER OF COPIES REQUIRED: LTTR 44 ENCL 41

Pacific Gas and Electric Co.

Division of [illegible]

Diablo Canyon (DG-2/3) Independent Design Verification Program

[illegible]

PACIFIC GAS AND ELECTRIC COMPANY

PGandE — 77 BEALE STREET • SAN FRANCISCO, CALIFORNIA 94106 • (415) 781-4211 • TWX 910-372-6587

J. O. SCHUYLER
VICE PRESIDENT
NUCLEAR POWER GENERATION

August 30, 1983

Mr. Darrell G. Eisenhut, Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Re: Docket No. 50-275, OL-DPR-76
Diablo Canyon Unit 1
Safety Evaluation Report, Supplement No. 18

Dear Mr. Eisenhut:

The Diablo Canyon Safety Evaluation Report, Supplement No. 18 (SSER 18), identified items which the Staff considered unresolved. Specifically, these items relate to final verification of certain matters including the completion and/or documentation of some modifications. This letter provides PGandE's response to certain of these items and the status of resolution of the remaining items.

A list of the unresolved items identified in SSER 18 is set forth in Enclosure 1. Enclosure 2 contains information which resolves many of these items. Enclosure 3 contains information on the status of the remaining items, including a schedule for resolution, as appropriate.

Sincerely,

John B Hoch
For J. O. Schuyler

Enclosures

cc: W. E. Cooper
J. B. Martin
Service List

4070a

D013
1/1

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

ENCLOSURE 1

This enclosure contains a list of potential unresolved items identified in SSER No. 18. This list summarizes each item by its SSER section, SSER page location, and a closure or status reference. Items for which information is provided in Enclosure 2 are considered by PGandE to resolve these items. Items for which information is provided in Enclosure 3 are currently being resolved by PGandE and their status and schedule are provided. A description of the resolution or status of each open item is provided in Enclosures 2 and 3, respectively.

ENCLOSURE 1
SAFETY EVALUATION REPORT
SUPPLEMENT NO. 18
POTENTIAL UNRESOLVED ITEMS

SER SECTION	DESCRIPTION	PAGE NO./ COMMENTS	CLOSURE/STATUS DOCUMENT
3.2.1	Containment Annulus Structure		
	o Freehand averaging of spectra	C.3-9	Enclosure 2 Attachment 1
	o 20 Hz cutoff frequency	C.3-9	Enclosure 3 Attachment 1
	o Documentation	C.3-9	ITR-51 (Pending)
3.2.2	Containment Interior Structure		
	o Documentation	C.3-13	ITR-54 (Pending)
3.2.3	Containment Exterior Shell		
	o AISC code for containment penetration analysis	C.3-17	Enclosure 2 Attachment 2
	o Equipment hatch local stress level	C.3-17	Enclosure 2 Attachment 3
	o Documentation	C.3-17	ITR-54 (Pending)
3.2.4	Auxiliary Building		
	o Floor slab qualification	C.3-22	Enclosure 2 Attachment 4
	o ACI code	C.3-22	Enclosure 2 Attachment 5
	o Soil springs		Enclosure 2 Attachment 6
	o Documentation	C.3-22	ITR-55 (Pending)

ENCLOSURE 1
SAFETY EVALUATION REPORT
SUPPLEMENT NO. 18
POTENTIAL UNRESOLVED ITEMS

SER SECTION	DESCRIPTION	PAGE NO./ COMMENTS	CLOSURE/STATUS DOCUMENT
3.2.5	Fuel Handling Building		
	o Input from auxiliary building to base of fuel handling building	C.3-26	Enclosure 2 Attachment 7
	o Degree-of-freedom reduction procedure	C.3-26	Enclosure 2 Attachment 8
	o Documentation		ITR 57 Rev. 0 Issued 8/02 Rev. 1 (Pending)
3.2.6	Intake Structure		
	o Documentation	C.3-29	ITR 58 Rev. 0 Issued 8/10 Rev. 1 (Pending)
	o Verify slab modifications	C.3-28	Enclosure 3 Attachment 5
3.2.8	Turbine Building		
	o Modeling and analysis issues	C.3-36, 37	Enclosure 2 Attachments 9-15
	o Documentation	C.3-37	ITR-56 (Pending)

ENCLOSURE 1
SAFETY EVALUATION REPORT
SUPPLEMENT NO. 18
POTENTIAL UNRESOLVED ITEMS

SER SECTION	DESCRIPTION	PAGE NO./ COMMENTS	CLOSURE/STATUS DOCUMENT
3.3.1	Large Bore Piping and Supports		
	o Pipe supports	C.3-48	Enclosure 2 Attachment 16 and 22 Enclosure 3 Attachment 2
	o High stress ratios support and nozzle loads	C.3-48	Enclosure 2 Attachment 22
	o Documentation (Piping)	C.3-48	ITR-59, Rev. 0 Issued 8/20 Rev. 1 (Pending)
	o Documentation (Supports)	C.3-48	ITR-60, Rev. 0 Issued 8/18 Rev. 1 (Pending)
3.3.2	Small Bore Piping and Supports		
	o Documentation	C.3-57	Enclosure 2 Attachment 17
	o Documentation (Small bore piping)	C.3-58	ITR-61 Rev. 0 Issued 8/26 Rev. 1 (Pending)
	o Documentation (Supports)	C.3-58	ITR-60 Rev. 0 Issued 8/18 Rev. 1 (Pending)

ENCLOSURE 1
SAFETY EVALUATION REPORT
SUPPLEMENT NO. 18
POTENTIAL UNRESOLVED ITEMS

SER SECTION	DESCRIPTION	PAGE NO./ COMMENTS	CLOSURE/STATUS DOCUMENT
3.4.1	Mechanical Equipment and Supports		
	o Qualification of equipment	C.3-59 C.3-70	Enclosure 3 Attachment 4
	o Nozzle-to-pipe interface	C.3-66	ITR-67
	o Pumps flanges	C.3-69	Enclosure 2 Attachment 24
	o Documentation	C.3-70	ITR-67 Rev. 0 Issued 8/15 Rev. 1 (Pending)
3.4.2	HVAC Equipment		
	o Documentation	C.3-73	ITR-31 Rev. 1 Issued 8/4
	o Documentation	C.3-73	TR-63 Rev. 0 Issued 8/23 Rev. 1 (Pending)
3.4.3	Electrical Raceways, Instrument Tubing and Supports		
	o Cable tray qualification	C.3-80	Enclosure 2 Attachment 18
	o Superstrut welds	C.3-80	Enclosure 2 Attachment 19
	o Documentation (Raceways)	C.3-76	ITR-63 Rev. 0 Issued 8/23 Rev. 1 (Pending)
	o Documentation (Tubing/supports)	C.3-77	ITR-63 Rev. 0 Issued 8/23 Rev. 1 (Pending)

ENCLOSURE 1
SAFETY EVALUATION REPORT
SUPPLEMENT NO. 18
POTENTIAL UNRESOLVED ITEMS

SER SECTION	DESCRIPTION	PAGE NO./ COMMENTS	CLOSURE/STATUS DOCUMENT
3.5.1	Soils and Foundations		
	o Documentation (Soils intake structure)	C.3-83	ITR-58, Rev. 1 (Pending)
	o Documentation (Soils intake structure - bearing capacity, etc.)	C.3-85	ITR-58, Rev. 1 (Pending)
	o Documentation (Soils intake structure - sliding)	C.3-86	ITR-58, Rev. 1 (Pending)
	o Documentation (HLA soils work)	C.3-83-86	ITR-68 (Pending)
3.5.2	Shake Table Testing		
	o Documentation (CAP - equipment)	C.3-89	ITR-67 Rev. 0 Issued 8/15 Rev. 1 (Pending)
3.5.3	Main Control Board		
	o Staff acceptance	C.3-91	Enclosure 2 Attachment 23
3.6.6	Seismic and Stress Analysis of Buried Diesel Tanks		
	o DCP analysis	C.3-99	Enclosure 2 Attachment 20 Revised report sent to NRC; PGandE (Schuyler) to NRC (Eisenhut) dated 8/19/83

