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are presented in Section 5, where the term Findings is used to identify those aspects which the IDVP considered to be in violation of the DCNPP-1 license application criteria. These Findings are evaluated in Section 6 in response to the requirements of the Commission Order and Staff Letter.

The Findings and Evaluations reported here are based upon the work completed by the IDVP. Section 7 identifies those planned IDVP activities which have not been completed. With recognition of those limitations, this report completes the activities of the IDVP. However, in the process of completing the verification in accordance with the original program plans, certain additional information will be developed and added to the report or supplementary material prepared, as appropriate.

2.0 CONCLUSIONS

The DCNPP-1 Independent Design Verification Program was conducted in accordance with Commission-approved program plans responsive to a Commission Order and an NRC Staff Letter, both dated November 19, 1981. The IDVP also performed a construction Quality Assurance audit at the request of the licensee.

The design verification considered work performed by the licensee and by its service-related contractors with respect to:

- Seismic, structural, and mechanical aspects of safety-related structures, systems, and components

- Design of safety systems and the performance of safety analyses

In response to the IDVP and to internally generated findings, the licensee is performing corrective actions. The present status of that program, and of the IDVP verification, is presented in Section 7 of this report.

Based upon the design verification efforts performed between November 1981 and June 1983, the IDVP conclusions are:

- The IDVP has been conducted in a technically competent, independent, and timely manner (see 6.2) and has effectively identified uncertainties in the compliance of the design with license application criteria.

- Design errors requiring modification or reanalysis of the design have been identified (see 5.0). The basic cause

for these errors is the amalgamation of a number of factors (see 6.3).

- The corrective action program being conducted by PGandE (see 3.5.7), and being verified by the IDVP, is a planned and controlled program which has been effective and is expected to continue to be effective.

- The PGandE and IDVP efforts, when taken together, provide reasonable assurance that the design of DCNPP-1 conforms or will conform to the criteria of the license application (see 6.2).

- The IDVP has not identified any substantial safety hazards which exist when the criteria of the license application are satisfied (6.4.1).

The IDVP intends to complete their verification effort in accordance with the NRC-approved program plans, in order to confirm the effectiveness of the design activities being performed by the licensee.

4.3.2.2 Verification of DCP Activities

The DCP has addressed the IDVP concerns and recommendations in their Corrective Action Program. The DCP has assembled the current URS/Blume Hosgri spectra into a design document, Design Criteria Memorandum (DCM) C-17, and is controlling these spectra and all revisions thereto. In addition, the DCP is reviewing the effects of any changes in structural response spectra on the safety-related systems, equipment, and components.

The IDVP has verified that the DCP has issued their DCM C-17 and its revisions in a controlled manner and that the DCM does include the current Hosgri spectra. The IDVP effort included a verification of the DCP activities related to their review and evaluation of the current Hosgri spectra for design qualification of systems and equipment. The first specific review of this aspect was the Design Office Verification reported in ITR-41 and summarized in 4.2.1.7 of this report. In addition, the IDVP verified the correct transfer of Hosgri spectra from the building analyses to DCM C-17 and from DCM C-17 to piping, equipment, and structural analyses.

The IDVP verified the spectra transfer process by reviewing a portion of the DCP analyses selected as part of the ITRs-8 and -35 sample. For this effort, the IDVP selected samples from the following categories:

Buildings
Large Bore Piping
Small Bore Piping
Equipment
Electrical Raceways and Supports
Instrumentation Tubing and Supports
HVAC Ducts and Supports

The IDVP verification of the DCP control and application of the Hosgri spectra considers a review of the following items:

- Damping
- Torsion arm
- Combinational methodology
- Spectra selection
- Interpolation
- Newmark/Blume enveloping
- Correct transfer into DCM C-17 (Building analyses only)

The results of the IDVP verification of a portion of the sample are summarized below:

Buildings:	Correct transfer of spectra to DCM C-17 (3 analyses).
Computer Piping Analyses:	Correct application of DCM C-17 spectra (10 analyses). One analysis used preliminary spectra which did not envelop DCM C-17 spectra.
Span Rule Piping:	See 4.5.3.2 for verification of spectra application for small bore piping.
Equipment:	Correct application of DCM C-17 spectra in one case but not in another case, however there was no stress impact.
HVAC Duct and Supports:	Correct application of DCM C-17 spectra (5 analyses).

Electrical Raceways and Supports:	Correct application of DCM C-17 spectra (2 analyses).
Instrumentation Tubing and Supports:	Spectra correspond to DCM C-17 in one case but did not in three others, however there was no stress impact.

The three instrumentation tubing and support analyses which use spectra that do not correspond to DCM C-17 were performed prior to the existence of DCM C-17. These analyses have been reviewed by the IDVP using DCM C-17 spectra and no stresses exceeded allowables.

One computer piping analysis used preliminary spectra that did not envelop DCM C-17 spectra. The DCP used clearly marked preliminary spectra in several piping analyses as part of their redesign process. This is considered acceptable by the IDVP because the Corrective Action Program requires a final check against the last revision of DCM C-17.

One EOI, File 1125, was issued to document the incorrect application of DCM C-17 spectra to the analysis of HVAC Compressor 35. This EOI is classified as an Error Class C. This was considered to be an isolated case of spectra misapplication which did not result in an overstress condition. Programmatic control of spectra was not an issue.

Based upon the verification efforts the IDVP considers the DCP control and application of Hosgri spectra to be acceptable for all categories except small bore piping. The small bore piping effort will be treated in 4.5.3.2.

4.3.3 Non Hosgri Spectra

In addition to the Hosgri spectra, the Diablo Canyon licensing criteria specifies loading combinations that include the Design Earthquake (DE) and Double Design Earthquake (DDE). In the DCP Program, the DE and DDE spectra are generated, controlled, and applied in a manner similar to the Hosgri spectra. As noted in Section 4.3.2.2, this control methodology for spectra has been found acceptable by the IDVP.

For each of the five buildings, DE and DDE spectra have been generated and transferred to Design Control Memorandum (DCM) C-25 and C-30, respectively. These controlled DCMs contain uniquely numbered spectra which are being used as input for DE and DDE seismic loading combinations for piping, equipment, and structural qualifications.

The IDVP verified the transfer of DE and DDE spectra to and from the DCM's by reviewing a portion of the DCP analyses selected as part of the IDVP ITRs-8 and -35 sample. The categories and numbers of DCP analysis specifically reviewed for the correct transfer of DE and DDE spectra include:

Category	Number of Samples
Buildings	2
Computer Analyzed Piping	2
Span Rule Piping	Certain Span Rules
Equipment	1
Electrical Raceways and Supports	2
HVAC Ducts and Supports	5

IDVP verification of DE and DDE spectra transfer to and from DCMs C-25 and -30, considered the following items:

- Damping
- Torsion arm
- Combinational methodology
- Spectra selection
- Interpolation
- Correct transfer into DCM's C-25 and 30 (Building analysis only)

The results of the IDVP verification were that transfer and application of the DE and DDE spectra was performed correctly by the DCP for all the above samples except small bore piping. The verification of the small bore piping is not as yet complete.

The IDVP considers the DCP control and application of the DE and DDE spectra to be acceptable for all categories except for small bore piping. The small bore piping verification will be treated in 4.5.3.2.

4.3.4 Effect on Design Verification

The Diablo Canyon Nuclear Power Plant has been licensed to the following seismic standards:

.2g	Design Earthquake (DE)
.4g	Double Design Earthquake (DDE)
.75g	Postulated Hosgri Earthquake (Hosgri)

These standards control the physical design of the plant in many areas.

Interim Technical Report Number 1, Revision 0 (6/9/82) notes control and application of spectra (Hosgri) as a generic concern with the design of the plant. This concern was based in part on the Findings of the R.F. Reedy, Inc. Quality Assurance Audit of URS/J.A. Blume and Pacific Gas and Electric Company. This audit indicated inadequate control of design inputs and in particular, Hosgri spectra inputs. Technical reviews of RLCA also noted numerous instances of misapplied Hosgri spectra.

The initial errors in Hosgri spectra specification and applications constituted a generic error. Correction of this generic error required extensive physical modifications to the structures, piping, equipment, and supports.

In the formulation of the Corrective Action Program, the DCP recognized the importance of seismic input control. For each of the seismic criteria (DE, DDE, and Hosgri) controlled volumes of spectra were established and essentially all the structural, piping and equipment qualification analyses were reviewed for correct seismic inputs. This extensive program incorporates the concerns of the Phase II RLCA review, which was intended to remove the uncertainties in the current

(as of 11/30/81) design of the plant with respect to non-Hosgri loading (e.g., DE, DDE, thermal, pipe break and accidental conditions).

The DCP Corrective Action Program, as formulated, therefore supersedes the IDVP RLCA Phase II program, which has been terminated.

As a result of the previous concerns, the IDVP has reviewed the current DCP control and application of seismic inputs. As reported in Sections 4.3.2 and 4.3.3, the previous generic concern has been addressed, and the DCP is currently controlling this interface.

4.4.2 Auxiliary Building

The auxiliary building, a reinforced concrete structure, was defined by the IDVP Phase I Program Plan as the initial structure sample. It was selected because it is a complex structure containing the largest amount of safety-related equipment. Both Units 1 and 2 of the Diablo Canyon Nuclear Power Plant are served by the auxiliary building, which is constructed of concrete shear walls and floor slabs. It houses the control room and other rooms containing safety-related equipment. The fan room and the fuel handling building (see 4.4.3) are constructed on the auxiliary building at elevation 140 feet.

The auxiliary building was evaluated for the DE, DDE, and Hosgri events. Load combinations for these seismic inputs are given in the FSAR and Hosgri Reports and are summarized in the PGandE Phase I Final Report. The auxiliary building is expected to respond to an earthquake excitation as a typical shear wall building. The major deformation for horizontal excitation should be shearing deformation of the walls. Very little rotation, except torsional rotation about a vertical axis, is expected for the floor slabs.

4.4.2.1 Verification of the Initial Sample

The initial sample verification of the auxiliary building was reported in ITR-6. The Hosgri analysis performed by RLCA was limited to horizontal dynamic response in the North/South and East/West directions. Dynamic time-history analyses were performed utilizing stick models.

The scope of the RLCA initial sample effort reported in ITR-6 included the following:

- Review of the URS/Blume horizontal models for the seismic analyses of the auxiliary and fuel handling buildings.

- Calculation and comparison of the building properties for the horizontal models.

- Calculation and comparison of natural frequencies and modes of vibration for the horizontal models.

The results of the verification analyses were compared with the design analyses reported in the URS/Blume October 1979 Report. The acceptance criteria used in the comparison of results, as defined in the Phase I Engineering Program Plan, was 15 percent of the considered parameter. Differences exceeding the 15 percent acceptance criteria were noted for the following:

- Soil spring stiffnesses at elevation 100 feet

- Gross bending moment of inertias

- Torsional rigidity for auxiliary building mode 1 element between elevations 115 feet and 140 feet

- Centers of masses

- Structural stiffness of fuel handling building

- Natural periods associated with fuel handling building response

The reasons for some of the above differences were the result of discrepancies between the IDVP field observations and the design drawings. The IDVP performed parametric studies on two parameters, namely the soil spring stiffness and bending moment of inertia, to assess the sensitivity of the building natural periods to these parameters.

These studies were performed for the North/South model using five percent accidental eccentricity to the West.

The results of these parametric studies indicated that the effects of soil spring stiffness could produce variations in important building periods, from 6 to 12 percent, and the effects of bending moment inertia, from 6 to 15 percent. These percentage variations are within the acceptance criteria.

The error and open item reports issued as a result of ITR-6 are as follows:

Findings (ER/A, ER/AB, ER/B):	1092, 1097
Combined with Findings:	920, 986, 990, 991, 1027, 1029, 1070, 1079, 1091, 1093
Observations (ER/C, ER/D, Deviation):	None
Closed Items:	985, 987, 1095
Unresolved:	1028

EOI 1092 has been used to track the DCP corrective action on the fuel handling building, as reported in 4.4.3. EOI 1097 has been used to track the DCP corrective action on the auxiliary building, as reported in 4.4.2.2. EOI 1028, which deals with the issue of combination of translational and torsional response, was still open with the issuance of ITR-6, and was transferred to IDVP verification of DCP corrective action, see 4.4.2.2.

4.4.2.2 Verification of Corrective Action

The IDVP verification of the DCP Corrective Action Program for the auxiliary building is defined in ITRs-8 and -35. Several items were

identified as a result of the initial sample verification which are described in 4.4.2.1. The IDVP included consideration and resolution of these items in its verification of DCP corrective action. The IDVP verification consisted of examining on a sampling basis the analyses for all seismic and non-seismic loads. The seismic loads are the DE, DDE, and Hosgri events, while the non-seismic loads are dead and live loads. ITR-55 will report on the IDVP verification of the auxiliary building. The fuel handling building steel structure supported at elevation 140 feet of the auxiliary building is discussed in Section 4.4.3.

The IDVP reviewed DCP dynamic analyses, member qualification, and response spectra generation for accuracy and conformance to licensing criteria. Structural stabililty with respect to transfer of lateral loads to the foundation was reviewed. Also, the IDVP performed a field inspection of concrete portions of the auxiliary building to ensure conformance between design drawings and as-built conditions for selected portions of the structure. A sample of DCP qualification analyses was selected and reviewed in detail.

The DCP reviewed the as-built drawings to ensure accuracy of input to the analyses and made modifications as necessary. This review is detailed in the PGandE Phase I Final Report. For the auxiliary building, the DCP performed a reanalysis of the dynamic models, member evaluation, generation of response spectra, and structural stabililty calculations.

The DCP methodology for review and qualification of the auxiliary building included all essential steps of the qualification process. The DCP supplied a calculation index which documented the qualification analyses and computer files of record and served as the basis for selection of the IDVP sample of DCP qualification analyses.

The IDVP selected a sample of the DCP qualification analyses to ensure conformance to criteria and accuracy of calculations and to assess the essential steps of the qualification process. Specifically, files chosen to review were:

- Determination of the lumped mass properties at elevation 85 feet (DE/DDE only) and elevation 115 feet. This includes weight, center of mass, and mass moment of inertia about a vertical axis.

- Computation of the shear area, center of rigidity, and torsional rigidity for the beam representation of the shear walls between elevation 115 and 140 feet.

- Soil spring calculation at elevations 85 and 100 feet for the dynamic models. Identical soil springs were used for all seismic models at elevation 100 feet. The DE/DDE models consider soil structure interaction (SSI) by use of the soil spring at elevation 85 feet, while the Hosgri model has a fixed base at elevation 85 feet.

- Modeling of the fan rooms supported at elevation 140 feet. These element properties were lumped at elevation 140 of the auxiliary building model.

- Formulation of the Hosgri dynamic models. This file includes the dynamic solution, time history solution, and generation of response spectra for both horizontal and vertical responses.

- Evaluation of the vertically flexible control room floor slab for generation of response spectra.

- Member evaluation for in-plane loads on the shear walls. Selected walls were reviewed for shear and flexural (overturning) capacities against demand.

- Out-of-plane loading on floor slabs, specifically the vertically flexible (less than 33 Hertz) control room slab.

- In-plane evaluation of the floor diaphragms at elevations 115 and 140 feet near the spent fuel pool.

- Transfer of lateral loads and capacity of the foundation system.

This sample covers approximately 20 percent of DCP model properties determination, 80 percent of the dynamic analyses (including the vertically flexible floor slabs) and 15 percent of the member evaluation calculation files. The IDVP did not review the DE/DDE models. However, the differences between the DE/DDE model and the Hosgri model properties (that is, elevation 85 feet mass and soil spring) were examined.

The IDVP performed design verification for the DCP analyses selected . A design review checklist was developed by the IDVP to ensure that all necessary items would be examined and documented in a standard format. This checklist varies slightly from review to review, depending on the content of the analyses under consideration. Field verification of the as-built condition of the shear walls and slabs was performed to ensure consistency with the design drawings and analysis. Alternate hand calculations and parameter studies were performed by the IDVP

where necessary to assess the effects of various DCP assumptions and calculations. For the auxililary building, the IDVP performed separate analyses, such as sensitivity studies for the dynamic models, to assess the significance of modeling parameters.

Two EOIs were written as a result of the IDVP verification:

EOI 1124 was issued for the finite element modeling of the control room floor slab. The location of the supporting walls in the model did not match the actual locations. This model was used to generate Hosgri floor response spectra. The DCP has corrected this error. The IDVP then verified that slab qualification analyses for vertical loading were acceptable. This EOI was classified as a Class B Error.

EOI 1132 was issued because the Auxiliary Building DCP member evaluations had been reported as being complete. This file was combined with EOI 1097. The DCP is still in the process of evaluating the slabs for in-plane loads, and this effort is subject to further verification.

The verification program intended to be conducted by the IDVP is not yet completed. Based upon the efforts performed to June 25, 1983, the IDVP considers the following aspects of the DCP work to be acceptable and to satisfy the licensing criteria:

- Qualification analyses reflect the as-built structure.
- Accidental eccentricities for the concrete portions were applied properly.
- The synthetic time-histories used for analyses give an acceptable representation of the smooth design spectra.

- The dynamic models used for analyses are representative of the as-built structure. The IDVP accepts the DCP degrees of freedom specified, mass and stiffness properties, and boundary conditions, i.e., soil springs.

- Slabs under out-of-plane loading and shear walls sampled by the IDVP were qualified for all loading combinations and seismic events.

- Response spectra were properly generated at required locations and for specified damping values for the Hosgri event. Spectra were properly broadened, smoothed, and enveloped for use in the controlled document Design Criteria Memorandum DCM C-17.

The IDVP considers the following aspects of the DCP work to be unresolved issues at this time:

- Evaluation of the generated response spectra for the vertically flexible control room slab.

- Evaluation of the in-plane qualifications of the floor diaphragms and the implication to total response.

The IDVP intends to formulate a final conclusion as to the qualification of the auxiliary building and its conformance to licensing criteria when all analyses have been evaluated by the IDVP.

(To Be Supplemented)

4.4.3 Fuel Handling Building

The Fuel Handling Building (FHB) is a Design Class I steel-framed structure which is supported at elevation 140 feet of the auxiliary building. The building dimensions are 58 feet (E-W direction) by 366 feet (N-S direction) by 48 feet high. It supports a fuel handling bridge crane and houses other equipment. Moment-resisting steel frames in the East-West direction and cross-braced columns in the North-South direction comprise the structural system. The roof is a trussed and cross-braced diaphragm covered with metal decking and built-up roofing. A portion of the end frames in the East-West direction are supported on a concrete wall common with the fan rooms.

In accordance with the FSAR and Hosgri report, Design Class I structures must be qualified for all seismic events; thus, member evaluation for the structural steel members was performed for the DE, DDE, and Hosgri events and the required loading combinations.

4.4.3.1 Verification of Corrective Action

The IDVP verification of the DCP Corrective Action Program for the FHB is defined in ITRs-8 and -35. The IDVP verification consisted of examining on a sampling basis the analyses for both seismic and non-seismic loads. The seismic loads are the DE, DDE, and Hosgri events, while the non-siesmic loads are dead, live, wind, temperature, etc. The IDVP will perform a field inspection of the FHB when modifications are complete. Connections, additional members and/or removed members, etc., will be examined and checked for conformance with the design and qualification analyses. ITR-57 will report on the IDVP verification of the FHB.

The DCP conducted its evaluation of the criteria implementation and qualification analyses through the Internal Technical Program (ITP).

The DCP reviewed the as-built drawings to ensure accuracy of inputs to analyses and made modifications as necessary, detailed in the PGandE Phase I Final Report. For the FHB, the DCP developed new models and performed a reanalysis for member evaluation, generation of response spectra, and crane qualification.

The DCP methodology for review and qualification of the FHB included all essential steps of the qualification process. The DCP supplied a calculation index which documented the qualification analyses and computer files of record and served as the basis for selection of the IDVP sample of DCP qualification analyses.

The IDVP performed design reviews for selected DCP analyses. A design review checklist was developed by the IDVP to ensure that all necessary items would be examined and documented in a standard format. This checklist varied slightly from review to review, depending on the content of the analyses under consideration. The IDVP design review included assessments of the completeness, applicability, and consistency of the DCP review and reanalysis methodology. Alternate hand calculations were performed by the IDVP, where necessary, to assess the effects of various DCP assumptions and calculations. For the FHB, the IDVP performed no separate analyses.

Specifically, files chosen for review were:

- Methodology and procedures used in the formulation of the dynamic and equivalent static models.

- Geometry and member properties used in the models.

- Free vibration analysis of the dynamic models to determine dynamic characteristics.

- Time history analyses (Hosgri) of the dynamic models which produced response spectra and provided accelerations for use in the equivalent static model. The input time history from elevation 140 feet of the auxiliary building was also reviewed.

- Evaluation of the nodal accelerations used to determine equivalent static loads.

- Computation of loads for the equivalent static analysis and a sample of the computer runs for a static analysis load case.

- Comparison of selected member loads with member allowables loads for the postulated Hosgri event.

The selected sample covers approximately 50% of the structure dynamic analyses, excluding the crane, and the same percentage for the static analysis and member evaluation. The IDVP did not review the preliminary static model, which was used by the DCP as a basis for determining analysis and modification requirements.

No EOIs were issued for the FHB with regard to the DCP Corrective Action Program.

The verification program intended to be conducted by the IDVP is not yet complete. Based upon the efforts performed to June 25, 1983, the IDVP considers the following aspects of the DCP work to be acceptable and to satisfy the licensing criteria:

- Omission of an allowance for accidental eccentricity in the FHB because the torsional effects are accounted for in the auxiliary building response at elevation 140 feet.

- The ranges of crane locations and assessment of their effects upon results.
- The dynamic models used in the FHB evaluation.
- Response spectra generation.
- Equivalent static loads determined from the dynamic acceleration profiles.
- Qualification of members and connections.

The IDVP intends to formulate final conclusions as to the qualification of the FHB and conformance to licensing criteria when the DCP modifications and field walkdown have been completed and the IDVP has verified the as-built against the design conditions.

(To Be Supplemented)

4.4.4 Containment Structure

The containment structure is a Design Class I reinforced concrete structure. It is comprised of three basic parts: the exterior shell, the interior structure, and the base slab.

The exterior shell consists of a cylinder, 142 feet high, capped with a hemispherical dome. The cylinder wall is 3 feet 8 inches thick and the dome is 2 feet 8 inches thick. Both have an inside diameter of 140 feet. The base is a reinforced concrete circular slab 153 feet in diameter and 14 feet 6 inches thick, with the reactor cavity near the center. The inside of the dome, cylinder, and base slab is lined with welded steel plate, to form a leaktight membrane. The liner is 3/8 inch thick on the cylinder wall and dome, with the exception of a 3/4 inch thickness close to the bottom of the cylinder wall, and 1/4 inch thickness on the base slab.

The piping and electrical connections between equipment inside the containment structure and other parts of the plant are made through containment penetrations. Other penetrations are the 18 foot 6 inch diameter equipment hatch, the 9 foot 7 inch diameter personnel hatch, the 5 foot 6 inch diameter emergency personnel hatch, and the fuel transfer tube.

The containment interior structure consists of three major components, the crane wall, reactor cavity wall, and fuel transfer canal. The 106 foot outside diameter crane wall is 3 feet thick, and it extends vertically from the base slab to an operating floor at elevation 140 feet. The polar crane is supported on the crane wall at elevation 140 feet. The reactor cavity wall, which is at the center of the containment building, encloses and supports the reactor vessel.

The containment structure was evaluated for DE, DDE, and Hosgri

events. Load combinations for these seismic inputs are given in the FSAR and Hosgri Reports, and are summarized in the PGandE Phase I Final Report.

4.4.4.1 Verification of Corrective Action

The IDVP verification process of the DCP Corrective Action Program for the containment structure is defined by ITRs-8 and -35. The IDVP verification consisted of examining on a sampling basis analyses for seismic and certain non-seismic loads. The seismic loads were the DE, DDE, and Hosgri events, while the non-seismic loads, some of which were sampled, were pressure, temperature, pipe reaction, jet impingement, missile, dead, and live loads. ITR-54 will report on the IDVP verification of the containment structure.

The DCP reviewed the as-built drawings to ensure accuracy of input to the analyses, and made modifications as necessary, as detailed in the PGandE Phase I Final Report. For the containment exterior structure, the DCP reviewed and accepted the original seismic analyses. The DCP then used these results and performed member evaluation calculations. The DCP performed reanalysis of the equipment hatch region and the base slab/shell junction, as well as the base slab. The DCP also performed a reanalysis of the reactor support ring, reactor cavity wall, and polar crane. The DCP supplied a calculation index which documented the qualification analyses and computer files of record and served as the basis for selection of the IDVP sample of DCP qualification analyses.

The IDVP had a number of open technical meetings with the DCP to discuss the DCP methodology, criteria and analytical results. Major topics in these meetings included the polar crane evaluation, interior structure floor response spectra generation and the qualification of the external shell including the equipment hatch and shell/base

junction. The IDVP selected a sample of the DCP qualification analyses to ensure conformance to licensing criteria, accuracy of calculations, and to assess the essential steps of the qualification process. A design review checklist was developed by the IDVP to ensure that all necessary items were examined and documented. In addition to the checklist, the IDVP design review included assessments of the completeness, applicability, and consistency of the DCP review and reanalysis methodology.

Specifically, sample files chosen for review were:

- Seismic analysis (Hosgri) and member evaluation for the containment shell considered as an axisymmetric structure

- A sample of the computer run results for a specific load combination of the above

- Reactor cavity wall member evaluation considering compartment pressure, reactor vessel seismic loads, etc.

- Reactor ring support evaluation

- Equipment hatch member evaluation-steel plate and shell interface elements

- Base slab/shell junction-member evaluation of adjacent slab and shell elements, steel meridional soldier beams, rebar, etc.

- Polar crane-dynamic solution and member evaluation. This includes evaluation of the main crane components such as bridge girder, crane legs, guide struts, and rail capacity.

No EOIs were issued based on the IDVP review of the containment structure.

The verification program intended to be conducted by the IDVP is not yet complete. Based upon the efforts performed to June 25, 1983, the IDVP considers the following aspects of the DCP work to be acceptable and to satisfy the licensing criteria:

- The analyses of the containment structure reflected as-built conditions with conservative assumptions incorporated into the analyses. Pressure and temperature were properly applied.
- Numerical accuracy of the calculations sampled was satisfactory. Minor discrepancies were noted in such areas as determination of section properties, but had no significant impact on results.
- Analysis and qualification of containment exterior shell under various load combinations, as given in the FSAR and Hosgri report.
- Analysis and qualification of the reactor cavity wall.

Pending completion of the verification effort, the IDVP considers the following aspects of the DCP work to be unresolved issues at this time.

- Analysis and qualification of containment shell in the vicinity of the equipment hatch.
- Calculation of interior structure horizontal floor response spectra.

The IDVP intends to formulate a final conclusion as to the qualification of the containment structure and the polar crane and their conformance to licensing criteria when the analyses have been evaluated by the IDVP.

(To Be Supplemented)

4.4.5 Containment Annulus Structure

The annulus structure is a Design Class I Structure located within the containment between the crane wall and the containment shell. It is attached directly to the crane wall and the containment floor, but is not connected to other parts of the containment. The annulus is a welded and bolted structural steel frame extending from elevation 91 feet to 140 feet. Radial and tangential beams of the annulus structure support piping, equipment, and walkways.. The three lowest floor levels (elevations 101 feet, 106 feet, and 117 feet) are structural steel, while the floor at elevation 140 feet is a composite concrete and steel deck with a nonmoment-resisting connection to the top of the crane wall. Some of the beam-to-column connections at the lower elevations are moment resisting. Radial beam to crane wall connections are bolted.

Originally, PGandE utilized a five-frame dynamic model for the vertical analysis of the annulus. The radial frames of the structure were condensed at the five fan coolers and tangential beams were excluded from the dynamic model. The crane wall was modeled as a rigid member so the five frames were essentially independent and uncoupled.. After the "diagram error" was uncovered, the five-frame model analysis was revised. The revised PGandE model, also referred to as the 1981/1982 URS/Blume model, included more accurate mass data, increased nodes on the radial elements, and more realistic representations of the structural connections.

4.4.5.1 Additional Verification

The NRC engaged the services of Brookhaven National Laboratories (BNL) to perform an independent seismic analysis of the structure. The BNL vertical seismic analysis utilized a three-dimensional model and time-history dynamic analysis techniques. Since the model included most of

the structural steel members, many local modes of vibration were computed. It was found that tangential beams responded to the earthquake excitation and affected the floor response spectra. The NRC (Denton) letter to TES (Cooper) of July 1, 1982 requested TES to review the validity of the enclosed BNL report and the specific concerns raised therein as part of the Phase I verification effort. Consequently, the IDVP reviewed both the BNL and PGandE containment annulus Hosgri analyses as part of the additional verification and sampling effort. BNL also performed a three-dimensional time-history analysis for horizontal excitation. The crane wall, which is more flexible in the horizontal direction, was included in this model. The BNL horizontal analysis, however, has not been documented to our knowledge. The DCP, however, initiated a frequency study of the annulus for horizontal response and determined that modifications were required to increase natural frequencies. The IDVP verification of this effort is reported in 4.4.5.2.

The IDVP reviewed both the 1981/1982 URS/Blume five-frame model and the BNL three dimensional model used to analyze vertical excitation. Also, the annulus structure was inspected for the as-built condition in a field walkdown. It was found that the BNL vertical floor spectra, in many instances, differed significantly from those developed by the 1981/1982 URS/Blume model. One of the major differences was that the BNL model had the ability to account for local member flexibilities. However, it was found during the report comparison that BNL incorrectly modeled the crane wall to slab connection at elevation 140 feet as a moment connection, whereas concrete design drawings show that this connection would be more appropriately modeled as a simple pin connection, as was the case in the PGandE analysis. BNL reran their model with a pin connection at the IDVP request. A comparison of data led the IDVP to conclude that this model change had a significant effect on the BNL response spectra, increasing spectral accelerations at some nodes while decreasing accelerations at other nodes.

The review of the PGandE model resulted in two areas of concern. The first had to do with the frame consolidation used to obtain the equivalent radial beam flexural rigidity properties. The IDVP concluded that the frame consolidation does not adequately represent the structure at elevations 101 and 106 feet.

The second concern was that the PGandE model does not consider the possible effects of tangential beam flexibility on local response spectra. The IDVP studies included simple one and two degrees-of-freedom lumped mass models which confirmed that the tangential beam flexibility is an important factor in the response spectra generation.

The results and conclusions of the verification review of the containment annulus will be reported in ITR-50. The conclusions relative to the specfic concerns of the NRC letter are:

- There are no significant differences in the computed masses and member joints (with the exception of the BNL error in the slab to crane wall connection mentioned) between the 1981/1982 URS/Blume analyses and BNL (Model B) analysis.

- The joint characteristics in the Blume analysis realistically represent the as-built configuration.

- The spectra smoothing technique applied by PGandE is consistent with the DCNPP licensing criteria.

- The issue of discrepancies between design piping analyses and the as-built configurations is a generic concern that has been identified by the IDVP and is discussed in 4.5.2.

- The significance of the errors in the modeling of bends in annulus structure piping is considered negligible.

- The differences in piping support loads between PGandE and BNL are primarily due to differences in developed spectra input from the respective analyses. This issue is addressed by the concerns previously discussed regarding the PGandE analysis.

- With respect to possible generic implications of the differences between URS/Blume and BNL results, there are several aspects which could be considered:

  (1) With respect to significance to other DCNPP structures, the IDVP considers it to be highly improbable that any differences indicate a generic concern. The configuration of the annulus region is unique and there are other structures, such as the control room, where URS/Blume considered the local effects. Moreover, all structures are under review by DCP and are subject to verification by the IDVP.

  (2) With respect to the general methods available for use in seismic analysis of structures, the IDVP believes that either the non-condensed models (such as those used by BNL) or condensed models properly applied are capable of producing adequate results.

  (3) With respect to other nuclear plant containment structures analyzed by URS/Blume or by any other organization using similarly condensed models, there is no basis for judgment within the IDVP as to the potential for a generic concern.

The following EOI Files for the containment annulus structure were issued:

Finding (ER/A, ER/AB, ER/B): 1014
Combined with Finding: 977, 3006, 3007, 3008
Observations (ER/C, ER/D, PRR/DEV): None

The four EOI Files were combined into EOI 1014, which was defined to track verification of DCP corrective action on the containment structure including the annulus.

4.4.5.2 Verification of DCP Corrective Action

The IDVP verification process of the DCP Corrective Action Program is defined in ITRs -8 and -35. The IDVP is verifying on a sampling basis the DCP dynamic seismic analyses, member qualification and response spectra generation to ensure accuracy and conformance to licensing criteria. Details of the IDVP verification of this corrective action for the annulus structure will be given in ITR-51.

The DCP has embarked on an extensive corrective action program and the annulus structure has been reanalyzed to account for the concerns raised in EOIs 3006 and 3007. The DCP conducted its evaluation of the criteria implementation and qualification analyses through the Internal Technical Program (ITP). The DCP reviewed the as-built drawings to ensure accuracy of input to the analyses and made modifications as necessary, as stated in the PGandE Phase I Final Report.

The DCP methodology included all essential steps of the qualification process. The DCP supplied a calculation index which documented the qualification analyses and computer files of record and served as the basis for selection of the IDVP sample of DCP qualification analyses.

A design review checklist was developed for the IDVP to ensure that all necessary items were examined and documented. The IDVP design review included assessments of the completeness, applicability, and

consistency of the DCP review and reanalysis methodology.

Specifically, DCP sample files chosen for review were:

- Vertical seismic analysis of radial frame #6.
- Vertical seismic analysis of radial frame #14.
- Horizontal frequency analysis of elevation 101 feet.
- Horizontal frequency analysis of elevation 117 feet.

Additional files relative to member evaluation will be sampled when such files have been indexed.

No EOIs have been issued for the annulus with regard to the DCP Corrective Action Program.

The verification program intended to be conducted by the IDVP is not yet complete. Pending completion of ongoing efforts, the IDVP considers the following aspects of the DCP work to be unresolved issues:

- Whether the horizontal floor response spectra developed for the annulus properly reflects the dynamic characteristics of the interior structure.
- Whether the physical modifications in progress to stiffen the annulus for horizontal excitation will ensure compliance with the requirement that the minimum frequency be 20 Hz.

The IDVP intends to formulate a final conclusion as to the qualification of the annulus structure and its conformance to licensing criteria when all analyses have been evaluated by the IDVP.

4.4.6 Intake Structure

The intake structure is a massive Design Class II concrete structure that houses the Design Class I Auxiliary Saltwater (ASW) Pumps. The vent shaft and snorkel pipes, as well as nearby supporting equipment, are part of the ASW system. The dynamic analysis of the Intake Structure produces response spectra used as input to these systems.

In accordance with the FSAR, a Design Class II structure is required to retain its integrity during a seismic event so that the function of Class I equipment will not be impaired. Hence, the DCP has evaluated the structural integrity of the intake structure for the postulated Hosgri event, but floor response spectra used for evaluation of safety-related equipment have been computed for DE, DDE and Hosgri conditions.

4.4.6.1 Verification of Corrective Action

The IDVP verification of the DCP Corrective Action Program for the intake structure is defined in ITRs-8 and -35. The IDVP review consisted of examining the qualification of the structure for seismic and non-seismic loads. The seismic loads are the DE, DDE, and Hosgri events, while the non-seismic loads are soil bearing pressures, hydrodynamic, wave force, dead and live load, and missile loads. ITR-58 will report the IDVP verification of corrective action for the intake structure.

The DCP reviewed the as-built drawings to ensure an accurate input to the analysis and made modifications as necessary, as detailed in the PGandE Phase I Final Report. For the intake structure, the DCP reviewed and accepted the dynamic analysis, member evaluation, generation of response spectra, and structural stability calculations performed by URS/John Blume Associates. In addition, the Blume Internal

Technical Review findings were annotated and resolved. DCP performed the stress analysis of the vent shaft and snorkel, which were modified to ensure that no salt water would be ingested into the pumps.

The DCP methodology for review and qualification of the intake structure included all essential steps of the qualification process. The DCP supplied a calculation index which documented the qualification analyses and computer files of record and served as the basis for selection of the IDVP sample of DCP qualification analyses.

The IDVP performed design reviews for selected DCP analyses. A design review checklist was developed to ensure that all necessary items were examined and documented in a standard format. This checklist varies slightly from review to review, depending on the content of the analyses under review. In addition to the checklist, the IDVP design review included assessments of the completeness, applicability, and consistency of the DCP review and reanalysis methodology. Alternate hand calculations were performed by the IDVP as necessary, to assess the effects of various DCP assumptions and calculations. For the intake structure, the IDVP did not perform separate analyses such as formulation of dynamic models. However, the IDVP performed a field inspection for selected portions of the structure to ensure conformance between design drawings and as-built conditions.

The IDVP verification sample represented approximately one-third of the DCP qualification analyses.

Specifically, samples chosen for review were:

- The Hosgri and DE mathematical models. This included generation of response spectra and member loads. The DE model was also used to determine the DDE response spectra.

- Member evaluation for the beams, columns, walls and slabs. Structural stability was also reviewed with respect to sliding, overturning, and soil bearing pressure.

- The vent shaft and snorkels which are part of the ASW Design Class I system.

No EOIs were issued which apply to the intake structure.

The verification program conducted by the IDVP is complete, and the DCP work is considered to be acceptable. Specifically:

- Qualification analyses reflected the as-built condition.

- Criteria were properly applied. The 10 percent amplification of horizontal response to account for accidental eccentricity was conservative with respect to floor response spectra. It was not conservative with respect to certain structural members; however, the capacity of these members was sufficient to satisfy properly amplified demands.

- Use of fixed base model for the DE/DDE event and the Hosgri event is acceptable.

- The dynamic models used were satisfactory.

- The response spectra generated were satisfactory.

- Structural members including walls and slabs were qualified for the Hosgri event.

- The flow straighteners possessed adequate strength using the ductility criteria specified. Walls and slabs were qualified without the use of ductility considerations.

- Vent shaft system was shown to be adequate.

As noted by the above statements and by consideration of the DCP qualification analyses, the IDVP considers the intake structure to be qualified and to meet licensing requirements. The sliding, overturning and soil bearing pressure calculations are under continuing review as discussed in Section 4.9.2.

(To Be Supplemented)

4.4.7 Outdoor Water Storage Tanks

The Outdoor Water Storage Tanks (OWST) consist of four types of tanks: the refueling water storage tank, firewater/transfer storage tank, condensate tank, and primary water storage tank. The refueling water storage tank (Design Class I) includes a steel liner surrounded by a concrete shell, which was provided for protection against external hazards. The tank is supported on concrete fill to provide level surface for tank support. It is anchored to the foundation by rock bolts placed around the perimeter. This tank was selected as the sample for review by the IDVP.

4.4.7.1 Verification of Corrective Action

The IDVP verification of the DCP Corrective Action Program for the OWST is defined by ITRs-8 and -35. The IDVP verification consists of examining the DCP qualification analyses for all seismic and non-seismic loads. The seismic loads are the DE, DDE, and Hosgri events and the associated fluid dynamic forces. Non-seismic loads are pipe reaction, hydrostatic, and dead loads.

The DCP reviewed the as-built drawings to ensure an accurate basis for analysis. For the OWST, the DCP reviewed and accepted the previous qualification analyses. The DCP supplied an index for the OWST which documented the qualification analyses and computer files of record and served as the basis for selection of the IDVP sample of DCP qualification analyses.

The IDVP performed design reviews of the DCP qualification analyses selected. A design review checklist was developed by the IDVP to ensure that all necessary items were examined and documented in a standard format. The IDVP design review included assessments of the completeness, applicability, and consistency of the DCP review and

reanalysis methodology. Alternate hand calculations were performed by the IDVP, where necessary, to assess the effect of various DCP assumptions and calculations.

The IDVP selected a sample of the DCP qualification analyses to ensure conformance with the licensing criteria, the accuracy of calculations, and to assess the essential steps of the qualification process. The IDVP sample for the OWST consisted of the refueling water storage tank. This tank was chosen for the sample because it contained significant modifications. Topics reviewed were:

- Conformance of analyses to as-built condition
- Formulation of dynamic models
- Consideration of fluid forces under seismic excitation
- Structural stability - sliding, overturning, and soil bearing pressure.

The results of the IDVP review of the DCP qualification are summarized here in categories that parallel the design review checklist items:

- The as-built condition was compared against the design drawing which showed slight variation with respect to wall thickness. This variation in wall thickness was evaluated and found to be acceptable.

- Dynamic models used to represent the structure considered all necessary fluid forces and gave an acceptable representation of the structure.

- Sliding, overturning, and soil bearing pressure factors of safety computations showed values that met the licensing criteria.

- Both the original analyses and the DCP review showed acceptable results. The DCP review used alternate methods in several cases to review the original analyses results and found them to be acceptable.

EOI 993 (which also incorporates EOI 992) was issued as a result of the RLCA preliminary report results. These combined EOIs documented the need to perform a review of the OWST analysis interface between PGandE and URS/Blume. Such a review was conducted by the Project with results accepted by the IDVP. Therefore, EOI 993 was closed.

The verification program conducted by the IDVP is complete, and it was determined that:

- The qualification analysis was found to be acceptable.
- The dynamic analyses and results are acceptable.
- Sliding, overturning, and soil bearing pressure factors of safety are acceptable.

Therefore, the IDVP considers the Outdoor Water Storage Tanks to be qualified and to meet licensing requirements.

4.4.8 Turbine Building

The turbine building is a Design Class II structure containing Design Class I equipment. In accordance with the FSAR, a Design Class II structure is required to retain its integrity during a seismic event so that the function of Class I equipment will not be impaired. The DCP has evaluated the structural integrity of the turbine building for the postulated Hosgri event, but floor response spectra used for evaluation of safety-related equipment have been computed for DE, DDE and Hosgri conditions. Safety-related equipment in the turbine building consists primarily of the emergency diesel generators, switchgear, component cooling water heat exchangers, associated piping, etc.

The turbine building is a combined steel-framed and concrete structure. There are four concrete working floor levels. A reinforced concrete, post-tensioned turbine pedestal which is structurally independent of floor slabs is located in the center of the structure. Both concrete shear walls and cross-bracing are used to transmit lateral forces between floor levels. A steel superstructure consisting of braced columns and roof trusses exists above elevation 140 feet.

4.4.8.1 Verification of Corrective Action

The IDVP verification of the DCP Corrective Action Program for the turbine building is defined by ITRs-8 and -35. The IDVP verification consisted of examining the DCP qualification analyses for all seismic and non-seismic loads. The seismic loads are the DE, DDE, and Hosgri events, while the non-seismic loads are dead and live loads. The IDVP verified, on a sampling basis, DCP dynamic analysis, member qualification, response spectra generation for accuracy and conformance to licensing criteria. The results of this verification will be presented in ITR-56.