ENCLOSURE 1
SAFETY EVALUATION REPORT
SUPPLEMENT NO. 18
POTENTIAL UNRESOLVED ITEMS

SER SECTION	DESCRIPTION	PAGE NO./ COMMENTS	CLOSURE/STATUS DOCUMENT
4.2.3	Instrumentation and Controls Design		
	o EOI 8018 AFWS isolation valves	C.4-11	Enclosure 2 Attachment 21 PGandE letter (Schuyler) to NRC (Eisenhut) dated 8/10/83
	o EOI 8047 - acceptability of single relay to isolate steam generator blowdown	C.4-12	Enclosure 3 Attachment 3
4.3.2	System Design Pressure/ Temperature and Differential Pressure Across Power-Operated Valves		
	o Modifications	C.4-26	Enclosure 3 Attachment 6
4.3.5	Jet Impingement Effects Inside Containment		
	o Documentation	C.4-29 Fuel load requirements have been satisfied	Enclosure 3 Attachment 7
4.3.6	Rupture Restraints		
	o Documentation (Outside containment)	C.4-32 Fuel load requirements have been satisfied	Enclosure 2 Attachment 25
	o Documentation (Inside containment)	C.4-32 Fuel load requirements have been satisfied	

ENCLOSURE 2

This enclosure contains information which addresses potential unresolved items extracted from SSER No. 18. The information provided is considered by PGandE to resolve these items and is provided for review, as appropriate. Information for each item is provided on an individual attachment. Each attachment contains a reference, the identification of the unresolved item, and a response to the identified item. No further action on these issues is contemplated by the Project at this time, with the exception of 1) revising or supplementing the Phase I and II Final Reports at a future date, if appropriate, or 2) the potential unresolved items that relate to completion of evaluations and/or modification work, and documentation of said work.

CONTAINMENT ANNULUS STRUCTURE

Freehand averaging of spectra

A. REFERENCE

Containment Annulus Structure
Section 3.2.1.6, p. C.3-9

B. POTENTIAL UNRESOLVED ITEM

"It is noted, however, that while the use of freehand averaging of peaks and valleys in the spectra previously has been accepted by the Staff, the smoothed curve should be a reasonable average but not a lower bound. Also, its use should be limited to frequencies away from structural frequencies (peaks of the curve)."

C. DCP RESPONSE

The process used to smoothen and broaden the raw spectra in the annulus structure does provide a reasonable average and, in fact, is more conservative than the original "freehand averaging" process. The current process, which has been automated, smoothens and averages the spectra curves for $T \geq 0.2$ sec ($f < 5$ cps), but for smaller periods (higher frequencies), the raw curves are simply broadened from peaks with no averaging. The resulting curves are the same as the "freehand averaged" curve for frequencies below 5 cps and more conservative at higher frequencies. All the important and significant modes of attached piping, systems, and components have, in reality, frequencies higher than 5 cps and, therefore, the final response spectra curves provide a conservative basis for assessments of these systems.

Attachment 2

CONTAINMENT EXTERIOR SHELL

AISC Code for containment penetration analysis

A. REFERENCE

Containment Exterior Shell
SER Section 3.2.3.4, p. C.3-17

B. POTENTIAL UNRESOLVED ITEM

"It is noted, however, that instead of the AISC Code used by the DCP, the design code for containment penetrations accepted in the original licensing documents was Section III of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code as indicated in Table 3.2-4 of the FSAR."

C. DCP RESPONSE

The qualification was initially done to the AISC Code. The calculations necessary to meet the ASME Code were in preparation at the time of previous review (SERs cutoff date of June 30, 1983). The penetrations have since been shown to meet Section III of the ASME Code.

CONTAINMENT EXTERIOR SHELL

Equipment hatch local stress level

A. REFERENCE

Containment Exterior Shell
SER Section 3.2.3.4, p. C.3-17

B. POTENTIAL UNRESOLVED ITEM

"The IDVP verification work on the containment exterior consisted of reviewing a sample of the DCP analysis. The IDVP considers the containment exterior shell to be acceptable except in the vicinity of the equipment hatch."

"In addition, IDVP should evaluate the justification for local yielding of the steel plates around the opening."

C. DCP RESPONSE

There is a hexagonal steel plate around the equipment hatch opening in the containment shell where the discontinued rebars are connected. DCP calculation shows that for a loading condition including earthquake and accident loads, the steel plate exhibits local yielding. The Project has developed detailed calculations which provide stresses in the steel plate for all possible loading combinations. Local yielding, where produced, has been justified by the provisions of the ASME code. This information has been forwarded to the IDVP for their review.

AUXILIARY BUILDING

Floor slab qualification

A. REFERENCE

Auxiliary Building
SER Sections 3.2.4.4 and 3.2.4.5, p. C.3-22

B. POTENTIAL UNRESOLVED ITEM

"The Staff also requires that the DCP formally document all the parametric studies performed and used to demonstrate the adequacy of its assumptions on slab flexibility."

"The seismic model used by the DCP to predict the structural loads and produce the floor response spectra is of the generally accepted type for normal seismic analysis. However, the model has many simplifications and inherent assumptions. One assumption is that the floor slabs are rigid as compared to the walls. If floor-slab flexibilities are to be used as justification for accepting an overstress condition, then these flexibilities should be incorporated into the dynamic model used to predict the structural loadings, or show the flexibilities to be unimportant."

C. DCP RESPONSE

The seismic analyses of the auxiliary building using stick models is consistent with the FSAR and the Hosgri Report. The stick models give average seismic responses for the entire structure. The hand calculation method of distributing these global responses to the individual resisting elements has inherent conservative assumptions, resulting in unrealistically high demands in the slab diaphragms. A 3-D "macro" model is being used to more accurately represent distribution of the global responses from the stick model for obtaining seismic loads in the resisting elements.

The results from the 3-D model analyses, indicate that the capacity-to-demand ratios for the critical sections of the diaphragms are at least 1.4 and larger, thus qualifying the slabs for the DE, DDE, and Hosgri event.

Pertinent information from the 3-D model analysis and sample calculations are being transmitted to the IDVP for final review.

AUXILIARY BUILDING

ACI code

A. REFERENCE

Auxiliary Building
SER Section 3.2.4.4, p. C.3-22

B. POTENTIAL UNRESOLVED ITEM

"A structural evaluation of the slabs and walls for significant loadings was made. The loadings considered were the seismic, dead, and live loads. Original criteria of acceptance were taken from the American Concrete Institute (ACI) 318-63 Code and Structural Engineers Association of California (SEAOC) Code 1974 for slabs and walls, respectively."

"The use of different versions of the ACI 318 Code for evaluation of the floor slabs and walls is not appropriate. The versions ACI 318-63 and ACI 318-77 are not the versions committed to in the Hosgri evaluation criteria outlined in the FSAR. The use of the different versions of the code and the modifications to the 1977 code, as described in Appendix 2A to the DCP Phase I Final Report, should be justified by the DCP and evaluated by the IDVP."

C. DCP EXPLANATION

The provisions of ACI 318-63 are the bases of acceptance criteria in accordance with the FSAR and the Hosgri Report. The Structural Engineers Association of California (SEAOC) Code, 1974 is applicable only to concrete shear walls of Class II structures as indicated in the Hosgri Report, Section 4.1.4. ACI 318-63 is used for evaluation of out-of-plane loads; however, in-plane forces are not explicitly covered by ACI 318-63 for walls and slabs. Section 104 of ACI 318-63 allows criteria based on test data to be used for the design of elements not covered by its provisions. Accordingly, Appendix 2A of the Phase I report, which is based on test data, is used as the criteria which is consistent with the FSAR and Hosgri Report. It is noted that the criteria of Appendix 2A to the Phase I report are more conservative than the allowable shear stress of $10\sqrt{f'_c}$ utilized in the FSAR and Hosgri Report for wall qualification.