The DCP reviewed the as-built drawings and made modifications to the analysis as necessary, as detailed in the PGandE Phase I Final Report. For the turbine building, the DCP developed new dynamic models and performed reanalyses for member evaluation, generation of response spectra, and crane and pedestal qualification. The DCP is currently reanalyzing the area near the switchgear at elevation 119 feet; this reanalysis is expected to lead to physical modifications intended to stiffen the structure, thereby reducing response spectra at this floor.

The DCP methodology for review and qualification of the turbine building included all essential steps of the qualification process. The DCP supplied a calculation index which documented the qualification analyses and computer files of record and which served as the basis for selection of the IDVP sample of DCP qualification analyses.

A sample of DCP qualification analyses was selected and reviewed in detail by the IDVP. A design review checklist was used by the IDVP to ensure that critical items concerning criteria, methodology, and results were adequately reviewed and documented. The IDVP verification included an assessment of the completeness, applicability, and consistency of the DCP review and reanalysis methodology.

Specifically, sample files selected for review were:

- Methodology and procedures used in the formulation of mass properties at elevation 140 feet.

- Computation of stiffness properties for the Hosgri horizontal models. This included review of the various DCP models for both response spectra generation and member evaluation.

- DCP procedures and calculations for determining equivalent beam properties used in the dynamic models.

- Methodology and calculational procedures for one of the four vertical dynamic models, including review of boundary conditions at adjacent vertical modes.

- Generation of response spectra at required locations from the Hosgri horizontal and vertical models.

- The turbine pedestal/operating deck relative horizontal motions.

- Calculation of stresses and comparison with allowable values according to licensing criteria for a sample consisting of:

  - Roof chord connections
  - Bracing along exterior walls
  - Exterior shear walls
  - Floor diaphragms at elevation 140 feet
  - Floor beams at elevation 140 feet

The turbine building crane was not reviewed by the IDVP. The IDVP selected samples consisted of approximately 30 percent of the DCP qualification analyses files for the turbine building. Alternate hand calculations were performed by the IDVP, where necessary, to assess the effects of various DCP assumptions and calculations. For the turbine building, the IDVP performed no separate analyses of the dynamic models.

No EOIs have been issued regarding corrective action.

The verification program intended to be conducted by the IDVP is not yet complete. Based upon the efforts performed to June 25, 1983, the IDVP considers the following aspects of the DCP work to be acceptable and to satisfy the licensing criteria.

- Qualification analyses properly reflect the as-built design drawings
- Mass properties used in the computer models
- Bolt-bearing and connection capacities for the roof chords

The IDVP considers the following aspects of the DCP work to be unresolved issues at this time.

- The capacities of certain cross-braced exterior panels
- Modifications planned by the DCP to stiffen the elevation 119 floor.

The IDVP intends to formulate a final conclusion as to the qualification of the turbine building and its conformance to licensing criteria when all analyses have been evaluated by the IDVP. In addition, the IDVP will perform a field inspection of the turbine building when modifications are complete.

(To Be Supplemented)

4.5.2.3 Verification of DCP Activities - Large Bore Piping and Supports

a. Large Bore Piping

Verification of DCP activities regarding large bore piping is defined by ITRs-8 and -35. This was based upon RLCA independent design reviews of 18 DCP piping analyses chosen from the category of computer-analyzed Design Class 1 large bore piping. ITR-59 will report the results of this verification.

The DCP reviewed the as-built drawings to ensure an accurate basis for analysis and made modifications as necessary. The DCP Corrective Action Program for computer-analyzed Design Class 1 large bore piping includes the complete reanalysis of all original work. The list of new DCP analyses was documented in the PGandE Phase I Final Report.

A list of new DCP analyses and their corresponding old analyses presented in the PGandE Phase I Final Report served as the sample for the IDVP review. From approximately 270 new analyses, RLCA selected 11 for overall review and 7 for review in specific areas. The selected samples were chosen to include various combinations of the following considerations identified in ITRs-12 and -17.

Concerns Previously Identified:

1. Configuration of piping

- Connected to flexible equipment

- With branch lines and/or overlaps
- With heavy in-line components (i.e., motor-operated valves)

2. Building location and application of spectra

- Piping attached to the containment annulus and/or turbine building
- Piping spans at various elevations in the turbine building
- Piping spans between buildings

General Areas Of Interest:

1. Characteristics of piping

- High energy line (design temperature $\geq$ 200 degrees Fahrenheit or design pressure $\geq$ 275 psig)
- Piping attached to pipeway and/or auxiliary building flexible slab

2. New systems not examined before

- Fire protection system

3. Groups performing analysis

- Bechtel Power
- CYGNA (EES)
- EDS Nuclear

4. Design analysis results

- High stress ratio
- High number of support modifications required

The chosen sample analyses serve as the means to provide assurance that all previous concerns have been incorporated into the DCP Corrective Action Program, and to identify new concerns, if any, in the course of the review.

From the 18 chosen samples, the IDVP reviewed the DCP calculation packages and computer outputs. Methodologies and results were reviewed for accuracy and conformance to the licensing criteria. Model geometries for 12 of the analyses were completely or partially field walked-down by the IDVP to ensure conformance between design drawings and the as-built condition. Field verifications for specific areas were also performed as necessary as part of the review process.

For the 11 overall reviews, the IDVP examined, through the use of checklists, all inputs and outputs of the DCP computer analyses. The verification checklists were used to ensure that critical items concerning criteria, methodology, and results were adequately checked and documented in the IDVP review process. In addition to the checklists, the IDVP design review included asessments of the completeness, applicability, and consistency of the DCP review and reanalysis.

These checklists cover essential areas of review, from modeling and coding accuracy of all in-line components and piping, to final stress evaluations. For the 7 partial

reviews, specific areas of interest were chosen for reviews. These specific areas included items such as valve modeling and qualification, application of stress intensification factor, spectra inputs, etc. Alternate calculations were performed by the IDVP as necessary to review DCP calculations.

As a result of the above-described activity, four EOIs were issued. EOI 1126 addresses the SIF discrepancy for intermediate butt welds and the omission of a SIF of 1.9 at valve/elbow interfaces. This item has been incorporated into the DCP final review checklist for review of potential impacts on all DCP analyses.

EOI 1133 addresses the discrepancy noted for one DCP valve model where only two-thirds of the required eccentric mass was considered in the DCP analysis. This item has been resolved through revision of the DCP analysis.

EOI 1135 addresses the discrepancies in valve body and operator weights for valves LCV-113 and -115. This item will be resolved through revision of DCP analysis.

EOI 1137 addresses a discrepancy in valve weight for FCV-365. This EOI together with EOIs 1133 and 1135 combined to form a generic concern with valve modeling. The item has been incorporated into the DCP Final Review checklist for review of potential impacts on all DCP analyses.

The verification program intended to be conducted by the IDVP is not yet complete. Based upon the efforts performed to June 25, 1983, the IDVP considers the following aspects of the DCP work to be acceptable and to satisfy the licensing criteria.

- The DCP reanalysis of all original work and the development of the DCP final review checklist is an appropriate program for qualification of all DCP analyses.

- Qualification analyses in general reflect the as-built conditions.

- Overall modeling methods were found acceptable, except for application of stress intensification factors (SIF) and valve modeling as noted above.

- Loadings used in the DCP analyses were found acceptable. Loading data were found properly controlled and applied by the DCP.

- Internal documentation was found to be in sufficient detail to allow the verification of transfer of data. Computer files and descriptions were indexed.

- Stress analyses were found acceptable for all reviewed analyses except Analyses 2-111, Revision 0, and 4A-100, Revision 0, which contained unique discrepancies and were reanalyzed by the DCP.

- Numerical accuracy of the calculations sampled was adequate.

In summary, the IDVP concluded that DCP is following established procedures and licensing criteria, and is meeting the latest loading criteria and operating modes. The concerns on stress intensification factors and valve modeling were determined to be generic concerns. These

generic concerns are resolved by the inclusion of specific checks in the DCP final review checklist. Certain valve models and SIFs will be reviewed by the IDVP after they have passed the DCP final review. None of the specific concerns that led to these two generic concerns caused an exceedence of the licensing criteria. The DCP Corrective Action Program for Design Class 1 large bore piping adequately covers all essential steps required to obtain proper qualification of the piping.

The IDVP considers the following aspects of the DCP work to be unresolved issues at this time: EOIs 1126, 1133, 1135, and 1137.

The IDVP intends to formulate a final conclusion as to the qualification of large bore piping and its conformance to licensing criteria when the IDVP verification is completed.

(To Be Supplemented)

b. Large Bore Piping Supports

The IDVP verification of the DCP Corrective Action Program for large bore pipe supports is defined in ITRs -8 and -35. The IDVP review consisted of an examination of qualification of each pipe support for all seismic and non-seismic loads. Seismic loads are the DE, DDE, and Hosgri events, while non-seismic loads are deadload, thermal accident, friction, fast valve closure, and relief valve opening thrust. This activity will be reported in ITR-60.

The DCP has conducted its evaluation of the criteria implementation and qualification analyses through an Internal Technical Program (ITP). The DCP reviewed the as-built drawings to ensure the analyses reflected the as-built condition and made modifications as necessary, as detailed in the PGandE Phase I Final Report.

All Design Class I large bore pipe supports throughout the plant were reviewed by the DCP to assure compliance with design criteria, as contained in the FSAR and Hosgri Report. Engineering analysis and designs that were found to be satisfactory were not reanalyzed or redesigned. Modifications were performed where necessary.

The DCP review process for the pipe supports included the following:

- As-built drawings, designs, calculations, and analyses for existing pipe supports were reviewed to determine that appropriate design criteria were used.

- Assumptions and input data for the analyses were checked to verify application of models, computer codes, formulas, and methods of calculation. Analysis results were reviewed for compliance with licensing criteria. Acceptance of the need for further analytical or design work was determined.

- If indicated by the above review, the supports were reanalyzed. If required, the supports were redesigned and modified.

The IDVP selected a sample of the DCP large bore pipe support design analyses to ensure conformance to DCP

criteria and accuracy of calculations. The process by which the IDVP selected support samples included the following:

- In general, the selected supports were associated with piping that was part of the IDVP large bore piping sample.

- Several supports were selected as a result of IDVP field verification activities for piping samples.

- The DCP General Pipe Support Status (GPSS) log was reviewed to determine revision status, respective piping analyses, etc. This status log listed approximately 6000 to 7000 supports.

- Supports were selected to represent various support types, pipe sizes, plant locations, and organizations (consultants) performing design analyses.

The IDVP selected a total of 23 support analyses for review. The support types were as follows:

- 3 snubbers

- 6 spring hangers

- 6 anchors

- 8 rigid supports

The IDVP performed design reviews for the selected DCP analyses to verify the following aspects of the design analysis:

- Validity and completeness of design inputs
- Compliance with design procedure and criteria
- Validity of design assumptions
- Validity of analysis conclusions

Approximately 70 percent of the support sample was field verified to confirm the as-built condition.

A design review checklist was developed for the IDVP verification to ensure that all necessary items were examined and documented. Checklist observations were further expanded with comments where clarification or more detailed consideration was appropriate.

The IDVP performed an analysis package and pipe support review to evaluate the completeness of all pertinent design input data, output results, and associated documentation.

Alternate calculations were performed by the IDVP, where necessary, to assess the effects of various DCP assumptions and to confirm calculations.

EOI 1122 notes that the design analysis for pipe support 10/70SL (Calculation S-1281, Revision 3) does not address support frequencies in the unrestrained direction as required by the DCP criteria. Simplified IDVP calculations show these frequencies to be less than 20 hertz. Although licensing criteria does not require the frequencies to be greater than 20 hertz, the DCP program does. The DCP has

revised this analysis to address frequencies in the unrestrained directions. This revision remains to be verified by the IDVP. Since this EOI represents an instance where only program criteria may have been exceeded, the IDVP does not consider it a generic concern.

EOI 1129 notes that errors were made in calculating the weld stress for a 1/4-inch weld between pipe lug and supporting steel on Pipe Support 56S/3A. These errors offset each other and no overstress occurred. This item has been classified as an error Class C. This EOI does not represent a generic concern.

EOI 1131 notes that the design analyses for Pipe Supports 58S/16V and 63/26V do not evaluate the shear lugs and attachment welds, as required in the DCP Corrective Action Program. The DCP has revised these analyses to include the shear lugs and attachment welds. The IDVP review of the revised DCP calculations shows these stresses to be small. This EOI has been classified as a deviaiton.

The verification program intended to be conducted by the IDVP is not yet complete. Based upon the efforts performed to June 25, 1983, the IDVP considers the following aspects of the DCP work to be acceptable and to satisfy the licensing criteria.

- Support drawings are satisfactory.
- Loads and load combinations used in the pipe support analyses are correct.
- Pipe support frequencies are satisfactory (except as noted in EOI 1122).

- Pipe support stress analyses are satisfactory. (except as noted in EOI 1129).

- Attachments welded to the pipe are frequently not evaluated in the DCP analysis. Except as noted in the EOI 1131, they were found to be satisfactory from IDVP calculations.

- Standard component supports such as spring hangers, snubbers, and pipe clamps are satisfactory.

- Pipe Support analyses were generally performed in accordance with the design procedures.

The IDVP intends to formulate a final conclusion as to the qualification of and its conformance to licensing criteria when all analyses have been evaluated by the IDVP.

(To Be Supplemented)

4.5.3.2 Verification of DCP Corrective Action - Small Bore Piping and Supports

a. Small Bore Piping

The IDVP verification of DCP corrective action related to small bore piping is defined by ITRs-8 and -35. ITR-61 will provide a detailed description of the IDVP verification process and results.

The DCP Corrective Action Program (CAP), as defined by the PGandE Phase I Final Report, includes a complete review of all small bore piping qualifications. This review was divided into two parts: the first part was a Generic Review; the other a Sampling Review.

The Generic Review was a comprehensive review of small bore piping potentially affected by issues previously identified either by the IDVP or the DCP. The review considered all components or areas of concern, or worst-case examples.

The Sampling Review was designed to assure qualification of piping or issues not considered within the Generic Review.

The IDVP verification consists of examining the qualification of small bore piping for all seismic and nonseismic loads.

The IDVP performed design reviews for the DCP analyses selected. A design review checklist was developed for the IDVP review of computer analyzed piping to ensure that all

necessary items were examined and documented in a standard format. These checklists cover all essential areas of review from modeling/coding accuracy of piping and valves, application of stress evaluation, to qualification of valve acceleration and nozzle loads.

Also, the IDVP performed a certain amount of field verification of the sample computer analyzed piping to assess the adequacy for the piping walkdown isometric drawings that served as a basis for the computer model input.

The IDVP performed design reviews on the application of the span rules (DCM M-40) calculations. The IDVP reviews of these calculations included the following items:

- Seismic spans and corresponding accelerations
- Thermal flexibility (SAM and TAM)
- Code break requirements
- Support of eccentric masses (valves with operators)
- Support loads
- Pipe stresses
- Use of engineering judgement

In addition to the above types of reviews, the IDVP performed a more general review of the span rules. The areas of special interest and review included the following:

- Scope of applicability
- Frequency of seismic spans
- Thermal rules
- Spectral acceleration factors (SAT)

In all the above areas, alternate calculations were performed by the IDVP to assess the effects of various DCP assumptions and calculations where necessary.

The IDVP sample of DCP qualification analyses was selected to ensure conformance to criteria and accuracy of calculations. The sample selected was chosen to assess the essential steps of the qualification process. Specifically, groups of files chosen for review were as follows:

- Five samples out of a total of 81 computer analyses. The IDVP selections focused on a combination of the review issued with emphases on piping in high seismic locations and with high temperature operating modes.

- Four samples out of a total of 115 span rule calculation files

In addition, the span rules (DCP Design Criteria Memorandum M-40) were reviewed by the IDVP for methodology and applicability.

No EOIs have been issued to date concerning this review of small bore piping.

The verification program intended to be conducted by the IDVP is not yet complete. Based upon the efforts performed to June 25, 1983, the IDVP considers the following aspects of the DCP work to be acceptable:

Computer Analyzed Piping

- The piping computer analyzed by the IDVP adequately represented the worst cases for the issues/design considerations determined by generic and sampling reviews.
- Piping walkdown isometric drawings reflected as-built conditions.
- Stress intensification factors were adequately input.
- Piping and valves were adequately modeled.
- Seismic analyses used appropriate spectra input.
- Thermal operating conditions were correctly input.
- Piping and valves met stress and acceleration allowables.
- Numerical accuracy of the calculations sampled was adequate.

Application of span rules (DCM-40)

- Valves with eccentric operators were properly supported, when required (one case).
- Temperatures and SAM/TAM displacements were properly determined.

- o Seismic spans were in accordance with DCM M-40 or were qualified by additional DCP calculations.
- o Sufficient piping overlap was considered for code break requirements.

Span Rule Methodology (DCM-40)

- o DCM-40 span rules may be applied anywhere in the plant as long as spectral acceleration factors are correctly selected and used. Methodology is acceptable and the spectra reviews are continuing.
- o Support spacing is established such that frequencies for uniform straight pipe spans are approximately 15 Hz. Rules and space reduction factors are provided to evaluate other spans.

The IDVP intends to formulate a final conclusion as to the qualification of small bore piping and its conformance to licensing criteria when all analyses have been evaluated by the IDVP.

(To Be Supplemented)

b. Small Bore Piping Supports

The IDVP plan for verification of DCP corrective action related to small bore pipe supports is defined by ITRs-8

and -35. ITR-62 will provide a detailed description of the IDVP verification process and results.

The DCP Corrective Action Program (CAP), as defined by the Phase I Final Report, included a complete review of all small bore pipe support qualifications. This review was divided into two parts: a Generic Review and a Sampling Review.

The Generic Review was a comprehensive review of small bore pipe supports potentially affected by issues previously identified either by the IDVP or the DCP. The review considered all components or areas of concern, or worst-case examples.

The Sampling Review was designed to assure qualification of supports, or to address issues, not considered within the Generic Review.

The IDVP review consisted of examining the qualification of small bore pipe supports for all seismic and non-seismic loads. The IDVP performed design reviews for selected DCP analyses to verify the following aspects of the design analysis:

- Validity and completeness of design inputs
- Compliance with design procedure and criteria
- Validity of design assumptions
- Validity of analysis conclusions

Approximately 40 percent of the support sample was field verified to confirm the as-built condition.

A design review checklist was developed for the IDVP review to ensure that all necessary items were examined and documented. Checklist observations were further expanded with comments where clarification or more detailed consideration was appropriate. In addition to the checklist, the IDVP design review included asessments of the completeness, applicability, and consistency of the DCP review and reanalysis methodology.

The IDVP performed an analysis package and pipe support review to evaluate the completeness of all pertinent design input data, output results and associated documentation.

Alternate calculations were performed by the IDVP, where necessary, to assess the effects of various DCP assumptions and to confirm calculations.

The IDVP selected a sample of 12 DCP small bore pipe support analyses to ensure conformance to DCP criteria and accuracy of calculations. The selection process included the following:

- The DCP list of small bore supports that comprised the full DCP review sample (approximately 210 supports) was reviewed by the IDVP.

- Supports were selected to represent various support types, pipe sizes, plant locations, and organizations (consultants) performing design analyses.

- In general, the selected supports were associated with piping that was part of the IDVP small bore piping sample.

- Several supports were selected as a result of IDVP field verification activities for piping samples.

No EOIs have been issued as of this date.

The verification program intended to be conducted by the IDVP is not yet complete. Based upon the efforts performed to June 25, 1983, the IDVP considers the following aspects of the DCP work to be acceptable:

- The small bore pipe supports analyzed by the DCP adequately represent the worst cases for the issues/design considerations determined by their generic and sampling reviews.

- Support drawings are satisfactory.

- Pipe support drawings and information used in the analyses reflect the as-built conditions.

- Loads and load combinations used in the pipe support analyses are correct.

- Standard component supports such as spring hangers, snubbers, and pipe clamps are satisfactory.

- Four analyses meet criteria.

The IDVP intends to formulate a final conclusion as to the qualification of small bore pipe supports and its conformance to licensing criteria when all analyses have been evaluated by the IDVP.

(To Be Supplemented)

4.6.2.2 Verification of DCP Activities

The IDVP verification of DCP work on tanks is defined by ITRs -8 and -35. The IDVP verification of the DCP work includes all aspects described in Section 4.6.1 and the following aspects were emphasized:

- Verification of the PGandE review methodology to assure that the correct spectra were checked by PGandE against qualification analyses.
- Completeness of qualification

The results of the verification will be reported in ITR-67.

The DCP Internal Technical Program for equipment consisted of a review of the seismic qualification, implemented by checking the latest seismic qualification data against those used for the qualification of equipment. This check used the latest response spectra for the DE, DDE, and Hosgri event. Whenever changes to the response spectra required requalification of the equipment, the equipment was requalified by analysis or testing. Equipment identified for review was that associated with the engineered safety systems designed by PGandE (Reference PGandE Phase I Final Report).

The CCW surge tank was selected as the IDVP verification sample of the DCP implementation. The CCW surge tank is a Design Class I tank and is located atop the auxiliary building at elevation 163 feet. This tank is classified and built to ASME Section VIII (Rules for Construction of Pressure Vessels). This is one of five mechanical tanks reviewed by the DCP. Of the five, three were verified for Hosgri loadings as part of the initial sample. Of the two remaining tanks, only the CCW surge tank was required to be evaluated for both DE and DDE loadings.

The IDVP performed a design review for the DCP reanalysis. A checklist was developed which covered all required criteria items, and critical analytical procedures, and ensured completeness of the IDVP review. In addition to the checklist, the IDVP review included assessments of the completeness, applicability, consistency, and adequacy of the DCP review and reanalysis methodology. Where discrepancies were noted, or methodology was deemed not totally appropriate, alternate calculations were carried out by the IDVP to verify the conclusions of the DCP reanalysis.

The IDVP issued EOI 1136 which notes that the DCP analysis for the CCW surge tank calculated bolt shear stress allowables that did not conform to established DCP criteria and the ASME code. However, the bolt stresses remain below the correct allowable values. The DCP analysis also did not consider internal pressure induced stress in the tank for the evaluation of tank stresses at the nozzle. Tank stresses would exceed the specified allowable stress if pressure was considered using the same values and procedures as the DCP analysis. However, it was determined that the DCP reanalysis was very conservative and the actual pressure stresses were negligible. Thus, actual total stresses were below criteria.

The verification program intended to be conducted by the IDVP is not yet complete. Based upon the efforts performed to June 25, 1983, the IDVP considers the following aspects of the DCP work to be acceptable and to satisfy the licensing criteria:

- The seismic spectra utilized by the DCP for tanks reflects the current spectra.

- The mathematical modeling used in the reanalysis was considered to be acceptable.

- All established DCP criteria are considered to have been adequately met.

The items identified in EOI 1136 are considered to be random analytical discrepancies.

The IDVP intends to formulate á final conclusion as to the qualification of all mechanical equipment and its conformance to licensing criteria when all IDVP verification work in this area is complete.

(To Be Supplemented)

4.6.3 Valves

Valves perform a mechanical function as well as pressure retention and may be seismically qualified by analysis, test, or a combination thereof. In general, the analysis technique is employed for structural elements of valve/operator assemblies such as valve bodies and bonnets, yoke assemblies and other operator support hardware. Qualification of these structural elements are based on design stress limits which preclude deformations that will impair the ability of the valve to perform its intended function. These stress limits are specified in the Hosgri Report in Table 7-1 for active valves. For active valve elements such as disk-stem assemblies, deflection analysis results are compared to stem clearances as well. Valve operator elements such as motors, air cylinders, and other electrical devices associated with valve operation, are qualified by shake table testing.

4.6.3.1 Verification of Initial Sample

The following valves were identified as the initial sample:

- Auxiliary Feedwater Valve (FCV-95)
- Main Steam Isolation Valve (FCV-41)

Valve FCV-95 is motor operated and is physically located in the auxiliary building. Valve FCV-41 is air operated and is located on the pipeway outside of the containment building.

ITR-37 reports the results of the RLCA review of the initial valve sample. The review methodology included independent calculations and field verification of design input quantities. In addition, the IDVP performed field verification of physical modifications resulting from the initial sample review. Applications of loading combinations and structural design criteria were based on the Hosgri Report.

The RLCA effort may be summarized as follows:

- The equipment physical dimensions and other design data were obtained from drawings and field measurements.

- Analytical models were developed for frequency, stress, and deflection analysis.

- Seismic accelerations in combination with other loads were applied to the analytical models to calculate seismic response of the valve.

- Calculated stresses were compared to the Hosgri structural criteria, and deflection clearances were evaluated.

- Results of the verification analysis were compared with the PGandE design analyses. Differences were evaluated for significance.

In general, RLCA used more rigorous and detailed analytical techniques than PGandE used. This, combined with the diversity in conservatism of assumptions, loadings, and boundary conditions, in many cases accounted for differences in the results in excess of the 15% criteria. These aspects are more fully described in ITR-37. In all cases, the calculated stresses were within the allowable values for both the verification analysis and the design analysis.

Five EOI Files were issued and were resolved as follows:

Finding (ER/A, ER/AB, ER/B):	None
Observation (ER/C, ER/D, PRR/DEV:	950
Closed Items:	998, 999, 1082, 1116

The one observation, EOI File 950, was the result of a discrepancy in stiffener plate thickness determined from the field verification. Although the IDVP did not consider physical modifications of FCV-95 to be necessary to satisfy criteria, the DCP modified the valve by replacing a 3/8" thick plate with a plate of the 1/2" design thickness. The IDVP verified this modification.

No additional sampling or verification of valves was required.

4.6.3.2 Verification of DCP Activities

The IDVP performed verification of DCP activities for Valves in accordance with ITRs-8 and -35. The IDVP examined the DCP work for all aspects discussed in Section 4.6.1. The results of this verification will be reported in ITR-67.

The DCP Internal Technical Program (ITP) for Valves is closely tied to the DCP efforts for piping. Certain valves were selected by the DCP for reanalysis to determine valve natural frequencies and allowable accelerations. These valves had been originally qualified by seismic service-related contractors to PGandE. Only motor-operated valves with eccentric masses were reanalyzed. The allowable acceleration results were then used by piping to determine if modifications to the valve or pipe supporting structure were required.

Electro-Hydraulic Valve LCV-110 was selected as the IDVP verification sample. The valve is a Design Class I level control valve located on the pipeway structure outside the containment building. LCV-110 is one of the 6 different types of valves analyzed as part of the DCP's ITP.

LCV-110 is one of four similar valves: LCV-110, 111, 113 and 115. This type of valve was selected for the IDVP review sample because a similar valve had caused an overstress condition in the pipe line in

one of the IDVP initial sample piping analyses (Reference EOI 1069). In addition, the actuator motor on these valves had been replaced.

The IDVP performed a design review of DCP reanalysis. A checklist was developed which covered all criteria items, critical analytical procedures, and completeness of the DCP reanalysis. In addition to the checklist, the IDVP design review included reviewer assessments on the completeness, applicability, consistency and adequacy of the DCP reanalysis methods. Where discrepancies were noted, or methods deemed not totally appropriate, alternate calculations were carried out by the IDVP to verify the conclusions of the DCP reanalysis.

Actual piping accelerations as well as any additional valve support bracing were not included in this portion of the review because the results of this DCP reanalysis are to be used as criteria for the piping system qualification.

No EOIs have been issued in this review area to date.

The verification program intended to be conducted by the IDVP is not yet complete. Based upon the efforts performed to June 25, 1983, the IDVP considers the following aspects of the DCP work to be acceptable and to satisfy the licensing criteria.

- The methods and results of the reanalysis comply with the established DCP criteria.
- Mathematical modeling of the valve adequately represents the structure of the valve.
- Critical areas were examined.

The IDVP intends to formulate a final conclusion as to the qualification of and its conformance to licensing criteria when the IDVP verification is complete.

(To Be Supplemented)

4.6.4.3 Verification of DCP Activities

The IDVP verification of DCP activities for Pumps is defined by ITRs -8 and -35. The IDVP review examines the DCP work for all aspects described in Section 4.6.1 above. The results of this verification will be reported in ITR-67.

The DCP Internal Technical Program for Equipment consisted of a review of the seismic qualification. This review consisted of checking the latest seismic qualification data against those used for the qualification of equipment. This checking was performed using the latest response spectra for the DE, DDE, and Hosgri event. Whenever changes to the response spectra required requalification of the equipment, the equipment was requalified by analysis or testing. Equipment identified for review consisted of those associated with the engineering safety sytems designed by PGandE (Reference DCP Phase I Final Report).

Two identical fire pumps located in the Unit I Auxiliary Building at elevation 115 feet were selected as the IDVP verification sample The fire pumps are Design Class I equipment.

This pump is one of eight pumps reviewed by the DCP. Of these eight, one was qualified by shake table testing (see Section 4.9.1) and is thus excluded from the sampling of reviewed/reanalyzed pumps. Five of the remaining seven pumps were included in the IDVP initial sample and additonal verification work. Thus, with the IDVP review of the fire pump, six of the seven pumps qualified by analysis and in the IDVP scope have been verified.

The IDVP verification included assessments of the completeness, applicability, consistency, and adequacy of the DCP review and reanalysis methodology. Where discrepancies were noted, or methodology deemed not totally appropriate, alternate calculations

were carried out by the IDVP to verify the conclusions of the DCP reanalysis.

The verification program intended to be conducted by the IDVP is not yet complete. Based upon the efforts performed to June 25, 1983, the IDVP considers the following aspects of the DCP work to be acceptable:

- Operability, as defined by rotating element clearances and interfereces, was adequately demonstrated.

- The seismic spectra utilized by the DCP for pumps reflects the current spectra.

- The mathematical modeling used in the reanalysis was judged to be acceptable for the fire pump.

- With the exception of the item identified in the next paragraph all established DCP criteria are judged to have been adequately met.

The IDVP considers the following aspects of the DCP work to be unresolved concerns at this time.

Flanges on pumps require reevaluation.

The IDVP intends to formulate a final conclusion as to the qualification of and its conformance to licensing criteria when all analyses have been evaluated by the IDVP.

(To be supplemented)

4.6.5.2 Verification of DCP Activities

The IDVP verification of DCP activities for heat exchangers is defined by ITRs -8 and -35. The IDVP verification of the DCP work includes all aspects described in Section 4.6.1. The results of the verification will be reported in ITR-67.

The DCP Internal Technical Program for equipment consisted of a review of the seismic qualification. This review comprised checking the latest seismic qualification data against those used for the qualification of equipment. This checking was performed using the latest response spectra for the DE, DDE, and Hosgri event. Whenever changes to the response spectra required requalification of the equipment, the equipment was requalified by analysis or testing. Equipment identified for review comprised that associated with the engineered safety systems designed by PGandE (Reference PGandE Phase I Final Report). The DCP performed a reanalysis of the CCW pump lube oil cooler with revised seismic imputs.

The CCW pump lube oil cooler was selected as the IDVP verification sample of the DCP's ITP activities for heat exchangers. One lube oil cooler is mounted with each of the three ccw pumps located in the auxiliary building at elevation 73 feet. the CCW pump lube oil coolers are Design Class I Equipment. This cooler, or heat exchanger, is one of two heat exchangers reviewed by the DCP. The other was the CCW heat exchanger, which was in the IDVP initial sample.

The IDVP performed a design review of the reanalysis. A checklist was developed which covered all criteria items, and critical analytical procedures, and ensured completeness of the DCP review. In addition to the checklist, the IDVP work included assessments of the completeness, applicability, consistency of the reanalysis methodology. Where discrepancies were noted, or methodology was deemed not totally appro-

priate, alternate calculations were carried out by the IDVP to verify the conclusions of the DCP reanalysis.

One EOI file, 1130, was established. The DCP reanalysis of the CCW pump lube oil cooler showed that allowable criteria were exceeded and that physical modifications were required. This reanalysis was the analysis of record when the DCP had indicated that all ITP work in this area was complete and no physical modifications were necessary (DCP Phase I Final Report, Revision 3, dated 4/22/83). There is no concern with the engineering of this item. The IDVP determined that the status of qualification was internally tracked within the DCP and required actions would have been implemented, even though this was not apparent from the DCP Phase I Final Report. EOI 1130 was resolved as a Deviation.

The verification program intended to be conducted by the IDVP is not yet complete. Based upon the efforts performed to June 25, 1983, the IDVP considers the following aspects of the DCP work to be acceptable:

- Seismic spectra utilized in the reanalysis were the current spectra.

- The methods and results of the reanalysis reviewed comply with the established DCP criteria.

- Mathematical modeling of the tank adequately represented the cooler structure.

- Because all DCP reviewed heat exchangers are included in the IDVP, all such heat exchangers have been verified as complying with criteria.

The IDVP intends to formulate a final conclusion as to the qualification of all mechanical equipment and its conformance to licensing criteria when all IDVP verification work in this area is complete.

(To Be Supplemented)

4.6.6.2 HVAC Equipment - Additional Sample

Additional verification was performed to address the concerns previously identified for this category of equipment. The results of the additional verification are reported in ITR-31, Revision 1.

The IDVP randomly selected two sample HVAC equipment items to which the concerns could apply. Both items are rotating machinery: exhaust fan E-101 and condenser CR-35. In both instances, the analytical methods used were found to be acceptable for boundary conditions and thrust bearing modeling assumptions.

However, an incorrect bolt size was used for the analysis of CR-35. This was reported in EOI 1120. Use of the correct bolt size resulted in stresses that still remained below allowables. Thus, EOI 1120 was classified as an Error C.

The DCP implemented a complete field verification program for HVAC equipment bolt sizes to address the concern noted in EOI 1120. Upon completion of this program, the IDVP randomly selected a sample of eight HVAC equipment items for verification of bolt sizes. From this sample, the analysis of one item, filter unit FU-39, was found to use an incorrect bolt size. This is reported in EOI 1121.

Use of the correct bolt size for FU-39 resulted in stresses that still remained below allowables. Thus, EOI 1121 was classified as an Error C.

Based on this additional verification, the IDVP concluded:

- Bolt size concerns are limited to HVAC equipment only. No generic implications exist that would apply to other safety-related equipment because the IDVP sample sizes in

these other areas are sufficiently large, and they have not identified any similar concerns (see other equipment sections).

- If there are further instances of incorrect bolt size, the IDVP does not believe there will be an impact on licensing criteria, for two reasons. First, the DCP has inspected all bolt sizes in HVAC equipment; any errors will be within measurement tolerances. Second, all discrepancies identified by the IDVP were small and did not affect criteria.

To further strengthen these conclusions, the IDVP will perform further field verification for bolt sizes as part of the verification of corrective action.

4.6.6.3 Verification of DCP Activities - HVAC Equipment

The IDVP performed verification of DCP activities for HVAC equipment in accordance with ITRs -8 and -35. The IDVP verification of the DCP work included all aspects described in Section 4.6.1 above. The samples selected for IDVP review are representative of Design Class I rotating machinery. The results of this verification will be issued in ITR-67.

The DCP Internal Technical Program (ITP) for equipment consisted of a review of the newest seismic qualification data against data used for the qualification of equipment. This check was performed using the latest response spectra for the DE, DDE and Hosgri event. Whenever changes to the response spectra required requalification of the equipment, this was done by analysis or testing. Equipment identified for review was that associated with the engineered safety systems designed by PGandE (see PGandE Phase 1 Final Report).

The DCP assembled documentation packages for seismic qualification of all safety-related HVAC equipment. This equipment is identified and the method of seismic qualification is documented. The qualification is reviewed for effect of any seismic spectra changes. A reanalysis or test was performed if the spectra affected the qualification of the component. Redesign and modifications were implemented, if required, to maintain qualification.

The sample selected by the IDVP for verification of the DCP's ITP for HVAC equipment consisted of supply fan S-1 and compressor CP-35. Supply fan S-1 and an identical fan, S-2, are located in the auxiliary building at elevation 85 feet. Compressor CP-35 and an identical unit, CP-36, are located in the auxiliary building at elevation 154 feet, 6 inches. Both the fan and compressor are Design Class I equipment.

One DCP review/reanalysis package pertained to each pair of identical equipment (i.e., fans S-1 and S-2). The fan is one of ten types of fans reviewed by the DCP. Individual fans within each type classification are identical. The compressor is the only compressor reviewed by the DCP.

Selection of this rotating machinery for IDVP verification reflects concerns from the initial sample. The sample fan was selected on a random basis but with a bias towards the physically larger units.

The DCP had already performed a partial reanalysis of fan S-1 as part of the ITP. The DCP review of the previous qualification determined that certain portions of the qualification were not appropriate. Reanalysis was performed to examine the affected critical areas and to incorporate any revised seismic spectra.

A similar procedure was used by the DCP for compressor CP-35. A discrepancy in the previous qualification was found. The DCP subsequently reanalyzed the compressor using revised seismic spectra.

For both sample items, the IDVP performed a design review of the reanalysis. A checklist was developed which covered all criteria items, critical analytical procedures, seismic spectra inputs and completeness of the DCP review. In addition to the checklist, the IDVP design review included assessments on the completeness, applicability, consistency and adequacy of the DCP review and reanalysis methods. Where discrepancies were noted, or methods deemed not totally appropriate, alternate calculations were carried out by the IDVP to verify the conclusions of the DCP reanalysis.

Two EOI files were established in the course of the review. EOI 1125 was issued because the Revision 1 reanalysis of compressor CP-35 used an incorrect Hosgri vertical acceleration. Use of either the correct

or incorrect value produced stresses within allowables. EOI 1125 was classified as a Class C Error. The resolution is discussed under "Hosgri Spectra," section 4.3.2.2.

EOI 1127 was issued for two concerns over the modeling technique and methods used in the reanalysis of fan S-1. One concern was resolved as not significant based on the IDVP initial sample work. The IDVP determined that the second concern was not valid and the DCP modeling method was correct. EOI 1127 was classified as a Closed Item.

The verification program intended to be conducted by the IDVP is not yet complete. Based upon the efforts performed to June 25, 1983, the IDVP considers the following aspects of the DCP work to be acceptable and to satisfy the licensing criteria.

- The mathematical modeling of the structures was found to be adequate.
- Application and satisfaction of established DCP criteria were found to be adequate.
- A concern did exist over the proper control and application of seismic spectra, an issue which is related to work done in the initial sample. The concern was resolved as discussed in section 4.3.2.2.

The IDVP intends to formulate a final conclusion as to the qualification of and its conformance to licensing criteria when the IDVP verification is complete. The IDVP effort will include a completion sample to verify hold down bolt size as described in 4.6.6.2.

(To Be Supplemented)

4.6.6.5 Verification of DCP Activities HVAC Ducts and Duct Supports

The IDVP verification of DCP Corrective Action related to HVAC ducts and duct supports is defined by ITRs -8 and -35. ITR-63 will provide a detailed description of the IDVP verification process and results.

Following a preliminary review of existing seismic analyses, the DCP committed to a complete reanalysis of the 790 duct supports and the associated duct systems. The DCP seismic review of Class I HVAC ducts and duct supports was done using the criteria given in FSAR Section 3.0 for DDE, and in Section 9.0 of the Hosgri Report for the Hosgri event. The DCP performed a field walkdown to ensure that as-built configurations were incorporated into the design reanalysis.

The DCP design was verified generically; that is, the duct supports were grouped by type and a worst case analysis was performed. This was to provide a conservative representation of all the supports in the group.

Supports and ducts which did not satisfy the criteria based on the generic review were analyzed individually using actual configuration data determined by field walkdowns.

The IDVP verification included a sample of Design Class I HVAC duct and duct support analyses from a sample space of all Design Class I HVAC ductwork.

The IDVP review methodology for the HVAC duct/support Corrective Action Program included review of the design qualification methodology, design reviews of the selected analyses, and field verification of as-built configurations. In addition, the IDVP addressed concerns resulting from its independent analysis of the Phase I initial sample, documented in ITR-15, Revision 0.

The design qualification methodology contained in HV-4 was reviewed against documented procedures and criteria presented in the Design Criteria Memorandum DCM C-31. This review was performed using a written checklist developed by the IDVP specifically for procedural or "design-aid" packages, including HV-1, HV-2, and HV-72.

The generic calculation HV-3 was derived from a Bechtel Power Corporation testing program. The verification of this package was performed by review of the source documents in the DCP offices. The focus of the review was the scope and extent of the test program, including any limitations or qualifications as to the applicability of the results. The HV-3 package was also reviewed for numerical accuracy.

The remainder of the IDVP sample of HVAC duct/support packages are actual design qualification analyses. These were design reviewed using an extensive checklist developed to reflect the procedures as directed by HV-4.

The IDVP selected 17 calculation packages as the sample for review. Of these, 5 are the generic "design aid" packages listed above. These packages are applicable to all Class I duct/support analyses. The remaining 12 packages contain the qualification analyses for 33 supports and associated ducts.

The majority of Class I ductwork is within the auxiliary building, so the IDVP selected the majority of the sample from various areas and elevations within this structure. One sample was chosen from the turbine building, which contains less Class I ductwork than the auxiliary building.

EOI 1134 was issued as a result of the IDVP review of the DCP Corrective Action Program. The DCP has developed an approximate method for the dynamic analysis of the HVAC ducts that is based upon

the Rayleigh-Ritz approach. The IDVP determined that the DCP approach, which appears to give conservative results, does not always give correct frequencies.

The DCP has provided additional information on the basis for the approximate method. This material is currently under review. There appears to be little or no possibility that allowable stresses will be exceeded in any event.

The IDVP considers the following aspects of the DCP work to be unresolved concerns at this time:

- EOI 1134

The IDVP intends to formulate a final conclusion as to the qualification of and its conformance to licensing criteria when all analyses have been evaluated by the IDVP.

4.6.7 Electrical Equipment and Instrumentation

4.6.7.1 Initial Sample

ITR-33 covers the independent analysis and verification of the initial sample of electrical equipment and instrumentation cabinets. This initial sample consisted of the hot shutdown remote control cabinet and the main annunciator cabinet assembly. Additional verification of electrical equipment was also carried out in accordance with ITR-1 and reported in ITR-33.

The procedures for the independent design verification analyses of electrical equipment cabinets included the following:

- The location of the electrical equipment was determined.
- The physical dimensions and configuration of the cabinets were verified in the field.
- The cabinets and their contents were mathematically modeled to determine the mass and stiffness characteristics.
- Specific natural frequencies were calculated.
- Applicable seismic accelerations were obtained using the natural frequencies calculated with the appropriate Hosgri response spectra.
- Forces and moments were calculated for the key areas.
- Stresses were determined from the forces and moments and were compared to the allowable stresses.