ACI 318-77, which has provisions for in-plane loads, was originally used for reevaluation of shear walls before the criteria of Appendix 2A were established. The provisions of ACI 318-77 are generally more conservative than those of Appendix 2A. Therefore, shear capacities according to ACI 318-77 are typically evaluated as conservative estimates of the shear capacities of the structural elements. The provisions of Appendix 2A are applied when warranted by the shear demands.

ENCLOSURE 2

Attachment 6

AUXILIARY BUILDING

Soil springs

A. REFERENCE

Auxiliary Building
SER Sections 3.2.4.4 and 3.2.4.5, p. C.3-22

B. POTENTIAL UNRESOLVED ITEM

"The Staff also requires that the DCP formally document all the parametric studies performed and used to demonstrate the adequacy of its assumptions on soil springs."

"The discrepancy between the IDVP and the DCP sensitivity study of the soil spring influence on the seismic response should be reconciled. Also the values of the soil properties should be resolved."

C. DCP RESPONSE

Soil springs were calculated in November 1970 by URS/Blume at elevation 85 ft and 100 ft and were used in the horizontal models for the DE and DDE analysis of the auxiliary building to represent soil-structure interaction effects.

The springs at elevation 100 ft were also used in October 1979 in the horizontal models for the Hosgri analysis of the building.

In March 1982, in the earlier stages of the design reverification, the IDVP calculated the soil springs at elevation 100 ft and determined values that were 50% lower for the horizontal spring and 6% higher for the torsional spring. The IDVP issued EOI 1070 for the resolution of the difference in values. The discrepancy between the IDVP soil spring values and the 1970 URS/Blume soil springs can be attributed to differences in application of the soil properties of the building foundation in the soil spring calculations by both the IDVP and URS/Blume. The IDVP also performed sensitivity studies of the effect of variation of the soil springs on important building periods.

ITR No. 6 reflects the status of the soil springs up to July 1982.

In July 1982, a complete reanalysis of auxiliary building for Hosgri, DE and DDE was started. The seismic model properties were recalculated and included reevaluation of the soil springs.

AUXILIARY BUILDING/Attachment 6 (continued)

In July 1982, new soil springs were calculated by URS/Blume. This calculation incorporated soil property data from bore holes that were not available in 1970. These new 1982 soil springs superseded the 1970 soil springs and were used in the horizontal models in the auxiliary building reanalysis for Hosgri, DE and DDE. These new soil spring values were submitted to the IDVP for review.

As a result of their review, the IDVP issued RFI 471. The DCP response to RFI 471 in April 1983, provides justification for the use of new bore hole data, evaluated embedment effects, and responded to all IDVP concerns. There are no outstanding issues from the IDVP concerning the soil springs.

In April and May 1983, the DCP performed parametric studies to determine the effect of variation of the soil springs on the building response to the Hosgri earthquake. The results indicate that the variation affects important building periods 5% to 10%.

The DCP also studied the effect of the soil spring variation on floor response spectra, translational and torsional accelerations, displacements and maximum total shears. The results indicate that these parameters are not affected significantly by the soil spring variation.

The parametric studies described above were discussed and resolved with the IDVP and are documented in DCP calculations. Note that information given in ITR 6 is no longer valid. It is expected that the forthcoming ITR on the auxiliary building will reflect the IDVP's concurrance of DCP's parametric evaluations of soil springs.

FUEL HANDLING BUILDING

Input from auxiliary building to base of fuel handling building.

A. REFERENCE

Fuel Handling Building
SER Sections 3.2.5.4 and 3.2.5.5, p. C.3-26

B. POTENTIAL UNRESOLVED ITEM

"The use of the translational and torsional response of the auxiliary building as input to the base of the fuel handling building must be documented more completely in the Phase I Report. Parametric studies to demonstrate the validity of the DCP approach should be included in the report."

"The DCP should show by parametric studies whether the input of floor slab motions at elevation 140 ft can be applied to the fuel handling building if accidental torsion is omitted."

C. DCP RESPONSE

The dynamic analysis of the auxiliary building, using a stick model, includes the fuel handling building (FHB). In the auxiliary building stick model, a 5% eccentricity of mass is used to account for the effects of accidental torsion, and the appropriate translational time-history is applied at the base.

The FHB is decoupled and analyzed separately using very detailed 3-D finite element models. The rationale for decoupling the FHB is that its small mass relative to the auxiliary building (about 1.5% refer to Phase I Report Table 2.1.2-3), and its fundamental frequency is about four and ten times less than that of the auxiliary building in the north-south and east-west direction respectively (refer to Table 2.1.2-6 of Phase I Final Report).

Two very detailed finite element models of the center six bays, and of the decoupled end six bays of the FHB are used for the dynamic analyses. The seismic input consisted of acceleration time-histories (translational and torsional) from the auxiliary building dynamic analysis developed at the center of mass at elevation 140 ft. The geometric eccentricity of the FHB relative to elevation 140 ft center of mass is accounted for by applying the translational time-history together with the eccentric distance times the torsional time-history, both applied at the base of the FHB dynamic models.

FUEL HANDLING BUILDING/Attachment 7 (continued)

Maximum nodal accelerations from the two dynamic models are determined. Average nodal acceleration at different levels of the two dynamic models are used as equivalent static input to the full detailed 3-D finite element model of the FHB.

The natural frequencies obtained from the 3-D dynamic models showed very good agreement with the results obtained from the auxiliary building stick model (coupled system, refer to Tables 2.1.2-6 and 2.1.3-3 of Phase I). The dynamic analyses show that the FHB can be adequately modeled by a single-degree-of-freedom since the effective modal masses are from 86 to 92 percent corresponding to the fundamental modes (Table 2.1.3-3 of the Phase I Final Report)

Comparison of the base shears, roof accelerations, and roof displacements from the dynamic stick model of the auxiliary building (coupled system) with the full static FHB model (uncoupled system), shows that the decoupled fuel handling building model gives conservative results. This conservatism ranges from 10 to 30 percent. These comparisons show that the decoupled FHB approach leads to conservative results.

FUEL HANDLING BUILDING

Degree-of-freedom reduction procedure

A. REFERENCE

Fuel Handling Building
SER Sections 2.3.5.4 and 3.2.5.5, p. C.3-26

B. POTENTIAL UNRESOLVED ITEM

"The total number of degrees of freedom contained in the dynamic models was reduced to 20-30 degrees of freedom before the dynamic analyses were performed. Some recent studies have indicated that this dynamic reduction often results in serious errors particularly with regard to member loads. The particular set of dynamic degrees of freedom selected for the models should be justified."

"It should be shown by the DCP and evaluated by the IDVP that the use of this reduction technique yields correct results."

C. DCP RESPONSE

The two dynamic models of the fuel handling building (FHB), as shown in Figures 2.1.3-19 and 20 of the Phase I Final Report which incorporate the final modifications to the structure, have 52 and 54 dynamic degrees-of-freedom (DDOF's) for each of the three orthogonal direction (a total of 156 and 162 DDOF's). Note that the models of the unmodified structure shown on Figures 2.1.3-5, 6, and 7 in the Phase I Final Report, had 20 to 30 dynamic degrees-of-freedom.

The dynamic models are analyzed using the STARDYNE computer code, a public domain, general purpose structural finite element program for analysis of the static and dynamic response of linear systems. The dynamic degree of freedom reduction is accomplished by using the Guyan reduction procedure, a condensation performed on both the stiffness and mass matrices. This method was first suggested by R. J. Guyan in "Reduction of Stiffness and Mass Matrices," AIAA Journal, Volume 3, No. 2, 1965.

For the FHB, the use of this reduction procedures produces very good results based on the following:

- The natural frequencies obtained from the 3-D dynamic models showed very good agreement with the results obtained from the auxiliary building stick model (coupled system), refer to Tables 2.1.2-6 and 2.1.3-3 of the Phase I Report. The dynamic analyses shows that the FHB can be adequately modeled by a single-degree-of-freedom since the effective model masses is from 86 to 92 percent for the fundamental modes.