- The stresses computed by the IDVP were compared to those from the design analyses.

Seven EOI Files were established and were resolved as follows:

Finding (ER/A, ER/AB, ER/B):	949
Observations (ER/C, ER/D, PPR/DEV):	1008, 1117
Closed Items:	1004, 1006, 1007, 1087

Only EOI 949 required physical modification. The design analysis of the main annunciator cabinets and their supports incorrectly assumed that the structure was rigid in the side-to-side direction. The IDVP analysis showed the support to be inadequate for the amplified loads accompanying a low side-to-side natural frequency. In response to this analysis PGandE modified the main annunciator cabinet assembly to make it rigid in the side-to-side direction (North-South).

4.6.7.2 Additional Verifications

The following additional verifications were specified by ITR-1 to address the concerns raised.

- Review the adequacy of all assumptions used in the frequency calculations for all electrical equipment qualified by analysis.

- Review all seismic inputs as already set forth on the DCP Corrective Action Program (concern raised in EOI 1008).

For the additional verification effort, RLCA reviewed the design analysis of local instrument panels and instrument AC panels for natural frequency calculations. Although one EOI File 1117 classified as an Error C was issued, the IDVP determined that the frequency criteria requirements were met.

4.6.7.3 Verification of DCP Activities

The IDVP performed verification of DCP activities for electrical equipment in accordance with ITRs -8 and -35. The IDVP review examined the DCP work for all aspects discussed in Section 4.6.1. This category of electrical equipment and instrumentation includes all such equipment qualified by analysis. This verification effort will be reported in ITR-67. Equipment items qualified by shake table testing are discussed in Section 4.9.1.

The DCP reviewed the previous seismic qualifications of equipment to determine their validity with respect to current spectra for the DE, DDE, and Hosgri event. If the analysis was invalid, the equipment was reanalyzed to ensure qualification to the current response spectra and then redesigned or modified as required. Equipment identified for review is equipment associated with the engineered safety systems designed by PGandE (see PGandE Phase I Final Report).

The station battery racks were selected as the IDVP verification sample of the DCP's review of electrical equipment qualified by analysis. The racks support the station batteries, which are Design Class I equipment. This equipment is located in the auxiliary building at elevation 115 feet.

The station battery racks are one of five major items of electrical and instrumentation equipment qualified by analysis that are within the IDVP scope. Major equipment in this case excludes small panels, transmitters, switches, circuit breakers and other small items of this type.

Of the five major equipment items, two were included in the IDVP initial sample work: the main annunciator cabinet and the hot shutdown remote panel. Two others were included in the additional verification sample: the local instrument panels and the instrument AC panel.

Thus, with the inclusion of the station battery racks, all analyzed major electrical equipment and instrumentation items have been included in the IDVP verification effort.

The IDVP performed a design review of the reanalysis performed by the DCP on the station battery racks, using a checklist to cover analysis criteria items, critical analytical procedures, and completeness of the DCP review. In addition to the checklist, the IDVP design review included assessments on the completeness, applicability, consistency and adequacy of the DCP review and reanalysis methodology. Where discrepancies were noted, alternate calculations were carried out by the IDVP to verify the conclusions of the DCP reanalysis.

Results of the IDVP reviews of the DCP reanalysis of the station battery racks are:

- Seismic spectra used in the reanalysis were the current spectra.
- No specific analysis criteria were formally established for this equipment. However, the American Institute of Steel Construction Code was used by the DCP as criteria for the structural analysis.
- An incorrect bolt size was used in the analysis. (See EOI 1128).

EOI 1128 notes that in the DCP reanalysis of the station battery racks 3/8 inch bolts were used instead of the 1/2 inch bolts called for and the shear force was incorrectly calculated. Use of the correct values in the original DCP calculation indicate that stress may exceed the allowable. This appears to be an isolated concern in the elecrical equipment area.

The verification program intended to be conducted by the IDVP is not yet complete. Based upon the efforts performed to June 25, 1983, the IDVP considers the following aspects of the DCP work to be acceptable and to satisfy the licensing criteria.

- The seismic response spectra used by the DCP for electrical equipment and instrumentation qualified by analysis reflects the current spectra.

- Although no specific criteria have been established by the DCP for analyses in this area, use of the AISC Code is adequate.

- The mathematical modeling used for the reanalysis was considered to be acceptable.

The IDVP considers the following aspects of the DCP work to be unresolved issues at this time.

- EOI 1128

The IDVP intends to formulate a final conclusion as to the qualification of all electrical equipment and instrumentation and its conformance to licensing criteria when all IDVP verification work in this area is complete.

(To Be Supplemented)

4.6.8 Electrical Raceways, Instrument Tubing, and Supports

There were approximately 500 standard electrical raceway support designs used in the Diablo Canyon Plant. Each design had been generically qualified to carry a certain number of cables/trays and to be installed in particular areas of the plant. They were located based upon allowable span criteria. The Phase I review of electrical raceways was based upon a sample of 20 raceway supports and the verification of DCP corrective action was based upon a second sample of 20 raceway supports.

Instrument tubing was also originally supported by a spacing criteria.

No review of instrument tubing or supports was included in the IDVP Phase I Initial Sample. However, the DCP identified instrument tubing as an item for review and possible corrective action within the Internal Technical Program.

4.6.8.1 Electrical Raceways

a. Verification of the Initial Sample

ITR-7 reported the IDVP review of Design Class I electrical raceways and supports. The review included:

- Evaluation of design criteria/methodology
- Determination of applicable Hosgri response spectra
- Sample selection
- Documentation of actual sample configuration at the plant

The IDVP evaluated design criteria/methodology from a number of PGandE documents such as preliminary criteria memoranda, qualification analyses, and drawings.

The IDVP reviewed the Hosgri Report for applicable response spectra at the locations where the sample raceway supports were attached.

Following evaluation of the design criteria, the sample of 20 electrical raceway supports was chosen at various elevations and locations. The sample was based on judgement with types of supports selected that were judged to be designed with the least margin of safety. Supports with long cantilever arms, relatively large supported mass, and long raceway spans were typically selected.

Once this sample was selected, the IDVP documented the as-installed configuration by taking physical measurements.

Five concerns were identified related to design criteria/methodology:

- Longitudinal support for conduits was not specified in any installation drawing and was not checked by PGandE in the qualification analysis.

- Raceway stresses calculated for the largest design span may exceed allowables.

- Joint fatigue and local joint flexibility may result in more flexible supports that are characterized by higher seismic response.

- Flexibility of adjacent supports may change the effective load distribution of the support being examined, resulting in higher seismic response of individual supports.

- The design methodology did not consider the coupling of support and raceway in determining natural frequency. Such consideration might result in the determination of lower natural frequencies and greater seismic response.

The following four additional concerns were raised as a result of physical measurements taken at the plant:

- Sample 3 was installed with larger members than were specified in the original design drawings.

- Sample 4 had an additional one inch conduit attached to the support which exceeded the specified maximum support capability.

- Sample 15 was secured to a wall with a less conservative anchor bolt configuration than specified on the design drawings.

- Sample 20 was installed in an area not specifically authorized by the design drawing.

Seven EOI Files were opened as a result of this review and were classified as follows:

Findings (ER/A; ER/AB; ER/B):	983, 1026
Combined with Findings:	910, 930, 1010
Observation (ER/C; ER/D; PRR; DEV):	None
Closed Item:	None

EOIs 1093 and 1097 were also related to this subject, but relate to the Auxiliary Building so are reported in 4.4.2.

Although EOI 1026 is listed here, it was redesignated to cover the DCP Turbine Building seismic review and is reported in 4.4.8.

EOI 983 has been broadened by inclusion of EOIs 910 and 930 to track the DCP activities in response to the ITR-7 recommendations that DCP:

1. Modify design criteria and methodology used to seismically qualify electrical raceway supports.

2. Define Hosgri response spectra inputs for all electrical raceway supports.

3. Establish and implement a program to insure that raceway supports conform to design installation criteria.

b. Verification of DCP Corrective Action

The IDVP verification of DCP Corrective Action related to Electrical Raceways and Supports is defined in ITR-8 and -35. ITR-64 will provide a detailed description of the IDVP verification process and results.

The Corrective Action Program as defined in the PGandE Phase I Final Report included a complete review and reanalysis of the raceway and support qualifications. The program included a physical survey and documentation of the location of each support, categorized by support type; generic qualification of support types using worst-case seismic response spectra; and alternative qualification of support types using worst-case "as-built" information

related to each individual support within such support type category.

Qualification for transverse/vertical loadings were reviewed separately from those for longitudinal loadings.

The scope of the IDVP review of the DCP Corrective Action Program included the following categories of Class IE electrical raceway and raceway support analyses:

- Transverse and vertical support qualifications
- Longitudinal support qualification
- Conduit span qualification
- EOI resolutions

For each of the first two categories, the IDVP selected a sample of analyses as the basis for design reviews. The remaining two categories are each contained in single calculation packages which were reviewed completely by the IDVP. The IDVP review process includes review of the methodology and criteria, design review of the qualification analyses, and field verification of as-built configurations used as input to the analyses.

The IDVP verification of the transverse and vertical, and the longitudinal qualifications was accomplished through field verification of site conditions and design review of the qualification analyses. The design reviews were performed using technical checklists developed to reflect procedures and criteria documented in DCM C-15 Revision 3.

For the conduit span calculations and EOI resolutions, the IDVP design reviewed the calculations using checklists

developed specifically for each type of calculation. In addition, the IDVP field verified a sample of the as-built information used as input to the analyses.

The IDVP sample selected for the transverse and vertical qualifications consisted of 17 analyses selected from a total of approximately 460 support types. These support types were chosen as representative of a variety of configurations, locations, loading conditions, and analysis type (i.e., generic, as-built, or modified).

For the longitudinal qualification, the IDVP selected a sample of five analyses of conduit runs in various locations. A supplemental sample will be established to verify analyses performed by an outside consultant to the DCP. None of these analyses were complete when the preliminary sample was taken.

For conduit span qualifications and EOI resolutions, the IDVP reviewed the complete scope of DCP analyses.

No Error and Open Item Reports have as yet been issued as a result of the IDVP review of the DCP Corrective Action Program.

The verification program intended to be conducted by the IDVP is not yet complete. Based upon the efforts performed to June 25, 1983, the IDVP considered the following aspects of the DCP work to be acceptable:

- Field verification of a sample of the supports showed a satisfactory correlation with the drawings.

- Nine analyses followed procedures and were accurate within a satisfactory tolerance.

The DCP has performed a dynamic analysis for longitudinal motion. This analysis will be reviewed by the IDVP.

The IDVP intends to formulate a final conclusion as to the qualification of and its conformance to licensing criteria when all analyses have been evaluated by the IDVP.

(To Be Supplemented)

4.6.8.2 Instrument Tubing and Supports

Class 1 instrument tubing is tubing containing a fluid which runs between a transducer and a sensing device. The sensing device interprets the pressure of flow rate of the contained fluid into other information measured by the transducer such as temperature or pressure of another fluid within a pipe or vessel, thereby providing a remote indication of such information.

The tubing is of small diameter, typically 1/4", composed of stainless steel or copper. Tubing supports are typically made of standard cold-formed members, welded together or assembled with standard fastener devices.

The majority of Class I instrument tubing and supports associated with Class I safety-related instrumentation is within the containment structure. There are also isolated systems in both the auxiliary and turbine buildings. These instrument sensing lines supply pressurized fluid signals to the Class I instrumentation.

a. Verification of the Initial Sample

Instrument tubing and supports were not part of the initial IDVP Phase I Program and, therefore, there was no initial sample defined and no review made.

b. Verification of Corrective Action

The IDVP verification of DCP corrective action related to instrument tubing and supports is defined by ITRs-8 and -35. ITR-66 will provide a detailed description of the IDVP verification process and results.

The DCP program for instrument tubing and tubing supports is based on a sample of 88 tubing supports in specific areas of the containment annulus structure. In addition, DCP program includes generic calculations performed for the purpose of qualifying instrument tubing spans on a plant wide basis, using worst case assumptions concerning Hosgri response spectra.

The basic criterion utilized by the DCP to qualify instrument tubing supports is to ensure that the supports are rigid. Ridigity is based on a minimum frequency of 33 Hertz. Those supports found not to be rigid were qualified by stress analyses utililzing criteria established for pipe supports (DCM M-9).

To qualify the tubing, a worst case analysis was performed to show that regardless of resonance, the tubing spans using the original support spacing do not experience stresses exceeding allowables.

The scope of the IDVP verification included all Class 1 instrument tubing and tubing supports located in areas of the containment annulus structure which are adversely affected by revised response spectra.

This scope represents a complete review of the DCP scope for the Corrective Action Program in the area of instrument tubing and supports.

The methodology adopted by the IDVP for review of the DCP program included review of the completeness, applicability and consistency of the procedures and criteria implemented in the DCP design review of the six qualification analysis packages, and field verification of the input to the qualification analyses.

The procedure utilized by the IDVP to perform the design reviews involved a combination of design review checklists and alternate calculations. The latter were performed in those cases where checklist review results were not sufficient to verify that supports met licensing commitments.

The IDVP review of the DCP plan implementation was based on a 100 percent sample of the DCP program for instrument tubing and supports. The DCP program implementation is contained in six qualification analysis packages which make up the IDVP scope for design review. One of the six packages contains the generic tubing span qualifications. The remaining five contain tubing support qualifications based on a DCP walkdown to identify controlling or specific worst case configurations in specific areas of the annulus structure.

EOI 1123 was issued due to the use of incorrect member properties for a particular support type. The member properties for a particular support type. The member properties were different from both the DCP documented as-built information and the IDVP field verified data, which were equivalent. The DCP concurs with this assessment of the discrepancy. However, this EOI is as yet unresolved.

The verification program intended to be conducted by the IDVP is not yet complete. Based upon the efforts performed to June 25, 1983, the

IDVP considers the following aspects of the DCP work to be acceptable:

- Four DCP qualification analyses have been verified to be sufficient and in conformance with licensing requirements.

- The DCP provided sufficient and accurate "as-built" survey documentation supporting DCP qualification analyses for 12 support types.

The IDVP considers the following aspects of the DCP work to be unresolved concerns at this time: Resolution of EOI 1123.

The IDVP intends to formulate a final conclusion as to the qualification of and its conformance to licensing criteria when all analyses have been evaluated by the IDVP.

(To Be Supplemented)

4.6.9 Filters

The IDVP verification of DCP activities for filters is defined by ITRs-8 and -35. The IDVP verification of the DCP work included all aspects described in 4.6.1. The results of the verification will be reported in ITR-67.

The DCP Internal Technical Program for filters involved a review of the seismic qualification. This review consisted of checking the newest seismic qualification data against data used for the qualification of equipment. This check was performed using the latest response spectra for the DE, DDE, and Hosgri event. Whenever changes to the response spectra required requalification of the equipment, the equipment was requalified by analysis or testing. Equipment identified for review comprised that associated with the engineered safety systems designed by PGandE (Reference PGandE Phase I Final Report). this includes the safety injection pump lube oil filter, diesel oil transfer filter, and the strainer.

The safety injection pump lube oil filter was selected as the IDVP verification sample. One lube oil filter is mounted with each of the two safety injection pumps located in the auxiliary building at elevation 85 feet. The safety injection pump lube oil coolers are Design Class I equipment.

For the safety injection lube oil filter, the IDVP performed a design review of the the DCP reanalysis. A design review checklist was developed which covered all criteria items, critical analytical procedures, and completeness of the DCP review. In addition to the checklist, the IDVP design review included reviewer assessments on the completeness, applicability, consistency, and reanalysis methodology. Where discrepancies were noted, or methodology deemed not totally

appropriate, alternate calculations were carried out by the IDVP to verify the conclusions of the DCP reanalysis.

No EOI files were established for this category of equipment.

The verification program intended to be conducted by the IDVP is not yet complete. Based upon the efforts performed to June 25, 1983, the IDVP considers the following aspects of the DCP work to be acceptable and to satisfy the licensing criteria:

- The seismic spectra utilized by the DCP for the filter reflect the current spectra (see 7.0).
- Mathematical modeling adequately represented the filter and support structure.
- The methods and results of the reanalysis comply with established DCP criteria.

The IDVP intends to formulate a final conclusion as to the qualification of all mechanical equipment and its conformance to licensing criteria when all IDVP verification work in this area is complete.

(To Be Supplemented)

4.9.1.4 Verification of DCP Activities

The IDVP verification of DCP work on shake table testing is defined by ITRs-8 and -35 and in response to IDVP concerns developed during verification for the initial sample. The results of the verification will be reported in ITR-67.

The DCP Internal Technical Program for equipment consisted of a review of the seismic qualification conducted by checking the newest seismic qualification data against data used for the qualification of equipment. This checking was performed using the latest response spectra for the DE, DDE, and Hosgri event. Whenever changes to the response spectra required requalification of the equipment, the equipment was requalified by analysis or testing. Equipment identified for review comprised that associated with the engineered safety systems designed by PGandE (reference PGandE Phase I Final Report).

The previous seismic qualifications of equipment were reviewed by the DCP to determine their validity with respect to current spectra. If the qualifying test response spectra did not completely envelop the current required response spectra, an attempt was made to qualify the equipment by analysis. If this was not possible, equipment modifications were performed and the equipment was retested.

The sample selected by the IDVP for verification of the DCP's ITP for shake table tested equipment consists of the portable fire pump and radiation monitor RE-14A. Both items are Design Class I equipment.

The portable fire pump is Design Class I equipment. Two identical units are located at ground level, elevation 85 feet, just west of the turbine building. The portable fire pump was qualified by the mechanical equipment discipline within the DCP and represents the only shake table tested equipment within their responsibility. Thus, the inclu-

sion of the portable fire pump in the IDVP sample represents a 100 percent sample of the mechanical equipment tested by shake table.

Radiation monitor RE-14A and an identical and adjacent unit, RE-14B, are Design Class I instrumentation, located in the auxiliary building at elevation 115 feet. The radiation monitor represents one of approximately 27 categories of tested equipment within the electrical equipment and instrumentation scope. Radiation monitor RE-14A was qualification tested as part of an upgrade program. Reports were published which completely documented the testing and qualification of this equipment.

For both sample items, the IDVP performed design reviews and test reviews of the qualification documentation. A design review checklist was developed which covered all applicable criteria items, test procedures and completeness of the qualification. In addition to the checklist, the IDVP design review included reviewer assessments on the completeness, applicability and validity of the test, and conclusions drawn from the test. The test was evaluated to determine satisfaction of the applicable or established criteria and/or standards.

No EOIs have been issued to date for this review area.

The verification program intended to be conducted by the IDVP is not yet complete. Based upon the efforts performed to June 25, 1983, the IDVP considers the following aspects of the DCP work acceptable and to satisfy the licensing criteria:

- Applicable criteria have been identified and applied for shake table testing.

- Functional capability requirements have been specified and met.

- Mounting of the test specimens were either representative of the installed condition or were adequately evaluated.

The IDVP intends to formulate a final conclusion as to the qualification of and its conformance to licensing criteria when IDVP verification work in this area is complete.

(To Be Supplemented)

4.9.2 Soils

4.9.2.1 Introduction

Harding Lawson Associates (HLA) was identified in 4.1 as one of the seismic safety-related contractors who had a significant effect on the seismic design or qualification of DCNPP-1. The principal purpose of the HLA work was to determine soil rock characteristics input into the Hosgri qualification analyses for the Intake Structure, auxiliary salt water lines, outdoor water storage tanks, and diesel fuel oil tanks. In addition, HLA independently checked the PGandE qualification work for buried pipelines between the Intake Structure and the Turbine Building.

Section 4.2 of this report summarizes the R. F. Reedy QA Audit and Review of HLA which revealed QA deficiencies. Additional technical verification to verify the HLA activites was required. The additional soils verification effort with respect to soils was reported in a series of separate ITRs which are summarized in this subsection.

The initial IDVP verification program for review of the HLA soils work, formulated by RLCA and Dr. McNeill, specified a review of essentially all of the HLA Hosgri related soils work. This IDVP review was limited to the HLA results and, in this initial program, did not consider the application of the HLA work to the overall plant structural evaluations.

4.9.2.2 Intake Structure

a. ITR-13 reported verification of the HLA Intake Structure work related to bedrock depth determination. The following HLA activities with respect to determination of bedrock depth, which are provided in "A Geophysical Investi-

gation of Compacted Earth Fill at Diablo Canyon Nuclear Power Plant," March 9, 1978, were noted:

- Seismic and core sampling at the Intake Structure site to define the bedrock depth

- Seismic refraction surveys consisting of downhole and crosshole tests

- Both the seismic and core sampling work

To verify the bedrock depth reported by HLA, RLCA made the following comparisons:

- HLA field geologist's boring information from the logs were compared against the HLA report for boring locations.

- The boring information was compared against the seismic information from the HLA report and the final excavation surveys for the bedrock depth.

The comparison of boring/sampling hole locations between the logs and the HLA report show reasonable agreement. One noted discrepancy in the documentation on hole location was determined to be a typographical error. The comparison of bedrock levels between HLA core/sampling and the seismic refraction surveys and final excavation surveys also indicated reasonable agreement.

b. ITR-13 also included verification of the HLA work to define the properties of the backfill material. HLA performed laboratory tests on the boring samples and reported

the results of the following tests: Moisture-Density, Atlerberg Limits, Amount of Fines, Sieve Analysis, Quick Triaxial, and Cyclic Triaxial.

To verify the backfill property definition resulting from the above tests, RLCA performed the following:

- One value from each of the lab tests performed under HLA direction was independently calculated and compared to the test value.

- The classifications assigned by the field geologist on the field logs (Reference 7) were compared to the classifications assigned by the laboratory technicians (Reference 11).

- Property values from two laboratory tests were compared to classification values assigned by HLA and accepted literature to assess the reasonableness of the backfill property definitions.

Based on these comparison studies, the IDVP concluded that the HLA activities in defining material properties for the backfill were acceptable. As a result of the efforts reported in ITR-13, one Observation (EOI 1094) was reported and resolved as a Deviation.

c. In ITR-39, the IDVP reported on the evaluation of the HLA soils effort for the Intake Structure related to bearing capacity and lateral earth pressures.

The results of the IDVP evaluation indicated the following:

- The HLA lithology definition was found to be consistent with other DCNPP data and conservative with respect to values from accepted literature.

- The HLA bearing capacity allowable values for the bedrock at the Intake Structure were conservative when compared to independent IDVP calculations.

- HLA lateral earth pressure values were within 10 percent of the upper bound IDVP calculated values.

Based on the above, the IDVP concluded that the HLA soils work related to lithology definition, bearing capacity, and lateral pressure in the Intake Structure area is acceptable. One Observation (EOI 1112) was resolved as a Deviation as reported in ITR-39. Portions of this work and ITR-40 are under review as part of the effort to be reported in ITR-68.

d. ITR-40 on the IDVP review of the HLA postulated sliding surface and resistive forces completed the IDVP verification effort on the HLA soils activities related to the Intake Structure. In this review, the IDVP performed independent calculations, examined HLA reports, and compared results. The results of the IDVP review reported in ITR-40 are summarized as follows:

  - The HLA postulated sliding surface and resistive force values either agree with or are conservative with IDVP results.

  - The HLA intake sliding resistance conclusions are acceptable.

4.9.2.3 Outdoor Water Storage Tanks

The IDVP verified the HLA analyses of the rock under both the Unit 1 and Unit 2 Design Class 1 Outdoor Water Storage Tanks (OWST) and reported the results in ITR-16. The IDVP review consisted of a verification of:

- The HLA lithology definition
- The HLA determined bearing pressure allowables

In the review of the HLA soil analysis for the OWST, RLCA and their soils consultant performed the following:

- Toured the DCNPP site to examine exposed rock and in-situ backfill
- Reviewed the HLA soil analyses
- Compared boring location information from HLA boring logs to a IDVP field verified drawing and to the HLA report
- Compared HLA bedrock depth information with the PGandE final excavation drawing
- Compared the HLA lithology definition with HLA boring and test pit lugs and the Blume studies
- Compared HLA strength values against accepted literature data for comparable rock
- Verified the bearing capacity allowables for the bedrock in the OWST area

The results of the IDVP review determined that the HLA soils work related to lithology definition and bearing capacity allowables was acceptable. Two Files (EOIs 1100 and 1101) were issued based on the OWST soils review. Both of these EOIs were resolved as Deviations (Observations).

4.9.2.4 Further Verification of Soils

Based upon the NRC staff review of these ITRs, the IDVP verification program for review of the HLA soils work was expanded. This expansion included an IDVP review of the application of HLA work to the overall structural evaluation of the plant. As a result revisions to existing soils ITRs will be either necessary or desirable.

One ITR, ITR-68 is planned to document the results of this expanded program. It will contain combined results of the Intake Structure, outdoor water storage tanks, auxiliary saltwater lines and diesel fuel oil tanks verification of HLA work in a single ITR, as well as overall IDVP conclusions about the adequacy of the HLA work.

4.9.3 Rupture Restraints

The IDVP verification of the DCP Corrective Action Program for rupture restraints is outlined in ITR-35. The IDVP review consisted of examining the qualification of rupture restraint designs outside of containment for pipe rupture loadings. The IDVP review included field inspection to ensure conformance of design drawings to as-built conditions for selected DCP calculations. This activity will be reported in ITR-65.

Rupture restraints are mechanical devices and structural elements used to restrain, or protect against, the dynamic effects (pipe whip) of high energy piping subsequent to a postulated rupture of the pipe pressure retaining boundary. These restraint devices/elements consist of steel frames, wall and floor penetrations, and U-Bolts/rod beams whose design loading envelope includes loads due to DE, DDE, or Hosgri earthquake as well as pipe rupture.

Rupture restraints are provided to restrain high energy pipe of one inch diameter or more. The postulated pipe break locations are determined on the basis of the stress effects due to pressure, deadweight, thermal expansion, fluid transients, and DE during normal upset and test conditions. The FSAR defines high energy pipe as pipe having a service temperature and design pressure exceeding 200 degrees Fahrenheit and 275 psig.

The DCP has conducted its evaluation of rupture restraint criteria implementation and qualification analyses through an Internal Technical Program (ITP). The purpose of the DCP evaluation was to demonstrate the adequacy of the as-built rupture restraints outside containment designed by Nuclear Service Corporation (Quadrex).

The DCP methodology was based on the section of a representative sam-

ple according to restraint configurations and piping systems. The sample was selected by grouping all the restraints specified in NSC's Structural Evaluation Report by configuration (30 groups) and then selecting the restraints that appear to be the critical cases. Approximately 25 percent to 40 percent of the restraints in each group were selected for evaluation. The selection was based on member size, applied pipe rupture load, design margins, and engineering judgment. For each restraint substructure selected, the corresponding U-Bolt/rod assemblies were identified and evaluated.

The following is a general description of the DCP selected rupture restraint sample by plant location:

- Auxiliary and Turbine Buildings - 46 selected out of 124 restraints

- Hellwell area - 12 selected out of 24 restraints

- Pipeway structure - 19 selected out of 43 restraints

In addition, the DCP methodology required evaluation of the remaining restraints in a group if a modification was required to a restraint within a specific group.

The following items were included in the DCP review:

- Comparison of as-built drawings with design drawings
- Generic studies related to the NSC Reports
- Design load verification
- Verification of the adequacy of design and construction of:
  - Restraint substructure (frames)
  - Building attachments (base plates and anchor bolts)

- U-Bolts/rod beams and gaps
- Restraint weldments
- Building elements (e.g., walls, columns)

- Testing program for U-Bolt anchorages and couplings

The DCP review calculations were tabulated on a calculation index log which grouped calculations by category: generic, U-Bolt/rod beam, substructure, and specific weld evaluation.

The IDVP selected a sample of the DCP qualification analyses to ensure conformance to criteria and accuracy of calculations. The sample was chosen to assess the essential steps of the qualification process.

Prior to actual sample selection, the IDVP reviewed the DCP's FSAR (for pipe break/restraint locations and gap characteristics) as well as the DCP rupture restraint calculation index log. This DCP log listed approximately 210 calculations in the categories named above. The IDVP selected for review 12 rupture restraints involving 25 individual calculations. Specific restraints were selected for review based on the following considerations:

- A variety of systems and plant locations

- Critical restraints based on location (e.g., close to containment or control room)

- Gap characteristics

- Combination of calculations addressing U-bolts, substructure, and weld evaluation

The IDVP is performing design reviews for the DCP analyses selected.

The IDVP also is reviewing generic calculations listed in the DCP calculation index log based on their applicability to the specific IDVP design review samples. Alternate calculations are being performed by the IDVP where necessary to assess the effects of various DCP assumptions and calculations.

The IDVP intends to formulate final conclusions as to the qualification of and its conformance to licensing criteria when the IDVP review of calculations is complete.

(To Be Supplemented)

TABLE 5-1-938

SIGNIFICANT FINDING: EOI FILE: 938

PHYSICAL MODIFICATION(S)?: ERROR CLASS: A

TITLE: Piping Problem 102-Valve 8805B

1. THE FOLLOWING EOI FILE NUMBERS WERE COMBINED WITH THIS FILE: 1105

2. STRUCTURE(S), SYSTEM(S) OR COMPONENT(S) INVOLVED:

   Piping

3. SUMMARY OF CONCERN:

   Valve 8805B is shown on PGandE Design Review Isometric 446544, Revision 11, and Design Analysis 8-24 (computer date 770802) in a vertical position. RLCA field inspection showed that the valve is in horizontal position.

   RLCA Piping Analysis 102 showed all stresses under allowable, however, Anchor Valve drawing PGandE number DC663219-458-2 indicates that this valve must be mounted in the vertical position.

4. SUMMARY OF RESOLUTION:

   Westinghouse reevaluated this valve and notified PGandE that the valve did not require reorientation.

   However, the DCP reanalysis of this piping system indicated that seismic supports were required on the valve operator. Therefore it will be resolved through verification of DCP Corrective Action.

5. RESULTED IN ADDITIONAL VERIFICATION/SAMPLE OR VERIFICATION OF DCP EFFORTS PER ITR(S): 8

6. FOR FURTHER INFORMATION SEE:

   APPENDIX D AND SUBSECTION(S): 4.5.2
   INTERIM TECHNICAL REPORT(S): 12

TABLE 5-1-983

SIGNIFICANT FINDING: EOI FILE: 983

PHYSICAL MODIFICATION(S)?: Yes ERROR CLASS: A

TITLE: Electrical Raceway Supports Reevaluation

1. THE FOLLOWING EOI FILE NUMBERS WERE COMBINED WITH THIS FILE: 910 and 930

2. STRUCTURE(S), SYSTEM(S) OR COMPONENT(S) INVOLVED: Electrical raceway supports

3. SUMMARY OF CONCERN:

   Electrical raceway support calculations (9 out of 12) were found to have been performed using inapplicable seismic spectra.

4. SUMMARY OF RESOLUTION:

   The DCP committed to review the seismic analysis and design of all electrical raceway supports per Rev. 1 to Section 2.4.1 of the DCP Phase I Final Report and to reanalyze and redesign, if necessary, such supports. The therein Table 2.4-11, Rev. 2, lists all raceway support types, indicates whether that support type was requalified generically or on an as-built basis, and identifies supports identified as requiring modification as of date of issue.

   The IDVP will verify the DCP Corrective Action per ITRs-8 and -35.

5. RESULTED IN ADDITIONAL VERIFICATION/SAMPLE OR VERIFICATION OF DCP EFFORTS PER ITR(S): 8

6. FOR FURTHER INFORMATION SEE:

   APPENDIX D AND SUBSECTION(S): 4.6.8

   INTERIM TECHNICAL REPORT(S): 7, 10, and 64

TABLE 5-1-1003

SIGNIFICANT FINDING: EOI FILE: 1003

PHYSICAL MODIFICATION(S)?: Yes ERROR CLASS: A/B

TITLE: HVAC Duct Support Reanalyses

1. THE FOLLOWING EOI FILE NUMBERS WERE COMBINED WITH THIS FILE: 1077

2. STRUCTURE(S), SYSTEM(S) OR COMPONENT(S) INVOLVED: HVAC duct supports

3. SUMMARY OF CONCERN:

   Certain HVAC duct supports may not have been evaluated for Hosgri loadings prior to 811008.

4. SUMMARY OF RESOLUTION:

   DCP committed to review the seismic analysis and design of all Design Class 1 HVAC duct supports per Rev. 0 to Section 2.5.1 of the DCP Phase I Final Report and to reanalyze and, if necessary, redesign such supports.

   The IDVP will verify the DCP Corrective Action per ITRs-8 and -35.

5. RESULTED IN ADDITIONAL VERIFICATION/SAMPLE OR VERIFICATION OF DCP EFFORTS PER ITR(S): 8

6. FOR FURTHER INFORMATION SEE:

   APPENDIX D AND SUBSECTION(S): 4.6.6

   INTERIM TECHNICAL REPORT(S): 15 and 63

TABLE 5-1-1022

SIGNIFICANT FINDING: EOI FILE: 1022

PHYSICAL MODIFICATION(S)?: Yes ERROR CLASS: A/B

TITLE: Intake Structure Reevaluation

1. THE FOLLOWING EOI FILE NUMBERS WERE COMBINED WITH THIS FILE: 967 and 988

2. STRUCTURE(S), SYSTEM(S) OR COMPONENT(S) INVOLVED: Intake structure

3. SUMMARY OF CONCERN:
   As a result of IDVP concerns listed in the above files and their own internal technical program review, the DCP committed to a reevaluation of the Intake Structure in their corrective action program.

4. SUMMARY OF RESOLUTION:
   To be resolved through verification of DCP Corrective Action.

5. RESULTED IN ADDITIONAL VERIFICATION/SAMPLE OR VERIFICATION OF DCP EFFORTS PER ITR(S): 8

6. FOR FURTHER INFORMATION SEE:

   APPENDIX D AND SUBSECTION(S): 4.3 and 4.4.6
   INTERIM TECHNICAL REPORT(S): 10, 32, and 58

TABLE 5-1-1026

SIGNIFICANT FINDING: EOI FILE: 1026

PHYSICAL MODIFICATION(S)?: Yes ERROR CLASS: A/B

TITLE: Turbine Building Reevaluation

1. THE FOLLOWING EOI FILE NUMBERS WERE COMBINED WITH THIS FILE: 982, 984, 989, 1010, 1025

2. STRUCTURE(S), SYSTEM(S) OR COMPONENT(S) INVOLVED: Turbine Building

3. SUMMARY OF CONCERN:
   As a result of the IDVP concerns in the above files and their own internal technical program review, the DCP committed to a reevaluation of the Turbine Building in their corrective action program.

4. SUMMARY OF RESOLUTION:
   To be resolved through verification of DCP Corrective Action.

5. RESULTED IN ADDITIONAL VERIFICATION/SAMPLE OR VERIFICATION OF DCP EFFORTS PER ITR(S): 8

6. FOR FURTHER INFORMATION SEE:

   APPENDIX D AND SUBSECTION(S): 4.3 and 4.4.8
   INTERIM TECHNICAL REPORT(S): 7, 10, and 56

TABLE 5-1-1092

SIGNIFICANT FINDING: EOI FILE: 1092

PHYSICAL MODIFICATION(S)?: Yes ERROR CLASS: A

TITLE: Fuel Handling Building Reevaluation

1. THE FOLLOWING EOI FILE NUMBERS WERE COMBINED WITH THIS FILE: 990, 991, 1027, 1079, and 1091

2. STRUCTURE(S), SYSTEM(S) OR COMPONENT(S) INVOLVED: Fuel Handling Building

3. SUMMARY OF CONCERN:
As a result of IDVP concerns listed in the above files and their own internal technical review, the DCP committed to a reevaluation of the Fuel Handling Building in this corrective action program.

4. SUMMARY OF RESOLUTION:
To be resolved through verification of DCP Corrective Action.

5. RESULTED IN ADDITIONAL VERIFICATION/SAMPLE OR VERIFICATION OF DCP EFFORTS PER ITR(S): 8

6. FOR FURTHER INFORMATION SEE:

   APPENDIX D AND SUBSECTION(S): 4.4.3
   INTERIM TECHNICAL REPORT(S): 6 and 57

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TABLE 5-1-1097

SIGNIFICANT FINDING: EOI FILE: 1097

PHYSICAL MODIFICATION(S)?: No ERROR CLASS: A/B

TITLE: Auxiliary Building Reevaluation

1. THE FOLLOWING EOI FILE NUMBERS WERE COMBINED WITH THIS FILE: 920, 986, 1029, 1070, 1093,and 1132

2. STRUCTURE(S), SYSTEM(S) OR COMPONENT(S) INVOLVED: Auxiliary Building

3. SUMMARY OF CONCERN:
   As a result of the IDVP concerns listed in the above files and their own internal technical program review, the DCP committed to a reevaluation of the Auxiliary Building in their corrective action program.

4. SUMMARY OF RESOLUTION:
   To be resolved through verification of DCP Corrective Action.

5. RESULTED IN ADDITIONAL VERIFICATION/SAMPLE OR VERIFICATION OF DCP EFFORTS PER ITR(S): 8

6. FOR FURTHER INFORMATION SEE:

   APPENDIX D AND SUBSECTION(S): 4.3 and 4.4.2
   INTERIM TECHNICAL REPORT(S): 6, 7, 10, and 55

TABLE 5-1-1098

SIGNIFICANT FINDING: EOI FILE: 1098

PHYSICAL MODIFICATION(S)?: Yes ERROR CLASS: A/B

TITLE: Piping Reevaluation

1. THE FOLLOWING EOI FILE NUMBERS WERE COMBINED WITH THIS FILE: 961, 1021, 1058, 1059, 1060, 1104, 1115, 1126, 6001, and 6002

2. STRUCTURE(S), SYSTEM(S) OR COMPONENT(S) INVOLVED: Large bore piping and supports, small bore piping and supports, and pipe rupture restraints

3. SUMMARY OF CONCERN:

   The IDVP initial sample effort for large bore and small bore piping and the additional sample for large bore piping identified a number of concerns reflected in the above EOI Files. These concerns were grouped into one file, EOI File 1098, labeled as ER A/B, because the DCP committed to a review and requalification, where necessary, of all large and small bore piping and supports. The DCP program also included a review of the non-Hosgri qualifications for piping and piping supports and a reanalysis of a sample of pipe rupture restraints; hence, the IDVP effort on these items was transferred to verification of DCP activities by combining Files 6001 and 6002 into 1098.

4. SUMMARY OF RESOLUTION:

   To be resolved through verification of DCP Corrective Action.

5. RESULTED IN ADDITIONAL VERIFICATION/SAMPLE OR VERIFICATION OF DCP EFFORTS PER ITR(S): 8, 12, and 35

6. FOR FURTHER INFORMATION SEE:

   APPENDIX D AND SUBSECTION(S): 4.5 and 4.9.3

   INTERIM TECHNICAL REPORT(S): 12, 17, 59, 60, 61, 62, and 65

TABLE 5-1-7002

SIGNIFICANT FINDING: EOI FILE: 7002

PHYSICAL MODIFICATION(S)?: ERROR CLASS: A/B

TITLE: Jet Impingement Inside Containment

1. THE FOLLOWING EOI FILE NUMBERS WERE COMBINED WITH THIS FILE: None

2. STRUCTURE(S), SYSTEM(S) OR COMPONENT(S) INVOLVED: Safety-related systems, structures, and components inside containment

3. SUMMARY OF CONCERN:
Design analysis of jet impingement effects on safety-related structures, systems, and components inside containment were not documented.

4. SUMMARY OF RESOLUTION:
The DCP will perform a complete reanalysis of the effects of HELB jet impingement on safety-related systems, structures, and components inside containment. The IDVP will review a sample of this analysis to verify compliance with licensing documents and determine if the concern of this file has been adequately addressed.

5. RESULTED IN ADDITIONAL VERIFICATION/SAMPLE OR VERIFICATION OF DCP EFFORTS PER ITR(S): 34

6. FOR FURTHER INFORMATION SEE:

APPENDIX D AND SUBSECTION(S): 4.2.3 and 4.8.5
INTERIM TECHNICAL REPORT(S): 42 and 48

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TABLE 5-1-8012

SIGNIFICANT FINDING: EOI FILE: 8012

PHYSICAL MODIFICATION(S)?: Yes   ERROR CLASS: A

TITLE: CRVP Electrical System Redundancy

1. THE FOLLOWING EOI FILE NUMBERS WERE COMBINED WITH THIS FILE: 8016 and 8046

2. STRUCTURE(S), SYSTEM(S) OR COMPONENT(S) INVOLVED: Class IE electrical equipment

3. SUMMARY OF CONCERN:
   With Unit 2 unlicensed, a single bus failure would result in loss of certain vital equipment in the CRVP system.

4. SUMMARY OF RESOLUTION:
   The electrical system will be modified so that each redundant equipment train has both a Unit 1 and a Unit 2 power supply. The IDVP will verify the modifications.

5. RESULTED IN ADDITIONAL VERIFICATION/SAMPLE OR VERIFICATION OF DCP EFFORTS PER ITR(S): 34

6. FOR FURTHER INFORMATION SEE:
   APPENDIX D AND SUBSECTION(S): 4.7.3, 4.8.2, and 7.2
   INTERIM TECHNICAL REPORT(S): 20 and 45

TABLE 5-1-8057

SIGNIFICANT FINDING: EOI FILE: 8057

PHYSICAL MODIFICATION(S)?: Yes ERROR CLASS: A

TITLE: Circuit Separation

1. THE FOLLOWING EOI FILE NUMBERS WERE COMBINED WITH THIS FILE: None

2. STRUCTURE(S), SYSTEM(S) OR COMPONENT(S) INVOLVED: Auxiliary Feedwater System (AFW) and Control Room Ventilation and Pressure System (CRVP).

3. SUMMARY OF CONCERN:
   Some instrument and control circuits in panels associated with the AFW and CRVP did not meet the circuit physical separation criteria established in Section 8.3.3 of the FSAR. A single failure of such a device could challenge the integrity of safety-related circuits.

4. SUMMARY OF RESOLUTION:
   The DCP resolution consisted of a field review, redesign of some circuits, and revised field separation procedure.

   The IDVP has verified that circuits have been separated in panels identified by the EOI.

5. RESULTED IN ADDITIONAL VERIFICATION/SAMPLE OR VERIFICATION OF DCP EFFORTS PER ITR(S): 34

6. FOR FURTHER INFORMATION SEE:
   APPENDIX D AND SUBSECTION(S): 4.7.2 and 4.8.6
   INTERIM TECHNICAL REPORT(S): 27 and 49

TABLE 5-2-1106

SIGNIFICANT FINDING: EOI FILE: 1106

PHYSICAL MODIFICATION(S)?: No   ERROR CLASS: A/B

TITLE: Nozzle and Valve Loadings

1. THE FOLLOWING EOI FILE NUMBERS WERE COMBINED WITH THIS FILE: 1109

2. STRUCTURE(S), SYSTEM(S) OR COMPONENT(S) INVOLVED: Piping, equipment, and valves

3. SUMMARY OF CONCERN:

   Equipment and valve loads from the IDVP independent piping analyses exceeded the design analysis values in several cases. It is understood that the design analysis nozzle loads were vendor approved. The true maximum acceptable nozzle loads are unspecified, but may well be higher than IDVP values.

4. SUMMARY OF RESOLUTION:
   To be resolved by verification of DCP Corrective Action.

5. RESULTED FROM ADDITIONAL VERIFICATION/SAMPLE OR VERIFICATION OF DCP EFFORTS PER ITR(S): 1

6. FOR FURTHER INFORMATION SEE:

   APPENDIX D AND SUBSECTION(S): 4.5.2
   INTERIM TECHNICAL REPORT(S): 12, 17, and 59

TABLE 5-2-1124

SIGNIFICANT FINDING: EOI FILE: 1124

PHYSICAL MODIFICATION(S)?: NO ERROR CLASS: B

TITLE: Auxiliary Building Spectra Generation

1. THE FOLLOWING EOI FILE NUMBERS WERE COMBINED WITH THIS FILE: None

2. STRUCTURE(S), SYSTEM(S) OR COMPONENT(S) INVOLVED:

   Control Room Floor Slab

3. SUMMARY OF CONCERN:

   The design analysis finite element model of the control room slab used to generate Hosgri response spectra does not agree with the field verified location of the supporting walls.

   The DCP has revised the finite element model to agree with the field verified dimensions. At certain frequencies the response spectra have increased by more than 15 percent.

4. SUMMARY OF RESOLUTION:

   To be resolved through verification of DCP Corrective Action.

5. RESULTED IN ADDITIONAL VERIFICATION/SAMPLE OR VERIFICATION OF DCP EFFORTS PER ITR(S): 8

6. FOR FURTHER INFORMATION SEE:

   APPENDIX D AND SUBSECTION(S): 4.4.2
   INTERIM TECHNICAL REPORT(S): 55

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TABLE 5-3-932

MODIFICATION IN RESPONSE TO SPECIFIC ERROR: EOI FILE: 932

ERROR CLASS: A

1. STRUCTURE(S), SYSTEM(S), OR COMPONENT(S) INVOLVED:

Containment Spray System, PGandE Model 8-33

2. DESCRIPTION OF PHYSICAL MODIFICATION:

Support 58S-23R has been modified to restrain the pipe in the vertical and E-W directions.

3. PHYSICAL MODIFICATION VERIFIED BY IDVP: Yes

4. FURTHER DESCRIPTION IS AVAILABLE IN TABLE 5-1-932 AND IN PGandE PHASE I FINAL REPORT:

SECTION(S): 1.7.2; Appendix 1C
TABLE(S): 2.2.1-4

TABLE 5-3-938

MODIFICATION IN RESPONSE TO SPECIFIC ERROR: EOI FILE: 938
ERROR CLASS: A

1. STRUCTURE(S), SYSTEM(S), OR COMPONENT(S) INVOLVED:

   Piping - Valve 8805B

2. DESCRIPTION OF PHYSICAL MODIFICATION:

   Initially, PGandE was going to reorient the above valve from horizontal to vertical axis, but Westinghouse reevaluated and determined reorientation was not required. DCP reanalysis of piping indicated that seismic supports were required on valve operator.

3. PHYSICAL MODIFICATION VERIFIED BY IDVP: No

4. FURTHER DESCRIPTION IS AVAILABLE IN TABLE 5-1-938 AND IN PGandE PHASE II FINAL REPORT:

   SECTION(S): Appendix 1C
   TABLE(S): 2.2.1-3

TABLE 5-3-949

MODIFICATION IN RESPONSE TO SPECIFIC ERROR: EOI FILE: 949
ERROR CLASS: AB

1. STRUCTURE(S), SYSTEM(S), OR COMPONENT(S) INVOLVED:

Main Annunciator Cabinet

2. DESCRIPTION OF PHYSICAL MODIFICATION:

Cabinet was modified and braced in the longitudinal (North-South) direction to increase natural frequency and reduce forces.

- o Two vertical beams have been installed
- o Adjacent columns have been connected
- o Doorway struts have been replaced with stronger ones
- o The braced frame at the top of the cabinet has been reinforced
- o The frame to wall connection has been improved
- o The channel splice at the top of the cabinet has been improved

3. PHYSICAL MODIFICATION VERIFIED BY IDVP: Yes

4. FURTHER DESCRIPTION IS AVAILABLE IN TABLE 5-1-949 AND IN PGandE PHASE I FINAL REPORT:

SECTION(S): 1.7.2; Appendix 1C; Appendix 1E; 2.3.2.4
TABLE(S): E.1; 2.3.2-1

TABLE 5-3-963

MODIFICATION IN RESPONSE TO SPECIFIC ERROR: EOI FILE: 963
ERROR CLASS: B

1. STRUCTURE(S), SYSTEM(S), OR COMPONENT(S) INVOLVED:
Containment Spray System, Analysis 8-34

2. DESCRIPTION OF PHYSICAL MODIFICATION:
Support 58S-32R has been shimmed to restrain the pipe in the vertical and E-W directions

3. PHYSICAL MODIFICATION VERIFIED BY IDVP: Yes

4. FURTHER DESCRIPTION IS AVAILABLE IN TABLE 5-1-963 AND IN PGandE PHASE I FINAL REPORT:

SECTION(S): 1.7.2; Appendix 1C
TABLE(S): 2.2.1-3

TABLE 5-3-1069

MODIFICATION IN RESPONSE TO SPECIFIC ERROR: EOI FILE: 1069
ERROR CLASS: A

1. STRUCTURE(S), SYSTEM(S), OR COMPONENT(S) INVOLVED:

Auxiliary Feedwater System, Analysis 2-14

2. DESCRIPTION OF PHYSICAL MODIFICATION:

Addition of supports on valves LCV 113 and LCV 115
Modification not complete at this time

3. PHYSICAL MODIFICATION VERIFIED BY IDVP: No

4. FURTHER DESCRIPTION IS AVAILABLE IN TABLE 5-1-1069 AND IN PGandE PHASE I FINAL REPORT:

SECTION(S): 1.7.2; Appendix 1C
TABLE(S): 2.2.1-4

TABLE 5-3-1107

MODIFICATION IN RESPONSE TO SPECIFIC ERROR: EOI FILE: 1107
ERROR CLASS: A

1. STRUCTURE(S), SYSTEM(S), OR COMPONENT(S) INVOLVED:

Reactor Coolant System RTD Line 4259

2. DESCRIPTION OF PHYSICAL MODIFICATION:

Replaced one deadweight support with a snubber and installed a code break anchor

3. PHYSICAL MODIFICATION VERIFIED BY IDVP: Yes

4. FURTHER DESCRIPTION IS AVAILABLE IN TABLE 5-2-1107 AND IN PGandE PHASE I FINAL REPORT:

SECTION(S): 1.7.2; Appendix 1C

TABLE(S): NA

TABLE 5-3-8009

MODIFICATION IN RESPONSE TO SPECIFIC ERROR:

EOI FILE: 8009
ERROR CLASS: A

1. STRUCTURE(S), SYSTEM(S), OR COMPONENT(S) INVOLVED:

AFW system discharge piping upstream of last manual isolation valve before the Feedwater system

2. DESCRIPTION OF PHYSICAL MODIFICATION:

1. Lower the overspeed setpoint of AFW Pump 1-1 drive turbine. Since steam in the system is needed to make such an adjustment, this is scheduled to be completed during startup testing, and it will not be verified by the IDVP.

2. A group of 42 valves as listed in DC1-E-P-7877 has been replaced.

3. PHYSICAL MODIFICATION VERIFIED BY IDVP: Yes

4. FURTHER DESCRIPTION IS AVAILABLE IN TABLE 5-1-8009 AND IN PGandE PHASE II FINAL REPORT:

SECTION(S): 3.3.4
TABLE(S): 5-1

TABLE 5-3-8010

MODIFICATION IN RESPONSE TO SPECIFIC ERROR: EOI FILE: 8010
ERROR CLASS: A

1. STRUCTURE(S), SYSTEM(S), OR COMPONENT(S) INVOLVED:

AFW turbine bearing coolers and supply piping

2. DESCRIPTION OF PHYSICAL MODIFICATION:

Modifications were performed as described in DC1-EM-5009 Rev. 0. The modifications consisted of:

a. Reroute line 2076 from line K16-564-1½ upstream of RO-61 and downstream of the check valve. Remove the existing item 22 valve and cap the existing connection.

   Add a restricting orifice in line 2076.

   Change the piping for line 2076 from K to K16

   Change the piping for lines 1907, 1908, and 2077 upstream of and including item 51 and 52 valves from K to K16.

   Change the piping for line 4575 downstream of and including item 9 valve from K to K16.

b. Remove the item #49 throttle valve from line 757.

c. Remove item #22 isolation valve from line 2078.

   Reroute line 2079 to connect with line 558 between item #31 isolation valve and item #71 check valve.

d. Spec item #31, manual isolation valve on line K558-8 is to be sealed open.

e. Change valves as required to meet ANSI 900# ratings.

3. PHYSICAL MODIFICATION VERIFIED BY IDVP: Yes

4. FURTHER DESCRIPTION IS AVAILABLE IN TABLE 5-1-8010 AND IN PGandE PHASE II FINAL REPORT:

SECTION(S): 3.3.4
TABLE(S): 5-1

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TABLE 5-3-8012

MODIFICATION IN RESPONSE TO SPECIFIC ERROR:

EOI FILE: 8012
ERROR CLASS: A

1. STRUCTURE(S), SYSTEM(S), OR COMPONENT(S) INVOLVED:

   CRVP Class IE electric power wiring

2. DESCRIPTION OF PHYSICAL MODIFICATION:

   The wiring system has been modified to provide for redundancy without Unit 2 operating. All panels (including ventilation and isolation) will be supplied from the existing pressurization transfer switch. In addition, all panels fed from the shared F buses will be supplied from a second or bus source.

3. PHYSICAL MODIFICATION VERIFIED BY IDVP: Yes

4. FURTHER DESCRIPTION IS AVAILABLE IN TABLE 5-1-8012 AND IN PGandE PHASE II FINAL REPORT:

   SECTION(S): 3.3.3

   TABLE(S):

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TABLE 5-3-8017

MODIFICATION IN RESPONSE TO SPECIFIC ERROR: EOI FILE: 8017
ERROR CLASS: A

1. STRUCTURE(S), SYSTEM(S), OR COMPONENT(S) INVOLVED:

CRVP System power transfer switch (item 178, IVB4)

2. DESCRIPTION OF PHYSICAL MODIFICATION:

The existing switch was replaced by two separated switches. This physically separates the redundant safety-related circuits connected to the switches.

3. PHYSICAL MODIFICATION VERIFIED BY IDVP: Yes

4. FURTHER DESCRIPTION IS AVAILABLE IN TABLE 5-1-8017 AND IN PGandE PHASE II FINAL REPORT:

SECTION(S): 3.3.7

TABLE(S):

TABLE 5-3-8057

MODIFICATION IN RESPONSE TO SPECIFIC ERROR: EOI FILE: 8057
ERROR CLASS: A

1. STRUCTURE(S), SYSTEM(S), OR COMPONENT(S) INVOLVED:

AFW and CRVP safety-related electrical control systems

2. DESCRIPTION OF PHYSICAL MODIFICATION:

A revision has been made to Note 16 of Dwg. 0-50029 which provides instructions or allowable separation methods. A field inspection was made of all "asterisked" devices in safety-related circuits to assure that all instances are acceptable or corrected. Corrections consisted of additional wrapping of exposed conductors (Note 16) or separation to achieve a minimum 5 inch air gap. Inadequate separation of interlocks in mutually redundant circuits were corrected by circuit modifications.

3. PHYSICAL MODIFICATION VERIFIED BY IDVP: Yes

4. FURTHER DESCRIPTION IS AVAILABLE IN TABLE 5-1-8057 AND IN PGandE PHASE II FINAL REPORT:

SECTION(S): 3.3.7
TABLE(S):

TABLE 5-3-8062

MODIFICATION IN RESPONSE TO SPECIFIC ERROR: EOI FILE: 8062
ERROR CLASS: A

1. STRUCTURE(S), SYSTEM(S), OR COMPONENT(S) INVOLVED:

AFW Control Valve FCV-95

2. DESCRIPTION OF PHYSICAL MODIFICATION:

Gear modifications have been made to the actuator internals for FCV-95. This modification is documented in DCN-DCO-E-M-549 Rev 1.

3. PHYSICAL MODIFICATION VERIFIED BY IDVP: Yes

4. FURTHER DESCRIPTION IS AVAILABLE IN TABLE 5-1-8062 AND IN PGandE PHASE II FINAL REPORT:

SECTION(S): 3.3.9

TABLES(S): 5-1

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TABLE 5-4-983

MODIFICATION IN RESPONSE TO GENERIC CONCERN: EOI FILE: 983
ERROR CLASS: A

1. STRUCTURE(S), SYSTEM(S), OR COMPONENT(S) INVOLVED:

Electrical Raceways

2. GENERAL TYPE(S) OF MODIFICATION(S):

Electrical raceway supports modified by adding simple angle brace or additional welding around angle fitting.

3. EXAMPLE(S):

Electrical raceways: S-48, S-415, S-432 and S-521 will be modified for correct spectra loads

4. PHYSICAL MODIFICATION(S) VERIFIED BY IDVP? No
IN ACCORDANCE WITH: ITR-8

5. FURTHER DESCRIPTION IS AVAILABLE IN TABLE 5-1-983 AND IN PGandE PHASE I FINAL REPORT:

SECTION(S): 1.7.2; Appendix 1C; Appendix 1E; 2.4.5.2
TABLE(S): E1

TABLE 5-4-1003

MODIFICATION IN RESPONSE TO GENERIC CONCERN: EOI FILE: 1003
ERROR CLASS: AB

1. STRUCTURE(S), SYSTEM(S), OR COMPONENT(S) INVOLVED:
   HVAC duct supports

2. GENERAL TYPE(S) OF MODIFICATION(S):
   (a) Replacement of expansion anchors with through bolts
   (b) Replacement of straps with rolled angles
   (c) Install additional supports

3. EXAMPLE(S)
   Described above

4. PHYSICAL MODIFICATION(S) VERIFIED BY IDVP? No
   IN ACCORDANCE WITH: ITR-8

5. FURTHER DESCRIPTION IS AVAILABLE IN TABLE 5-1-1003 AND IN PGandE PHASE I FINAL REPORT:

   SECTION(S): Appendix 1E; 2.5.4.2
   TABLE(S): E1

TABLE 5-4-1014

MODIFICATION IN RESPONSE TO GENERIC CONCERN: EOI FILE: 1014
ERROR CLASS: A/B

1. STRUCTURE(S), SYSTEM(S), OR COMPONENT(S) INVOLVED:

   Containment Structure

2. GENERAL TYPE(S) OF MODIFICATION(S):

   Strengthened the annulus structure and parts of polar crane.

3. EXAMPLE(S):

   Added columns, beams, and bracing and stiffened other beams in the annulus. Guide struts added to polar crane to replace rail damps which were removed. Gantry legs were reinforced.

4. PHYSICAL MODIFICATION(S) VERIFIED BY IDVP? No
   IN ACCORDANCE WITH: ITR-8

5. FURTHER DESCRIPTION IS AVAILABLE IN TABLE 5-1-1014 AND IN PGandE PHASE I FINAL REPORT:

   SECTION(S): Appendix 1E, 2.1.1.4.3, 2.1.1.5.1
   TABLE(S): E1

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TABLE 5-4-1022

MODIFICATION IN RESPONSE TO GENERIC CONCERN: EOI FILE: 1022
ERROR CLASS: A/B

1. STRUCTURE(S), SYSTEM(S), OR COMPONENT(S) INVOLVED:

   Intake Structure

2. GENERAL TYPE(S) OF MODIFICATION(S):

   Modifications made to improve resistance to wave forces.

3. EXAMPLE(S):

   Later

4. PHYSICAL MODIFICATION(S) VERIFIED BY IDVP? NO

   IN ACCORDANCE WITH: ITR-8

5. FURTHER DESCRIPTION IS AVAILABLE IN TABLE 5-1-1022 AND IN PGandE PHASE I FINAL REPORT:

   SECTION(S): 2.1.5.7

   TABLE(S):

TABLE 5-4-1026

MODIFICATION IN RESPONSE TO GENERIC CONCERN:

EOI FILE: 1026
ERROR CLASS: AB

1. STRUCTURE(S), SYSTEM(S), OR COMPONENT(S) INVOLVED:
Turbine Building

2. GENERAL TYPE(S) OF MODIFICATION(S):
Building is to be stiffened by addition of cross bracing and axial members in floors and exterior walls. This will be done to reduce floor spectra at switchgear room which was found to be high when building was reanalyzed as part of corrective action in response to this EOI.

3. EXAMPLE(S):
See above. Beam stiffened at El 119' along column line G.
Neoprane compression strip between turbine floor and turbine pedestal removed to eliminate interaction.

4. PHYSICAL MODIFICATION(S) VERIFIED BY IDVP? No
IN ACCORDANCE WITH: ITR-8

5. FURTHER DESCRIPTION IS AVAILABLE IN TABLE 5-1-1026 AND IN PGandE PHASE I FINAL REPORT:

SECTION(S): 2.1.4.4.1.2
TABLE(S):

TABLE 5-4-1092

MODIFICATION IN RESPONSE TO GENERIC CONCERN: EOI FILE: 1092
ERROR CLASS: A

1. STRUCTURE(S), SYSTEM(S), OR COMPONENT(S) INVOLVED:
Fuel Handling Building (FHB)

2. GENERAL TYPE(S) OF MODIFICATION(S):
Structural steel modifications including connection changes (sliding joints made pinned), elimination of expansion joint. Also, DCP has performed a complete reanalysis of FHB.

3. EXAMPLE(S):
In addition to above, diagonal braces were added to center portion of the bottom chord root truss, filler plates installed in double-angle diagonals of main trusses, and diagonal and horizontal braces added to east-west wall to increase stability.

4. PHYSICAL MODIFICATION(S) VERIFIED BY IDVP? No
IN ACCORDANCE WITH: ITR-8

5. FURTHER DESCRIPTION IS AVAILABLE IN TABLE 5-1-1092 AND IN PGandE PHASE I FINAL REPORT:

SECTION(S): Appendix 1E, 2.1.3.4.2.1
TABLE(S): E1

TABLE 5-4-1098

MODIFICATION IN RESPONSE TO GENERIC CONCERN: EOI FILE: 1098
ERROR CLASS: A/B

1. STRUCTURE(S), SYSTEM(S), OR COMPONENT(S) INVOLVED:

   Large Bore Piping

2. GENERAL TYPE(S) OF MODIFICATION(S):

   To be determined.

3. EXAMPLE(S):

   To be determined.

4. PHYSICAL MODIFICATION(S) VERIFIED BY IDVP? No
   IN ACCORDANCE WITH: ITR-8

5. FURTHER DESCRIPTION IS AVAILABLE IN TABLE 5-1-1098 AND IN PGandE PHASE I FINAL REPORT:

   SECTION(S): 1.9 Appendix 1C; 2.2

   TABLE(S): E1

TABLE 5-4-8009

MODIFICATION IN RESPONSE TO GENERIC CONCERN: EOI FILE: 8009
ERROR CLASS: A

1. STRUCTURE(S), SYSTEM(S), OR COMPONENT(S) INVOLVED:

   CCW pumps, AFW steam traps.

2. GENERAL TYPE(S) OF MODIFICATION(S):

   Pressure reduction, replacement of studs.

3. EXAMPLE(S):

   A restriction orifice was added to the cooling water supply to the lube oil coolers to reduce the pressure.

   The studs on the steam traps on the steam supply lines to the AFW turbine were replaced.

4. PHYSICAL MODIFICATION(S) VERIFIED BY IDVP? Not Applicable
   IN ACCORDANCE WITH: ITR-34

5. FURTHER DESCRIPTION IS AVAILABLE IN TABLE 5-1-8009 AND IN PGandE PHASE II FINAL REPORT:

   SECTION(S): 3.3.4

   TABLE(S): N/A

TABLE 5-4-8057

MODIFICATION IN RESPONSE TO GENERIC CONCERN: EOI FILE: 8057
ERROR CLASS: A

1. STRUCTURE(S), SYSTEM(S), OR COMPONENT(S) INVOLVED:

   All safety-related circuits for plant systems.

2. GENERAL TYPE(S) OF MODIFICATION(S):

   Added fireproofing tape or otherwise provided separation.

3. EXAMPLE(S):

   Low voltage fuses were added to provide isolation of non-vital circuit functions. Common terminal blocks were replaced by separate terminal blocks. Circuits were separated by silicone fire barriers.

4. PHYSICAL MODIFICATION(S) VERIFIED BY IDVP? Yes
   IN ACCORDANCE WITH: ITR-34

5. FURTHER DESCRIPTION IS AVAILABLE IN TABLE 5-1-1098 AND IN PGandE PHASE I FINAL REPORT:

   SECTION(S): 3.3.7

   TABLE(S): N/A

5.5 POSSIBLE FINDINGS RESULTING FROM OBSERVATIONS

The IDVP realized that some combination of those files classified as Observations could represent a concern as significant as some of the Findings. Therefore, the IDVP evaluated all Observations as described here.

The number of EOI Files identified as Findings represented less than 10 percent of the total number of EOI Files established. Most EOI Files were determined to be neither a Finding nor an Observation.

This subsection analyzes the entire population of EOI Files originating from the initial sample and additional verification/sample efforts of RLCA* (5.5.1), SWEC (5.5.2), and TES (5.5.3). Of the Phase II Files originated by RFR, one file (EOI 7002) was a Finding, two files (EOIs 7004 and 7005) were combined with a Finding, and none of the other files were Observations. The Phase I efforts of RFR are reflected in the TES analysis, since the various QA Findings were eventually tracked by TES-issued, 3000-series Files.

The conclusions of these analyses are given in 5.5.4.

More details with respect to each of the EOI Files is available in Appendix D.3.

*The RLCA originated EOI Files considered here are those numbered below 1121, with the exceptions that EOI 1028 is not included.

5.5.1 RLCA Activities

5.5.1.1 Status as of Initiation of RLCA Work

This subject is addressed by 1.2.1. In brief, PGandE and their consultants had identified the following concerns prior to initiation of RLCA work:

- "Mirror-image" definition of containment annulus structure
- Use of outdated floor response spectra in the design of cable tray and conduit supports
- Annulus region weights used in development of spectra differed from as-built data
- Piping analysis discrepancies in the annulus area

5.1.1.2 RLCA Preliminary Report

In the approximately one month period prior to issuance of the RLCA Preliminary Report on November 18, 1981, and working with the assignment described in 1.2.1, RLCA identified many of the concerns which were confirmed and amplified by the work performed over the next seven months. It is the opinion of TES that the confusion over non-technical aspects of this RLCA Preliminary Report obscured the major contribution of that report in identifying uncertainties with respect to the original design. The RLCA effort established the foundation of the technical program conducted as the IDVP Phase I technical effort. In order to assure the tracking of each of the concerns identified by the RLCA Preliminary Report, the NRC Staff required RLCA to open an EOI File on each. This was done in early February 1982 and included 30 of the Phase I EOIs (976-1001 and 1004-1007) covering such topics as:

- Containment Building spectra
- Intake Structure qualification
- Buried pipeline qualification
- Raceway support analysis events
- Turbine Building interface procedure
- Control room spectra
- Auxiliary Building qualification
- Crane qualifications
- Outdoor water tank qualifications
- Piping qualification interfaces
- Valve qualification
- Electrical equipment qualification

Each of the EOI Files was evaluated by TES when they became IDVP Program Manager at the end of March 1982. If the then-defined IDVP program plans specifically required that the work be performed, that fact was noted and 19 of the EOI Files were closed. Otherwise, the file remained open. Of those that remained open, one (EOI 983) was identified as a Finding and nine were combined with EOI Files identified as a Finding, see 5.5.1.4. One (EOI 985) was determined to be invalid and was closed.

5.5.1.3 RLCA EOIs Identified as Findings*

The 15 EOI Files classified as Findings (932, 938, 949, 963, 983, 1003, 1014, 1022, 1026, 1069, 1092, 1097, 1098, 1106, and 1107) are identified in 5.2 and 5.3.

5.5.1.4 EOIs Combined with Findings

The last paragraph of 5.2 describes the reasons for EOI combination and the circumstances under which files were combined. Thirty-two of the applicable RLCA files were so combined (910, 920, 930, 961, 967,

977, 982, 984, 986, 988, 989, 990, 991, 992, 1009, 1010, 1021, 1025, 1027, 1029, 1058, 1059, 1060, 1070, 1077, 1079, 1091, 1093, 1104, 1105, 1109, and 1115). Each concern of these 32 files was subject to verification through the IDVP activities with respect to the Finding with which each is combined.

5.5.1.5 EOIs Resolved as Neither a Finding nor an Observation

At the opposite extreme from a Finding is a file which has not been resolved as either a Finding or an Observation. These will be considered prior to discussion of the EOIs classified as Observations, the only additional category. The RLCA Phase I initial sample and additional verification/sample EOI Files which were resolved as neither a Finding nor an Observation and which were not combined with a Finding as described in 5.5.1.4 were:

- Twenty-five EOIs based upon the RFR QA Audit and Review Reports discussed in 4.2. Of these, the 12 which were QA Findings (968, 969, 970, 1040, 1041, 1042, 1052, 1064, 1065, 1066, 1067, and 1068) were combined into files in the 3000 series and were resolved by ITR-2 in the manner discussed in 5.5.3.1. The 13 which were QA Observations (971, 972, 973, 974, 975, 1033, 1034, 1035, 1036, 1037, 1038, 1039, and 1056) were closed in accordance wth the IDVP Plan I Program Management Plan.

- Twenty-nine EOIs were found to be invalid based on additional verification performed for the purpose of resolving the specific file (935, 955, 962, 993, 1012, 1015, 1016, 1019, 1023, 1024, 1031, 1032, 1044, 1047, 1048, 1049, 1051, 1054, 1057, 1061, 1078, 1082, 1083, 1087, 1095, 1103, 1108, 1111, 1113, and 1116).

5.5.1.6 EOI Files Resolved as Observations

Of the 192 EOI Files opened by RLCA during the Phase I initial sample and additional verification/sample efforts, 71 were resolved as Observations. Of these:

- Thirty-six were Class C Errors (incorrect engineering or installation of safety-related equipment was found, but no design criteria or operating limits were exceeded).

- Thirty-five were resolved as Deviations (a departure from standard procedure which is not a mistake in analysis, design or construction).

The important question to be asked is: does this number of minor items indicate the existence of a concern which has not been addressed through the identified Findings?

By far the largest number of these files, 37, involved the PGandE response to IE Bulletin 79-14. To understand these results, it is necessary to understand that the IDVP starting point for piping system verification was the isometric drawings prepared in response to that Bulletin. A total of 22 of these EOI Files originated because the "ISOS" were in conflict with both the RLCA field verification and the design analysis as of November 30, 1981 (EOIs 931, 934, 936, 941, 942, 943, 944, 945, 948, 951, 952, 958, 960, 965, 966, 1043, 1045, 1046, 1075, 1076, 1089, and 1090). Each was resolved as a Deviation, because the RLCA field verification confirmed that the design analysis did reflect the as-built condition within the stated tolerances. Stated differently, these 22 EOIs may not have existed if the IDVP starting point had been the original IE Bulletin 79-14 marked-up drawing instead of the ISOS which contained drafting errors. Another

group of these files were categorized as an Error C because one or more differences existed between the as-constructed and as-designed configurations. Although these differences were not sufficient to cause the design criteria to be exceeded, they were differences which should have been identified and resolved through the IE Bulletin 79-14 effort. There are 15 such files classified as Error C (933, 937, 939, 940, 946, 947, 953, 954, 956, 957, 959, 964, 1050, 1062, 1063). For completeness it should also be noted that two files included in previous subparagraphs may not have been established if the IE Bulletin 79-14 had been properly performed (938, 963). This concern with respect to the IE Bulletin 79-14 work was also identified by the DCP in their Open Item 13. This work has been redone as part of the CAP and verified by the IDVP in accordance with ITR-8.

The previous paragraph identified 15 files classified as Error C because of differences between the design analysis and the IDVP independent calculations. In addition, such differences were identified in 7 other EOI Files classified as Error C which concerned piping (1071, 1074, 1080, 1081, 1084, 1085, 1086). In each of these 22 cases where the low threshold (15 percent) verification criteria were exceeded, but where the stresses remained below allowable values based upon the IDVP calculations, the IDVP performed additional analyses for the purpose of determining the source(s) of the difference(s) in results so that any generic errors could be identified. Many different small sources were identified, with no commonality with the exception that seismic input deficiencies were often present.

Differences between design calculations and IDVP independent calculations were found for components other than piping, 2 files being classified as Error C (1073, 1088). One of these involved the calculation of a pump mode shape and the other the analysis of a heat exchanger, so both were unique.

Seismic input deficiencies were the next most common basis for establishing an EOI File, there being seven such files in the category discussed. One was a Class C Error (1002) and six were Deviations (1008, 1011, 1020, 1053, 1055, 1072). The latter all involved the control of seismic spectra, a subject being verified in accordance with ITR-8. The single error involved a supply fan where the gravity component of the load was neglected.

The remaining ten Class C errors included two cases involving qualification of equipment by shake table testing (1013, 1118), failure to modify a valve in accordance with stated intent (950), miscalculation of a site glass weight (1017), an error in calculation versus installed bolt diameter which led to additional verification (1096), the calculation of the location of a center of gravity (1102), a difference between installation and design of an HVAC duct wall penetration (1110), the neglect of virtual mass in a pump frequency calculation which resulted in additional verification (1114), a conservative PGandE frequency calculation for an instrumentation power ac panel board (1117) and a case where the design analyses had not been updated to reflect field strengthening of a condenser mounting (1120).

All were considered to be specific with the exception of the bolt diameter issue. The additional verification performed with respect to bolt diameters was performed as verification of DCP activities and resulted in additional EOIs.

The remaining eight Deviations included two cases where a drawing change was required (1018, 1099), a case where the design calculations were considered to be incomplete (1030), four cases involving documentation of soil test hole records (1094, 1100, 1101, 1112), and an aspect of shake table testing (1118). All were considered to be specific and not to indicate a generic concern or Finding.

5.5.2 SWEC Activities

5.5.2.1 SWEC EOIs Identified as Findings

The seven EOI Files classified as Findings (8001, 8009, 8010, 8012, 8017, 8057, and 8062) are identified in 5.2.

5.5.2.2 EOIs Combined with Findings

The last paragraph of 5.2 discusses the reason for EOI combination and the circumstances under which files were combined. Six of the SWEC files were combined with Findings (8003, 8006, 8016, 8033, 8034, and 8046). All but EOIs 8016 and 8046 were combined with EOI 8001, as were RFR EOI Files 7004 and 7005. EOIs 8016 and 8046 were combined with EOI 8012. Each concern of these six files was subject to verification through the IDVP activities with respect to the Finding with which each is combined.

5.5.2.3 EOIs Resolved as Neither a Finding nor an Observation

At the opposite extreme from a Finding is a file which has not been resolved as either a Finding or an Observation. These will be considered prior to discussion of the EOIs classified as Observations, the only additional category. A total of 18 SWEC Phase II initial sample EOI Files were resolved as neither a Finding nor an Observation and were not combined with a Finding, as discussed in 5.5.2.2 (EOIs 8002, 8004, 8005, 8007, 8008, 8015, 8018, 8019, 8027, 8031, 8037, 8042, 8043, 8045, 8048, 8049, 8056, and 8058).

These were found to be invalid based upon verification performed for the purpose of resolving the specific file.

5.5.2.4 EOI Files Resolved as Observations

Of the 64 EOI Files opened by SWEC during Phase II initial sample verification efforts, 37 were resolved as Observations. Of these:

- 11 were Class C Errors (incorrect engineering or installation of safety-related equipment was found, but no design criteria or operating limits were exceeded).

- 26 were resolved as Deviations (a departure from standard procedure which is not a mistake in analysis, design, or construction).

Of the 11 Class C Errors, three (EOIs 8003, 8033, and 8034) were resolved as Class C Errors because of their insignificant effect on the specific initial example, but were combined with EOI 8001 because of their possible generic implications.

Seven of the files classified as Observations were resolved by planned revisions to the FSAR or other licensing documents when the DCP documented the PGandE Plant Staff Review Committee (PSRC) determination that there was no unreviewed safety question and the PSRC approval of the proposed change. Three of these EOI Files were resolved as Class C Errors (8014, 8055, and 8059) and four as Deviations (8028, 8029, 8030, and 8051).

Several of these files (EOIs 8023, 8024, 8025, 8026, 8060, and 8063) were resolved by physical changes which were not considered to be physical modifications, as discussed by the last paragraph on page 5.4-6 of this report. EOI 8060 was a Class C Error and the other five were Deviations.

Three remaining Class C Errors did require physical modifications to achieve resolution (8021, 8032, and 8035), but the consequences of the error were not of sufficient significance to regard them as Findings. Nevertheless, the possible generic implications were considered and each of the modifications was field verified by the IDVP.

Due to questions regarding water inventory, the remaining Class C Error (EOI 8040) considered possible flooding levels in Auxiliary Building Area GW. The DCP provided an evaluation which indicated that the volume neglected which was of concern to the IDVP was smaller than the volume included as a conservatism in the original PGandE evaluation. The IDVP concluded that this concern had been adequately addressed by the DCP.

Four of the Deviations were related to fire protection. EOIs 8038 and 8039 required evaluation of fire propagation through gratings in a ceiling which PGandE identified in the FSAR to be all concrete; EOI 8036 questioned the routing of hydrogen lines through pump rooms and loose and missing seal covers; and EOI 8020 involved CRVP cable separation considerations with respect to control room habitability. All were satisfactorily resolved as indicated by Appendix D, without identification as a Finding.

Three pairs of Observations were identified which have some common characteristics:

- EOI 8011 involved cable insulation qualification; EOI 8044 involved cable splice qualification.

- EOI 8013 involved the ability of the diesel generator to start and accelerate motor loads; EOI 8061 involved the time for electric motors to accelerate to full load speed at rated voltage.

- EOI 8053 involved a drafting error in instrument schematics; EOI 8054 involved an incorrect description on a drawing.

However, the commonality was not sufficient to indicate a generic concern.

The remaining six EOIs classified as Observations were considered to be unique and isolated instances (EOIs 8022, 8041, 8047, 8050, 8052, and 8064). The IDVP concluded that these Observations, either singularly or in combination, did not indicate a Finding.

5.5.3 TES Activities

5.5.3.1 Relative to RFR Phase I Audit and Review

EOI Files in the 3000 series were issued by TES to track resolution of RFR Phase I QA Findings. The file numbers and organizations were as follows:

EOI	ORGANIZATION
3000	Harding Lawson Associates
3001	Cygna (EES)
3002	ANCO
3003	Wyle Lab
3004	PGandE
3005	URS/Blume

These EOIs were resolved by ITR-2 in the manner summarized by 4.2.2 and 4.2.3 of this report. As stated there, in response to EOI 3000, additional verification was performed with respect to the soils work by HLA. This additional verification was defined by ITR-1 and is reported in 4.9.2 of this report.

5.5.3.2 Relative to the Containment Annulus Structure

The remaining three EOI Files issued by TES were concerned with the Containment Annulus Structure (3006, 3007, and 3008). All were combined with the Finding of EOI 1014, as reported in 5.2 of this report. The IDVP verification is reported in 4.4.5.

5.5.4 Conclusions

The status of EOIs discussed in 5.5 may be summarized as follows:

	EOI Originated by:				
	RLCA*	SWEC	RFR	TES	TOTAL
Finding:	15	7	1	0	23 (9%)
Combined with Finding:	32	6	2	3	43 (16%)
Observations:					
ER/C	36	8	0	0	44 (16%)
DEV	35	25	0	0	60 (22%)
None of Above:	74	18	3	6	101 (37%)
Total:	192	64	6	9	271 (100%)

*EOIs 1028 and ≥ 1121 not included.

One of the six TES files identified as "None of the Above" was the source of additional verification as if it had been a Finding; EOI 3000, the file resulting from the QA Audit and Review of the soils work performed by Harding Lawson Associates.

With respect to the 104 files classified as Observations, the preceding text indicates that the IDVP did consider their generic implications, singularly and in various combinations. As a result of this consideration, several important combinations were identified and the IDVP assured that additional consideration was given to each combination. These consisted of:

- Deviations in the performance of the work required by IE Bulletin 79-14

- Differences between the design analysis and the IDVP independent calculations

- Deficiencies in the definition of seismic inputs

- Differences between bolt diameters used in design or analysis and those actually installed

- Field changes, not considered physical modifications, undertaken to resolve various SWEC concerns

- Absence of previously committed MELB spray shields

The first three of these were considered by the DCP in response to other Findings. The fourth was identified for additional verification. The other two were determined by the IDVP not to be of sufficient importance to be a Finding.

6.2 EFFECTIVENESS OF THE IDVP

The Commission Order and Staff Letter require that PGandE provide "conclusions on the effectiveness of this design verification program in assuring the adequacy of the facility design." The key IDVP roles in this process have been to identify uncertainties in the design, as it existed prior to November 30, 1981, and to verify the corrective action of the DCP, so as to reasonably assure an adequate remedy for the deficiencies detected. This subsection is intended to address the effectiveness of the IDVP in performing these roles and to comment on several aspects affecting the effectiveness of the IDVP. The IDVP concludes that they have been effective in accomplishing their objectives. The effectiveness of the IDVP was significantly enhanced by the responsiveness of the DCP, and particularly by the extensive reanalysis of seismic design in its Phase I Corrective Action Program.

6.2.1 Technical Program Concept

The original concept of the IDVP, developed by PGandE and by RLCA prior to March 25, 1982, when TES became IDVP Program Manager, was effective for the contemplated scope of the original program. That concept employed a review of the design QA program and QA implementation of PGandE and the service-related contractors in parallel with a technical review of an initial sample which did not depend upon the effectiveness of the QA program of those organizations whose work was being verified. By March 24, 1982 the major IDVP concerns with respect to the development and control of the seismic spectra had been identified, PGandE had initiated the Blume Internal Review, and PGandE had announced their intention to retain BPC as Project Completion Manager. The IDVP Phase II technical effort was still in the startup stage at that time, but was conducted essentially in accordance with technical program concepts developed prior to March 25, 1982.

That original concept also provided for additional sampling/verification when the initial investigations indicated that such action was required and provided for verification of any corrective action.

This concept provided for either a positive or a negative result from the initial QA and technical verification activities. If the results were positive, the verification effort could be terminated. If negative results were obtained, the program provided for expansion on a preestablished basis.

As a result of this program concept, the IDVP effectively identified initial concerns, reported these for PGandE corrective action, and verified that corrective action.

6.2.2 Program Management

Transfer of TES from an IDVP audit role to an IDVP program management role resulted in a broadening of the IDVP program management aspects with but little change in the planned technical program. There was little change in the latter aspect because TES was in essential agreement with the previously developed concepts, and all IDVP participants reached early agreement as to the steps required to respond to the Staff's early 1982 recommendations for broadening the program. The TES developed program management plans for Phase I and Phase II had the effect of sharpening the IDVP program management aspects in recognition of the broadening program. They introduced the use of Interim Technical Reports, rather than delaying detailed reporting until program conclusion, and provided for Program Manager formal review and approval as the verification progressed.

6.2.3 IDVP Participation of Multiple Firms

The participation of four separate firms (TES, RLCA, RFR, SWEC) in the IDVP had major advantages and minor disadvantages. Independence was clearly enhanced by the multiple participation, as will be discussed further in 6.2.4. Internal program communications would have been enhanced if the program had been conducted by a single firm. The technical integrity of the IDVP may also have been enhanced by the use of multiple firms, with TES generally performing a technical review and approval role with respect to the other three firms. The latter effect might also have been achieved by separate organizations within a single firm, but without the same effect on independence. In any event, the IDVP obviously benefited from the availability of experts from four highly qualified organizations and the close working relationships between the four firms was a major contributor to the effectiveness of the IDVP.

6.2.4 Independence

The IDVP has concluded that the procedures under which it operated were effective in ensuring the independence of the DCNPP-1 design and construction QA reviews. From the outset of the program, the IDVP participants were sensitive to the matter of IDVP independence and undertook to ensure that the results of the program were not assailable on this ground. This sensitivity was heightened due to the misunderstandings that developed surrounding the original seismic review performed by RLCA.

Several factors operated to enhance and ensure independence. First, there were four separate organizations comprising the IDVP. The program was structured so that the technical work of one organization was always reviewed by at least one other organization (the Program Manager) and often IDVP responsibilities were undertaken on a joint basis. IDVP findings and conclusions were also the result of joint efforts by two or more organizations. Second, IDVP operating procedures required that all substantive meetings between the IDVP and the DCP were open to the NRC Staff and DOP. In addition, strict procedures governed the transfer of information from the DCP to the IDVP and vice versa. Third, the IDVP was required to publish the status of its work on an ongoing basis in Interim Technical Reports, Semimonthly Reports, and via the use of Error and Open Item Reports. Finally, all parties were equally free to provide input to the IDVP after reviewing the Reports and data made publicly available. The basic approach of the IDVP was that we had to receive and consider the comments of all interested parties at all times, but that the basic structure of the approved program plans, including those aspects designed to maintain independence, had to be maintained and fulfilled.

These were difficult operating procedures and they were unlike any of the other design verification programs with which the IDVP is

familiar. In particular, in all other programs, the verifying organization and the utility were permitted to work towards resolution of a Potential Finding without the involvement of outside organizations until the concern was established as a Finding. In this program, the Potential Findings were required to be publicly identified, through issuance of an Open Item Report, before verification was completed. The benefit was early identification of potential concerns to the Staff and the Designated Other Parties (DOP); the penalty was the improper magnification of the significance of Open Items by some NRC Staff and DCP employees, by the DOP and by the media. The IDVP also notes that the communications between the IDVP and the DOP were not effective in providing meaningful input into the verification process. The DOP provided essentially no comments to the IDVP during the course of this work, and made essentially no requests for information from the IDVP as permitted by the procedures.