FUEL HANDLING BUILDING/Attachment 8 (continued))

- Comparison of the base shears, roof accelerations and roof displacements from the dynamic stick model of the auxiliary buildings (coupled system) with the full static FHB model (uncoupled system), shows that the uncoupled FHB model gives conservative results. This conservatism ranges from 10 to 30 percent.

TURBINE BUILDING

Modeling and analysis issues - clarify load combination

A. REFERENCE

Turbine Building
SER Section 3.2.8.4, p. C.3-36

B. POTENTIAL UNRESOLVED ITEM

"Although the design criteria stipulate that the strength requirement for the structural members is based on combined dead, live, and earthquake forces, the summary tables showing the member forces do not indicate clearly such combination. If the member forces are due to earthquake alone, then a discrepancy exists."

C. DCP EXPLANATION

As stated on page 2.1.4-22 of the Phase I Final Report, the design forces given in the tables include loading combinations given in the design criteria. As stipulated in the design criteria, members are evaluated for combined dead, live, and earthquake forces. Member forces shown in the summary tables include such a combination.

Attachment 10

TURBINE BUILDING

Modeling and analysis issues - justify method of modeling roof trusses

A. REFERENCE

Turbine Building
SER Section 3.2.8.4, p. C.3-36

B. POTENTIAL UNRESOLVED ITEM

"The method of modeling the roof truss by two generalized uniaxial members and obtaining individual truss member responses from the uniaxial member model is questionable, since the action of the member is different from that of a truss and the maximum response of the model may not be the maximum response of each individual truss member."

C. DCP RESPONSE

The equivalent generalized uniaxial member truss model is used only to calculate global responses of the turbine building roof truss. As stated on page 2.1.4-9 of the Phase I Final Report, the equivalent generalized model represents the global respnses of the actual truss with a reasonable degree of accuracy. Individual roof truss member forces are obtained using a static model of the trusses in which all members are included. The displacements and accelerations obtained from the dynamic analysis are imposed on the static model of the truss to obtain the individual member forces.

TURBINE BUILDING

Modeling and analysis issues - investigate effect of continuous wall

A. REFERENCE

Turbine Building
SER Section 3.2.8.4, p. C.3-37

B. POTENTIAL UNRESOLVED ITEM

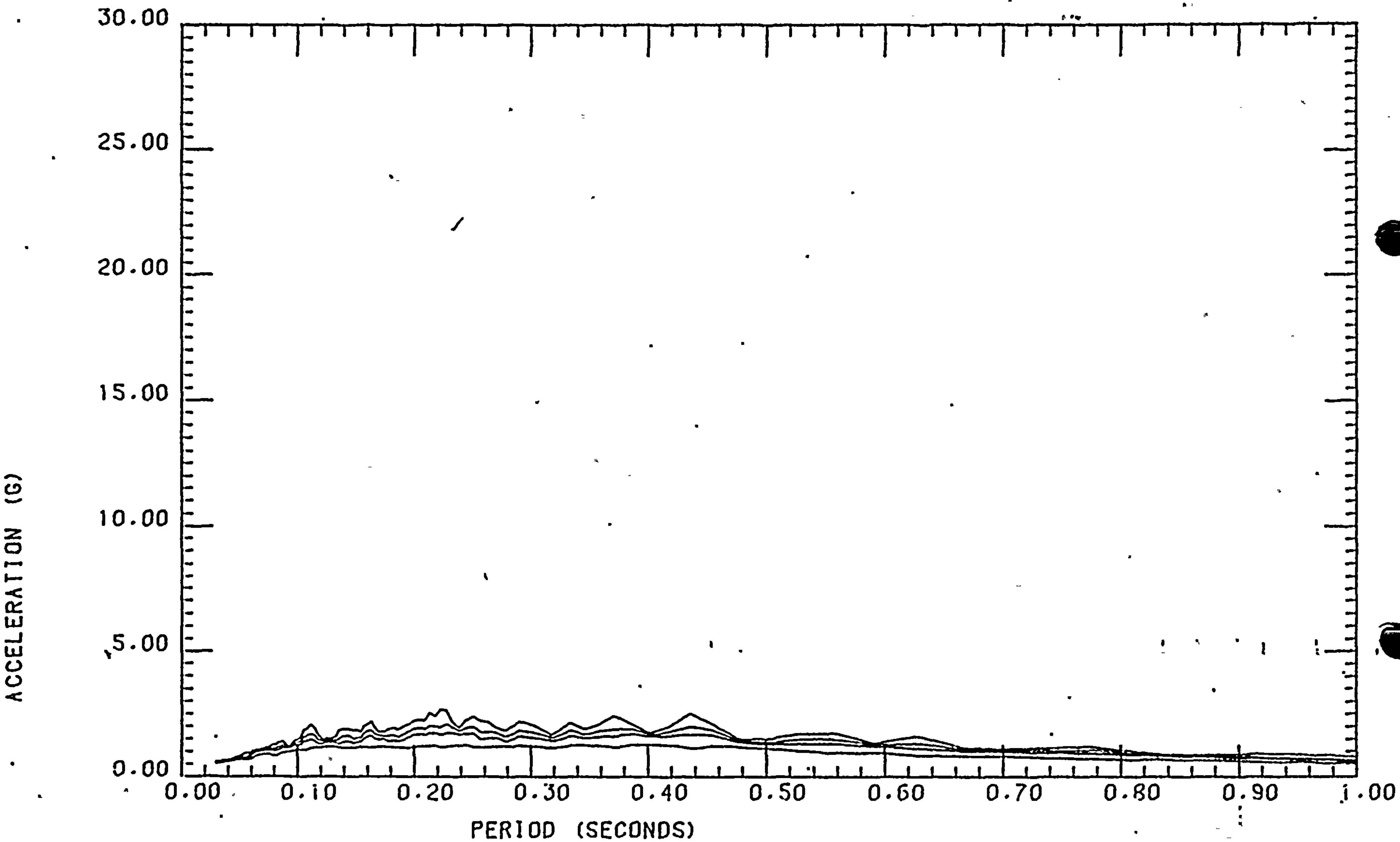
"The reason for using four separate vertical models for the turbine building is based on the fact that the large openings in the floors at the turbine pedestal divide the floors into separate areas. However, the effect of the continuous exterior wall that connects to all the floors was not investigated. This could affect the final results."

C. DCP RESPONSE

It should be noted that the exterior walls extend from column lines 5.7 to 16 which is the area represented by models 2 and 3. Furthermore, the exterior walls in model 3 extend for one bay and go up to elevation 104 ft only. Hence there is no coupling between vertical models 1 and 2, and the coupling between vertical models 2 and 3 due to the exterior walls is not considered to be significant.

In addition to the limited wall area that extends from model 2 to model 3, the exterior walls are stiff in their own plane and do not significantly amplify the ground motion. This can be seen by comparing the attached representative response spectra. Figure 1 shows the input ground response spectra. Figure 2 is the floor response spectra at column line A, bent 9 and elevation 140 ft. Figure 3 is the floor response spectra at column line G, bent 6.6 and elevation 140 ft. Comparison of the three spectra confirms that there is no significant amplification of ground motion through the wall.