6.2.5 Identification of Technical Concerns

Earlier in this report the IDVP has discussed in detail the procedures utilized to identify potential design-related concerns, and the basis for choosing and expanding the original sample of design work to be reviewed. (See 3.5). In particular, several aspects of the IDVP engineering program were effective in identifying technical concerns. First, the IDVP evaluated the QA programs and implementation of those programs by PGandE and by the appropriate service-related contractors identified in 4.1 of this report. Based upon the Audit and Review of the QA programs, the IDVP work was expanded in accordance with the program plans: (1) to assure that the design work of each organization was sampled, and (2) to provide a larger sample of any organization's work where, based on shortcomings in the QA program, the IDVP concluded that program expansion was necessary.

The initial sample and additional sample effort resulted in detailed verification of all aspects of the work, a so-called vertical slice. When the IDVP identified concerns with respect to specific aspects of these samples, the IDVP work was expanded in accordance with the program plans to review those concerns as they may have affected other safety-related structures, systems, and components, a so-called horizontal slice. The IDVP program, therefore, utilized a systematic approach for determining the extent of its review necessary to identify technical concerns. With respect to seismic design, the fact that the DCP undertook an essentially total review of the DCNPP seismic design, subject to verification by the IDVP, provides further assurance that technical concerns were identified. Similar, but naturally less extensive, DCP responses were made with respect to other generic concerns.

Based upon these program elements, the IDVP has concluded that the scope of the IDVP review was sufficient, and the procedures utilized

to identify concerns effective, to provide reasonable assurance that those aspects of design of the DCNPP-1 which did not meet the license application criteria prior to the IDVP, have now been identified. This conclusion should not be interpreted, however, to mean that the IDVP identified each and every error or questionable aspect of the design process-the IDVP was not intended to do this, so long as the aspects of design affecting whether the plant meets the requirements of the license application were identified.

6.2.6 Correction of Technical Concerns

The effectiveness of the IDVP to ensure that all identified technical concerns were corrected was enhanced by the system of tracking concerns in EOI files and reports, and by reviewing DCP responses addressing the resolution of individual EOIs. All potential concerns identified by the IDVP were, as discussed earlier, recorded at an early stage in Open Item Reports. This procedure enabled the IDVP to track each Error or Open Item until the concern was resolved by further analysis, new information from the DCP, or by corrective action taken by the DCP. The resulting publicly available record also afforded the NRC and DOP access to the necessary information to track the status of all IDVP-identified concerns from their inception through resolution.

In Section 5 of this report, the IDVP has identified and discussed those EOIs considered to have been the most significant and which have been designated as Findings. Modifications or reanalyses performed by the DCP in response to these EOIs were reverified by the IDVP in accordance with pre-established plans, to ensure that the originally identified concern was addressed appropriately and resolved. As discussed, no EOI File requiring corrective action was closed until the DCP corrective action was appropriately verified by the IDVP.

It is undoubtedly true that some of the additional design work and some of the modifications constituted upgrading. The intent of both the IDVP and DCP was to assure conformance with the criteria of the license application. However, there were occasions when the DCP and the IDVP could not achieve a common understanding of those criteria, and the DCP performed what they considered to be upgrading to resolve the IDVP concern.

Based upon the above-described program procedures, the IDVP has concluded that appropriate corrective actions have been accompished for all relevant aspects of design (other than the not-yet-completed but planned work discussed in Section 7), such that there is reasonable assurance that the DCNPP is now, or will be, designed in accordance with the requirements of the license application. Thus, the IDVP has been effective in ensuring appropriate correction of technical concerns.

6.3 BASIC CAUSES

6.3.1 Fundamental Factors

An assessment of the basic cause of design errors identified by this program was required by the Commission Order and Staff Letter, and was also requested by the NRC (Eisenhut) letter to the IDVP (Cooper) of October 6, 1982.

The term "basic cause" is generally understood to refer to the underlying problem or concern which led to or provided the basis for an identifiable error of commission or omission. For example, if the error is the use of incorrect design input in a calculation, the basic cause might be inappropriate design interface control or the absence of any definition of the input quantity. If properly identified and corrected, the source of like errors would be eliminated. It must be understood that identification of basic causes is a highly judgmental process and, almost by definition, cannot be done with precision. It should also be noted that problems can result from one or more basic causes, and that some basic causes may be more prevalent or important than others.

The IDVP sought to identify the basic cause or causes of DCNPP-1 design problems by consideration of the individual EOIs, whether or not they were designated as errors. After extensive consideration of this question among the IDVP participants, it was concluded that a discussion of basic cause only in the sense of underlying "problems" or "concerns" as defined above was not entirely appropriate in this case. The IDVP did identify two such basic causes and these are discussed in Sections 6.3.2 and 6.3.3. However, the IDVP has concluded that the question of basic cause can only be properly addressed in light of several underlying factors which do not fit neatly into the above definition of basic cause, primarily because they do not, in the

IDVP's view, carry any pejorative implications. Nonetheless, these factors in combination contributed significantly to, and in a sense caused, most of the design problems identified in this program. These factors are as follows:

- Safety-related systems for DCNPP-1 were seismically designed twice to meet two sets of design criteria, and with a substantial interval of time between the two designs.

- In addition to two complete seismic designs, the plant had substantial additional design work performed as a result of recent NRC IE bulletins and TMI requirements.

- This multiple design work has occupied 15 years of calendar time.

- Seismic design technology had advanced from a rudimentary effort in 1967 to a reasonably mature, systematic and sophisticated process today. In the natural course of this evolution, methodology and criteria have changed significantly.

- Nuclear plant design naturally requires the transfer of large amounts of design information from one design group to another. In the case of DCNPP-1, these design interfaces existed in especially large numbers both within PGandE and between PGandE and independent firms.

- Design document control practices in use at the time of the original design were not consistent with the eventual duration and complexity of the design process.

Of the above considerations, two are unique to DCNPP-1: multiple seismic designs and the long calendar time. All of these factors, however, contributed to the basic problems or concerns of greatest commonality which emerge from a review of the EOIs, namely, defective transfer of information across design interfaces (6.3.2) and inadequacies in the documentation and interpretation of design (6.3.3). Moreover, the effect of these factors may have been exacerbated by the fact that PGandE was designing its first plant.

The problems associated with these factors are easily visualized. It is extremely difficult to take major segments of design information that were developed several years previously, and took years to complete at that time, and accurately transfer this information to another company. To compound the problem, as a result of evolving technology the new designer might be working with new criteria, and certainly with new methodology. With the exception of random errors, nearly all the problems encountered involved some segment of this chain of events.

The original diagram error is a clear example. Most of the various EOIs addressing structural concerns involved the PGandE-URS Blume interface. Concerns involving inappropriate spectra in most cases involved either internal or external interfaces. Many of the EOIs in piping involved methodology, criteria, and external interfaces or design office-field office interfaces. Much of the weight problem discovered by PGandE involved the passage of time. Several issues involving differences in judgment, principally in the systems design area, may not have arisen a decade ago.

In summary, it is the opinion of the IDVP that the primary factors underlying the errors and open items found in this review were an amalgamation of the lengthy and complex design process involving multiple design interfaces, repeated redesign over a long time period, and an evolving technology.

6.3.2 Control of Design Interfaces

The basic cause which was common to the largest number of Open Items was the failure to adequately control design interfaces. The major example is, of course, the diagram error between the Unit 1 and Unit 2 containment annulus structures, the identification of which initiated this verification program. However, deficiencies in the control of design interfaces were broader than would be indicated by this example, as is illustrated by the number of EOIs found with respect to definition of seismic input data.

The procedure applied during the initial design phase, say prior to 1975, may have been adequate. However, the more sophisticated and time intensive seismic evaluation performed with respect to the postulated Hosgri event severely strained the design process. This statement is not intended to suggest that deficiencies existed only with respect to the Hosgri analysis, just that the iterative design process was of the type more susceptible to errors in the absence of careful control of interfaces.

A related interface deficiency affecting the design process existed between engineering and the site. However, this particular deficiency had been identified and was being brought under control before the IDVP started. Although the IDVP did identify several Findings related to this deficiency, they were not of the significance of the Findings arising from deficiencies in the control of design interfaces.

Because of the concern about control of design interfaces, once design chains were identified (see 4.1) the IDVP paid particular attention to review of the flow of information among PGandE and its contractors and within PGandE. With respect to design interfaces, this concern was addressed by both the QA and the design process verification efforts. As a result, the IDVP is confident that all interfaces potentially re-

sulting in Findings have either been identified and evaluated, or replaced by DCP corrective actions.

In its review of reanalyses, designs and corrective actions taken by DCP, the IDVP has found no indication of any present problem relating to control of design interfaces. There is confidence that no such problems should arise, since the design QA program for DCP, including interface controls, has been formulated to present standards, reviewed and approved by NRC, and its implementation verified by the IDVP.

6.3.3 Documentation and Interpretation of Design

A second basic cause of many of the EOIs discovered by the IDVP was inadequate documentation of some aspects of the original design and of subsequent revisions to that design which made it difficult to interpret and review PGandE's work. It was a consequence of this condition that:

- Designers performing subsequent design activities may have misunderstood the earlier requirement or intent; and
- Engineers performing design verification activities, including the IDVP, may have inappropriately identified errors.

The original design documentation involved with this basic cause included the license application criteria, drawings, analyses and correspondence. An important exception is the Hosgri evaluation criteria, which were developed relatively late in the design sequence (1977).

Various design criteria appear in different documents of various types which are subject to differing procedures with respect to maintaining a current record. An excellent example is the FSAR which, although it includes many essential design criteria, was not required to be maintained current. Other documents were originally prepared as reports to Staff. Sometimes the Staff required updating of the document; other times file revisions were acceptable. Although the IDVP has no reason to believe that the original designers were not able to address the criteria or did not fully appreciate distinctions between criteria and methodology, the documentation made it possible for subsequent designers to err more readily.

The inadequacy of the documentation of some of the criteria was not compatible with the pursuit of a detailed independent verification relative to those criteria up to 15 years later. Several of the IDVP concerns were resolved by clarifications to the FSAR and to other licensing application documents.

In order to assure itself that the present DCNPP-1 design was reviewed against the applicable license application criteria, the IDVP thoroughly reviewed the applicable licensing documents (see Appendix C and the references in the ITRs). The DCP also clarified these criteria in the PGandE Final Reports and the IDVP particularly distinguished between criteria and methodology in its efforts. The design review that was performed focused in particular on those aspects where ambiguities in interpreting documentation were likely to occur and many of the IDVP-DCP meeting discussions centered on these ambiguities. The IDVP is confident that sufficient design review was accomplished that any substantive misuse of criteria or other documentation would have been identified.

In the course of the review that has been accomplished by both IDVP and DCP, licensing criteria and methodology have been carefully defined and documented. It is therefore unlikely that similar problems could arise in the future.

Developments in technology and in the regulatory process over the past 15 years also contributed to differences in interpretation of the original design documentation. These technological and regulatory changes, in part, can be specifically attributed to the growth of the nuclear industry from a few individuals and organizations working on a limited number of projects to a large number of individuals and organizations working on a large number of projects. In view of this growth and to provide for a common basis to govern analysis and review, it was inevitable that required techniques and criteria would

become more rigid and that there would be less reliance on the exercise of technical judgments which might vary from individual to individual or even from organization to organization. The number of people in the IDVP and DCP organizations, and even in the NRC Staff, who were involved in nuclear design in the later 1960s is limited. Moreover, in those less sophisticated times the various organizations by which they were employed conducted their work in widely different ways. The only common denominator for all of these individuals is today's approach. It is not surprising, therefore, that there were differences in interpretation of design requirements between those working during the 1965-1976 time period and those reviewing that work in 1982-1983.

The possible existence of a technical bias in favor of today's engineering approach was of considerable concern to IDVP personnel, as it would result in an unintended and unwarranted conservatism in the IDVP conclusions. However, if after examining differences in the interpretation of design requirements, the IDVP personnel considered their judgment to be appropriate, the IDVP conclusions were made on that basis.

6.3.4 Random Causes

Several of the IDVP Findings are not the specific result of the previously identified causes, or were significantly influenced by causes in addition to those previously identified. These are termed random causes, because they are apparently isolated instances.

Two such Findings are related to EOIs 963 and 1069, each of which involved IDVP concerns with respect to supports. They are similar in that both Findings indicated that the Code allowable stresses were exceeded for the condition that existed before corrective action was taken. They are very different, however, in that EOI 963 involved an excessive gap in an existing support, and EOI 1069 involved the absence of a required support. Both are design errors, but they are quite different in concept and were not considered to indicate a basic cause.

There were three other Findings for which only a random cause contributed, without indication of another basic cause:

- EOI 949 involved an error in determining the flexibility of the main annunciator cabinet. (The IDVP is aware of a similar situation with respect to the flexibility of the main control panel, but the two evaluations were performed by different organizations.)

- EOI 7002 involved the absence of documented evaluation of jet impingement effects within containment. (As mentioned in 6.3.2.3, the state of documentation often contributed to differences in technical judgments, but this item is somewhat different in that no documentation was found.)

- EOI 8001 involved the misuse of a computer program.

EOIs 8001, 963, and 1069 may all have involved the misapplication of computer programs. However, there was no commonality between the computer programs involved in EOI 8001 and the other pair of EOIs, and the type of error in usage differed for the other pair. The calculational errors discussed in 5.5, all of which were Observations, represent a similar situation, in that there was no apparent commonality. The number of computer and calculational errors identified by the IDVP are very small when compared to the number of calculations verified. Therefore, the IDVP did not find a basic cause and attribute such errors to random causes.

Similar arguments can be made with respect to organizational and supervisory aspects. Errors certainly occurred as the result of such things as imperfect training and planning supervision, but they were not identifiable with one or more of these terms. Again, the IDVP considers the cause of any such errors to be random.

6.4 Significance of Design Error

6.4.1 Evaluation of Effect on Public Health and Safety

Identification as an IDVP Finding is indicative of a violation of the DCP license application criteria as the IDVP understands those criteria, without regard to whether or not a "substantial safety hazard" as defined in 10 CFR 21.3(k) existed. The IDVP also committed to report their identification of any "substantial safety hazard" which existed when the license application criteria were satisfied. However, no such "substantial safety hazard" was identified in the course of the IDVP efforts.

The IDVP did identify a number of conditions which resulted in violation of our understanding of the criteria of the license application, as summarized in Section 5 of this report. However, the IDVP did not continue their evaluation to determine if a "substantial safety hazard" existed as a consequence of those violations. To have performed such additional evaluations would have required a substantial expansion in the scope of the IDVP.

On the other hand, and appropriately in the opinion of the IDVP, evaluations of the effect of the IDVP and DCP Findings on public health and safety were performed by the DCP and are included in the PGandE Final Reports.

6.4.2 Influence of the IDVP Reporting System

The EOI and ITR reporting systems adopted by the IDVP unintentionally exhibited a negative bias with respect to the significance of the IDVP Findings, because they accented the negative conclusions and minimized the positive conclusions of the IDVP.

For example, it was common for an ITR to address the acceptability of the work being verified by a few summarizing sentences which were quite general in their content. In contrast, concerns were addressed in a specific and detailed manner which often required several pages. Thus, the bulk of an ITR emphasized the negative conclusions even when the vast majority of the work being verified was considered to be acceptable or even superior in some cases.

The EOI system had no ability to report positive conclusions. Because Potential Findings were required to be publicly identified at an early date, prior to completion of the verification efforts, a large number (over 300) were reported. This total number has often been identified as "errors" by the media and by the DOP's in their submittals to the ASLAB, and occasionally by the Staff in their various presentations. As is indicated by Section 5 of this report, less than 10 percent of these EOIs were ultimately identified by the IDVP as Findings. There are, of course, arguments that can be made that this reported percentage is either too low or too high, but it is clear that the errors found by the IDVP total much less than "several hundred."

6.4.3 Significance as Indicated by EOI File Classification

The EOI File classification system described in 3.6.2 included a classification method. As described in Section 5, the most significant errors, which were termed Findings, were identified by classification as Class A, Class A or Class B, or Class B Errors with no intent to distinguish significance among such classes. All IDVP Findings are summarized in Tables 5-1 and 5-2. As is indicated by the table included in 5.5.4, 9 percent of the initial sample and additional verification/sample EOI Files were classified as Findings. Another 16 percent of these Files were combined with Findings as discussed in Section 5.

The second most significant grouping was that termed Observations, which included all EOI Files classified as Class C Errors or as Deviations. This category would have also included Class D Errors had any been identified. EOI Files classified as Observations are summarized by 5.5, and included 38 percent of the initial sample and additional verification/sample files.

The remaining EOI Files resulting from the initial sample and additional verification/sample efforts were classed as being neither Findings or Errors. These were 37 percent of the total.

Several of the EOI Files resulted in the performance of modifications. The performance of modifications is a measure of significance, in that the absence of modifications would indicate a negligible impact of the IDVP on the actual DCNPP-1 configuration and imply that any errors identified by the IDVP were only "paper" concerns. The matter of modifications is treated briefly in 6.5, which references back to 5.4 and, specifically, to Tables 5-3 and 5-4.

6.5 IMPACT ON FACILITY DESIGN

The impact of a Finding on facility design is best measured by the modifications which result from these Findings.

Tables 5-3 and 5-4 describe, respectively, the modifications performed in response to specific and generic Findings identified by the IDVP. More details are available from the references to the PGandE Final Reports given by these tables.

SECTION 7.0

LIMITATIONS

7.1 INTRODUCTION

The date of issuance of this report, June 30, 1983, is as requested by the DCP. The DCP established this date by their letter to Staff of March 2, 1983. On March 1, 1983 the IDVP Program Manager was informed of the selection of the June 30, 1983 date and agreed, based upon his knowledge of the DCP and IDVP status, that that date was reasonable for schedule purposes. Despite subsequent slippages in the DCP and IDVP schedules, the DCP has continued the request that IDVP issue a final report on June 30, 1983. The IDVP has responded to the DCP request, and has prepared this report on that basis.

Section 5 and Section 6, respectively, of this report provide the IDVP Findings and Evaluations based upon the work completed. Section 7 includes identification of those planned IDVP activities which have not been completed, and evaluates the need for completion based upon the IDVP's opinion as to remaining uncertainties with respect to the conformance of DCNPP-1 with the criteria of the license application.

The next subsection, 7.2, was not affected by the state of completion and reports a concern identified by EOI 8016 which was resolved on the basis that Unit 1 could not be affected because Unit 2 was not in operation. However, corrective action will have to be completed before Unit 2 operation in order to insure safe shutdown capability.

Subsection 7.3 reports the DCP status, as reported by the DCP, as of June 22, 1983.

Subsection 7.4 reports on the June 25, 1983 status of IDVP verification of DCP design efforts.

With recognition of the limitations defined in this Section 7, this report completes the activities of the IDVP. However, in the process of completing the verification in accordance with the original program plans, certain additional information will be developed and added to the report or supplementary material prepared, as appropriate.

7.4 IDVP STATUS AS OF JUNE 25, 1983

This report is based upon the IDVP status as of June 25, 1983. The overall status may be summarized by the statement that the IDVP has completed all Phase I and Phase II efforts in accordance with the NRC-approved plans with the following exceptions:

- RLCA soils efforts defined by ITR-1 and subsequently expanded by Staff comment

- Certain RLCA efforts defined by ITRs-8 and -35

- SWEC efforts with respect to jet impingement effects of postulated pipe rupture inside containment as defined in ITR-34

The RLCA efforts are to be completed by supplementing various subsections of this report and by the issuance of various ITRs. The SWEC effort is to be completed by supplementing 4.8.5 of this report, and by issuance of ITR-48.

Table 7.4-1 summarizes the status of the IDVP effort as of June 25, 1983. The first column identifies all portions of this IDVP Final Report which must be supplemented at a later date to report completion of the IDVP effort defined by ITRs-8, -34, and -35. The second column provides a cross-reference to the PGandE Final Report sections which report on the same subject, and is also useful in examining the DCP status which is indexed in Table 7.3-1 through 7.3-6 by these numbers.

The third column of Table 7.4-1 identifies those EOI Files which pertain to each of the incomplete subsections and which were unresolved as of June 27, 1983.

The fourth column of Table 7.4-1 identifies the ITR which will be issued to report the details of the IDVP work summarized in the listed IDVP Final Report subsection, as well as the future efforts required to complete the IDVP. These include ITRs-48, -51, and -54 through -68. All other ITRs have been issued, except that ITRs-52 and -53 have been replaced by ITR-68.

The last three columns of Table 7.4-1 summarize the status of IDVP verification. In all cases, the IDVP verification program is that contained in either ITR-8, -34, or -35. The column headings are:

- "Field" - indicates the status of field verification, not inlcuding field verification of modifications.

- "Design" - indicates the status of verification of DCP design efforts.

- "Mod" - indicates the status of IDVP field verification of physical modifications.

One of four terms (Yes, Part, No or NA) is entered in Table 7.4-1 to summarize the IDVP status.

- In the first of these last three columns: "Yes" means that the IDVP has completed this field verification; "No" means that IDVP field verification is planned, but not yet completed; and, "NA" means that field verification is not applicable.

- In the second of these last three columns: "Yes" means that the IDVP has completed their design verification effort except, where applicable, the field verification of modifications; "Part" means that the IDVP has completed a

significant portion of their verification effort and is satisfied with the results to date, but that an additional sample is required by ITRs-8 or -35; and "No" means that the IDVP has either not completed a significant portion of their verification effort or that issues are unresolved.

- In the third of these last three columns: "Yes" means that physical modifications were performed and have been verified by the IDVP; "No" means that physical modifications are to be performed, or that physical modifications are expected to be performed, but have not yet been verified by the IDVP; and, "NA" means that no physical modifications requiring IDVP verification have been performed, or are expected to be performed.

In every case where the verification program intended to be conducted by the IDVP is not yet completed the text of this report identifies those aspects of the DCP work considered to be acceptable and those aspects of the DCP work where unresolved concerns exist. In addition, the IDVP states their intent to formulate a final conclusion on the qualification of the specific structure, system or component and its conformance to licensing criteria when the IDVP verification has been completed. Each subsection where the IDVP intended program is incomplete is easily identified by the phrase:

"(To Be Supplemented)"

which appears as the last line of text. The IDVP verification will be complete when the work defined by ITRs-8 and -35 is complete, in the judgment of the IDVP. Design verification of the corrective action program is being performed by in-depth review of methodology, mathematical approaches, inputs, and criteria. This work serves to verify the engineering design. In addition a sample of the completed work

will be examined for accuracy of design inputs (such as spectra), design interface criteria, (such as nozzle loads), and acceptance criteria. This sample, which will be referred to as a completion sample and which satisfies the program definition given in ITR-8, will be taken at such a time that the IDVP believes the various categories of work are sufficiently complete.

TABLE 7.4-1

STATUS OF INCOMPLETE VERIFICATIONS DEFINED BY ITRS-8, -34, AND -35

Report Subsections		Unresolved	ITR	Verification Complete?		
IDVP	PGandE	EOIs	No.	Field	Design	Mod.
4.4.2.2	2.1.2	1028 1097 1124	55	Yes	No	NA
4.4.3	2.1.3	1092	57	NA	Part	No
4.4.4	2.1.1	1014	54	NA	No	No
4.4.5	2.1.1.4.3	1014	51	Yes	No	No
4.4.6	2.1.5	1022	58	Yes	Yes	NA
4.4.8	2.1.4	1026	56	Yes	No	No
4.5.2.3a	2.2.1	938 1069 1098 1133 1135 1137	59	Yes	Part	No
4.5.2.3b	2.2.3	1098 1122	60	Yes	Part	No
4.5.3.2a	2.2.2	1098	61	Yes	Part	NA
4.5.3.2b	2.2.2	1098	62	Yes	No	No
4.6.2.2	2.3.1	950 1136	67	NA	Part	NA
4.6.3	2.3.1		67	NA	Part	NA
4.6.4	2.3.1		67	Yes	No	NA
4.6.5	2.3.1	1130	67	Yes	Yes	NA
4.6.6.3	2.3.3		67	Yes	Part	NA
4.6.6.5	2.5	1003 1134	63	No	Part	No

TABLE 7.4-1 (Cont)

Report Subsections		Unresolved	ITR	Verification Complete?		
IDVP	PGandE	EOIs	No.	Field	Design	Mod.
4.6.7	2.3.2	1128	67	Yes	Part	No
4.6.8.1b	2.4	983	64	Yes	No	No
4.6.8.2b	2.6	1123	66	Yes	Part	NA
4.6.9	NA	NA	67	Yes	Yes	NA
4.8.5	3.3.6 (Phase II)	7002 8065	48	Yes	No	NA
4.9.1.4	2.3.2.3.3	NA	NA	NA	Yes	NA
4.9.2	NA	NA	68	Yes	No	NA
4.9.3	NA	NA	65	No	No	No

SECTION 8.0

8.1 IDVP DOCUMENTATION

8.1.1 Teledyne Engineering Services

The following ITRs and Program Plans have been published by Teledyne Engineering Services, 130 Second Avenue, Waltham, Massachusetts.

- Diablo Canyon Nuclear Power Plant Design Verification Program Management Plan Phase I, March 29, 1982.
- Diablo Canyon Nuclear Power Plant Design Verification Program Management Plan Phase II, June 18, 1982.
- Diablo Canyon Nuclear Power Plant - Independent Design Verification Program Adjunct Program for Evaluation of Construction Quality Assurance, November 1982.
- ITR-2: Evaluation of the Quality Assurance Program and Implementation Reviews.

  Revision 0, June 23, 1982
- ITR-11: Pacific Gas and Electric Company NSSS Seismic Interface Review.

  Revision 0, November 2, 1982

8.1.2 Robert L. Cloud Associates

The following ITRs and Program Plans have been published by Robert L. Cloud Associates, 125 University Avenue, Berkeley, California.

- ITR-1: Additional Verification and Additional Sampling (Phase I).

  Revision 0, June 10, 1982
  Revision 1, October 22, 1982

- ITR-3: Evaluation of Initial Tank Sample.

  Revision 0, July 16, 1982

- ITR-4: Evaluation of Electrical Equipment Qualified by Test (Shake Table Testing Report).

  Revision 0, July 23, 1982

- ITR-5: Seismic Design Chain (Hosgri).

  Revision 0, August 19, 1982

- ITR-6: Auxiliary Building (Initial Evaluation).

  Revision 0, September 10, 1982

- ITR-7: Electrical Raceway Supports (Initial Evaluation).

  Revision 0, September 17, 1982

- ITR-8: Independent Design Verification Program for Verificaton of Pacific Gas and Electric Company Corrective Action (Phase I).

  Revision 0, October 5, 1982

- ITR-10: Hosgri Spectra (Initial Evaluation).

  Revision 0, October 29, 1982

- ITR-12: Initial Evaluation - Piping.

  Revision 0, November 5, 1982

- ITR-13: Soils Intake Structure.

  Revision 0, November 5, 1982

- ITR-15: HVAC Ducts and Supports Report.

  Revision 0, December 10, 1982

- ITR-16: Outdoor Water Storage Tanks Soils Review.
  Revision 0, December 8, 1982
- ITR-17: Additional Activity Piping.
  Revision 0, December 14, 1982
- ITR-30: Initial Evaluation - Small Bore Piping.
  Revision 0, January 12, 1983
- ITR-32: Initial Evaluation - Pumps.
  Revision 0, February 17, 1983
  Revision 1, April 1, 1983
- ITR-35: Verification of DCP Efforts by Robert L. Cloud Associates.
  Revision 0, April 1, 1983
- ITR-37: Initial Evaluation - Valves.
  Revision 0, February 23, 1983
- ITR-39: Soils - Intake Structure Bearing Capacity and Lateral Earth Pressure.
  Revision 0, February 25, 1983
- ITR-40: Additional Activity Soils Review, Intake Sliding Resistance.
  Revision 0, March 9, 1983
- ITR-43: Initial Evaluation of CCW Heat Exchangers.
  Revision 0, April 14, 1983
- ITR-44: Shake Table Mounting.
  Revision 0, April 15, 1983
- Preliminary Report on the Design Interface Review of the Seismic Reverification Program, November 12, 1981.
- Design Verification Program, Seismic Service-Related Contracts Prior to June 1978.
  Revision 0, December 3, 1981
  Revision 1, February 27, 1982
- Design Verification Program for Power Ascension - Diablo Canyon Nuclear Power Plant - Unit 1
  Revision 0, January 9, 1982

8.1.3 Roger F. Reedy, Inc.

The following ITRs and QA Audit and Review Reports have been published by Roger F. Reedy, Inc., 103 Albright Way, Los Gatos, California.

- ITR-9: Contractor List for Non-Seismic Prior to June 1978.

  Revision 0, October 15, 1982

- ITR-41: Quality Assurance Review and Audit of Diablo Canyon Project Corrective Action Program and Design Verification.

  Revision 0, April 19, 1983

- ITR-42: Phase II Quality Assurance and Design Control Practices.

  Revision 0, April 13, 1983

- Roger F. Reedy, Inc. Review of ANCO Engineers. Roger F. Reedy, Inc., Los Gatos, CA, March 1, 1982.

- Roger F. Reedy, Inc. Review of Cygna Energy Services. Roger F. Reedy, Inc., Los Gatos, CA, March 1, 1982.

- Roger F. Reedy, Inc., Review of EDS Nuclear, Inc. Roger F. Reedy, Inc., Los Gatos, CA, January 20, 1982.

- Roger F. Reedy, Inc. Review of Harding Lawson Associates. Roger F. Reedy, Inc., Los Gatos, CA, January 26, 1982.

- Roger F. Reedy, Inc. Review of Pacific Gas and Electric Company. Roger F. Reedy, Inc., Los Gatos, CA, March 8, 1982.

- Roger F. Reedy, Inc. Review of URS/Blume and Associates, Engineers. Roger F. Reedy, Inc., Los Gatos, CA, March 5, 1982.

- Roger F. Reedy, Inc. Review of Wyle Laboratories. Roger F. Reedy, Inc., Los Gatos, CA, March 1, 1982.

8.1.4 Stone & Webster Engineering Corporation

The following ITRs and Program Plans have been published by Stone & Webster Engineering Corporation, 245 Summer Street, Boston, Massachusetts.

- ITR-14: Initial Evaluation P/T Analysis Nuclear Technology Division.

  Revision 0, December 6, 1982
  Revision 1, May 9, 1983

- ITR-18: Initial Evaluation Fire Protection System.

  Revision 0, December 13, 1982
  Revision 1, May 24, 1983

- ITR-19: Initial Evaluation Radiation Analysis Nuclear Technology Division.

  Revision 0, December 16, 1982

- ITR-20: Initial Evaluation CRVP System Power Division Report.

  Revision 0, December 16, 1982
  Revision 1, April 20, 1983

- ITR-21: Initial Evaluation High Energy Pipe Line Cracks Report.

  Revision 0, December 15, 1982
  Revision 1, May 3, 1983

- ITR-22: Initial Evaluation Nuclear Auxiliary Feedwater System Report.

  Revision 0, December 17, 1982
  Revision 1, April 20, 1983

- ITR-23: Initial Evaluation High Energy Pipe Break Report.

  Revision 0, December 20, 1982
  Revision 1, May 27, 1983

- ITR-24: Initial Evaluation 4160V Electrical Distribution System Division.

  Revision 0, December 21, 1982
  Revision 1, May 4, 1983

- ITR-25: Initial Evaluation Auxiliary Feedwater System Electrical Division.

  Revision 0, December 21, 1982
  Revision 1, April 29, 1983

- ITR-26: Initial Evaluation CRVP System Electrical Division.

  Revision 0, December 21, 1982
  Revision 1, May 2, 1983

- ITR-27: Initial Evaluation Auxiliary Feedwater System I/C Division Report.

  Revision 0, December 23, 1982
  Revision 1, May 13, 1983

- ITR-29: Design Chain - Stone & Webster Engineering Corporation Initial Samples.

  Revision 0, January 17, 1983

- ITR-34: Verification of DCP Efforts by Stone & Webster Engineering Corporation.

  Revision 0, February 4, 1983
  Revision 1, March 24, 1983

- ITR-36: Construction Quality Assurance - G. F. Atkinson.

  Revision 0, February 25, 1983
  Revision 1, June 20, 1983

- ITR-38: Construction Quality Assurance - Wismer & Becker.

  Revision 0, March 1, 1983
  Revision 1, March 16, 1983
  Revision 2, June 20, 1983

- ITR-45: Additional Verification of Redundancy of Equipment and Power Supplies in Shared Safety-Related Systems.

  Revision 0, May 17, 1983

8.2 OPEN MEETINGS

8.2.1 NRC Meetings (Transcribed)

The following meetings were transcribed. The date of the meeting and the attendees are listed.

October 9, 1981, Nuclear Regulatory Commission and Pacific Gas and Electric Company.

February 3, 1982, Nuclear Regulatory Commission, Pacific Gas and Electric Company, Teledyne Engineering Services, Robert L. Cloud Associates, Roger F. Reedy, Inc., and Stone & Webster Engineering Corporation.

February 17, 1982, Nuclear Regulatory Commission, Pacific Gas and Electric Company, and Designated Other Parties.

March 4, 1982, Nuclear Regulatory Commission and Designated Other Parties.

March 25, 1982, Nuclear Regulatory Commission, Pacific Gas and Electric Company, Teledyne Engineering Services, Robert L. Cloud Associates, and Stone & Webster Engineering Corporation.

April 1, 1982, Nuclear Regulatory Commission, Pacific Gas and Electric Company, Teledyne Engineering Services, Robert L. Cloud Associates, Roger F. Reedy, Inc., and Stone & Webster Engineering Corporation.

June 10, 1982, Nuclear Regulatory Commission, Pacific Gas and Electric Company, Teledyne Engineering Services, Robert L. Cloud Associates, Roger F. Reedy, Inc., and Stone & Webster Engineering Corporation.

July 27, 1982, Nuclear Regulatory Commission, Diablo Canyon Project, Teledyne Engineering Services, Robert L. Cloud Associates, and Brookhaven National Laboratories.

August 6, 1982, Nuclear Regulatory Commission, Pacific Gas and Electric Company, Teledyne Engineering Services, Robert L. Cloud Associates, Roger F. Reedy, Inc., Stone & Webster Engineering Corporation, and Designated Other Parties.

September 1, 1982, Nuclear Regulatory Commission, Pacific Gas and Electric Company, Teledyne Engineering Services, Robert L. Cloud Associates, Roger F. Reedy, Inc., Stone & Webster Engineering Corporation, and Designated Other Parties.

September 9, 1982, Nuclear Regulatory Commission, Diablo Canyon Project, and Designated Other Parties.

October 19, 1982, Nuclear Regulatory Commission, Diablo Canyon Project, Teledyne Engineering Services, Robert L. Cloud Associates, Stone & Webster Engineering Corporation, and Designated Other Parties.

October 20, 1982. Nuclear Regulatory Commission, Teledyne Engineering Services, and Designated Other Parties.

November 10, 1982, Nuclear Regulatory Commission, Diablo Canyon Project, and Designated Other Parties.

December 8, 1982, Nuclear Regulatory Commission.

December 21, 1982, Nuclear Regulatory Commission, Diablo Canyon Project, Teledyne Engineering Services, and Brookhaven National Laboratories.

January 13, 1983, Nuclear Regulatory Commission, Diablo Canyon Project, Teledyne Engineering Services, Robert L. Cloud Associates, Roger F. Reedy, Inc., and Designated Other Parties.

January 28, 1983, Nuclear Regulatory Commission, Diablo Canyon Project, Teledyne Engineering Services, and Stone & Webster Engineering Corporation.

February 15, 1983, Nuclear Regulatory Commission, Diablo Canyon Project, Teledyne Engineering Services, Robert L. Cloud Associates, and Designated Other Parties.

April 14, 1983, Nuclear Regulatory Commission and Designated Other Parties.

May 4, 1983, Nuclear Regulatory Commission Teledyne Engineering Services, and Designated Other Parties.

May 20, 1983, Nuclear Regulatory Commission, Diablo Canyon Project, and Designated Other Parties.

May 21, 1983, Nuclear Regulatory Commission, Teledyne Engineering Services, Stone & Webster Engineering Corporation, and Designated Other Parties.

8.2.2 Other "Open" Meetings

November 12, 1982, Nuclear Regulatory Commission, Diablo Canyon Project, Teledyne Engineering Services, Robert L. Cloud Associates, and Brookhaven National Laboratories.

December 20, 1982, Nuclear Regulatory Commission, Diablo Canyon Project, Teledyne Engineering Services, and Roger F. Reedy, Inc.

December 9, 1982, Nuclear Regulatory Commission, Pacific Gas and Electric Company, Teledyne Engineering Services, and Robert L. Cloud Associates.

December 14-15, 1982, Nuclear Regulatory Commission, Diablo Canyon Project, Teledyne Engineering Services, and Robert L. Cloud Associates.

February 4, 1983, Nuclear Regulatory Commission, Diablo Canyon Project, Teledyne Engineering Services, Robert L. Cloud Associates, Roger F. Reedy, Inc., Stone & Webster Engineering Corporation, and Brookhaven National Laboratories.

February 14, 1983, Nuclear Regulatory Commission and Brookhaven National Laboratories.

April 21, 1983, Nuclear Regulatory Commission, Diablo Canyon Project, Teledyne Engineering Services, Robert L. Cloud Associates, Roger F. Reedy, Inc., and Stone & Webster Engineering Corporation.

April 25-26, 1983, Nuclear Regulatory Commission, Diablo Canyon Project, Teledyne Engineering Services, Stone & Webster Engineering Corporation, and Designated Other Parties.

April 26-27, 1983, Nuclear Regulatory Commission, Diablo Canyon Project, Teledyne Engineering Services, and Robert L. Cloud Associates.

April 27-28, 1983, Nuclear Regulatory Commission, Diablo Canyon Project, Teledyne Engineering Services, and Robert L. Cloud Associates.

May 12, 1983, Nuclear Regulatory Commission, Diablo Canyon Project, Teledyne Engineering Services, Robert L. Cloud Associates, Roger F. Reedy, Inc., Stone & Webster Engineering Corporation, and Designated Other Parties (as Observers).

June 17, 1983, Nuclear Regulatory Commission, Pacific Gas and Electric Company, Teledyne Engineering Services, Robert L. Cloud Associates, and Brookhaven National Laboratories.

	REV. 0		LATEST REV.				ACTION	PG&E		
FILE NO.	DATE	BASIS	REV.	DATE	BY	STATUS	ORG	TES	MODS	SUBJECT
992	820206	OD	2	820701	TES	PRR/OIP	PG&E	RDC		OD WATER STORAGE TANKS-DESIGN INFO

COMMENT: TES REVIEWED "PRELIMINARY REPORT, SEISMIC REVERIFICATION REPORT, SEISMIC REVERIFICATION PROGRAM -NOV. 12, 1981". AS A RESULT OF THIS OIP, RLCA WILL REVIEW BLUME INTERNAL REVIEW.

992	820206	OD	3	820823	TES	OIR	RLCA	RDC		OD WATER STORAGE TANKS-DESIGN INFO

COMMENT: THIS FILE WILL BE RECONSIDERED BY TES AND RLCA BECAUSE OF ITS SIMILARITY WITH FILE 993. TES AND RLCA WILL CONSIDER COMBINING THIS FILE WITH 993.

992	820206	OD	4	820824	RLCA	PPRR/CI	TES	RDC		OD WATER STORAGE TANKS-DESIGN INFO

COMMENT: RLCA RECOMMENDS COMBINING THIS FILE INTO 993 BECAUSE THESE 2 FILES ARE SIMILAR.

992	820206	OD	5	820909	TES	PRR/CI	TES	RDC		OD WATER STORAGE TANKS-DESIGN INFO

COMMENT: THIS FILE IS COMBINED INTO 993.

992	820206	OD	6	820909	TES	CR	NONE	RDC	NO	OD WATER STORAGE TANKS-DESIGN INFO

COMMENT: REF: "PRELIMINARY REPORT, SEISMIC REVERIFICATION REPORT, SEISMIC REVERIFICATION PROGRAM - NOV. 12, 1981". BECAUSE OF INFORMAL TRANSMITTAL OF INFO., CHECKS ARE REQUIRED TO ENSURE ACCURACY OF TRANSMITTED INFO. THIS CONCERN IS IDENTICAL TO EOI 993. IT IS COMBINED INTO 993.

993	820206	OD	0	820206	RLCA	OIR	RLCA	RDC		OD WATER STORAGE TANKS

COMMENT: CHECKS ARE NEEDED TO DETERMINE ACCURACY OF INFORMATION TRANSFERRED BETWEEN PG&E AND URS/BLUME REGARDING DESIGN INFORMATION.

993	820206	OD	1	820628	RLCA	PPRR/OIP	TES	RDC		OD WATER STORAGE TANKS

COMMENT: RLCA RECOMMEND PG&E TO CHECK ON ACCURACY OF INFORMATION TRANSFER TO URS/BLUME AS PART OF BLUME INTERNAL REVIEW & RLCA TO REVIEW THIS. TES REVIEWED " PRELIMINARY REPORT, SEISMIC REVERIFICATION REPORT, SEISMIC REVERIFICATION PROGRAM NOV. 12, 1981"

993	820206	OD	2	820701	TES	PRR/OIP	PG&E	RDC		OD WATER STORAGE TANKS.

COMMENT: ITR-1, SECTION 3.5.3.9. PG&E TO INCLUDE THIS ITEM IN THE BLUME INTERNAL REVIEW. SUBJECT TO RLCA REVIEW.

993	820206	OD	3	820823	TES	OIR	RLCA	RDC		OD WATER STORAGE TANKS.

COMMENT: THIS FILE WILL BE RECONSIDERED BY RLCA & TES TO INCLUDE EOI 992 WHICH IS VERY SIMILAR.

993	820206	OD	4	820824	RLCA	PPRR/OIP	TES	RDC		OD WATER STORAGE TANKS.

COMMENT: RLCA RECOMMENDS BECAUSE THE CONCERNS ARE SIMILAR EOI 992 IS COMBINED WITH THIS EOI. PG&E TO CHECK ON INFORMATION TRANSMITTAL AND ACCURACY.

993	820206	OD	5	820909	TES	PRR/OIP	PG&E	RDC		OD WATER STORAGE TANKS.

COMMENT: BECAUSE THE CONCERNS ARE SIMILAR EOI 992 IS COMBINED WITH THIS EOI. PG&E TO CHECK ON INFORMATION TRANSMITTAL AND ACCURACY.

993	820206	OD	6	830210	TES	OIR	RLCA	RDC		OD WATER STORAGE TANKS.