DIABLO CANYON
GROUND SPECTRA

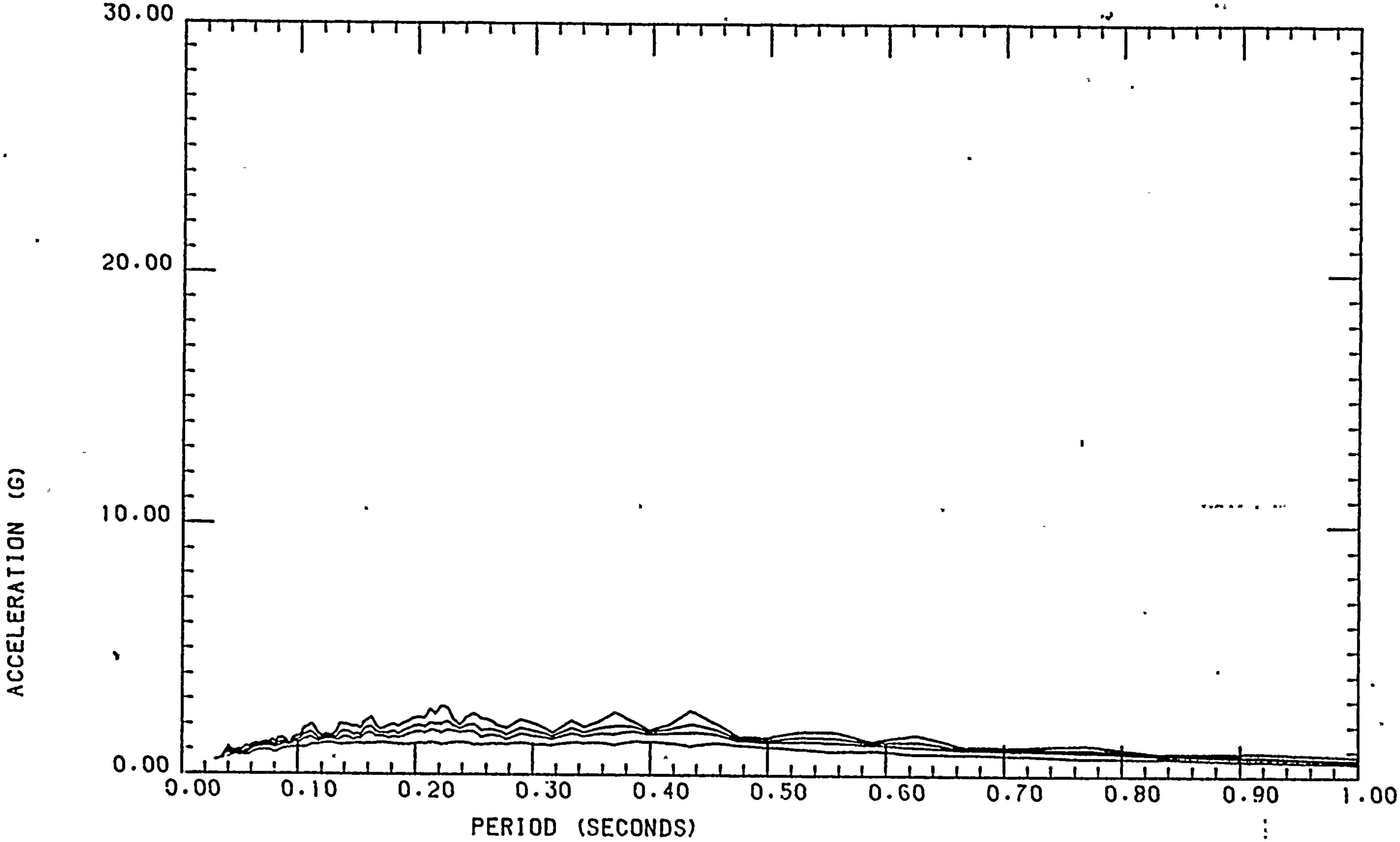


NEWMARK TAU=0.0 * 2/3
DAMPING = 2,3,4,7 0/0

FIGURE 1

URS/BLUME
RUN ID DMBLIPR
JOB NO. .15320
BY BNS DT.07/06/83
CHK JOE DT. 7/6/83

DIABLO CANYON NUCLEAR POWER PLANT
TURBINE VERTICAL 5-15



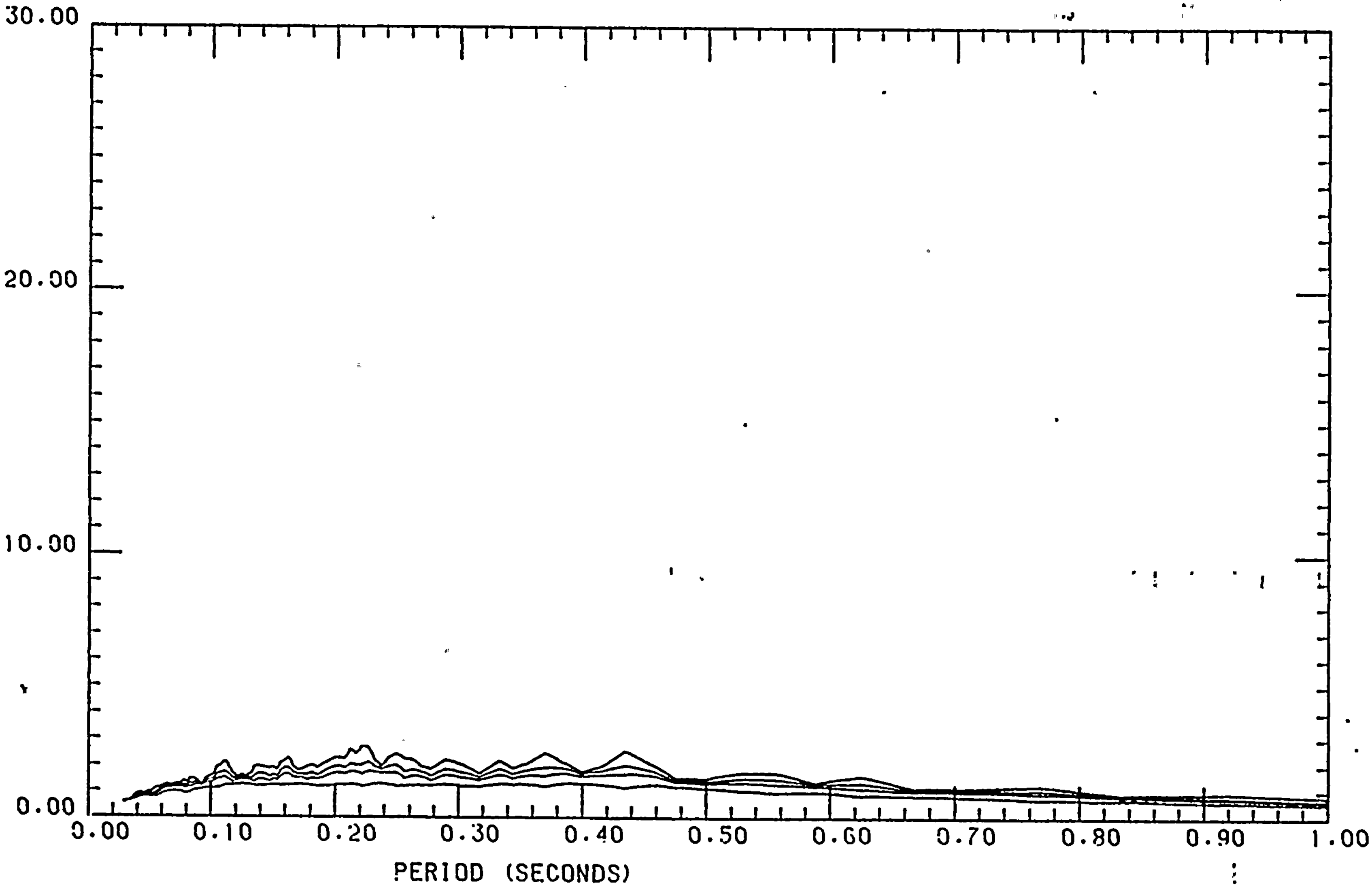
NEWMARK TAU=0.0*23 Z-DIR. EQ NODE
137 Z-DIR DAMP .02 .03 .04 .07

URS/BLUME
RUN ID EAULEBV
JOB NO. ...
BY. LJS DT.02/23/83
CHK. BNS DT. 3/1/83

FIGURE 2

CALC: 64-T-312 Rev.0
SHT: 267

DIABLO CANYON NUCLEAR POWER PLANT
TURBINE VERTICAL 5-15



NEWMARK TAU=0.0*2/3 Z-DIR. EQ
NODE 467 Z-DIR DAMP .02 .03 .04 .07

URS/BLUME	
RUN ID	EAULECB
JOB NO.	.. ....
BY. LJS	DT.02/23/83
CHK. RNS	DT 2/3/83

FIGURE 3

CALC: GA-T-912 Rev.0
SHT: 313

ENCLOSURE 2

Attachment 12

TURBINE BUILDING

Modeling and analysis issues - vertical models 1 and 2

A. REFERENCE

Turbine Building
SER Section 3.2.8.4, p. C.3-37

B. POTENTIAL UNRESOLVED ITEM

"The differences in modeling the steel frame and roof truss for vertical model 1 and vertical model 2 need clarification. Specifically, the reason for changing the roof truss, modeled as a truss in model 1, to uniaxial members in model 2. Furthermore, a basis should be provided for why the nodes above 140 ft have 6 degrees of freedom for model 1, while they only have 3 degrees of freedom for model 2."

C. DCP RESPONSE

The turbine building includes three different types of roof trusses. At and south of line 4.8, the trusses T1 are identical and at the same elevation. North of line 4.8, the roof slopes toward the north resulting in trusses, T2 and T3, being different and at lower elevations.

The superstructure portions of vertical models 1 and 2 are different geometrically, and are used for different purposes. The model 1 area contains a "T2" and a "T3" truss. Since the results from this model were used to determine member forces in these trusses, it was decided to model them in detail. Also, since the roof at the end of the structure slopes toward north, the north-south responses due to vertical ground motion are significant; accordingly, 6 degrees of freedom are retained for this portion of the model.

Vertical model 2 covers an area of the structure where all roof trusses are type "T1". The member forces used for evaluation of T1 trusses were derived from the vertical crane model, where the T1 truss is modeled in detail. In model 2, therefore, it was only necessary to model the roof trusses in such a way that the effects of the roof on the rest of the structure were accurately represented. The generalized uniaxial members used for the roof trusses are identical to those used in the horizontal model, and the masses are distributed such that the principal vertical roof frequency is matched. Since the roof does not slope in the region of model 2, little north-south response due to vertical ground motion is expected to be significant for this region of the structure so the degrees of freedom associated with these responses are not included.

TURBINE BUILDING

Modeling and analysis issues - model combination

A. REFERENCE

Turbine Building
SER Section 3.2.8.4, p. C.3-37

B. POTENTIAL UNRESOLVED ITEM

"The statement in the PGandE Phase I Final Report, "Alternative procedures are being reviewed to assure that the modal combination by SRSS is acceptable," needs to be explained as to what alternative procedures were used."

C. DCP RESPONSE

The turbine building has been evaluated for dynamic responses calculated on the basis of a modal superposition response spectrum analysis with modal responses combined on an SRSS basis. The principal lateral and vertical force resisting elements of the turbine building were also evaluated for dynamic response calculated on the basis of a double algebraic sum (DAS) combination of modal reponses, (these results were not reported in the final report). The principal load resisting members have capacities which exceed the demand predicted by the DAS.

TURBINE BUILDING

Modeling and analysis issues - ground motion response

A. REFERENCE

Turbine Building
SER Section 3.2.8.4, p. C.3-37

B. POTENTIAL UNRESOLVED ITEM

"The statement in the PGandE Phase I Final Report, "Co-directional response due to the three orthogonal components of ground motion are combined on an SRSS basis, or equivalent," indicates some other material or component combination was used. The equivalent method needs to be explained."

C. DCP RESPONSE

The equivalent method used is that in which the full value of one earthquake component is added to the sum of 40% of each of the other two components.

ENCLOSURE 2

Attachment 15

TURBINE BUILDING

Modeling and analysis issues - AISC Code, 8th Edition

A. REFERENCE

Turbine Building
SER Section 3.2.8.4, p. C.3-37

B. POTENTIAL UNRESOLVED ITEM

"The use of the AISC Code 8th Edition is in violation of the acceptance criteria delineated in the FSAR. The use of the increased allowable stresses should be justified."

C. DCP RESPONSE

As stated in the Hosgri Report (Section 4.1.4), the allowable stress limitation of AISC Code 7th Edition need not apply. The acceptance criteria stated in the same section of the Hosgri Report is that lateral force resisting elements are allowed inelastic deformation according to those indicated in Table 4-2. The use of the AISC Code 8th Edition is appropriate and meets the acceptance criteria.

ENCLOSURE 2

Attachment 16

LARGE BORE PIPING AND SUPPORTS

Phase I Final Report piping table

A. REFERENCE

Large Bore Piping and Supports
SER Section 3.3.1.4, p. C.3-48

B. POTENTIAL UNRESOLVED ITEM

"The results of the DCP reevaluation were summarized in tabular form in the PGandE Phase I Final Report ... values. However, ... the table did not indicate a stress or load comparision for the supports. The Staff believes this to be a deficiency to the table. Since all supports were reviewed and qualified for satisfaction of licensing criteria, this information should be available."

C. DCP RESPONSE

Detailed reporting and tracking of pipe support stress ratios would require a very large engineering manhour expenditure. The status and results of the DCP review of all Class I large bore supports is maintained by computer and indicates:

1. Location
2. Status of design review, construction and as-built review
3. Acceptance as-built or modification required
4. Associated piping analyses and revisions
5. The plant mode of operation associated with support

A printout of this data is periodically provided to the IDVP and it is included in their review and verification.

Two analyses were chosen at random and all supports on these analyses reviewed to determine the critical load case and maximum stress ratio. One analysis consists of 4 in. diameter reactor coolant system piping located in the containment building and the other consists of 12 in. diameter safety injection system piping located in the auxiliary building.

The results of this review are tabulated in Table 1; they may be considered typical.

Table 1

Analysis 3-101

Pressurizer Spray from Cold Loop 1 & 2

Hanger No.	Critical Load Case	Critical Component	Actual Load/Allowable Load Ratio
10-36	3	Snubber	0.11
10-37	3	Snubber	0.34
11-74	3	Snubber	0.15
11-105	3	Snubber	0.92
11-110	3	Snubber	0.40
42-9	4	Eye Nut	0.32
42-10	1	Hgr. Rod	0.38
42-23	1	Weld	0.84
42-71	3	Weld	0.77
42-72	1	Spring	0.78
52-12	1	Spring	0.69
52-13	1	Clamp	0.50
52-14	1	Spring	0.72
52-15	1	Spring	0.70
52-32	3	Mem. Stress	0.20
52-33	5	Anchor Bolt	0.48
52-34	1	Spring	0.91
52-35	3	Mem. Stress	0.83
52-39	5	Anchor Bolt	0.79

Table 1 (Continued)

Analysis 8-114

Containment Spray Suction Header

Hanger No.	Critical Load Case	Critical Component	Actual Load/Allowable Load Ratio
4-27	3	Snubber	0.67
85N-34	1	Weld	0.84
85N-37	4	Weld	0.48
85N-82	5	Anchor Bolt	0.65
85S-31	1	Spring	0.79
85S-42	5	Anchor Bolt	0.88
85S-142	5	Anchor Bolt	0.97
85S-166	5	Anchor Bolt	0.99

Legend for Load Case:

1 = Thermal + Dead Wt.

2 = Thermal + Dead Wt. + Seismic (DE)

3 = Thermal (Normal/Accident) + Dead Wt. + Seismic (DDE)

4 = Dead Wt. + Seismic (Hosgri)

5 = Thermal (Normal/Accident) + Dead Wt. + Seismic (Hosgri)

SMALL BORE PIPING AND SUPPORTS

Documentation

A. REFERENCE

Small Bore Piping and Supports
SER Section 3.3.2.4, p. C.3-57

B. POTENTIAL UNRESOLVED ITEM

Phase I Final Report

"The DCP report is unclear as to the actual extent of the review. The scope of the review states that all seismic Class I small-bore piping was reviewed for compliance with the original design criteria. However, there is no clear indication that the piping reviewed under the generic review, and the piping reviewed under the sample review, comprise the total small-bore piping."

C. DCP RESPONSE

The first two sentences of paragraph 2.2.2.1 of the Phase I Final Report state "All Design Class I small bore piping less than or equal to 2 in. in diameter are reviewed for compliance with the original design criteria. The piping is qualified by either generic or a sampling review." The intent of this statement is not to indicate that all small bore piping is analyzed, but instead, to commit to qualification of all small bore piping on a sample basis and to review and reanalyze as necessary all piping for certain design considerations. The review of all piping for certain considerations is termed the generic review. The issues addressed under these two design reviews are detailed in paragraphs 2.2.2.1.1 and 2.2.2.1.2 of the Phase I Final Report. The program resulted in review and reanalysis of approximately 63% of the piping and 75% of the supports.