COMMENT: AS REQUESTED IN REV. 5, DCP HAS PERFORMED A REEVALUATION AND REPORTED RESULTS IN SECT. 2.1.6 OF THEIR PH I REPORT. DCP COMPLETION SHEET ON THIS FILE ISSUED ON 830203. RLCA AND TES TO REVIEW DCP RESPONSE AND RESOLVE IF SATISFIED. THIS FILE INCLUDES THE CONCERNS OF FILE 992.

993	820206	OD	7	830621	RLCA	PPRR/CI	TES	RDC		OD WATER STORAGE TANKS.

COMMENT: DCP PERFORMED REEVALUATION OF OWST, RESULTS FOUND IN SECT. 2.1.6 OF THEIR PH. I REPORT. IDVP SELECTED A SAMPLE OF OWST ANALYSIS FOR REVIEW. IDVP CONCLUDES ANALYSIS HAS BEEN FULLY IMPLEMENTED AND LICENSING CRITERIA MET.

993	820206	OD	8	830627	TES	PRR/CI	TES	RDC		OD WATER STORAGE TANKS.

COMMENT: TES REVIEWED PG&E PHASE I FINAL REPORT AND RLCA'S DESIGN REVIEW COVERING DCP FILE 52.21.1 AND CONCURS THAT THIS FILE BE CLOSED.

993	820206	OD	9	830627	TES	CR	NONE	RDC		OD WATER STORAGE TANKS.

COMMENT: CHECKS WERE REQUIRED TO DETERMINE ACCURACY OF INFO TRANFERRED BETWEEN PG&E AND URS/BLUME. BASED ON DCP REEVALUATION OF OWST AND RLCA/TES REVIEW OF SAMPLE CALC, THIS ITEM IS CLOSED.

994 820206 OD 0 820206 RLCA OIR RLCA RDF PIPING CONSULTANT INTERFACE
COMMENT: PG&E USES FORMAL DESIGN GUIDE FOR SEISMIC FACTORS WHICH THEY TRANSMIT TO CONSULTANTS. THIS WILL BE A SIGNIFICANT INTERFACE TO EXAMINE IN OVERALL VERIFICATION PROGRAM. GENERICALLY COVERED BY RLCA IN CURRENT PROGRAM.

994 820206 OD 1 820309 RLCA PPRR/CI TES RDF PIPING CONSULTANT INTERFACE
COMMENT: PHASE I PIPING SAMPLE INCLUDES SEVERAL LINES ANALYZED BY CONSULTANTS. THIS INTERFACE IS COVERED BY INDEPENDENT CALCS.

994 820206 OD 2 820409 TES CR NONE RDF NO PIPING CONSULTANT INTERFACE
COMMENT: PG&E USES A FORMAL DESIGN GUIDE FOR THE SEISMIC FACTORS WHICH THEY TRANSMIT TO THE CONSULTANTS. THIS WILL BE A SIGNIFICANT INTERFACE TO EXAMINE IN THE OVERALL VERIFICATION PROG. SINCE THE PHASE I PIPING SAMPLE INCLUDES SEVERAL LINES ANALYZED BY CONSULTANTS, THIS INTERFACE IS COVERED BY THE INDEPENDENT CALCULATIONS.

995 820206 OD 0 820206 RLCA OIR RLCA RDF EES TRANSMITTAL COVER SHEETS
COMMENT: PG&E TRANSMITTAL COVER SHEETS DO NOT LIST CONTENTS OF ENTIRE ATTACHMENTS SENT TO EES.

995 820206 OD 1 820309 RLCA PPRR/CI TES RDF EES TRANSMITTAL COVER SHEETS
COMMENT: RLCA HAS SELECTED SEVERAL EES PIPING ANALYSES. BY COMPARISON OF STRESS RESULTS, THIS INTERFACE WILL BE EXAMINED IN THE CURRENT PROGRAM.

995 820206 OD 2 820409 TES CR NONE RDF NO EES TRANSMITTAL COVER SHEETS
COMMENT: THE TRANSMITTALS OF PIPING INFORMATION FROM PG&E TO EES NEED TO BE EXAMINED. RLCA HAS SELECTED SEVERAL EES PIPING ANALYSES. BY COMPARISON OF STRESS RESULTS, THIS INTERFACE WILL BE EXAMINED IN THE CURRENT PROGRAM.

996 820206 OD 0 820206 RLCA OIR RLCA RDF BLUME PIPING CORRESPONDENCE
COMMENT: FOR THE SCOPE OF PIPING ASSIGNED TO URS/BLUME, VERY LITTLE CORRESPONDENCE WAS LOCATED DURING TIME FRAME OF UNIT 1 PIPING ANALYSES. URS/BLUME HAS NOT YET BEEN CONTACTED TO PROVIDE ANY TRANSMITTALS.

996 820206 OD 1 820430 RLCA PPRR/CI TES RDF BLUME PIPING CORRESPONDENCE
COMMENT: SEVERAL PIPING PROBLEMS SELECTED FOR INDEPENDENT ANALYSIS WERE AUTHORED BY URS/BLUME PRIOR TO EES REVISION.THIS PG&E - URS/BLUME PIPING INTERFACE IS COVERED IN PHASE I PROGRAM.

996 820206 OD 2 820510 TES PRR/CI TES RDF BLUME PIPING CORRESPONDENCE
COMMENT: INTERFACE BETWEEN PG&E AND THEIR CONSULTANTS IS COVERED BY THE IDVP INDEPENDENT CALCULATIONS.

996 820206 OD 3 820510 TES CR NONE RDF NO BLUME PIPING CORRESPONDENCE
COMMENT: THE TRANSMITTAL OF PIPING INFORMATION FROM PG&E TO URS/BLUME NEED TO BE EXAMINED. RLCA HAS SELECTED SEVERAL PIPING PROBLEMS AUTHORED BY URS/BLUME PRIOR TO EES REVISION. BY COMPARISON OF STRESS RESULTS, THIS INTERFACE WILL BE EXAMINED IN THE CURRENT PROGRAM.

997 820206 OD 0 820206 RLCA OIR RLCA JCT PG&E VALVE TRANSMITTALS TO EES
COMMENT: LIMITED DOCUMENTATION BETWEEN PG&E AND EES AVAILABLE. SOME RECORDS OF EES TRANSMITTALS TO PG&E HAVE BEEN FOUND TO DATE. A COMPLETE SET OF EES TRANSMITTALS TO PG&E HAS NOT BEEN COMPILED YET.

997 820206 OD 1 820309 RLCA PPRR/CI TES JCT PG&E VALVE TRANSMITTALS TO EES
COMMENT: IDVP SAMPLE INCLUDES EES PIPING SYSTEM ANALYSIS AND REVIEW OF VALVE ACC'L'S.

997 820206 OD 2 820409 TES CR NONE JCT NO PG&E VALVE TRANSMITTALS TO EES
COMMENT: DOCUMENTATION CONCERNING TRANSMITTAL OF VALVE INFORMATION FROM PG&E TO EES LACKING, RLCA PRELIMINARY REPORT, 811112 3.3.7.2.2. PROGRAM SAMPLE INCLUDES EES PIPING ANALYSIS REVIEW, IDVP PROGRAM PLAN, PHASE 1, REV. 1, 820706, 5.4.2, TABLE II.

998 820206 OD 0 820206 RLCA OIR RLCA JCT PG&E VALVE TRANSMITTALS TO EDS
COMMENT: A LIMITED AMOUNT OF DOCUMENTATION OF INFORMATION TRANSFERRED FROM PG&E TO EDS HAS BEEN FOUND TO DATE. COMPLETE DOCUMENTATION OF REQUALIFICATION INFORMATION FOR THE VALVES BEING REVIEWED HERE HAS NOT BEEN COMPILED AT THIS POINT IN TIME.

	REV. 0		LATEST REV.				ACTION		PG&E		
FILE NO.	DATE	BASIS	REV.	DATE	BY	STATUS	ORG	TES	MODS	SUBJECT	COMMENT
1068	820315	QAR	1	820524	TES	CR	NONE	MAR	NO	URS/BLUME QA FINDINGS	NO QA PROGRAM, IN CONFORMANCE WITH 10CFR50 APPENDIX B, WAS IMPLEMENTED, RESULTING IN LACK OF FORMAL DESIGN CONTROL. TO BE REPLACED BY EOI 3005. CLOSED ITEM.
1069	820315	FID	0	820315	RLCA	OIR	RLCA	RDF		VALVE LCV 113/115 UNSUPT. AFW LINES 577/578 AUX. B.	PG&E AFW ISO 447119, REV.12 SHOWS VALVES LCV 113 & 115 UNSUPPORTED. RLCA FIELD INSPECTION CONFIRMED THIS. PG&E ANALYSIS 2-14, COMPUTER DATE 1/16/82 INDICATES SUPPORTS HAVE BEEN ADDED TO VALVES. RLCA TO COMPLETE VERIFICATION BASED ON ORIGINAL FIELD INFORMATION, WITH SUBSEQUENT CONSIDERATION OF REVISIONS.
1069	820315	FID	1	820426	RLCA	PPRR/CI	TES	RDF		VALVE LCV 113/115 UNSUPT. AFW LINES 577/578 AUX. B.	PG&E CONFIRMED ADDITION OF NEW SUPPORTS TO VALVES AND PROVIDED 1981 ANALYSIS. EOI 1071 REPORTS OVERSTRESS IN THIS PIPING ANALYSIS.
1069	820315	FID	2	820511	TES	OIR	RLCA	RDF		VALVE LCV 113/115 UNSUPT. AFW LINES 577/578 AUX. B.	TES RECOMMENDS THAT FILE 1069, REV.0, BE RESOLVED EXCLUSIVELY BASED ON THE REVIEW OF THE PG&E 1981 ANALYSIS, PG&E REASONS FOR THE CHANGES AND THE ADDITION OF THE NEW SUPPORTS TO VALVES LCV113 AND LCV115 RATHER THAN CLOSED OUT AND TRANSFERRED TO FILE 1071 FOR EVENTUAL RESOLUTION.
1069	820315	FID	3	820517	RLCA	PER/A	TES	RDF		VALVE LCV 113/115 UNSUPT. AFW LINES 577/578 AUX. B.	LACK OF SUPPORTS ON VALVE OPERATOR CAUSES OVERSTRESS IN RLCA PIPING ANALYSIS 109. PG&E IN PROCESS OF ADDING SUPPORTS. ADDITIONAL SUPPORTS TO BE FIELD VERIFIED BY RLCA. RLCA 109 HAS RERUN WITH SUPPORTS ON VALVE OPERATOR (K15YCVF) TO SHOW STRESSES BELOW ALLOWABLE. PG&E PIPING ANALYSIS 2-4 DATED 1-16-82 INDICATE SUPPORTS ON VALVE OPERATOR.
1069	820315	FID	4	820607	TES	ER/A	PG&E	RDF		VALVE LCV 113/115 UNSUPT. AFW LINES 577/578 AUX. B.	PG&E PIPING ISO 447119, R.12, PIPING ANALYSES 2-14 (7/26/77 & 1/16/82). RLCA PIPING ANALYSIS RLCA 109 SEQ. #S K15VFW3 & K15YCVF (3/19/82 & 5/9/82). PG&E LTR. DCVP-RLCA-67 (4/23/82). PG&E DWG. 049264, SHEETS 157-169. VERIF. ANALYSIS FAILS STRESS EQUATIONS DUE TO UNSUP. VALVE OPERATORS. THE ADDI. OF SUPT. ON VALVE OPERATOR RESULTS IN ACCEPTABLE STRESSES.
1069	820315	FID	5	820630	TES	ER/A	PG&E	RDF	YES	VALVE LCV 113/115 UNSUPT. AFW LINES 577/578 AUX. B.	PG&E TO ADD SUPPORTS AND TO ASK VALVE SUPPLIER FOR VALVE QUALIFICATION FOR SUPPORTS ON VALVE OPERATOR.
1069	820315	FID	6	830625	TES	OIR	RLCA	RDF	YES	VALVE LCV 113/115 UNSUPT. AFW LINES 577/578 AUX. B.	DCP COMPLETION SHEET DATED 830620 INDICATED THAT SUPPORTS HAVE BEEN ADDED TO LCV-113 AND LCV-115 VALVE OPERATORS AND VALVES HAVE BEEN QUALIFIED WITH THE SUPPORTS. RLCA TO VERIFY SUPPORT ADDITION AND REVIEW DCP VALVE QUALIFICATION.
1069	0		7	0							SPACE RESERVED FOR LATER REVISION.
1069	0		8	0							SPACE RESERVED FOR LATER REVISION.
1069	0		9	0							SPACE RESERVED FOR LATER REVISION.
1069	0		10	0							SPACE RESERVED FOR LATER REVISION.
1069	0		11	0							SPACE RESERVED FOR LATER REVISION.
1070	820315	DMD	0	820315	RLCA	OIR	RLCA	RDC		AUX. BLDG. HORIZONTAL SOIL SPRING CALC.	ITR-1, 3.1.4 AUXILIARY BUILDING RLCA TO COMPLETE MCNEILL WORK. THE HORIZONTAL SOIL SPRING INDEPENDENTLY CALCULATED BY RLCA DIFFERS FROM THE URS/BLUME SOIL SPRING BY 50% .
1070	820315	DMD	1	820721	RLCA	PPRR/CI	TES	RDC		AUX. BLDG. HORIZONTAL SOIL SPRING CALC.	DELETE FROM ITR-1, 3.1.4 RLCA RECOMMENDS THAT THIS FILE BE COMBINED WITH EOI 1097.

	REV. 0		LATEST REV.				ACTION	PG&E		
FILE NO.	DATE	BASIS	REV.	DATE	BY	STATUS	ORG	TES	MODS	SUBJECT
1096	820709	ICD	6	830225	TES	CR	NONE	CHK	NO	SUPPLY FAN S-31, AUX. BUILDING.

COMMENT: STRESSES DIFFER BTWN DESIGN AND VERIFICATION ANALYSES BY MORE THAN 15%. DA SHOWS BOLTS BTWN BASE ANGLES AND WIDE FLANGE BEAMS AS 7/8", FIELD SHOWS 5/8". DA RESTRAINTS FAN SUPPORTS FROM TRANS MOTION, ASSUMES THRUST TO TAKE BOTH AXIAL LOAD. DA USES CORRECT MOMENT ARM=5.8", VA USES 2.1". VA SHOWS ALL STRESSES BELOW ALLOWABLE. ERROR CLASS C.

1097	820713	SID	0	820713	RLCA	OIR	RLCA	RDC		AUXILIARY BUILDING

COMMENT: HOSGRI RESPONSE SPECTRA IS NOT AVAILABLE FOR THE FAN/MACHINE ROOM ABOVE ELEVATION 163' 6". THIS AREA IS LOCATED AT THE INTERSECTION OF COLUMN LINES "H" & 18 AND CONTAINS FAN E-27.

1097	820713	SID	1	820714	RLCA	PPRR/OIP	TES	RDC		AUXILIARY BUILDING

COMMENT: RLCA RECOMMENDS PG&E IDENTIFY ALL CLASS 1 PIPING AND COMPONENTS LOCATED IN THIS AREA.

1097	820713	SID	2	820720	TES	OIR	RLCA	RDC		AUXILIARY BUILDING

COMMENT: BASED ON THE PG&E PRESENTATION (JULY 14-16, 1982) OF THEIR INTERNAL TECHNICAL PROGRAM IN WHICH THE AUXILIARY BUILDING IS BEING COMPLETELY REANALYZED, TES AND RLCA WILL RECONSIDER AND RESOLVE THIS FILE.

1097	820713	SID	3	820721	RLCA	PER/AB	TES	RDC		AUXILIARY BUILDING REEVALUATION.

COMMENT: RLCA RECOMMENDS THAT EOI'S 920, 986, 1029, 1070 AND 1093 BE COMBINED WITH THIS FILE, 1097.

1097	820713	SID	4	820722	TES	ER/AB	PG&E	RDC		AUXILIARY BUILDING REEVALUATION.

COMMENT: EOI'S 920, 986, 1029, 1070 AND 1093 ARE COMBINED INTO THIS FILE. PG&E REANALYZING AUXILIARY BUILDING AS PART OF ITS INTERNAL TECHNICAL PROGRAM.

FILE NO.	DATE	BASIS	REV.	DATE	BY	STATUS	ORG	TES	MODS	SUBJECT
1097	820713	SID	5	830625	TES	ER/AB	PG&E	RDC		AUXILIARY BUILDING REEVALUATION.

COMMENT: EOI'S 920, 986, 1029, 1070 AND 1093 ARE COMBINED INTO THIS FILE. PG&E REANALYZING AUXILIARY BUILDING AS PART OF ITS INTERNAL TECHNICAL PROGRAM. REVISION 5 ISUED TO INCLUDE EOI 1132.

1097	0		6	0						

COMMENT: SPACED RESERVED FOR LATER REVISIONS.

1097	0		7	0						

COMMENT: SPACED RESERVED FOR LATER REVISIONS.

1097	0		8	0						

COMMENT: SPACED RESERVED FOR LATER REVISIONS.

1098	820714	ICD	0	820714	RLCA	OIR	RLCA	RDF		RLCA PIPING ANALYSIS 102 - SEPARATOR/STABILIZER

COMMENT: DESIGN ANALYSIS 8-25 MODELED THE CVC SEPARATOR/STABILIZER SUPPORT AS X & Y TRANSLATIONAL RESTRAINT. RLCA FIELD INSPECTION SHOWS THIS SUPPORT AS X & Y TRANS AND X & Z ROTATIONAL RESTRAINT.

1098	820714	ICD	1	820714	RLCA	PPRR/OIP	TES	RDF		RLCA PIPING ANALYSIS 102 - SEPARATOR/STABILIZER

COMMENT: PG&E TO REVIEW IN LINE QUALIFICATION OF SEPARATOR/STABILIZER IN CONSIDERATION OF ADDITIONAL ANCHOR BOLT LOADS.

1098	820714	ICD	2	820723	TES	PRR/OIP	PG&E	RDF		RLCA PIPING ANALYSIS 102 - SEPARATOR/STABILIZER

COMMENT: PG&E ANALYSIS 8-25 DATED 8/19/80. DESIGN ANALYSIS DOES NOT RECORD THE CORRECT ANCHOR BOLT LOADS ON THE SEPARATOR/STABILIZER. PG&E TO REVIEW THE IN LINE QUALIFICATION OF THE SEPARATOR/STABILIZER IN CONSIDERATION OF THE ADDITIONAL ANCHOR BOLT LOADS.

1098	820714	ICD	3	820910	TES	OIR	RLCA	RDF		RLCA PIPING ANALYSIS 102-SEPARATOR/STABILIZER

COMMENT: BASED ON PG&E PRESENTATION (AUGUST 6 & 26 , 1982) OF THEIR INTERNAL TECHNICAL PROGRAM OF PIPING, TES AND RLCA WILL RECONSIDER COMBINING THIS FILE WITH FILES 961, 1021, 1058 AND 1059 INTO ONE ERROR CLASS A OR B FILE.

1098	820714	ICD	4	820913	RLCA	PER/AB	TES	RDF		PIPING REEVALUATION.

COMMENT: BASED ON PG&E PRESENTATIONS (8/6/82 AND 8/26/82) OF THEIR INTERNAL TECHNICAL PROGRAM OF PIPING, THIS FILE COMBINES WITH FILES 961, 1021, 1058, AND 1059 TOGETHER.

FILE NO.	REV. 0 DATE	BASIS	LATEST REV. REV.	DATE	BY	STATUS	ACTION ORG	TES	PG&E MODS	SUBJECT
1098	820714	ICD	5	820922	TES	ER/AB	PG&E	RDF		PIPING REEVALUATION.

COMMENT: BASED ON PG&E PRESENTATIONS OF THEIR TECHNICAL PROGRAM, THIS FILE IS COMBINED WITH FILES 961, 1021, 1058,1059, 1060 AND 1104 AS AN ERROR CLASS A OR B. THE INCLUSION OF FILES 1060 AND 1104 INTO THIS FILE WAS ACHIEVED BY PROGRAM REVIEW COMMITTEE ACTION . ALL CONCERNS OF THE ABOVE MENTIONED FILES WILL BE REVIEWED UNDER THIS FILE.

1098	820714	ICD	6	830120	TES	ER/AB	PG&E	RDF		PIPING REEVALUATION.

COMMENT: BASED ON PG&E PRESENT. OF THEIR TECHNICAL PROGRAM, THIS FILE IS COMBINED W/FILES 961, 1021, 1058,1059,1060 & 1104 AS AN ER A/B. THE INCLUSION OF FILES 1060 AND 1104 INTO THIS FILE WAS ACHIEVED BY PROGRAM REVIEW COMMITTEE ACTION.ALL CONCERNS OF THE ABOVE MENTIONED FILES WILL BE REVIEWED HERE. REV 6 WAS ISSUED TO REFLECT INCLUSION OF FILE 6001.

1098	820714	ICD	7	830225	TES	ER/AB	PG&E	RDF	YES	PIPING REEVALUATION.

COMMENT: BASED ON PG&E PRESENT. OF THEIR TECH. PROGRAM, THIS FILE IS COMBINED W/FILES 961,1021,1058,1059,1060&1104 AS AN ER/A/B THE INCL OF FILES 1060 & 1104 INTO THIS FILE WAS ACHIEVED BY PROG REVIEW COMMITTEE ACTION. ALL CONCERNS OF THE ABOVE FILES WILL BE REVIEWED HERE. REV 6 WAS ISSUED TO REFLECT INCL OF 6001.REV 7 ISSUED TO REFLECT INCL OF 1115 & 6002.

1098	820714	ICD	8	830627	TES	ER/AB	PG&E	RDF	YES	PIPING REEVALUATION.

COMMENT: BASED ON PG&E PRESENT. OF THEIR TECH. PROGRAM, THIS FILE IS COMBINED W/FILES 961,1021,1058,1059,1060 & 1104 AS AN ER/AB THE INCL OF FILES 1060 & 1104 INTO THIS FILE WAS ACHIEVED BY PROG REVIEW COM ACTION. ALL CONCERNS OF THE ABOVE FILES WILL BE REVIEWED HERE. REV 6 ISSUED TO REFLECT INCL OF 6001. REV 7 ISSUED TO REFLECT INCL OF 1115 & 6002. REV. 8 - 1126.

1098	0		9	0						

COMMENT: SPACE RESERVED FOR LATER REVISIONS.

1098	0		10	0						

COMMENT: SPACE RESERVED FOR LATER REVISIONS.

1098	0		11	0						

COMMENT: SPACE RESERVED FOR LATER REVISIONS.

1099	820804	FID	0	820804	RLCA	OIR	RLCA	PPR		COMPONENT COOLING WATER HEAT EXCH. TURBINE BLDG.

COMMENT: DRAWING SHOWS 3/4" STIFFENER PLATES ON NORTH SIDE OF FIXED END SUPPORT; FIELD VERIFICATION DOES NOT SHOW THESE PLATES ON HX # 1-2.

1099	820804	FID	1	820816	RLCA	PPRR/OIP	TES	PPR		COMPONENT COOLING WATER HEAT EXCH. TURBINE BLDG.

COMMENT: PG&E TO ESTABLISH GEOM. CONSIDERED BY DES. ANAL. & DETERMINE REASONS FOR DIFFERENCES BETWEEN SUPPORTS.

1099	820804	FID	2	820820	TES	PRR/OIP	PG&E	PPR	NO	COMPONENT COOLING WATER HEAT EXCH. TURBINE BLDG.

COMMENT: BASIS : TES REVIEW OF GEOM. DIFF. W/ RLCA, REVIEW OF RLCA BASIS FOR FINDING (PG&E FILES) & REVIEW OF 1099-1 ; TES MEMO 820819. PG&E TO ESTABLISH THE SUPPORT CONFIGURATION REPRESENTED BY THE DESIGN ANALYSIS AND DETERMINE THE REASONS FOR THE DIFFERENCES BETWEEN THE TWO SUPPORTS.

1099	820804	FID	3	821104	TES	OIR	RLCA	PPR		COMPONENT COOLING WATER HEAT EXCH. TURBINE BLDG.

COMMENT: RLCA AND TES TO ASCERTAIN VALIDITY OF PG&E COMPLETION SHEET AND VERIFY THAT THE ADDED PLATES OF CCWHX # 1-2 HAVE BEEN DESIGNED FOR HOSGRI. DESIGN CALCS. FOR ALTERNATE 'SHEAR RESTRAINT' HAVE BEEN FOUND IN PG&ES RESPONSE TO TES RFI 0108 (DCVP - TES 418 DATED 821006).

1099	820804	FID	4	830216	RLCA	PPRR/DEV	TES	PPR		COMPONENT COOLING WATER HEAT EXCH. TURBINE BLDG.

COMMENT: PG&E DRAWING 463683 REV. 6 SHOWS 3/4" STIFFNER PLATES ON NORTH SIDE OF FIXED SUPPORT. RLCA FIELD VERIFICATION SHOWS NORTH SIDE OF FIXED END SUPPORT OF HX 1-2 DOESN'T INCLUDE THESE. HX 1-1 DOES. DESIGN ANALYSIS NOT AFFECTED, SIMPLIFIED MODEL DOESN'T INCLUDE THESE PLATES. DRAWING HAS BEEN REVISED.

1099	820804	FID	5	830225	TES	PRR/DEV	TES	PPR		COMPONENT COOLING WATER HEAT EXCH. TURBINE BLDG.

COMMENT: PG&E DRAWING 463683 REV. 6 SHOWS 3/4" STIFFNER PLATES ON NORTH SIDE OF FIXED SUPPORT. RLCA FIELD VERIFICATION SHOWS NORTH SIDE OF FIXED END SUPPORT OF HX 1-2 DOESN'T INCLUDE THESE. HX 1-1 DOES. DESIGN ANALYSIS NOT AFFECTED, SIMPLIFIED MODEL DOESN'T INCLUDE THESE PLATES. DRAWING HAS BEEN REVISED.

1099	820804	FID	6	830225	TES	CR	NONE	PPR	NO	COMPONENT COOLING WATER HEAT EXCH. TURBINE BLDG.

COMMENT: PG&E DRAWING 463683 REV. 6 SHOWS 3/4" STIFFNER PLATES ON NORTH SIDE OF FIXED SUPPORT. RLCA FIELD VERIFICATION SHOWS NORTH SIDE OF FIXED END SUPPORT OF HX 1-2 DOESN'T INCLUDE THESE. HX 1-1 DOES. DESIGN ANALYSIS NOT AFFECTED, SIMPLIFIED MODEL DOESN'T INCLUDE THESE PLATES. DRAWING HAS BEEN REVISED. DEVIATION.

1100	820816	OD	0	820816	RLCA	OIR	RLCA	RDC		HLA SOIL REVIEW OUTDOOR WATER STORAGE TANKS.

COMMENT: HLA FIELD LOG OF BORING # 11 (820208) INDICATES TWO FIREWATER TANKS ; THERE SHOULD ONLY BE ONE FIREWATER TANK;

FILE NO.	REV. 0 DATE	BASIS	LATEST REV. REV.	DATE	BY	STATUS	ACTION ORG	TES	PG&E MODS	SUBJECT
1104	820903	FID	2	820922	TES	PRR/CI	TES	RDF		RLCA PIPING ANAL.110 LINES 4260 & 3078,CONT.BLDG.
COMMENT:	TES AND RLCA AGREED IN A PROGRAM REVIEW COMMITTEE ACTION TO MODIFY THE RECOMMENDATION FROM AN OPEN ITEM WITH FUTURE ACTION TO PG&E TO A CLOSED ITEM WITH THE CONCERN OF THIS FILE TRANSFERRED TO FILE 1098-ERROR A/B.									
1104	820903	FID	3	820922	TES	CR	NONE	RDF	NO	RLCA PIPING ANAL.110 LINES 4260 & 3078,CONT.BLDG.
COMMENT:	ONE SUPPORT ON LINE 3078, ADJACENT TO THE LINE 4259 TEE, AND TWO SUPPORTS ON LINE 4260, ADJACENT TO LINE 3078, ARE MISSING THE U-BOLTS REQUIRED TO PROVIDE BILATERAL RESTRAINT. RLCA WILL MODEL THESE LINES ASSUMING BILATERAL RESTRAINT AT THESE LOCATIONS. THIS FILE HAS BEEN COMBINED WITH FILE 1098-ERROR CLASSS A/B.									
1105	821013	SID	0	821013	RLCA	OIR	RLCA	RDF		PIPING ANALYSIS 103: VALVES 8724A, 8726A & 8728A
COMMENT:	RLCA FIELD VERIFICATION SHOWED VALVES INSTALLED IN HORIZONTAL POSITION. VENDOR DWG DC-663219-292-2 REQUIRES INSTALLATION IN VERTICAL POSITION. RLCA RECOMMENDS THIS FILE BE COMBINED WITH EOI 938.									
1105	821013	SID	1	821013	RLCA	PPRR/CI	TES	RDF		PIPING ANALYSIS 103: VALVES 8724A, 8726A & 8728A
COMMENT:	PG&E TO ASSESS THE SIGNIFICANCE OF HORIZONTAL VALVE INSTALLATION IN VIEW OF VENDOR REQUIREMENTS. COMBINE THIS FILE WITH EOI 938.									
1105	821013	SID	2	821018	TES	PRR/CI	TES	RDF		PIPING ANALYSIS 103: VALVES 8724A, 8726A & 8728A
COMMENT:	PG&E TO ASSESS THE SIGNIFICANCE OF HORIZONTAL VALVE INSTALLATION IN VIEW OF VENDOR REQUIREKENTS. THE CONCERN OF THIS FILE HAS BEEN TRANSFERED TO FILE 938.									
1105	821013	SID	3	821018	TES	CR	NONE	RDF	NO	PIPING ANALYSIS 103: VALVES 8724A, 8726A & 8728A
COMMENT:	RLCA FIELD VERIFICATION SHOWED VALVES TO BE INSTALLED IN HORIZONTAL POSITION. VENDOR DRAWING DC663219-292-2 REQUIRES THAT VALVES BE INSTALLED IN VERTICAL POSITION. PG&E TO ASSESS THE SIGNIFICANCE OF HORIZONTAL VALVE INSTALLATION IN VIEW OF VENDOR REQUIREMENTS. THE CONCERN OF THIS FILE HAS BEEN TRANSFERED TO FILE 938. CLOSED ITEM.									
1106	821101	ICD	0	821101	RLCA	OIR	RLCA	RDF		NOZZLE LOADS VALVE ACCEL.- RLCA PIPING ANALYSES.
COMMENT:	RHR PUMP 1-1 SUCTION AND DISCHARGE (RLCA 103), RHR HX 1-1 INLET (RLCA 103), CCWHX 1-1 & 1-2 OUTLET (RLCA 102),PRESSURIZE NOZZLES A,B,C (RLCA 105), VALVES 1-9001A (RLCA 100), 1-9003A(RLCA 107), LCV113(RLCA 109), LCV115(RLCA 109). FOR THESE COMPONENTS, NOZZLE LOADS AND VALUE ACCE. EXCEED PG&E DESIG. ALLO. VALUES.EOI 1106 TO BE COM. W/ EOI 1098 AS AN ER A OR B									
1106	821101	ICD	1	821101	RLCA	PPRR/CI	TES	RDF		NOZZLE LOADS VALVE ACCEL.- RLCA PIPING ANALYSES.
COMMENT:	EOI 1106 TO BE COMBINED WITH EOI 1098 AS AN ERROR CLASS A OR B.									
1106	821101	ICD	2	821118	RLCA	PER/AB	TES	RDF		NOZZLE LOADS VALVE ACCEL.- RLCA PIPING ANALYSES.
COMMENT:	THE NOZZLE LOADS AND VALVE ACCELERATIONS FROM THE RLCA VERIFICATION ANALYSES EXCEED THE PG&E DESIGNATED ALLOWABLE VALUES FOR THE COMPONENTS LISTED.									
1106	821101	ICD	3	821123	TES	ER/AB	PG&E	RDF		NOZZLE LOADS VALVE ACCEL.- RLCA PIPING ANALYSES.
COMMENT:	THE NOZZLE LOADS AND VALVE ACCELERATIONS FROM THE RLCA VERIFICATION ANALYSES EXCEED THE PG&E DESIGNATED ALLOWABLE VALUES FOR THE COMPONENTS LISTED.									
1106	821101	ICD	4	821210	TES	ER/AB	PG&E	RDF		NOZZLE LOADS VALVE ACCEL.- RLCA PIPING ANALYSES.
COMMENT:	THE NOZZLE LOADS AND VALVE ACCELERATIONS FROM THE RLCA VERIFICATION ANALYSES EXCEED THE PG&E DESIGNATED ALLOWABLE VALUES. BASED ON PG&E'S CORRECTIVE ACTION PROGRAM, THE CONCERN OF FILE 1109 HAS BEEN COMBINED INTO THIS FILE ALL CONCERNS OF THESE FILES WILL BE REVIEWED UNDER THIS FILE.									
1106	821101	ICD	5	830618	TES	OIR	RLCA	RDF		NOZZLE LOADS VALVE ACCEL.- RLCA PIPING ANALYSES.
COMMENT:	RLCA TO REVIEW THE DCP COMPLETION SHEET DATED 830617 RESPONDING TO THIS FILE AND DETERMINE WHETHER THE FILE CAN BE CLOSED OUT.									
1106	821101	ICD	6	830618	RLCA	PPRR/CI	TES	RDF		NOZZLE LOADS VALVE ACCEL.- RLCA PIPING ANALYSES.
COMMENT:	NOZZLE LOADS ARE BEING REVIEWED BY RLCA AS PART OF THE VERIFICATION OF DCP ACTIVITIES. VALVE ALLOWABLES ARE MET FOR 9001 VALVE ALLOWABLES FOR 9003A WILL BE VERIFIED AS PART OF EOI 1133. VALVE ALLOWABLES FOR LCV-113 AND LCV-115 WILL BE VERIFIED AS PART OF EOI 1135.									
1106	821101	ICD	7	830623	TES	PRR/CI	TES	RDF		NOZZLE LOADS VALVE ACCEL.- RLCA PIPING ANALYSES.
COMMENT:	RLCA CALCULATED NOZZLE LOADS THAT EXCEED D.A. LOADS (NOZZLE LOADS BEING REVIEWED BY RLCA AS PART OF VERIFICATION OF DCP) AND VALVE ACCELERATIONS EXCEED ALLOWABLES (ALLOWABLES MET FOR 9001A, WILL BE VERIFIED AS PART OF 1133 FOR 9003A, AND WILL BE VERIFIED AS PART OF 1135 FOR LCV'S 113 AND 115).									
1106	821101	ICD	8	830623	TES	CR	NONE	RDF		NOZZLE LOADS VALVE ACCEL.- RLCA PIPING ANALYSES.
COMMENT:	RLCA CALCULATED NOZZLE LOADS THAT EXCEED D.A. LOADS (NOZZLE LOADS BEING REVIEWED BY RLCA AS PART OF VERIFICATION OF DCP) AND VALVE ACCELERATIONS EXCEED ALLOWABLES (ALLOWABLES MET FOR 9001A, WILL BE VERIFIED AS PART OF 1133 FOR 9003A, AND WILL BE VERIFIED AS PART OF 1135 FOR LCV'S 113 AND 115). WAS ER/AB. CLOSED ITEM.									

FILE NO.	REV. 0 DATE	BASIS	LATEST REV. REV.	DATE	BY	STATUS	ACTION ORG	TES	PG&E MODS	SUBJECT
1107	821123	ICD	0	821123	RLCA	OIR	RLCA	RDF		COMPARISON: PG&E AND RLCA PIPING 110
COMMENT: RLCA MODELED TWO VALVES ON VENT LINE FROM LINE 3488, DESIGN ANALYSIS HAD ONE. RLCA VERIFIED TWO SUPPORTS ON LINE 4259 AS DEADWEIGHT ONLY. DESIGN ANALYSIS HAD THESE RIGID VERTICAL. VERIFICATION ANALYSIS USED 2.1 FOR SOCKET WELD CONNECTION SIF, DESIGN ANALYSIS USED 1.0. RLCA ANALYSIS SHOWED STRESSES TO EXCEED ALLOWABLE VALVES IN SEPARATE AREAS OF PIPING.										
1107	821123	ICD	1	821207	RLCA	PER/A	TES	RDF		COMPARISON: PG&E AND RLCA PIPING 110
COMMENT: RLCA VERIFIED AND MODELED TWO VALVES ON VENT LINE FROM LINE 3488, PG&E MODELED ONE. RLCA MODELED TWO SUPPORTS AS DW ONLY PG&E MODELED AS RIGID. RLCA USED SIF=2.1 FOR SOCKET WELD CONNECTION, PG&E USED 1.0. STRESSES CALCULATED IN VERIFICATION ANALYSIS EXCEED THE ALLOWABLE VALUES IN TWO SEPARATE AREAS OF PIPING.										
1107	821123	ICD	2	821209	TES	ER/A	PG&E	RDF		COMPARISON: PG&E AND RLCA PIPING 110
COMMENT: RLCA FIELD VERIFIED AND MODELED TWO VALVES ON 3/4" VENT LINE OFF OF LINE 3488, PG&E MODELED ONE. RLCA MODELED TWO SUPPORTS ON LINE 4259 AS DW ONLY, PG&E MODELED AS RIGID. RLCA USED SIF OF 2.1 WHERE PG&E USED 1.0. STRESSES CALCULATED IN VERIFICATION ANALYSIS EXCEED ALLOWABLES IN TWO SEPARATE AREAS OF PIPING.										
1107	821123	ICD	3	830309	TES	OIR	RLCA	RDF		COMPARISON: PG&E AND RLCA PIPING 110
COMMENT: STRESSES CALCULATED IN VERIF. ANALYSIS EXCEEDED ALLOWABLES IN TWO AREAS OF PIPING. RLCA IDENTIFIED 3 DIFFERENCES. BASED ON RES. SHT. DATED 830218, RLCA TO REVIEW NEW DESIGN ANALYSIS 7-103 WHICH HAS SUPERCEDED PREVIOUS ANALYSIS 7-1. NEW ANALYSIS (7-103) HAS ADDRESSED ALL 3 ITEMS.										
1107	821123	ICD	4	830311	RLCA	PPRR/OIP	TES	RDF		COMPARISON: PG&E AND RLCA PIPING 110
COMMENT: RLCA REVIEWED REVISED DCP ANALYSIS 7-103 R. 0, INCLUDES 2 VALVES ON LINE 3488 VENT LINE AND 2.1 SIF FOR SOCKET CONNECTIONS. TWO DW SUPPORTS ON LINE 4259 NOT MODELED AS RIGID VERTICAL. ALL CONCERNS OF RLCA 110 ADDRESSED BY REVISED DCP ANALYSIS. RLCA TO VERIFY MODS AFTER INSTALLATION.										
1107	821123	ICD	5	830314	TES	PRR/OIP	PG&E	RDF	YES	COMPARISON: PG&E AND RLCA PIPING 110
COMMENT: RLCA REVIEWED REVISED DCP ANALYSIS 7-103 R. 0, INCLUDES 2 VALVES ON LINE 3488 VENT LINE AND 2.1 SIF FOR SOCKET CONNECTIONS. TWO DW SUPPORTS ON LINE 4259 NOT MODELED AS RIGID VERTICAL. ALL CONCERNS OF RLCA 110 ADDRESSED BY REVISED DCP ANALYSIS. RLCA TO VERIFY MODS AFTER INSTALLATION.										
1107	821123	ICD	6	830524	TES	OIR	RLCA	RDF	YES	COMPARISON: PG&E AND RLCA PIPING 110
COMMENT: VERIFICATION CALCS SHOW OVERSTRESS IN TWO AREAS. QUESTION OF TWO VERTICAL SUPPORTS ADDRESSED IN AN ITR. ALL CONCERNS OF RLCA 110 HAVE BEEN ADDRESSED IN DCP REVISED ANALYSIS (7-103) HAVE BEEN REVIEWED BY RLCA. MODS PER DCP 830518 COMP. SHT. TO BE VERIFIED BY RLCA.										
1107	821123	ICD	7	830601	RLCA	PPRR/CI	TES	RDF	YES	COMPARISON: PG&E AND RLCA PIPING 110
COMMENT: ALL CONCERNS NOTED AS A RESULT OF RLCA PIPING ANALYSIS 110 HAVE BEEN ADDRESSED BY THE REVISED DCP ANALYSIS (7-103, R.0). RLCA HAS FIELD VERIFIED THE MODIFICATION REQUIRED TO ADDRESS THE CONCERNS.										
1107	821123	ICD	8	830607	TES	PRR/CI	TES	RDF	YES	COMPARISON: PG&E AND RLCA PIPING 110
COMMENT: RLCA FIELD VERIFIED AND MODELED TWO VALVES ATTACHED TO 3/4" VENT LINE FROM LINE 3488, FIELD VERIFIED 2 SUPPORTS ON LINE 4259 TO BE DW ONLY. USED DIFFERENT SOCKET WELD CONNECTION SIF. RLCA HAS FIELD VERIFIED MODS REQUIRED TO ADDRESS THE CONCERN.										
1107	821123	ICD	9	830607	TES	CR	NONE	RDF	YES	COMPARISON: PG&E AND RLCA PIPING 110
COMMENT: STRESSES CALCULATED IN VERIFICATION ANALYSIS EXCEED ALLOWABLE VALUES IN SEPARATE AREAS OF PIPING. ALL CONCERNS NOTED AS A RESULT OF RLCA PIPING SAMPLE 110 HAVE BEEN ADDRESSED BY THE REVISED DCP ANALYSIS 7-103, R. 0; RLCA HAS FIELD VERIFIED MODS REQUIRED. CLOSED ITEM. PREVIOUSLY ER/A.										
1108	821207	ICD	0	821207	RLCA	OIR	RLCA	RDF		RLCA PIPING 110,DESIGN ANALYSIS 7-1,REV-5
COMMENT: DESIGN ANALYSIS OF RTD LINES DOES NOT INCLUDE MOVEMENTS AT THE ATTACHMENT TO THE REACTOR COOLANT SYSTEM. RLCA INCLUDED THE MOVEMENTS IN VERIFICATION ANALYSIS. IN THIS CASE, THESE MOVEMENTS DID NOT CONTRIBUTE SIGNIFICANTLY TO THE OVERSTRESS REPORTED IN EOI 1107.										
1108	821207	ICD	1	821207	RLCA	PER/C	TES	RDF		RLCA PIPING 110,DESIGN ANALYSIS 7-1,REV-5
COMMENT: DESIGN ANALYSIS OF RTD LINES DOES NOT INCLUDE MOVEMENTS AT THE ATTACHMENT TO THE REACTOR COOLANT SYSTEM. RLCA INCLUDED THE MOVEMENTS IN VERIFICATION ANALYSIS. IN THIS CASE, THESE MOVEMENTS DID NOT CONTRIBUTE SIGNIFICANTLY TO THE OVERSTRESS REPORTED IN EOI 1107.										
1108	821207	ICD	2	821213	RLCA	PPRR/OIP	TES	RDF		RLCA PIPING 110,DESIGN ANALYSIS 7-1,REV-5
COMMENT: EOI 1107 NOTES OVERSTRESS IN VERIFICATION ANALYSIS. OVERSTRESS IS NOT CAUSED BY INCLUSION OF THESE SAM EFFECTS IN VERIFICATION ANALYSIS. LICENSING CRITERIA DOES NOT ADDRESS SMALL BORE PIPING ATTACHED TO RCS. PG&E TO CLARIFY LICENSING CRITERIA WITH RESPECT TO SMALL BORE PIPING ATTACHED TO RCS.										
1108	821207	ICD	3	821217	TES	PRR/OIP	PG&E	RDF		RLCA PIPING 110,DESIGN ANALYSIS 7-1,REV-5
COMMENT: EOI 1107 NOTES OVERSTRESS IN VERIFICATION ANALYSIS. OVERSTRESS IS NOT CAUSED BY INCLUSION OF SAM EFFECTS WHICH WERE INCLUDED. LICENSING CRITERIA DOES NOT ADDRESS SMALL BORE PIPING ATTACHED TO REACTOR COOLANT SYSTEM. PG&E TO CLARIFY LICENSING CRITERIA WITH RESPECT TO SMALL BORE PIPING ATTACHED TO RCS.										