The extent of the reanalysis has exceeded that originally planned due to expansion of sample reviews to total reviews as described in the Phase I Final Report Results sections.

ELECTRICAL RACEWAYS, INSTRUMENT TUBING AND SUPPORTS

Cable tray qualification

A. REFERENCE

Electrical Raceways, Instrument Tubing and Supports
SER Section 3.4.3.4, p. C.3-80

B. POTENTIAL UNRESOLVED ITEM

"The report, as filed, does not address the qualifications of the cable trays themselves or how the flexibility of the cable trays interact with the supports. This subject should be addressed."

C. DCP RESPONSE

The qualification of the cable trays and their flexibility was not addressed in Phase I Final Report, since the FSAR does not have any qualification requirement for the trays.

However, all Class 1E cable trays have been qualified for both Hosgri and DDE events. The qualification was first based on the maximum allowable tray span of 8'-0" and the maximum allowable weights for various sizes of trays. The cable trays were originally evaluated for the appropriate seismic responses at their specific locations. In those locations where cable trays could not be qualified with generic weights, the worst case as-built weights were used. If the tray could not be qualified with generic span, the maximum span that could be qualified was identified. A field walkdown was carried out to determine the maximum as-built span. In all cases, the maximum as-built span was less than the maximum span for which the trays could be qualified.

In evaluating cable tray supports, two separate analyses were made for each of the support types. In the first analysis, the support was evaluated based on the frequency of the support alone. The mass considered acting was the mass of the support itself and the tributary mass of the cable tray. Seven percent damping was used in determining the seismic response.

In the second analysis, the frequency of the tray/support system was used. The natural frequency of the support and that of the tray were combined to obtain the system frequency. The seismic response was obtained based on system frequency with 15% damping.

The more severe of the two seismic responses was used to evaluate the structural adequacy of the support. Sample calculations of cable tray analyses have been submitted to IDVP for review and approval. The results of the IDVP review will be reported in their forthcoming ITR on the same subject.

ELECTRICAL RACEWAYS, INSTRUMENT TUBING AND SUPPORTS

Superstrut welds

A. REFERENCE

Electrical Raceways, Instrument Tubing and Supports
SER Section 3.4.3.4, p. C.3-80

B. POTENTIAL UNRESOLVED ITEM

"The DCP in a separate effort established through testing of field samples the allowable limits for welds used in Superstrut construction. These limits should be used in the qualification of the cable trays supported by superstrut material."

C. DCP RESPONSE

The allowable limits for welds used in the back-to-back Superstrut channels have been established through testing of field samples. The effect of these allowables on the qualification of raceway supports has been reviewed as follows:

All the raceway support types that used back-to-back struts were identified. Thirty-five (35) support types were selected because they have the lowest margin of safety in strut bending. An additional 13 support types which were judged to be susceptable to direct shear in the spot weld were also examined for review. These support types were reanalyzed for shear flows in the spot welds against the allowable established by testing. Based on these analyses, the lowest margin of safety of shear flow in spot weld is 1.27.

ENCLOSURE 2

Attachment 20

SEISMIC AND STRESS ANALYSIS OF BURIED DIESEL TANKS

DCP analysis

A. REFERENCE

Seismic and Stress Analysis of Buried Diesel Tanks
SER Section 3.6.6, p. C.3-99

B. POTENTIAL UNRESOLVED ITEM

"In view of the BNL results, PGandE committed to perform the following further investigations:

(1) Refined mesh computer runs will be made using YY section properties.
(2) Runs with and without deconvolution will be made.
(3) A partially filled tank case will be examined.
(4) YY section properties in conjunction with the static analysis will be carefully examined."

C. DCP RESPONSE

The original HLA analysis, performed on limited extent of geometry (YY section properties), has been completely superseded by a finite element detailed soil structure interaction analysis with varying parameters. The results of the analyses show that the tanks satisfy the conservative acceptance criteria. Results of the analyses with description of the methodology are compiled in a revised report which updates the previous HLA report. The report was sent to the NRC on August 19, 1983.

ENCLOSURE 2

Attachment 21

INSTRUMENTATION AND CONTROLS DESIGN

EOI 8018, AFWS isolation valves

A. REFERENCE

Instrumentation and Controls Design
SER Section 4.2.3.1, p. C.4-11

B. POTENTIAL UNRESOLVED ITEM

"PGandE, by letter dated July 27, 1983, provided their justification for classifying the control circuits for these valves as not safety-related, and noted that these circuits were procured and installed as Class 1E components. The Staff requires, consistent with GDC-57, that these circuits be classified as safety-related and that PGandE should indicate their conformance to this requirement."

C. DCP RESPONSE

To address the PGandE action identified in Appendix C, Section 4.2.3.1 of SSER 18, PGandE will reclassify FCV-37 and FCV-38 instrumentation to Instrument Class IA. These valves were procured and installed as Class I; therefore, instrument reclassification will involve revising appropriate documentation and qualification files to reflect the change and confirming that related reviews are not affected. Their maintenance as Class I valves will be confirmed.

PGandE documented their position in a letter to the NRC (Eisenhut) dated August 10, 1983.

Attachment 22

LARGE BORE PIPING AND SUPPORTS

Piping high stress ratios with thermal effects and support and nozzle loads

A. REFERENCE

Large Bore Piping and Supports
SER Section 3.3.1.4, p. C.3-48

B. POTENTIAL UNRESOLVED ITEM

"The results of the reevaluation of piping indicate that the loading combination which caused the highest stress ratios and support modifications was that which included thermal effects. The staff recommends that the IDVP perform an evaluation and verification of a sample of piping where this condition was significant, and that this be reported as part of the IDVP verification of the DCP Corrective Action Program."

"In view of the significant differences in support and nozzle loads reported in ITRs 12 and 17, the staff recommends that the IDVP repeat the calculations for these piping systems with the present support configuration and the current loading, and verify that the stresses and support satisfy all corresponding design criteria."

C. DCP RESPONSE

To perform new independent calculations will not provide for a higher confidence level in the design, but instead will simply provide additional comparison of computer code results. The IDVP currently is verifying sample piping analysis inputs and outputs, both thermal and seismic. Therefore, the only aspect of the analyses which is not independently checked is the computer code. All analyses performed by the DCP use the Bechtel program ME 101. This program is verified and benchmarked with NRC programs and it has been used on many nuclear plants which are licensed and in operation. Certain of these plants were subjected to independent verification. Therefore, the DCP believes this additional analysis and verification to be a significant and unnecessary extension to the review process.

Attachment 23

MAIN CONTROL BOARD

Staff acceptance

A. REFERENCE

Main Control Board
SER Section 3.5.3.3, p. C.3-91

B. POTENTIAL UNRESOLVED ITEM

"Staff acceptance of the MCB is contingent upon written confirmation of completion of all modifications to the MCB including the devices with the complete qualification documentation being available at a central location for staff audit."

C. DCP RESPONSE

The modifications resulting from the Westinghouse requalification work are complete.

Control board qualification documentation will be available at Westinghouse by mid-September, 1983.

MECHANICAL EQUIPMENT AND SUPPORTS

Pump Flanges

A. REFERENCE

Mechanical Equipment and Supports
SER Section 3.4.1.4, p C.3-69

B. POTENTIAL UNRESOLVED ITEM

"The IDVP review for pumps is not yet complete."

"The IDVP has determined that the flanges on pumps require reevaluation. This aspect of the DCP work, therefore, is considered an unresolved concern at this time."

C. DCP RESPONSE

The IDVP has issued ITR-67, Rev. 0 on equipment. It was concluded that the seismic qualification of equipment was adequate. However, ITR-67 raised two new items related to fire pumps: allowable stresses in cast iron and stress in flange bolts.