FILE NO.	REV. 0 DATE	BASIS	REV.	LATEST REV. DATE	BY	STATUS	ACTION ORG	TES	PG&E MODS	SUBJECT
1120	830322	FID	1	830322	RLCA	PER/B	TES	CHK		CONDENSORS CR-35 (PHASE I DCP CORRECTIVE ACTION)
COMMENT: DESIGN ANALYSIS HV-4.1 SHOWS 3/4" EXT. HOUSING MOUNTING BOLTS USED IN EARLIER EDS CALC. IDVP FIELD CHECK SHOWS BOLTS TO BE 1/2". IDVP FACTORED BOLT STRESS IN D.A. BY DIFFERENCE IN BOLT SIZE (3/4" VS. 1/2"). RESULTANT BOLT STRESS EXCEEDS ALLOWABLE. DCP HAS REVISED D.A. AS A RESULT OF IDVP FIELD VERIFICATION TO SHOW BOLT STRESS TO BE BELOW ALLOWABLE.										
1120	830322	FID	2	830405	TES	ER/B	PG&E	CHK		CONDENSORS CR-35 (PHASE I DCP CORRECTIVE ACTION)
COMMENT: DESIGN ANALYSIS SHOWS 3/4" EXTERIOR HOUSING MOUNTING BOLTS USED IN EARLIER EDS CALC WERE ACCEPTED IN PH I DCP CAP. IDVP FOUND 1/2" BOLTS AND FACTORED BOLT STRESS BY DIFFERENCE IN BOLT SIZE. STRESS EXCEEDS ALLOWABLE. DCP HAS REVISED D.A. AND ABLE TO SHOW STRESSES BELOW ALLOWABLE.										
1120	830322	FID	3	830420	TES	OIR	RLCA	CHK		CONDENSORS CR-35 (PHASE I DCP CORRECTIVE ACTION)
COMMENT: ADVERSE EFFECT OF LOWER BOLT SIZE ON STRESS COMPENSATED FOR BY INCREASED NUMBER OF BOLTS AND OVERALL BOLT SPACING. TES RECOMMENDS RLCA TO REVIEW THIS FILE AND CONSIDER DOWNGRADING IT FROM AN ER/B TO AN ER/C.										
1120	830322	FID	4	830429	RLCA	PER/C	TES	CHK		CONDENSORS CR-35 (PHASE I DCP CORRECTIVE ACTION)
COMMENT: ORIGINAL EDS CALC SHOWED FOUR 3/4" MOUNTING BOLTS. FIELD SHOWS 1/2". HOWEVER, ADVERSE EFFECT OF SMALLER BOLT SIZE COMPENSATE BY ACTUAL FIELD CONFIGURATION (6 MOUNTINGS AS OPPOSED TO 4 IN DESIGN ANALYSIS) DOWNGRADED FROM ER/B TO ER/C SINCE CRITERIA OR LIMITS HAVEN'T BEEN EXCEEDED.										
1120	830322	FID	5	830504	TES	ER/C	PG&E	CHK		CONDENSORS CR-35 (PHASE I DCP CORRECTIVE ACTION)
COMMENT: ORIGINAL EDS CALC SHOWED FOUR 3/4" MOUNTING BOLTS. FIELD SHOWS 1/2". HOWEVER, ADVERSE EFFECT OF SMALLER BOLT SIZE COMPENSATE BY ACTUAL FIELD CONFIGURATION (6 MOUNTINGS AS OPPOSED TO 4 IN DESIGN ANALYSIS) DOWNGRADED FROM ER/B TO ER/C SINCE CRITERIA OR LIMITS HAVEN'T BEEN EXCEEDED.										
1120	830322	FID	6	830507	TES	CR	NONE	CHK	NO	CONDENSORS CR-35 (PHASE I DCP CORRECTIVE ACTION)
COMMENT: ORIGINAL EDS CALC SHOWED FOUR 3/4" MOUNTING BOLTS. FIELD SHOWS 1/2". HOWEVER, ADVERSE EFFECT OF SMALLER BOLT SIZE COMPENSATE BY ACTUAL FIELD CONFIGURATION (6 MOUNTINGS AS OPPOSED TO 4 IN DESIGN ANALYSIS) DOWNGRADED FROM ER/B TO ER/C SINCE CRITERIA OR LIMITS HAVEN'T BEEN EXCEEDED.										
1121	830506	FID	0	830506	RLCA	OIR	RLCA	CHK		BOLT SIZE, FILTER UNIT - 39.
COMMENT: DESIGN ANALYSIS HV-5.11, R. 0 SHOWS ANCHOR BOLT SIZE OF 5/8" BETWEEN CONCRETE SLAB AND WIDE FLANGE BASE BEAM. FIELD SHOWS 1/2" DIAMETER. RLCA TO DETERMINE SIGNIFICANCE. WILL BE EXAMINED W/1096 AND 1120 FOR POSSIBLE GENERIC CONCERN RE: HVAC COMPONENT HOLD DOWN BOLT SIZE.										
1121	830506	FID	1	830608	RLCA	PER/C	TES	CHK		BOLT SIZE, FILTER UNIT - 39.
COMMENT: DCP REVISED ANALYSIS SHOWS BOLTS TO MEET ALLOWABLES AND DESIGN CRITERIA. RESULT OF THIS EOI, 1096 AND 1020, POSSIBLE GENERIC CONCERN, EVEN THOUGH NO OVERSTRESS. RLCA WILL REVIEW DCP BOLT SIZE PROGRAM AND SPECIFIC SAMPLE OF CL. I HOLD-DOWN BOLTS.										
1121	830506	FID	2	830610	TES	ER/C	PG&E	CHK		BOLT SIZE, FILTER UNIT - 39.
COMMENT: DCP REVISED ANALYSIS SHOWS BOLTS TO MEET ALLOWABLES AND DESIGN CRITERIA. RESULT OF THIS EOI, 1096 AND 1020, POSSIBLE GENERIC CONCERN, EVEN THOUGH NO OVERSTRESS. RLCA WILL REVIEW DCP BOLT SIZE PROGRAM AND IF DEEMED NECESSARY, A SPECIFIC SAMPLE OF CL. I HOLD-DOWN BOLTS.										
1121	830506	FID	3	830610	TES	CR	NONE	CHK	NO	BOLT SIZE, FILTER UNIT - 39.
COMMENT: DISCREPANCY BETWEEN HOLD-DOWN BOLT SIZE IN D.A. AND IN FIELD. DCP REVISED ANALYSIS SHOWS BOLTS TO MEET ALLOWABLES AND DESIGN CRITERIA. RESULT OF THIS EOI, 1096 AND 1020, POSSIBLE GENERIC CONCERN, EVEN THOUGH NO OVERSTRESS. RLCA WILL REVIEW DCP BOLT SIZE PROGRAM AND IF DEEMED NECESSARY, A SPECIFIC SAMPLE OF CL. I HOLD-DOWN BOLTS.										
1122	830512	OD	0	830512	RLCA	OIR	RLCA	JFH		LARGE BORE PIPE SUPPORT 10/70SL
COMMENT: DESIGN ANALYSIS CALC NO. S-1281 R.3 DOESN'T ADDRESS SUPPORT FREQUENCIES IN UNRESTRAINED DIRECTIONS AS REQUIRED BY LICENSING CRITERIA. SIMPLIFIED IDVP CALCS SHOWS FREQUENCIES LESS THAN 20 HZ. DCP INDICATES ANALYSIS HAS BEEN REVISED (REV 4) AND IT ADDRESSES AND SHOWS ALL FREQ. IN UNRESTRAINED DIRECTION GREATER THAN 20 HZ. IDVP WILL VERIFY CALC										
1122	830512	OD	1	830623	RLCA	PER/C	TES	JFH		LARGE BORE PIPE SUPPORT 10/70SL
COMMENT: D.A. FOR SUPPORT 10/70SL (CALC S-1281, R. 3) DOESN'T ADDRESS SUPPORT FREQUENCY IN UNRESTRAINED DIRECTION AS REQUIRED BY DCP PROCEDURES. REALISTIC CALCS SHOW FREQ TO BE ABOVE 20 HZ ALLOWABLE. IDVP DOESN'T CONSIDER THIS EOI TO BE A GENERIC CONCERN.										
1122	0		2	0						
COMMENT: SPACE PROVIDED FOR LATER REVISIONS.										
1122	0		3	0						
COMMENT: SPACE PROVIDED FOR LATER REVISIONS.										
1122	0		4	0						
COMMENT: SPACE PROVIDED FOR LATER REVISIONS.										

FILE NO.	REV. 0 DATE	REV. 0 BASIS	LATEST REV. REV.	LATEST REV. DATE	LATEST REV. BY	LATEST REV. STATUS	ACTION ORG	ACTION TES	PG&E MODS	SUBJECT
1122	0		5	0						

COMMENT: SPACE PROVIDED FOR LATER REVISIONS.

1123 830513 OD 0 830513 RLCA OIR RLCA RCW INSTRUMENTATION TUBING SUPPORT
COMMENT: DESIGN ANALYSIS ITS-5, R. 0 ASSUMES SUPPORT MEMBER TO BE A 1202 SECTION. D.A. ITS-5, R.1 PROVIDES AS-BUILT DATA THAT SHOWS A B 1202 SECTION. SIMPLIFIED D.A. FOR SUPPORT MEMBER INDICATES STRESS ABOVE ALLOWABLE IF CORRECT SECTION PROPERTY (J) IS USED. REPRESENTS SOLE INSTANCE WHERE LICENSING CRITERIA MAY HAVE BEEN EXCEEDED.

1123 830513 OD 1 830623 RLCA PER/C TES RCW INSTRUMENTATION TUBING SUPPORT
COMMENT: D.A. ITS-5, R. 0 ASSUMES SUPPORT MEMBER TO BE A 1202 SECTION. REVISION 1 PROVIDES AS-BUILT DATA THAT SHOWS SUPPORT MEMBER TO BE A B 1202 SECTION. MORE REALISTIC CALCS SHOW ALL STRESSES TO BE UNDER ALLOWABLES. IDVP DOESN'T CONSIDER THIS EOI TO BE A GENERIC CONCERN.

1123 830513 OD 2 830627 TES ER/C PG&E RCW INSTRUMENTATION TUBING SUPPORT
COMMENT: DESIGN ANALYSIS ITS-5, R. 0 ASSUMES SUPPORT MEMBER TO BE A-1202 SECTION. R. 1 OF CALC PROVIDES AS-BUILT DATA THAT SHOWS SUPPORT MEMBER TO BE B-1202 SECTION. MORE REALISTIC CALCS SHOW ALL STRESSES TO BE UNDER ALLOWABLES. THIS EOI NOTES A SOLE INSTANCE, IDVP DOESN'T CONSIDER THIS A GENERIC CONCERN.

1123 0 3 0
COMMENT: SPACE RESERVED FOR LATER REVISIONS.

1123 0 4 0
COMMENT: SPACE RESERVED FOR LATER REVISIONS.

1123 0 5 0
COMMENT: SPACE RESERVED FOR LATER REVISIONS.

1124 830514 OD 0 830514 RLCA OIR RLCA RDC AUXILIARY BUILDING SPECTRA GENERATION
COMMENT: D.A. F.E. MODEL C.R. SLAB USED TO GENERATE HOSGRI RESPONSE SPECTRA DOESN'T AGREE WITH FIELD LOCATION OF SUPPORTING WALLS. SPAN LENGTHS OF SLAB MAY SHIFT FREQUENCY AND APPROACH FUNDAMENTAL VERTICAL FREQUENCY AND PROVIDE INCREASED AMPLIFICATION. CLASSIFICATION OF EOI WILL DEPEND ON SUBSEQUENT VERIFICATION.

1124 830514 OD 1 830627 RLCA PER/B TES RDC AUXILIARY BUILDING SPECTRA GENERATION
COMMENT: DESIGN ANALYSIS FEM OF CR SLAB USED TO GENERATE HOSGRI SPECTRA DOESN'T AGREE WITH FIELD VERIFIED LOCATION OF SUPPORTING WALLS. DCP REVISED FEM TO AGREE WITH FIELD. AT CERTAIN FREQUENCIES, SPECTRA INCREASED BY 15%. DCP INDICATES NO STRUCTURAL MODS RESULTED FROM THIS ERROR.

1124 830514 OD 2 830628 TES ER/B PG&E RDC AUXILIARY BUILDING SPECTRA GENERATION
COMMENT: DESIGN ANALYSIS FEM OF CR SLAB USED TO GENERATE HOSGRI SPECTRA DOESN'T AGREE WITH FIELD VERIFIED LOCATION OF SUPPORTING WALLS. DCP REVISED FEM TO AGREE WITH FIELD. AT CERTAIN FREQUENCIES, SPECTRA INCREASED BY 15%. DCP INDICATES NO STRUCTURAL MODS RESULTED FROM THIS ERROR.

1124 0 3 0
COMMENT: SPACE RESERVED FOR LATER REVISIONS.

1124 0 4 0
COMMENT: SPACE RESERVED FOR LATER REVISIONS.

1124 0 5 0
COMMENT: SPACE RESERVED FOR LATER REVISIONS.

1125 830520 SID 0 830520 RLCA OIR RLCA CHK HVAC COMPRESSOR CP-35, 36
COMMENT: CONTROL AND APPLICATION OF HOSGRI SPECTRA WAS IDENTIFIED IN INITIAL SAMPLE AS A GENERIC CONCERN. DCP CAP FORMULATED TO INCLUDE REVIEW FOR CORRECT HOSGRI SPECTRA INPUTS. DESIGN ANALYSIS D-HV-3.1-1, REV. 1 USES INCORRECT AND UNCONSERVATIVE SPECTRA. NO OVERSTRESS.

1125 830520 SID 1 830526 RLCA PER/C TES CHK HVAC COMPRESSOR CP-35, 36
COMMENT: CALC D-HV-3.1-1 REV. 1 USES INCORRECT AND UNCONSERVATIVE SPECTRA. CONTROL AND APPLICATION OF HOSGRI SPECTRA ID DURING INITIAL SAMPLE WORK AS GENERIC CONCERN. DCP CAP FORMULATED TO INCLUDE REVIEW FOR CORRECT HOSGRI SPECTRA INPUTS. THIS ITEM DOES NOT CAUSE OVERSTRESS.

	REV. 0		LATEST REV.				ACTION		PG&E	
FILE NO.	DATE	BASIS	REV.	DATE	BY	STATUS	ORG	TES	MODS	SUBJECT
1125	830520	SID	2	830602	TES	ER/C	PG&E	CHK		HVAC COMPRESSOR CP-35, 36

COMMENT: CALC D-HV-3.1-1 REV. 1 USES INCORRECT AND UNCONSERVATIVE SPECTRA. CONTROL AND APPLICATION OF HOSGRI SPECTRA ID DURING INITIAL SAMPLE WORK AS GENERIC CONCERN. DCP CAP FORMULATED TO INCLUDE REVIEW FOR CORRECT HOSGRI SPECTRA INPUTS. THIS ITEM DOES NOT CAUSE OVERSTRESS.

	REV. 0		LATEST REV.				ACTION		PG&E	
FILE NO.	DATE	BASIS	REV.	DATE	BY	STATUS	ORG	TES	MODS	SUBJECT
1125	830520	SID	3	830609	TES	CR	NONE	CHK	NO	HVAC COMPRESSOR CP-35, 36

COMMENT: CONTROL AND APPLICATION OF HOSGRI SPECTRA WAS IDENTIFIED DURING INITIAL SAMPLE AS GENERIC CONCERN. DCP CAP FORMULATED TO INCLUDE REVIEW FOR CORRECT HOSGRI INPUTS. D-HV-3.1-1, REV. 1 USES INCORRECT AND UNCONSERVATIVE SPECTRA. REV 2 INDICATES THIS ITEM DOES NOT CAUSE AN OVERSTRESS.

	REV. 0		LATEST REV.				ACTION		PG&E	
FILE NO.	DATE	BASIS	REV.	DATE	BY	STATUS	ORG	TES	MODS	SUBJECT
1126	830520	DHD	0	830520	RLCA	OIR	RLCA	RDF		SIF - CORRECTIVE ACTION PIPING

COMMENT: DCP NOT APPLYING SIF OF 1.8 AT INTERMEDIATE BUTT WELD LOCATIONS ON STRAIGHT PIPE (GENERIC CONCERN). AT VALVE/ELBOW INTERFACE, ME-101 PIPING ANALYSIS PROGRAM DOESN'T APPLY TAPER TRANSITION SIF TO ELBOW SIDE OF JOINT (NO OVERSTRESS). DCP TAKEN STEPS TO ADDRESS THIS GENERIC CONCERN.

	REV. 0		LATEST REV.				ACTION		PG&E	
FILE NO.	DATE	BASIS	REV.	DATE	BY	STATUS	ORG	TES	MODS	SUBJECT
1126	830520	DHD	1	830622	RLCA	PPRR/CI	TES	RDF		SIF - CORRECTIVE ACTION PIPING

COMMENT: DCP NOT APPLYING AN SIF OF 1.8 AT INTERMEDIATE BUTT WELD LOCATIONS ON STRAIGHT PIPE AND TAPER TRANSITION SIF OF 1.9 TO ELBOW SIDE OF JOINT. DCP 830620 COMPLETION PACKAGE; ALL SIF IN LARGE BORE PIPING TO BE REVIEWED. TO BE COMBINED WITH 1098 AS AN ER/AB.

	REV. 0		LATEST REV.				ACTION		PG&E	
FILE NO.	DATE	BASIS	REV.	DATE	BY	STATUS	ORG	TES	MODS	SUBJECT
1126	830520	DHD	2	830625	TES	PRR/CI	TES	RDF		SIF - CORRECTIVE ACTION PIPING

COMMENT: DCP NOT APPLYING AN SIF OF 1.8 AT INTERMEDIATE BUTT WELD LOCATIONS ON STRAIGHT PIPE AND TAPER TRANSITION SIF OF 1.9 TO ELBOW SIDE OF JOINT. DCP 830620 COMPLETION PACKAGE; ALL SIF IN LARGE BORE PIPING TO BE REVIEWED. TO BE COMBINED WITH 1098 AS AN ER/AB.

	REV. 0		LATEST REV.				ACTION		PG&E	
FILE NO.	DATE	BASIS	REV.	DATE	BY	STATUS	ORG	TES	MODS	SUBJECT
1126	830520	DHD	3	830625	TES	CR	NONE	RDF		SIF - CORRECTIVE ACTION PIPING

COMMENT: DCP NOT APPLYING SIF OF 1.8 AT INTERMEDIATE BUTT WELD LOCATIONS ON STRAIGHT PIPE (GENERIC CONCERN). AT VALVE/ELBOW INTERFACE, ME-101 PIPING ANALYSIS PROGRAM DOESN'T APPLY TAPER TRANSITION SIF TO ELBOW SIDE OF JOINT (NO OVERSTRESS). DCP WILL REVIEW ALL LARGE BORE CL. I ANALYSES FOR SIF. COMBINED WITH EOI 1098 AS ER/AB. CLOSED ITEM.

	REV. 0		LATEST REV.				ACTION		PG&E	
FILE NO.	DATE	BASIS	REV.	DATE	BY	STATUS	ORG	TES	MODS	SUBJECT
1127	830525	DHD	0	830525	RLCA	OIR	RLCA	CHK		HVAC SUPPLY FANS S-1, 2

COMMENT: DCP FREQUENCY CALC CONSIDERED ONLY BEARING BLOCK SUPPORT BEAM AND DOES NOT INCLUDE OTHER FLEXIBILITIES OF FAN SUPPORTING STRUCTURE. A MORE REALISTIC FREQUENCY MAY RESULT IN HIGHER SEISMIC ACCELERATIONS WHICH WOULD AFFECT STRESS RESULTS OF THIS ANALYSIS.

	REV. 0		LATEST REV.				ACTION		PG&E	
FILE NO.	DATE	BASIS	REV.	DATE	BY	STATUS	ORG	TES	MODS	SUBJECT
1127	830525	DHD	1	830613	RLCA	PPRR/CI	TES	CHK		HVAC SUPPLY FANS S-1, 2

COMMENT: DCP FREQUENCY CALC ACCEPTABLE BASED ON SIMILARITIES WITH RLCA INITIAL SAMPLE WORK (FAN S-31), ADDITIONAL FLEXIBILITIES NOT SIGNIFICANT. DCP BEARING BLOCK SUPPORT BEAM FREQUENCY CALC IS CORRECT, ORIGINAL RLCA CONCERN NOT VALID.

	REV. 0		LATEST REV.				ACTION		PG&E	
FILE NO.	DATE	BASIS	REV.	DATE	BY	STATUS	ORG	TES	MODS	SUBJECT
1127	830525	DHD	2	830616	TES	PRR/CI	TES	CHK		HVAC SUPPLY FANS S-1, 2

COMMENT: DCP FREQUENCY CALC FOUND ACCEPTABLE BASED UPON SIMILARITIES WITH RLCA INITIAL SAMPLE WORK (FAN S-31); THE ADDITIONAL FLEXIBILITIES ARE NOT SIGNIFICANT. DCP BEARING BLOCK SUPPORT BEAM FREQUENCY CALC IS CORRECT, ORIGINAL RLCA CONCERN WAS NOT VALID.

FILE NO.	REV. 0 DATE	BASIS	LATEST REV. REV.	DATE	BY	STATUS	ACTION ORG	TES	PG&E MODS	SUBJECT
1127	830525	DMD	3	830616	TES	CR	NONE	CHK	NO	HVAC SUPPLY FANS S-1, 2

COMMENT: DCP FREQUENCY CALC USED ONLY BEARING BLOCK SUPPORT BEAM AND NOT OTHER FLEX OF FAN SUPPORTING STRUCTURE. FN MAY ACTUALLY BE LOWER. DCP FREQ CALC ACCEPTABLE - SIMILIAR TO INITIAL SAMPLE WORK (FAN S-31). DCP BEARING BLOCK SUPPORT BEAM FREQ CALC CORRECT, ORIGINAL RLCA CONCERN NOT VALID. CLOSED ITEM.

FILE NO.	REV. 0 DATE	BASIS	LATEST REV. REV.	DATE	BY	STATUS	ACTION ORG	TES	PG&E MODS	SUBJECT
1128	830531	FID	0	830531	RLCA	OIR	RLCA	CHK		STATION BATTERY RACKS

COMMENT: D.A. FOR RACKS ASSUMES 1/2" DIAMETER A-307 STRUCTURAL BOLTS. RLCA FIELD VERIFIED BOLTS TO BE 3/8". IF BOLTS THREADED AT SHEAR LOCATIONS SHEAR STRESS EXCEEDS ALLOWABLES BY 63%, IF NOT THREADED, STRESS IS ACCEPTABLE.

FILE NO.	REV. 0 DATE	BASIS	LATEST REV. REV.	DATE	BY	STATUS	ACTION ORG	TES	PG&E MODS	SUBJECT
1128	830531	FID	1	830620	RLCA	OIR	RLCA	CHK		STATION BATTERY RACKS

COMMENT: D.A. FOR STATION BATTERY RACKS ASSUMES A-307 1/2" STRUCTURAL BOLTS. RLCA FIELD VERIFIED BOLTS TO BE 3/8". D.A. ALSO DOESN'T CONSIDER RESOLVED SHEAR FORCE FOR 3/8" BOLT ANALYSIS. STRESSES EXCEED ALLOWABLE IF CORRECT BOLT SIZE AND SHEAR FORCE IS USED.

FILE NO.	REV. 0 DATE	BASIS	LATEST REV. REV.	DATE	BY	STATUS	ACTION ORG	TES	PG&E MODS	SUBJECT
1128	830531	FID	2	830627	RLCA	PPRR/OIP	TES	CHK		STATION BATTERY RACKS

COMMENT: D.A. FOR STATION BATTERY RACKS ASSUMES A-307 1/2" STRUCTURAL BOLTS. RLCA FIELD VERIFIED BOLTS TO BE 3/8". D.A. ALSO DOESN'T CONSIDER RESOLVED SHEAR FORCE FOR 3/8" BOLT ANALYSIS. STRESSES EXCEED ALLOWABLE IF CORRECT BOLT SIZE AND SHEAR FORCE IS USED.

FILE NO.	REV. 0 DATE	BASIS	LATEST REV. REV.	DATE	BY	STATUS	ACTION ORG	TES	PG&E MODS	SUBJECT
1128	830531	FID	3	830628	TES	PRR/OIP	PG&E	CHK		STATION BATTERY RACKS

COMMENT: D.A. FOR STATION BATTERY RACKS ASSUMES A-307 1/2" STRUCTURAL BOLTS. RLCA FIELD VERIFIED BOLTS TO BE 3/8". D.A. ALSO DOESN'T CONSIDER RESOLVED SHEAR FORCE FOR 3/8" BOLT ANALYSIS. STRESSES EXCEED ALLOWABLE IF CORRECT BOLT SIZE AND SHEAR FORCE IS USED.

FILE NO.	REV. 0 DATE	BASIS	LATEST REV. REV.	DATE	BY	STATUS	ACTION ORG	TES	PG&E MODS	SUBJECT
1129	830603	OD	0	830603	RLCA	OIR	RLCA	JFM		LARGE BORE PIPE SUPPORT 56S/3A

COMMENT: D.A. INCORRECTLY ANALYZED 1/4" WELD BETWEEN PIPE LUG AND SUPPORTING STEEL. WELD STRESS EXCEEDS ALLOWABLE WHEN DIVIDED BY WELD CROSS SECTION. SUPPORT MODIFIED BY DCP. CONFIGURATION QUALIFIED BY CALC NO LONGER EXISTS IN PLANT. NO GENERIC CONCERN.

FILE NO.	REV. 0 DATE	BASIS	LATEST REV. REV.	DATE	BY	STATUS	ACTION ORG	TES	PG&E MODS	SUBJECT
1129	830603	OD	1	830620	RLCA	PER/C	TES	JFM		LARGE BORE PIPE SUPPORT 56S/3A

COMMENT: WELD STRESS CALC USED CONSERVATIVE ASSUMPTION FOR MOMENT OF INERTIA. STRESS MEETS ALLOWABLES IF ACCURATE MEMENT OF INERTIA IS USED AND RESULTANT STRESS IS DIVIDED BY WELD CROSS SECTION. SUPPORT MODIFIED BY DCP. SUPPORT QUALIFIED BY CALC A-103, R5 NO LONGER EXISTS IN PLANT. NOT A GENERIC CONCERN.

FILE NO.	REV. 0 DATE	BASIS	LATEST REV. REV.	DATE	BY	STATUS	ACTION ORG	TES	PG&E MODS	SUBJECT
1129	830603	OD	2	830627	TES	ER/C	PG&E	JFM		LARGE BORE PIPE SUPPORT 56S/3A

COMMENT: D.A. MADE COMPENSATING ERRORS ANALYZING 1/4" WELD BETWEEN PIPE LUG AND SUPPORTING STEEL. WELD STRESSES DO NOT EXCEED ALLOWABLES. NO GNERIC CONCERN. ERROR C.

FILE NO.	REV. 0 DATE	BASIS	LATEST REV. REV.	DATE	BY	STATUS	ACTION ORG	TES	PG&E MODS	SUBJECT
1129	830603	OD	3	830628	TES	CR	NONE	JFM		LARGE BORE PIPE SUPPORT 56S/3A

COMMENT: D.A. MADE COMPENSATING ERRORS ANALYZING 1/4" WELD BETWEEN PIPE LUG AND SUPPORTING STEEL. WELD STRESSES DO NOT EXCEED ALLOWABLES. NO GNERIC CONCERN. ERROR C.

	REV. 0		LATEST REV.				ACTION		PG&E	
FILE NO.	DATE	BASIS	REV.	DATE	BY	STATUS	ORG	TES	MODS	SUBJECT
1130	830603	OD	0	830603	RLCA	OIR	RLCA	PPR		COMPONENT COOLING WATER LUBE OIL FILTER

COMMENT: D.A. CONCLUDES COOLER NOT QUALIFIED AND MODS ARE REQUIRED. PG&E PH. I FINAL REPORT STATES IT IS AND MODS NOT NEEDED. ITR #8 R. 0 REQUIRES IDVP TO VERIFY DCP CAP HAS BEEN FULLY IMPLEMENTED. THE SIGNIFICANCE OF CONCERN IS THAT REQUIRED CORRECTIVE ACTION WAS NOT IMPLEMENTED. RLCA TO EXPAND REVIEW IN THIS AREA.

	REV. 0		LATEST REV.				ACTION		PG&E	
FILE NO.	DATE	BASIS	REV.	DATE	BY	STATUS	ORG	TES	MODS	SUBJECT
1130	830603	OD	1	830618	RLCA	PPRR/DEV	TES	PPR		COMPONENT COOLING WATER LUBE OIL FILTER

COMMENT: DCP SCHEDULE AND FINAL REPORT SHOWED WORK ON THIS ITEM TO BE COMPLETE AND QUALIFIED. AFTER 830614 TECHNICAL MEETING, DCP SHOWED THE ITEM INCLUDED ON INTERNAL INTERFACE LISTS OF ITEMS FOR ACTION. IT IS CLEAR THAT REQUIRED ACTION WOULD HAVE BEEN IMPLEMENTED. DCP COMMITTED TO REVISE THIS SECTION OF PH. I FINAL REPORT.

	REV. 0		LATEST REV.				ACTION		PG&E	
FILE NO.	DATE	BASIS	REV.	DATE	BY	STATUS	ORG	TES	MODS	SUBJECT
1130	830603	OD	2	830627	TES	PRR/DEV	PG&E	PPR		COMPONENT COOLING WATER LUBE OIL FILTER

COMMENT: PG&E PH. I FINAL REPORT INDICATES THIS ITEM QUALIFIED AND NO MODS. DESIGN ANALYSIS CONCLUDES THAT IT IS NOT QUALIFIED DUE TO HIGH NOZZLE LOADS. DCP INTERNAL MEMOS INDICATE ITEM ALREADY BEING TRACKED. PH. I FINAL REPORT IS INCORRECT, PG&E HAS COMMITED TO CORRECT IT.

	REV. 0		LATEST REV.				ACTION		PG&E	
FILE NO.	DATE	BASIS	REV.	DATE	BY	STATUS	ORG	TES	MODS	SUBJECT
1131	830606	OD	0	830606	RLCA	OIR	RLCA	JFM		LARGE BORE PIPE SUPPORTS 58S/16V AND 63/26V

COMMENT: D.A. DO NOT EVALUATE SHEAR LUGS AND ATTACHMENT WELDS. EVALUATION REQUIRED FOR CAP. IDVP WILL REVIEW REVISED DCP CALCS AND EVALUATE THE LUGS AND WELDS BASED ON ORIGINAL LOADS.

	REV. 0		LATEST REV.				ACTION		PG&E	
FILE NO.	DATE	BASIS	REV.	DATE	BY	STATUS	ORG	TES	MODS	SUBJECT
1131	830606	OD	1	830620	RLCA	PPRR/DEV	TES	JFM		LARGE BORE PIPE SUPPORTS 58S/16V AND 63/26V

COMMENT: DESIGN ANALYSES DON'T EVALUATE SHEAR LUGS AND ATTACHMENT WELDS [CALCS H-1040 R.2 AND H-359 R.4]. THIS IS REQUIRED BY DCP PROCEDURES. DEPARTURE FROM PROCEDURE, NOT ERROR. STRESSES ARE LOW BY INSPECTION.

	REV. 0		LATEST REV.				ACTION		PG&E	
FILE NO.	DATE	BASIS	REV.	DATE	BY	STATUS	ORG	TES	MODS	SUBJECT
1131	830606	OD	2	830624	TES	PRR/DEV	PG&E	JFM		LARGE BORE PIPE SUPPORTS 58S/16V AND 63/26V

COMMENT: D.A. FOR THESE SUPPORTS AND ASSOCIATED PIPING DON'T EVALUATE SHEAR LUGS AND ATTACHMENT WELDS. THIS EVALUATION REQUIRED BY DCP PROCEDURES. DEPARTURE FROM PROCEDURE, NOT AN ERROR. STRESSES IN THESE SHEAR LUGS AND ATTACHMENT WELDS ARE LOW BY INSPECTION.

	REV. 0		LATEST REV.				ACTION		PG&E	
FILE NO.	DATE	BASIS	REV.	DATE	BY	STATUS	ORG	TES	MODS	SUBJECT
1131	830606	OD	3	830624	TES	CR	NONE	JFM		LARGE BORE PIPE SUPPORTS 58S/16V AND 63/26V

COMMENT: D.A. FOR THESE SUPPORTS AND ASSOCIATED PIPING DON'T EVALUATE SHEAR LUGS AND ATTACHMENT WELDS. THIS EVALUATION REQUIRED BY DCP PROCEDURES. DEPARTURE FROM PROCEDURE, NOT AN ERROR. STRESSES IN THESE SHEAR LUGS AND ATTACHMENT WELDS ARE LOW BY INSPECTION. DEVIATION.

	REV. 0		LATEST REV.				ACTION		PG&E	
FILE NO.	DATE	BASIS	REV.	DATE	BY	STATUS	ORG	TES	MODS	SUBJECT
1132	830606	OD	0	830606	RLCA	OIR	RLCA	RDC		AUXILIARY BUILDING

COMMENT: DCP REPORTED COMPLETION OF AUX BUILDING MEMBER EVALUATIONS. DOES NOT INCLUDE EVALUATION OF SLABS FOR IN-PLANE LOADING. REQUIRED CORRECTIVE ACTION WAS NOT FULLY IMPLEMENTED, YET REPORTED AS COMPLETE. RLCA WILL CONTINUE REVIEW IN CIVIL/STRUCTURAL AREA.

FILE NO.	REV. 0 DATE	BASIS	LATEST REV. REV.	DATE	BY	STATUS	ACTION ORG	TES	PG&E MODS	SUBJECT
1132	830606	OD	1	830618	RLCA	PPRR/CI	TES	RDC		AUXILIARY BUILDING

COMMENT: THIS EOI CONTAINS AN INCORRECT STATEMENT. IT SHOULD READ '...THIS MODEL WAS REQUIRED TO MORE ACCURATELY DISTRIBUTE THE LOADS FROM THE ORIGINAL STICK MODEL...' RLCA RECOMMENDS COMBINING THIS EOI WITH EOI 1097 AS AN ERROR CLASS A OR B.

FILE NO.	REV. 0 DATE	BASIS	LATEST REV. REV.	DATE	BY	STATUS	ACTION ORG	TES	PG&E MODS	SUBJECT
1132	830606	OD	2	830625	TES	PRR/CI	TES	RDC		AUXILIARY BUILDING

COMMENT: THIS EOI CONTAINS AN INCORRECT STATEMENT. IT SHOULD READ '...THIS MODEL WAS REQUIRED TO MORE ACCURATELY DISTRIBUTE THE LOADS FROM THE ORIGINAL STICK MODEL...' RLCA RECOMMENDS COMBINING THIS EOI WITH EOI 1097 AS AN ERROR CLASS A OR B.

FILE NO.	REV. 0 DATE	BASIS	LATEST REV. REV.	DATE	BY	STATUS	ACTION ORG	TES	PG&E MODS	SUBJECT
1132	830606	OD	3	830627	TES	CR	NONE	RDC		AUXILIARY BUILDING

COMMENT: DCP REPORTED COMPLETION OF AUX BUILDING MEMBER EVALUATIONS. DOES NOT INCLUDE EVALUATION OF SLABS FOR IN-PLANE LOADING. THIS EOI CONTAINS AN INCORRECT STATEMENT. IT SHOULD READ '...THIS MODEL WAS REQUIRED TO MORE ACCURATELY DISTRIBUTE THE LOADS FROM THE ORIGINAL STICK MODEL...' RLCA RECOMMENDS COMBINING THIS EOI WITH 1097 AS AN ER/AB. CLOSED ITEM.

FILE NO.	REV. 0 DATE	BASIS	LATEST REV. REV.	DATE	BY	STATUS	ACTION ORG	TES	PG&E MODS	SUBJECT
1133	830613	OD	0	830613	RLCA	OIR	RLCA	RDF		LARGE BORE PIPING - ANALYSIS 8-117 REV. 2

COMMENT: VALVE 9003A IN D.A. 8-117, REV. 2 WAS MODELLED WITH 2/3 WEIGHT AT OVERALL VALVE C. OF G. SECT 4.5.6.2 OF DCP PROCEDURE P-11 REV. 3 REQUIRES TOTAL VALVE WEIGHT TO BE MODELLED THERE. RLCA TO EXAMINE REV. 3 TO CONFIRM STRESS IMPACT AND CONTINUE REVIEW OF VALVE MODELLING.

FILE NO.	REV. 0 DATE	BASIS	LATEST REV. REV.	DATE	BY	STATUS	ACTION ORG	TES	PG&E MODS	SUBJECT
1134	830615	OD	0	830615	RLCA	OIR	RLCA	RCW		HVAC DUCT AND DUCT SUPPORTS

COMMENT: RLCA HAS REVIEWED 3 D.A. THAT USED STRUDL-II . IN 2 OF THE 3, LOADING RESULTED IN MODAL FREQUENCY NOT CORRESPONDING TO FIRST MODE. ONE DIRECTIONAL LOADING USED WITH RAYLEIGH-RITZ METHOD MAY NOT ACCURATELY ESTABLISH FIRST MODE FREQUENCY. POSSIBLE GENERIC CONCERN.

FILE NO.	REV. 0 DATE	BASIS	LATEST REV. REV.	DATE	BY	STATUS	ACTION ORG	TES	PG&E MODS	SUBJECT
1135	830616	OD	0	830616	RLCA	OIR	RLCA	RDF		LARGE BORE PIPING ANALYSIS 2-120

COMMENT: VALVES LCV-113 AND 115 IN D. A. 2-120 REV. 0 WERE MODELLED WITH VALVE BODY WEIGHT OF 69 LBS AND OPERATOR WEIGHT OF 119 LBS. RLCA REVIEW SHOWED WEIGHTS TO BE APPROXIMATELY 125 LBS AND 130 LBS RESPECTIVELY.

FILE NO.	REV. 0 DATE	BASIS	LATEST REV. REV.	DATE	BY	STATUS	ACTION ORG	TES	PG&E MODS	SUBJECT
1136	830616	DMD	0	830616	RLCA	OIR	RLCA	PPR		COMPONENT COOLING WATER SURGE TANK

COMMENT: ALLOWABLE CALCULATED IN ANALYSIS IS LARGER THAN ALLOWABLE DEFINED BY CODE. TANK INTERNAL PRESSURE EXCLUDED FROM EVALUATION OF TANK SHELL STRESS AT NOZZLES. BOLT STRESSES WITHIN CORRECT ALLOWABLE. TANK SHELL STRESS EXCEED ALLOWABLE IN FORMAL SENSE. IDVP FAULTED CONDITION EVALUATION SHOWED STRESSES WITHIN ALLOWABLES.

FILE NO.	REV. 0 DATE	BASIS	LATEST REV. REV.	DATE	BY	STATUS	ACTION ORG	TES	PG&E MODS	SUBJECT
1137	830621	DMD	0	830621	RLCA	OIR	RLCA	RDF		LARGE BORE PIPING - ANALYSIS 4-101

COMMENT: VALVE FCV-365 IN REV. 1 OF THE ANALYSIS WAS MODELLED WITH A WEIGHT OF 405 LBS. RLCA REVIEW SHOWED WEIGHT TO BE APPROX. 502 LBS. COMBINES WITH 1133 AND 1135 AS A GENERIC CONCERN WITH VALVE MODELLING IN CAP.

REV. 0 | LATEST REV. | ACTION | PG&E

FILE NO. | DATE | BASIS | REV. | DATE | BY | STATUS | ORG | TES | MODS | SUBJECT

8012 820924 DMD 7 830315 TES ER/A PG&E JWW YES CLASS 1 PORTIONS OF CRVP SYSTEM
COMMENT: PORTIONS OF CRVP SYS REQUIRED TO MAINTAIN HABITABILITY ARE SHARED BTWN UNIT 1 & 2 AND ARE PROVIDED S-R POWER FROM UNIT W DIESEL GEN. AND ELECTRICAL SYS. CRVP SYS DOES NOT MEET SINGLE FAILURE CRITERIA. SWEC REVIEWED DCP RES SHT DATED 830201 & 830308 & ACCEPTS PG&E PROPOSED MODS TO SYS. IDVP TO FIELD VERIFY MODS, SEE ITR-34, INCLUDES EOIS 8016 & 8046.

8012 820924 DMD 8 830621 TES OIR SWEC JWW YES CLASS 1 PORTIONS OF CRVP SYSTEM
COMMENT: BASED ON THE IDVP SITE REVIEW ON 830615, SWEC TO REVIEW RESULTS FOR FUTURE DISPOSITION.

8012 820924 DMD 9 830622 SWEC PPRR/CI TES JWW YES CLASS 1 PORTIONS OF CRVP SYSTEM
COMMENT: DCP INDICATES UNIT 2 S-R POWER SOURCES WOULD BE AVAILABLE DURING OPERATION OF UNIT 1. IDVP'S CONCERN WITH ONLY U. 1 S-R BUSES AVAILABLE, CRVP WOULD NOT PERFORM ITS DESIGN BASIS S-R FUNCTION DESCRIBED IN FSAR ASSUMING SINGLE FAILURE. MODS HAVE BEEN COMPLETED AND FIELD VERIFIED.