The DCP has responded to these two concerns. The DCP believes that the calculated stress in the casing foot of the fire pump is acceptable and is consistent with the factor of safety for calculated stresses for ductile materials covered by the ASME Boiler and Pressure Vessel Code. The IDVP has agreed with this conclusion. To reduce the flange bolt stresses below allowable stress limits, flange gasket material of the fire pump will be changed.

RUPTURE RESTRAINTS

Requalification of rupture restraints

A. REFERENCE

Rupture Restraints
SER Section 4.3.6.2, p. C.4-31

B. POTENTIAL UNRESOLVED ITEM

"The staff finds that the DCP has not as yet satisfactorily reviewed the restraints nor has the IDVP verified that the rupture restaints outside and inside containment have been properly designed and installed to provide protection against postulated ruptures in high pressure piping. This is, therefore, considered an open safety issue whose resolution will be reported in a supplement to the SER. The staff considers the DCP and IDVP efforts reported so far acceptable only for meeting the requirements for fuel load authorization."

C. DCP RESPONSE

Rupture restraints, both inside and outside containment, have been evaluated and their acceptability verified utilizing a common program. The review program is complete with the exception of verification of the acceptability of piping loads where supports are attached to piping and determination and setting of the final gaps between the rupture restraints and the pipes. Setting gaps insures that the restraint will not be subjected to loads greater than their verified capacity. Hence, the rupture restraint design has now essentially been verified, unless field conditions prevent the setting of gaps.

Except for the use of crushable energy absorbing material inside containment only, restraint configurations and design principles used outside containment include all those used inside containment. Hence, although the current IDVP review does not include restraints inside the containment, the similarity in design should validate the design of restraints inside containment, as well as outside containment.

The DCP will complete the final phase of the rupture restraint review program by determining the acceptability of piping loads and by determining and setting the final gaps between the rupture restraints and the pipes.

ENCLOSURE 3

This enclosure contains status information of potential unresolved items extracted from SSER No. 18 and require additional actions for completion. These items are in the process of being addressed by the Project. The status of their resolution is provided in each individual attachment.

ENCLOSURE 3

Attachment 1

CONTAINMENT ANNULUS STRUCTURE

20 Hz cutoff frequency

A. REFERENCE

Containment Annulus Structure
SER Section 3.2.1.6, p. C.3-9

B. POTENTIAL UNRESOLVED ITEM

"It is noted, however, that a frequency of 20 Hz should not be considered as a frequency in the rigid range without verification. The Newmark Hosgri spectra approach ZPA at 33 Hz. It is the staff's position that use of the 20 Hz cutoff frequency for generation of floor response spectra should be verified and/or justified. With the exception noted, the results should lead to the acceptance of the annulus steel structure if the the program was carried out properly. The IDVP review will verify the accuracy of the DCP program."

"The staff considers the 20-Hz cutoff frequency for generation of floor response spectra an open issue and will require that the IDVP review verifications and/or justifications provided by the DCP and include the results of review in future reports."

C. DCP RESPONSE

The DCP is gathering data and performing studies that will demonstrate the validity of the 20 Hz criteria as given in the FSAR. This task is scheduled to be addressed by the DCP by September 9, 1983.

This item is currently under consideration by the DCP. This issue is related to accepted licensing criteria.

ENCLOSURE 3

Attachment 2

LARGE BORE PIPING AND SUPPORTS

Buckling criteria (IDVP action)

A. REFERENCE

Large Bore Piping and Supports
SER Section 3.3.1.4, p. C.3-48

B. POTENTIAL UNRESOLVED ITEM

"The IDVP should evaluate and justify the buckling criteria specified for linear supports, specifically the rise of the Euler buckling equation for calculating the critical buckling load for all slenderness ratios."

C. DCP RESPONSE

The Project is presently preparing a response to this item. A scheduled completion date will be provided on September 1, 1983.

ENCLOSURE 3

Attachment 3

INSTRUMENTATION AND CONTROLS DESIGN

EOI 8047 - acceptability of single relay to isolate steam generator blowdown

REFERENCE

Instrumentation and Controls Design
SER Section 4.2.3.1, p. C.4-12

B. POTENTIAL UNRESOLVED ITEM

"The staff...finds that the use of a single relay to isolate steam generator blowdown on automatic initiation of the AFWS is in conflict with the design shown in FSAR Figure 7.2-1, Sheet 15. Further, the redundancy, as shown by this figure, typical for all Westinghouse plants, is consistent with the Westinhouse analysis noted above which assumes that steam generator blowdown is terminated for those events not associated with safety injection. The staff concludes that the concern identified does represent a deviation from the Westinghouse interface requirements to be implemented by the balance-of-plant design."

"The staff will pursue this concern with PGandE to obtain a resolution of this matter."

C. DCP RESPONSE

The DCP is in the process of preparing a submittal to the NRC addressing the issues related to the method of isolating steam generator blowdown. A scheduled completion date will be provided on September 1, 1983.

ENCLOSURE 3

Attachment 4

MECHANICAL EQUIPMENT AND SUPPORTS

Qualification of equipment

A. REFERENCE

Mechanical Equipment and Supports
SER Section 3.4.1.1, p. C.3-59

B. POTENTIAL UNRESOLVED ITEM

"However, Table 2.3.1-1 of the DCP Phase I Final Report shows that the following equipment is not qualified for the nozzle loads:

(1) Boric acid tank
(2) CCW heat exchanger
(3) CCW pump lube oil cooler
(4) Diesel generator
(5) Diesel transfer filter
(6) Waste gas compressor"

C. DCP RESPONSE

Qualification of equipment for nozzle loads is nearing completion. A scheduled completion date will be provided on September 1, 1983. A letter response will be sent to the NRC prior to fuel load. The Phase I Final Report will be updated accordingly.

ENCLOSURE 3

Attachment 5

INTAKE STRUCTURE

Verify slab modifications in the intake structure

A. REFERENCE

Intake Structure
SER Section 3.2.6.3, p. C.3-28

B. POTENTIAL UNRESOLVED ITEM

"No significant slam pressures were noted from these tests on either the curtain wall or the floor of the pump compartment, provided that the top deck slab was modified. The slab was modified by providing a nonstructural fillet between the front curtain wall and the underside of the top slab and modifying the forebay access manhole to prevent air leakage. These modifications will be verified by the IDVP."

C. DCP RESPONSE

The above modifications are complete for Units 1 and 2. The SSER No. 18 identified this item for IDVP action. The IDVP or the Project will address this item as applicable. A scheduled completion date will be provided by the IDVP at a future date.

ENCLOSURE 3

Attachment 6

SYSTEM DESIGN PRESSURE/TEMPERATURE

AND DIFFERENTIAL PRESSURE ACROSS

POWER-OPERATED VALVES

Modifications

A. REFERENCE

System Design Pressure/Temperature and Differential Pressure Across Power-Operated Valves
SER Section 4.3.2, p. C.4-26

B. POTENTIAL UNRESOLVED ITEM

"PGandE is to complete modifications to systems. The staff will confirm that any modifications required in safety-related systems to satisfy pressure/temperature rating and power-operated valve operability under proper differential pressure conditions are implemented."

C. DCP RESPONSE

The Project will complete modifications to the systems prior to fuel load. A scheduled completion date will be provided on September 1, 1983.

ENCLOSURE 3

Attachment 7

JET IMPINGEMENT EFFECTS

Jet impingement effects

A. REFERENCE

Jet Impingement Effects
SER Section 4.3.5.3, p. C.4-29

B. POTENTIAL UNRESOLVED ITEM

"The staff finds that the DCP has not as yet demonstrated, nor has the IDVP verified, that possible jet impingement loads were considered in the design and qualification of safety-related piping and equipment inside containment. This is, therefore, considered an open safety issue whose resolution will be reported in a supplement to the SER. The staff, therefore, considers the DCP and IDVP efforts reported so far, acceptable only for meeting the requirements for fuel load authorization."

C. DCP RESPONSE

This is scheduled to be addressed by the Project by September 9, 1983.