8012 820924 DMD 10 830624 TES PRR/CI TES JWW YES CLASS 1 PORTIONS OF CRVP SYSTEM
COMMENT: MODS TO CRVP SYSTEM WILL ALLOW FOR PROPER ALIGNMENT OF POWER SOURCES TO PROVIDE ELECTRICAL POWER REDUNDANCY WITH ONLY UNIT 1 UP OR WITH BOTH UNITS UP. MODS PROVIDE NECESSARY ELECTRICAL POWER REDUNDANCY AND HAVE BEEN SATISFACTORILY COMPLETED.

8012 820924 DMD 11 830624 TES CR NONE JWW YES CLASS 1 PORTIONS OF CRVP SYSTEM
COMMENT: MODS TO CRVP SYSTEM WILL ALLOW FOR PROPER ALIGNMENT OF POWER SOURCES TO PROVIDE ELECTRICAL POWER REDUNDANCY WITH ONLY UNIT 1 UP OR WITH BOTH UNITS UP. MODS PROVIDE NECESSARY ELECTRICAL POWER REDUNDANCY AND HAVE BEEN SATISFACTORILY COMPLETED. PREVIOUSLY ER/A. CLOSED ITEM.

8013 820924 OD 0 820924 SWEC OIR SWEC JWW EMERGENCY DIESEL GEN. NOS. 11, 12, & 13
COMMENT: TEST DATA NOT AVAIL. TO VERIFY CAPABILITY OF DIESEL GENERATORS TO START & ACCELERATE AUTO. SEQUENCED MOTOR LOADS CONCURRENT W/PRIOR RUNNING MOTORS ASSOC. W/DC1 SAFETY SYS. ALSO NOT AVAIL. TO VERIFY EACH STARTING MOTOR OPERATION BEFORE NEXT LOAD IS SEQUENCED W/DIFF. TIME-INTERVALS. CONDUCT & DOC. TESTS TO VERIFY DIESEL GENERATOR CAPABILITIES.

8013 820924 OD 1 821001 SWEC PPRR/OIP TES JWW EMERGENCY DIESEL GEN. NOS. 11, 12, & 13
COMMENT: RETURN TO SWEC FOR REISSUE AS ER. PG&E TO TEST DIESEL GENERATOR STARTING AND SEQUENTIAL LOADING. TES RECOMMENDS TESTS TO BE AS SPECIFIED IN IEEE STD. 387-1977. ALSO INVESTIGATE POSSIBILITY OF COMPUTER SIMULATION. 821029.

8013 820924 OD 2 821022 TES OIR SWEC JWW EMERGENCY DIESEL GEN. NOS. 11, 12, & 13
COMMENT: SWEC SHOULD RECONSIDER THIS FILE TO BE A POTENTIAL ERROR CLASS B. TES RECOMMENDS SITE ACCEPTANCE TESTS PER IEEE STANDARD 387-1977.

8013 820924 OD 3 821116 SWEC PER/AB TES JWW EMERGENCY DIESEL GEN. NOS. 11, 12, & 13
COMMENT: IN THE EVENT OF LOCA AT DC UNIT I AND SIMULT.LOSS OF OFF-SITE POWER, TEST DATA NOT AVAILABLE TO DEMONSTRATE THAT DIESEL GENERATORS WOULD BE ABLE TO PERFORM THEIR FUNCTIONS TO SUPPLY POWER TO SAFETY SYSTEMS TO FACILITATE SAFE SHUTDOWN. PG&E TO DEMONSTRATE ADEQUATE CAPABILITY.

8013 820924 OD 4 821123 TES OIR SWEC JWW EMERGENCY DIESEL GEN. NOS. 11, 12, & 13
COMMENT: TEST DATA NOT AVAILABLE TO DEMONSTRATE CAPABILITY OF DIESEL GEN; TO PERFORM THEIR SAFETY-RELATED FUNCTIONS REQ.BY REG GUIDE 1.9, 710309. EXISTING TEST DATA DOES NOT VERIFY CAPABILITY OF D.G.TO START AND ACCELERATE TO RATED SPEED IN REQUIRED SEQUENCE FOR ALL THE NEEDED SAFETY-RELATED LOADS.

8013 820924 OD 5 821202 SWEC PER/AB TES JWW EMERGENCY DIESEL GEN. NOS. 11, 12, & 13
COMMENT: EITHER RETESTING USING LOAD AND SEQUENCING VALUES WHICH DIESEL GEN. MUST NOW SERVICE (TYPE B ERROR) OR MODIFY EXISTING LOAD AND/OR SEQUENCING TO ENSURE EXISTING TEST DATA WILL DEMONSTRATE CAPABILITY (TYPE A ERROR). NO INFO. PROVIDED BY PG&E ELIMINATES THE CONCERN.

8013 820924 OD 6 821206 TES ER/AB PG&E JWW EMERGENCY DIESEL GEN. NOS. 11, 12, & 13
COMMENT: PG&E SHOULD PERFORM RETESTING USING LOAD AND SEQUENCING VALUES WHICH DIESEL GENERATOR MUST NOW SERVICE OR MODIFY THE EXISTING LOADING AND/OR SEQUENCING TO ENSURE THE EXISTING TEST DATA WILL DEMONSTRATE ADEQUATE CAPABILITY.

8013 820924 OD 7 830222 TES OIR SWEC JWW EMERGENCY DIESEL GEN. NOS. 11, 12, & 13
COMMENT: SWEC TO REVIEW DCP RESOLUTION SHEET 8013, REVS. 0 AND 1, SIGNED 830208 & PROVIDE RECOMMENDATION FOR FUTURE DISPOSITION.

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           REV. 0               LATEST REV.           ACTION    PG&E
FILE NO.   DATE   BASIS  REV.   DATE     BY    STATUS   ORG  TES  MODS  SUBJECT

 8028     821014  DHD     5    830309   TES   PRR/DEV   TES  LCN        AFW SYS-FAILURE BY POSTULATED PIPE CRACK
COMMENT: DCP COMPLETION SHEET DATED 830303 TRANSMITTING PSRC APPROVAL OF FSAR UPDATE CHANGE NOTICE STATING NO PHYSICAL MODS.
         REQUIRES FSAR CHANGES TO CORRECT INCONSISTENCIES REGARDING APPLICABILITY OF HELB AND HELC TO LINE 760. NO ADDITIONAL DCP
         ACTION REQUIRED.

 8028     821014  DHD     6    830309   TES   CR        NONE LCN  NO    AFW SYS-FAILURE BY POSTULATED PIPE CRACK
COMMENT: FSAR APP 3.6,REF 5 ADDRESS HELC IN LINE 760.IT DOES NOT ADDRESS EFFECT ON AFW PUMP MOTORS LOCATED APPROX 4' ABOVE LINE.
         ELEV TEMPS DUE TO PC MAY CAUSE FAILURE OF THE TWO MOTORS. DCP COMP(830303) TRANS PSRC APPROVAL OF FSAR UPDATE CHG NOTICE
         STATING NO PHY MODS. REQUIRES FSAR CHG TO CORRECT INCONSIST REGARDING APPL OF HELB & HELC TO LINE 760. NO DCP ACTION.DEV

 8029     821014  DHD     0    821014   SWEC  OIR       SWEC LCN        AFW SYS-PIPING CRACK ANALYSIS, PT-434
COMMENT: PT-434 NOT IDENT. IN FSAR, APP 3.6, REF 5. EVAL. SHOULD HAVE BEEN DONE ON EFFECTS FROM 760 CRACK BREAK ON PT-434 & OF
         SINGLE CRACK ON PT-434 & PUMP 1-3 SIMULTANEOUSLY. POTENTIAL FAILURE OF LCV113 & 115. POSSIBLE BLOWDOWN THRU CRACK COULD
         BE ISOLATED BUT RENDER PUMP 1-1 INOPERABLE. POSTULATED CRACK IN 760 & SINGLE FAILURE COULD RESULT IN LOSS OF AFW FLOW.

 8029     821014  DHD     1    821014   SWEC  PPRR/OIP  TES  LCN        AFW SYS-PIPING CRACK ANALYSIS, PT-434
COMMENT: AN EVALUATION SHOULD BE MADE OF THE POSTULATED PIPE CRACK BREAK LOCATIONS ON LINE #760 TO ASSURE THAT LICENSING
         COMMITMENTS ARE MET.

 8029     821014  DHD     2    821030   TES   PRR/OIP   PG&E LCN        AFW SYS-PIPING CRACK ANALYSIS, PT-434
COMMENT: AN EVALUATION SHOULD BE MADE OF THE EFFECTS OF A CRACK BREAK FROM LINE #760 ON PT-434, AND OF THE EFFECTS OF A
         SINGLE CRACK FROM LINE #760 ON PT-434 AND PUMP 1-3 SIMULTANEOUSLY, TO DETERMINE IF LICENSING COMMITMENTS ARE MET.

 8029     821014  DHD     3    830113   TES   OIR       SWEC LCN        AFW SYS-PIPING CRACK ANALYSIS, PT-434
COMMENT: SWEC TO REVIEW THE PG&E COMPLETION SHEET SIGNED 830104 AND PROVIDE RECOMMENDATION FOR FUTURE DISPOSITION.

 8029     821014  DHD     4    830208   SWEC  PPRR/DEV  TES  LCN        AFW SYS-PIPING CRACK ANALYSIS, PT-434
COMMENT: PG&E RESPONSE TO THIS EOI IS ADEQUATE. PLANT OPERATING PROCEDURES L-2 AND L-5 RESULT IN LINE BREAK 760 FALLING OUTSIDE
         SCOPE OF GIAMBUSO LETTER RE. HELB AND C. DCP HAS INITIATED FSAR CHANGES (IOM BSL/GHM DATED 830124) TO CORRECT
         INCONSISTENCIES. NO FURTHER VERIFICATION REQUIRED.

 8029     821014  DHD     5    830309   TES   PRR/DEV   TES  LCN        AFW SYS-PIPING CRACK ANALYSIS, PT-434
COMMENT: DCP COMP SHT DATED 830303 TRANSMITTING PSRC APPROVAL OF FSAR UPDATE CHANGE NOTICE. REQUIRES FSAR CHANGES TO CORRECT
         INCONSISTENCIES REGARDING APPLICABILITY OF HELB AND HELC TO LINE 760. NO ADDITIONAL DCP ACTION.

 8029     821014  DHD     6    830309   TES   CR        NONE LCN  NO    AFW SYS-PIPING CRACK ANALYSIS, PT-434
COMMENT: PT-434 NOT ID IN FSAR, APP 3.6, REF 5. EVALUATION SHOULD'VE BEEN DONE ON EFFECTS FROM 760 CRACK BREAK ON PT-434 & ON
         PT-434 AND PUMP 1-3 SIMULTANEOUSLY. POTENTIAL FAILURE OF LCV 113 & 115. DCP COMP SHT 830303 TRANSMITTING PSRC APPROVAL
         OF FSAR UPDATE CHG NOTICE. REQUIRES FSAR CHG TO CORRECT INCONSIST REGARDING APPL OF HELB & HELC TO LINE 760. DEV.

 8030     821014  DHD     0    821014   SWEC  OIR       SWEC LCN        AFW SYS-PIPING CRACK ANALYSIS, PT-433
COMMENT: PT-433 NOT IDENTIFIED IN FSAR, APP 3.6, REF 5. EVALUATION SHOULD HAVE BEEN MADE OF LINE 760 CRACK BREAK ON THIS
         TRANSMITTER. JET COULD ENVELOPE PT-433 & RESULT IN POTENTIAL FAILURE OF LCV110 & 111. ISOLATION OF BLOWDOWN COULD
         RENDER TURBINE DRIVEN PUMP 1-1 INOPERABLE. POSTULATE CRACK IN LINE 760 & SINGLE FAILURE COULD RESULT IN LOSS OF AFW FLOW

 8030     821014  DHD     1    821014   SWEC  PPRR/OIP  TES  LCN        AFW SYS-PIPING CRACK ANALYSIS, PT-433
COMMENT: AN EVALUATION SHOULD BE MADE OF THE POSTULATED PIPE CRACK BREAK LOCATIONS ON LINE #760 TO ASSURE THAT LICENSING
         COMMITMENTS ARE MET.

 8030     821014  DHD     2    821029   TES   PRR/OIP   PG&E LCN        AFW SYS-PIPING CRACK ANALYSIS, PT-433
COMMENT: AN EVALUATION SHOULD BE MADE OF THE EFFECTS OF A CRACK BREAK FROM LINE #760 ON PT-433 TO DETERMINE IF LICENSING
         COMMITMENTS ARE MET.

 8030     821014  DHD     3    830113   TES   OIR       SWEC LCN        AFW SYS-PIPING CRACK ANALYSIS, PT-433
COMMENT: SWEC TO REVIEW THE PG&E COMPLETION SHEET SIGNED 830104 AND PROVIDE RECOMMENDATION FOR FUTURE DISPOSITION.

 8030     821014  DHD     4    830208   SWEC  PPRR/DEV  TES  LCN        AFW SYS-PIPING CRACK ANALYSIS, PT-433
COMMENT: PG&E RESPONSE TO THIS EOI IS ADEQUATE. PLANT OPERATING PROCEDURES L-2 AND L-5 RESULT IN LINE BREAK 760 FALLING OUTSIDE
         SCOPE OF GIAMBUSO LETTER RE. HELB AND HELC. DCP HAS INITIATED FSAR CHANGES TO CORRECT INCONSISTENCIES. NO
         FURTHER VERIFICATION REQUIRED.

 8030     821014  DHD     5    830309   TES   PRR/DEV   TES  LCN        AFW SYS-PIPING CRACK ANALYSIS, PT-433
COMMENT: DCP COMP SHT DATED 830303 TRANSMITTING PSRC APPROVAL OF FSAR UPDATE CHANGE NOTICE. REQUIRES FSAR CHANGES TO CORRECT
         INCONSISTENCIES REGARDING APPLICABILITY OF HELB AND HELC TO LINE 760. NO ADDITIONAL DCP ACTION.
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FILE NO.	REV. 0 DATE	BASIS	LATEST REV. REV.	DATE	BY	STATUS	ACTION ORG	TES	PG&E MODS	SUBJECT
8049	821025	DMD	16	830509	TES	CR	NONE	LCN	NO	LINE 594 PIPE RUPTURE EFFECT ON AFW SYSTEM

COMMENT: LONGITUDINAL SPLIT @ NODE 1800 DETERMINED TO HAVE NO ADVERSE AFFECT ON CONDUIT KK792 PER STANDARD BECHTEL METHODOLOGY. ALLOWABLE JET PRESSURE BY BECHTEL METHODOLOGY CONSIDERED OUTSIDE SWEC'S SCOPE. ASSUMING VALIDITY, INFO PROVIDED BY DCP SUFFICIENT TO ANSWER CONCERN. CLOSED ITEM.

8050	821025	SID	0	821025	SWEC	OIR	SWEC	LCN		CRVP SYSTEM-MODERATE ENERGY LINE BREAKS

COMMENT: PG&E COMMITED TO EVALUATE MODERATE ENERGY LINE BREAKS FOR EQUIPMENT NEEDED FOR SAFE SHUTDOWN. CRVP IS NEEDED TO MAINTAIN CR HABITABILITY BUT WAS NOT INCLUDED IN THE EVALUATION.

8050	821025	SID	1	821027	SWEC	PPRR/OIP	TES	LCN		CRVP SYSTEM-MODERATE ENERGY LINE BREAKS

COMMENT: PG&E TO IDENTIFY THE CRVP EQUIPMENT REQUIRED FOR CR HABITABILITY DURING COLD SHUTDOWN AND DETERMINE THE EFFECTS OF MODERATE ENERGY LINE BREAKS ON THIS EQUIPMENT IN ACCORDANCE WITH THE LICENSING COMMITMENT.

8050	821025	SID	2	821030	TES	PRR/OIP	PG&E	LCN		CRVP SYSTEM-MODERATE ENERGY LINE BREAKS

COMMENT: PG&E TO IDENTIFY THE CRVP EQUIPMENT REQUIRED FOR CR HABITABILITY DURING COLD SHUTDOWN AND DETERMINE THE EFFECTS OF MODERATE ENERGY LINE BREAKS ON THIS EQUIPMENT IN ACCORDANCE WITH THE LICENSING COMMITMENT.

8050	821025	SID	3	830309	TES	OIR	SWEC	LCN		CRVP SYSTEM-MODERATE ENERGY LINE BREAKS

COMMENT: SWEC TO REVIEW DCP COMPLETION SHEET SIGNED 830217 AND PROVIDE A RECOMMENDATION FOR FUTURE DISPOSITION.

8050	821025	SID	4	830311	SWEC	PPRR/DEV	TES	LCN		CRVP SYSTEM-MODERATE ENERGY LINE BREAKS

COMMENT: SWEC HAS REVIEWED DCP COMP SHT SIGNED 830310. CONCLUDED THAT IN UNLIKELY EVENT OF CR BECOMES UNINHABITABLE DUE TO MELB, PLANT SHUTDOWN AND COOLDOWN CAPABILITY WOULD BE MAINTAINED FROM HOT SHUTDOWN PANEL.

8050	821025	SID	5	830315	TES	PRR/DEV	TES	LCN		CRVP SYSTEM-MODERATE ENERGY LINE BREAKS

COMMENT: IDVP HAS REVIEWED DCP COMP SHT SIGNED 830310 AND CONCLUDED THAT IN UNLIKELY EVENT THAT MELB WOULD CAUSE CR TO BECOME UNINHABITABLE, PLANT SHUTDOWN AND COOLDOWN CAPABILITY WOULD BE MAINTAINED FROM HOT SHUTDOWN PANEL.

8050	821025	SID	6	830315	TES	CR	NONE	LCN	NO	CRVP SYSTEM-MODERATE ENERGY LINE BREAKS

COMMENT: CRVP SYSTEM REQ. FOR CR HABITABILITY BUT NOT INCL. IN PG&E MELB EVALUATION. IDVP HAS REVIEWED DCP COMP SHT SIGNED 830310 AND CONCLUDED THAT IN UNLIKELY EVENT THAT MELB WOULD CAUSE CR TO BECOME UNINHABITABLE, PLANT SHUTDOWN AND COOLDOWN CAPABILITY WOULD BE MAINTAINED FROM HOT SHUTDOWN PANEL. DEVIATION.

8051	821025	DMD	0	821025	SWEC	OIR	SWEC	RRB		AFW-PRESSURE TRANSMITTER PT 432

COMMENT: PRESSURE TRANSMITTER PT 432 MONITORING AUX. FEED PUMP 1-1 IDENTIFIED AS CLASS IC BUT ITS POWER SOURCE IS CLASS II. TRANSMITTER AND ASSOC. INDICATORS POWERED FROM A NON-SAFETY SOURCE WHICH MAY NOT BE CONSIDERED AVAILABLE. SAFETY CLASSIFICATION OF TD AFW PUMP DISCHARGE PRESSURE INDICATION IS NOT CONSISTANT BETWEEN DOCUMENTS.

8051	821025	DMD	1	821025	SWEC	PPRR/OIP	TES	RRB		AFW-PRESSURE TRANSMITTER PT 432

COMMENT: PG&E TO EVALUATE THE CLASSIFICATION AND POWER SUPPLY OF PT 432 AND ASSOCIATED PRESSURE INDICATORS.

8051	821025	DMD	2	821118	TES	PRR/OIP	PG&E	RRB		AFW-PRESSURE TRANSMITTER PT 432

COMMENT: PG&E TO EVALUATE THE CLASSIFICATION AND POWER SUPPLY OF PT-432 AND ASSOCIATED PRESSURE INDICATORS. COMPLETED PG&E RESOLUTION SHOULD BE DOCUMENTED FOR INDEPENDENT REVIEW BY SWEC.

8051	821025	DMD	3	830124	TES	OIR	SWEC	RRB		AFW-PRESSURE TRANSMITTER PT 432

COMMENT: SWEC TO REVIEW THE PG&E COMPLETION SHEET, IDVP FILE NO. 8051, REV. 1, AND PROVIDE A RECOMMENDATION FOR FUTURE DISPOSITION.

8051	821025	DMD	4	830207	SWEC	PPRR/DEV	TES	RRB		AFW-PRESSURE TRANSMITTER PT 432

COMMENT: SWEC HAS REVIEWED DCVP-SWEC-260 (821201) CONTAINING PG&E RES. AND COMP. SHEETS AND CONCLUDED THAT MOD TO FSAR, PER LETTER ICE-2650, WILL BE A SATISFACTORY RESOLUTION TO THE OIR. NO FURTHER VERIFICATION IS REQUIRED.

8051	821025	DMD	5	830309	TES	PRR/DEV	TES	RRB		AFW-PRESSURE TRANSMITTER PT 432

COMMENT: DCP COMP SHT SIGNED 830303 TRANSMITTING PSRC APPROVAL OF FSAR UPDATE CHANGE NOTICE. CHANGE REQUIRED IN FSAR HELB ANALYSIS TO DELETE PT-432 WHICH HAD WRONGLY BEEN IDENTIFIED AS 'ESSENTIAL'. NO ADDITIONAL DCP ACTION REQUIRED.

8051	821025	DMD	6	830309	TES	CR	NONE	RRB	NO	AFW-PRESSURE TRANSMITTER PT 432

COMMENT: PRESSURE TRANSMITTER PT-432 MONITORING AUX FEED PUMP 1-1 ID AS CL. IC BUT POWER SOURCE IS CL. II. DCP COMP SHT SIGNED 830303 TRANSMITTING PSRC APPROVAL OF FSAR UPDATE CHG NOTICE. CHG REQUIRED IN FSAR HELB ANALYSIS TO DELETE PT-432 WHICH HAD BEEN IDENTIFIED AS 'ESSENTIAL'. NO ADDITIONAL DCP ACTION REQUIRED. DEVIATION.

	REV. 0		LATEST REV.				ACTION		PG&E		
FILE NO.	DATE	BASIS	REV.	DATE	BY	STATUS	ORG	TES	MODS	SUBJECT	COMMENT
8056	821025	OD	1	821025	SWEC	PPRR/OIP	TES	RRB	----	CRVP SYSTEM - CLASS IE EQUIPMENT	PG&E TO EVALUATE THE CLASS IE COMPONENTS IN THE CR. PRESSURIZATION SYSTEM WITH REGARD TO NUREG-0588.
8056	821025	OD	2	821118	TES	PRR/OIP	PG&E	RRB	----	CRVP SYSTEM - CLASS IE EQUIPMENT	PG&E TO EVALUATE CLASS IE COMPONENTS IN CR PRESSURIZATION SYSTEM WITH REGARD TO NUREG-0588. COMPLETED PG&E RESOLUTION SHOULD BE DOCUMENTED FOR INDEPENDENT REVIEW BY SWEC.
8056	821025	OD	3	830223	TES	OIR	SWEC	RRB	----	CRVP SYSTEM - CLASS IE EQUIPMENT	SWEC TO REVIEW PG&E COMPLETION SHEET AND PROVIDE A RECOMMENDATION FOR FUTURE DISPOSITION.
8056	821025	OD	4	830225	SWEC	PPRR/CI	TES	RRB	----	CRVP SYSTEM - CLASS IE EQUIPMENT	SWEC REVIEWED PG&E COMP PACKAGE AND CONCLUDES NO ERROR OR DEVIATION BASED ON COMPLETION DATE FOR CL. IE EQUIPMENT PREDATED APPLICABLE REV. OF CRVP PIPING AND INST. SCHM. PG&E TO UPDATE CL IE FILES AFTER RESPONSE TO 8001 IS COMPLETED.
8056	821025	OD	5	830225	TES	PRR/CI	TES	RRB	----	CRVP SYSTEM - CLASS IE EQUIPMENT	PG&E COMP SHEET INDICATED COMPILATION OF CL IE EQUIPMENT PREDATES FINAL DRAWING OF CRVP SYSTEM, THEREFORE DOESN'T INCL. ITEM APPEARING ON THOSE DRAWINGS. SINCE NO SCHEDULE REQ. TO UPDATE ENVIRONMENTAL QUAL. RPT. IN RESPONSE TO COMM. ORDER CLI-80-21, FILE RECLASSIFIED AS CLOSED ITEM.
8056	821025	OD	6	830225	TES	CR	NONE	RRB	NO	CRVP SYSTEM - CLASS IE EQUIPMENT	PG&E COMP SHEET INDICATED COMPILATION OF CL IE EQUIPMENT PREDATES FINAL DRAWING OF CRVP SYSTEM, THEREFORE DOESN'T INCL. ITEM APPEARING ON THOSE DRAWINGS. SINCE NO SCHEDULE REQ. TO UPDATE ENVIRONMENTAL QUAL. RPT. IN RESPONSE TO COMM. ORDER CLI-80-21, FILE RECLASSIFIED AS CLOSED ITEM.
8057	821025	FID	0	821025	SWEC	OIR	SWEC	RRB	----	AFW AND CRVP CONTROL PANELS	CONTROL PANELS ASSOCIATED W/AFW AND CRVP SYSTEM CONTAIN CIRCUITS WHICH DO NOT MEET SEPARATION CRITERIA ESTABLISHED IN FSAR SECTION 8.3.3. CLASS IE CIRCUITS DO NOT MEET SINGLE FAILURE CRITERIA DUE TO LACK OF PHYSICAL SEPARATION.
8057	821025	FID	1	821028	SWEC	PER/AB	TES	RRB	----	AFW AND CRVP CONTROL PANELS	PG&E TO COMPLY WITH THE SEPARATION CRITERIA ESTABLISHED IN FSAR SECTION 8.3.3.
8057	821025	FID	2	821118	TES	ER/AB	PG&E	RRB	YES	AFW AND CRVP CONTROL PANELS	ONE OR MORE DISCREPANCIES NOTED IN SEVERAL CONTROL PANELS. CLASS IE CIRCUITS DO NOT MEET SINGLE FAILURE CRITERIA DUE TO LACK OF PHYSICAL SEPARATION. PG&E TO COMPLY WITH SEPARATION CRITERIA ESTABLISHED IN FSAR SECTION 8.3.3.
8057	821025	FID	3	830311	TES	OIR	SWEC	RRB	YES	AFW AND CRVP CONTROL PANELS	SWEC TO REVIEW PG&E RESOLUTION SHEET DATED 830307 AND PROVIDE A RECOMMENDATION FOR FUTURE DISPOSITION.
8057	821025	FID	4	830311	SWEC	PER/A	TES	RRB	YES	AFW AND CRVP CONTROL PANELS	CONTROL PANELS ASSOC. W/AFW AND CRVP SYS CONTAIN CIRCUITS WHICH DON'T MEET SEPARATION CRITERIA IN FSAR SEC. 8.3.3. SWEC REVIEWED DCP 830308 RESPONSE AND FOUND PROPOSED MODS ADEQUATE. DCP ALSO PROPOSED GENERIC CONCERNS BE SUBJECT OF ADDED VERIFICATION. SWEC TO FIELD VERIFY MODS. RECLASSIFIED FROM ER/AB.
8057	821025	FID	5	830315	TES	ER/A	PG&E	RRB	YES	AFW AND CRVP CONTROL PANELS	CL. IE CIRCUITS DON'T MEET SINGLE FAILURE CRITERIA. PG&E RES SHT DATED 830307 WAS REVIEWED AND FOUND ADEQUATE AS WAS THE PROPOSED MODS. DCP ALSO PROPOSED (830308 LTR. DCVP-TES-869) GENERIC CONCERNS OF OPEN ITEM AND RES BE SUBJECT OF ADDED VERIFICATION. PG&E TO COMPLY W/FSAR 8.3.3. RECLASSIFIED FROM ER/AB.
8057	821025	FID	6	830621	TES	OIR	SWEC	RRB	YES	AFW AND CRVP CONTROL PANELS	BASED ON THE IDVP SITE REVIEW ON 830615, SWEC TO REVIEW RESULTS FOR FUTURE DISPOSITION.
8057	821025	FID	7	830622	SWEC	PPRR/CI	TES	RRB	YES	AFW AND CRVP CONTROL PANELS	MODS HAVE BEEN COMPLETED AND FIELD VERIFIED BY SWEC TO BE CONSISTENT, WITH ONE EXCEPTION, WITH THE RES. PACKAGES AND DCN'S. SWEC'S REVIEW OF REVISED CRVP SYSTEM SCHEMATIC DRAWINGS CONFIRMED PG&E POSITION THAT SYSTEM FUNCTIONAL OPERATION NOT CHANGED BY MODS.
8057	821025	FID	8	830624	TES	PRR/CI	TES	RRB	YES	AFW AND CRVP CONTROL PANELS	MODS CONSIST OF FURTHER WRAPPING OR SLEEVING OF CONDUCTORS ADDING FUSES, AND/OR APPLICATION OF FOAM SEALANTS. ALSO, DCP REMOVED SOME RELAYS WHICH DON'T CHANGE CRVP FUNCTIONAL ARRANGEMENT. COMPLETED MODS HAVE BEEN FIELD VERIFIED AND ARE SUFFICIENT FOR SYSTEM TO MEET FSAR REQUIREMENTS.

	REV. 0		LATEST REV.				ACTION		PG&E	
FILE NO.	DATE	BASIS	REV.	DATE	BY	STATUS	ORG	TES	MODS	SUBJECT
8057	821025	FID	9	830624	TES	CR	NONE	RRB	YES	AFW AND CRVP CONTROL PANELS

COMMENT: CRVP CIRCUITS DON'T MEET SEPARATION CRITERIA. MODS CONSIST OF FURTHER WRAPPING OR SLEEVING OF CONDUCTORS ADDING FUSES, AND/OR APPLICATION OF FOAM SEALANTS. ALSO, DCP REMOVED SOME RELAYS WHICH DON'T CHANGE CRVP FUNCTIONAL ARRANGEMENT. COMPLETED MODS HAVE BEEN FIELD VERIFIED & ARE SUFFICIENT FOR SYSTEM TO MEET FSAR REQUIREMENTS. PREV. ER/A. CLOSED ITEM.

8058	821029	DMD	0	821029	SWEC	OIR	SWEC	RRB		AFW LCV'S 110, 111, 113 AND 115

COMMENT: CLASS IE LCV 110, 111, 113 AND 115 FOR AFW SYSTEM NOT QUALIFIED IN CONFORMANCE TO NUREG 0588 MAY NOT FUNCTION RELIABLY IN A SEVERE ENVIRONMENT RESULTING IN THE LOSS OF PART OR ALL OF A SAFETY-RELATED SYSTEM.

8058	821029	DMD	1	821109	SWEC	PPRR/OIP	TES	RRB		AFW LCV'S 110, 111, 113 AND 115

COMMENT: PG&E TO PROVIDE SWEC W/DOCUMENTATION THAT THE VALVE IS PROPERLY QUALIFIED TO PERFORM IN A SEVERE ENVIRONMENT AND THAT A FAILURE OF THE FAIL-SAFE MECHANISM WILL NOT PREVENT THE VALVE FROM OPENING FULLY.

8058	821029	DMD	2	821123	TES	PRR/OIP	PG&E	RRB		AFW LCV'S 110, 111, 113 AND 115

COMMENT: PG&E TO PROVIDE DOCUMENTATION THAT THE VALVE IS PROPERLY QUALIFIED TO PERFORM IN A SEVERE ENVIRONMENT AND THAT A FAILURE OF THE FAIL-SAFE MECHANISM WILL NOT PREVENT THE VALVE FROM OPENING FULLY.

8058	821029	DMD	3	830225	TES	OIR	SWEC	RRB		AFW LCV'S 110, 111, 113 AND 115

COMMENT: SWEC TO REVIEW PG&E COMPLETION SHEET DATED 830207 AND PROVIDE A RECOMMENDATION FOR FUTURE DISPOSITION.

8058	821029	DMD	4	830304	SWEC	PPRR/CI	TES	RRB		AFW LCV'S 110, 111, 113 AND 115

COMMENT: SWEC CONCLUDES THAT DCP RESPONSE SATISFIES THE TWO CONCERNS OF THIS FILE. DCP HAS COMMITTED TO RESOLVING THE OUTSTANDING ITEMS PREVIOUSLY IDENTIFIED TO THE NRC. NO PHYSICAL MODS OR ADDITIONAL VERIFICATION IS REQUIRED AS A RESULT OF THIS FILE.

8058	821029	DMD	5	830309	TES	PRR/CI	TES	RRB		AFW LCV'S 110, 111, 113 AND 115

COMMENT: DCP 830207 RESPONSE ADDRESSES TWO CONCERNS IDENTIFIED. DCP TO SATISFY QUALIFICATION OF MOTOR CAPACIATOR ID. BY NRC. FAIL-SAFE NOT REQUIRED DURING REMOTE VALVE OPERATION, ONLY WHEN POWER OR CONTROL DE-ENERGIZED. NO ADDITIONAL VERIF. REQUIRED.

8058	821029	DMD	6	830309	TES	CR	NONE	RRB	NO	AFW LCV'S 110, 111, 113 AND 115

COMMENT: AFW LCV'S NOT QUALIFIED TO NUREG 0588 AND MAY NOT BE RELIABLE IN SEVERE ENVIRONMENT. DCP 830207 RESPONSE ADDRESSES TWO CONCERNS IDENTIFIED. DCP TO SATISFY QUALIFICATION OF MOTOR CAPACITOR ID. TO NRC. FAIL-SAFE NOT REQUIRED DURING REMOTE VALVE OPERATION, ONLY WHEN POWER OR CONTROL DE-ENERGIZED. NO ADDITIONAL VERIF. REQUIRED. CLOSED ITEM.

8059	821029	FID	0	821029	SWEC	OIR	SWEC	RRB		AFW & CRVP CONTROL PANELS AND RACEWAYS

COMMENT: WIRING FOR CLASS IE CIRCUITS IS NOT READILY IDENTIFIABLE FROM NON-CLASS IE CIRCUITS. THIS DOES NOT MEET THE INTENT OF IEEE 308-1971 AND MAY RESULT IN THE LOSS OF A SAFETY-RELATED FUNCTION WHICH COULD OCCUR DUE TO THE LACK OF SEPARATION OF REDUNDANT CLASS IE AND NON-CLASS IE CABLES.

8059	821029	FID	1	821029	SWEC	PPRR/OIP	TES	RRB		AFW SYS & CRVP SYS CONTROL PANELS & RACEWAYS

COMMENT: PG&E TO EVALUATE WIRING FOR CLASS IE CIRCUITS NOT READILY IDENTIFIABLE FROM NON-CLASS IE CIRCUITS.

8059	821029	FID	2	821123	TES	PRR/OIP	PG&E	RRB		AFW SYS & CRVP SYS CONTROL PANELS & RACEWAYS

COMMENT: PG&E TO EVALUATE SPECIFIC PANELS IN CRVP WHICH CONTAIN NON-CL. IE CIRCUITS THAT ARE COLOR CODED ACCORDING TO CRITERIA FOR CL.IE CIRCUITS IN FSAR SECT.8.3.3. THIS DOES NOT MEET INTENT OF IEEE 308-1971 AND MAY RESULT IN LOSS OF A SAFETY-RELATED FUNCTION WHICH COULD OCCUR DUE TO LACK OF REDUNDANT CL. IE AND NON-CL. IE CABLES.

8059	821029	FID	3	830401	TES	OIR	SWEC	RRB		AFW SYS & CRVP SYS CONTROL PANELS & RACEWAYS

COMMENT: SWEC TO REVIEW DCP RESOLUTION SHEET, IDVP FILE 8059, SIGNED 830210 AND DCP LETTER, FILES 8055 AND 8059 DATED 830311, AND PROVIDE A RECOMMENDATION FOR FUTURE DISPOSITON.

8059	821029	FID	4	830404	SWEC	PER/C	TES	RRB		AFW SYS & CRVP SYS CONTROL PANELS & RACEWAYS

COMMENT: S-R CIRCUITS NOT READILY IDENTIFIABLE FROM NON-S-R CIRCUITS. ELECTRICAL SYSTEM ID DEFINED IN FSAR SECT 8.3.3 DIDN'T ACCURATELY DESCRIBE THE ACTUAL INSTALLED CONTROL WIRING FOR EQUIPMENT IN THE CRVP AND AFW SYSTEMS.

FILE NO.	REV. 0 DATE	REV. 0 BASIS	LATEST REV. REV.	LATEST REV. DATE	LATEST REV. BY	LATEST REV. STATUS	ACTION ORG	ACTION TES	PG&E MODS	SUBJECT
8061	821109	OD	6	830209	TES	PRR/OIP	PG&E	JWW		MOTOR RATINGS-AFW AND CRVP

COMMENT: DCP TO PROVIDE DOCUMENTATION VERIFYING MOTOR'S CAPABILITY TO START AND ACCELERATE TO FULL-LOAD SPEED AT 80% OF RATED VOLTAGE. DOCUMENTATION SHOULD BE THE PURCHASE SPECIFICATION SPECIFYING 80% START CAPABILITY AND A STATEMENT FROM VENDOR SHOWING HIS COMPLIANCE WITH THE PURCHASE SPECIFICATION.

FILE NO.	REV. 0 DATE	REV. 0 BASIS	LATEST REV. REV.	LATEST REV. DATE	LATEST REV. BY	LATEST REV. STATUS	ACTION ORG	ACTION TES	PG&E MODS	SUBJECT
8061	821109	OD	7	830310	TES	OIR	SWEC	JWW		MOTOR RATINGS-AFW AND CRVP

COMMENT: SWEC TO REVIEW THE DCP RESPONSE, DATED 830307, AND PROVIDE A RECOMMENDATION FOR FUTURE DISPOSITION.

FILE NO.	REV. 0 DATE	REV. 0 BASIS	LATEST REV. REV.	LATEST REV. DATE	LATEST REV. BY	LATEST REV. STATUS	ACTION ORG	ACTION TES	PG&E MODS	SUBJECT
8061	821109	OD	8	830311	SWEC	PPRR/DEV	TES	JWW		MOTOR RATINGS-AFW AND CRVP

COMMENT: SWEC HAS REVIEWED PG&E COMP PACKAGE SIGNED 830307 AND CONSIDERS IT TO SHOW CAPABILITY OF S-R MOTORS TO START AND ACCELERATE TO RATED SPEED W/80% RATED VOLTAGE APPLIED AT TERMINALS. RECLASSIFIED FROM ER/B.

FILE NO.	REV. 0 DATE	REV. 0 BASIS	LATEST REV. REV.	LATEST REV. DATE	LATEST REV. BY	LATEST REV. STATUS	ACTION ORG	ACTION TES	PG&E MODS	SUBJECT
8061	821109	OD	9	830315	TES	PRR/DEV	TES	JWW		MOTOR RATINGS-AFW AND CRVP

COMMENT: DCP COMP PACKAGE SIGNED 830307 ACCEPTABLE WHICH INDICATES SATISFACTORY CAPABILITY OF S-R MOTORS TO START AND ACCELERATE TO RATED SPEEDS W/80% RATED VOLTAGE APPLIED AT TERMINALS.

FILE NO.	REV. 0 DATE	REV. 0 BASIS	LATEST REV. REV.	LATEST REV. DATE	LATEST REV. BY	LATEST REV. STATUS	ACTION ORG	ACTION TES	PG&E MODS	SUBJECT
8061	821109	OD	10	830315	TES	CR	NONE	JWW	NO	MOTOR RATINGS-AFW AND CRVP

COMMENT: MOTORS MAY REQUIRE EXCESSIVE TIME TO ACCELERATE TO FULL LOAD SPEED. DCP COMP PACKAGE SIGNED 830307 ACCEPTABLE WHICH INDICATES SATISFACTORY CAPABILITY OF S-R MOTORS TO START AND ACCELERATE TO RATED SPEEDS W/80% RATED VOLTAGE APPLIED AT TERMINALS. DEVIATION.

FILE NO.	REV. 0 DATE	REV. 0 BASIS	LATEST REV. REV.	LATEST REV. DATE	LATEST REV. BY	LATEST REV. STATUS	ACTION ORG	ACTION TES	PG&E MODS	SUBJECT
8062	821118	DMD	0	821118	SWEC	OIR	SWEC	LCN		AFW CONTROL VALVES FCV37,38 AND 95

COMMENT: FCV'S DESIGNED TO OPEN CLOSE AGAINST MAX OF 805 PSI. VALVES COULD BE REQUIRED TO OPERATE AGAINST MAX OF 1100 PSI. VALVE OPERATORS MAY NOT FUNCTION UNDER CONDITIONS WHERE DIFFERENTIAL PRESSURE EXCEEDS 805 PSI.

FILE NO.	REV. 0 DATE	REV. 0 BASIS	LATEST REV. REV.	LATEST REV. DATE	LATEST REV. BY	LATEST REV. STATUS	ACTION ORG	ACTION TES	PG&E MODS	SUBJECT
8062	821118	DMD	1	821118	SWEC	PPRR/OIP	TES	LCN		AFW CONTROL VALVES FCV37, 38, & 95.

COMMENT: PG&E SHOULD EVALUATE VALVE OPERATORS ABILITY TO POSITION VALVES AGAINST CALCULATED MAX DIFFERENTIAL PRESSURE AGAINST WHICH VALVES MUST FUNCTION. SUPPORTING DOCUMENTATION SHOULD BE INDEPENDENTLY REVIEWED BY SWEC.

FILE NO.	REV. 0 DATE	REV. 0 BASIS	LATEST REV. REV.	LATEST REV. DATE	LATEST REV. BY	LATEST REV. STATUS	ACTION ORG	ACTION TES	PG&E MODS	SUBJECT
8062	821118	DMD	2	821122	TES	PRR/OIP	PG&E	LCN		AFW CONTROL VALVES FCV37, 38, & 95.

COMMENT: PG&E SHOULD EVALUATE THE OPERATOR'S ABILITY TO POSITION THE VALVES AGAINST CALCULATED MAX DIFFERENTIAL PRESSURE AGAINST WHICH THE VALVES MUST FUNCTION.

FILE NO.	REV. 0 DATE	REV. 0 BASIS	LATEST REV. REV.	LATEST REV. DATE	LATEST REV. BY	LATEST REV. STATUS	ACTION ORG	ACTION TES	PG&E MODS	SUBJECT
8062	821118	DMD	3	830219	TES	OIR	SWEC	LCN		AFW CONTROL VALVES FCV37, 38, & 95.

COMMENT: SWEC TO REVIEW DCP RESOLUTION SHEET, SIGNED 830210 AND PROVIDE RECOMMENDATION FOR FUTURE DISPOSITION.

FILE NO.	REV. 0 DATE	REV. 0 BASIS	LATEST REV. REV.	LATEST REV. DATE	LATEST REV. BY	LATEST REV. STATUS	ACTION ORG	ACTION TES	PG&E MODS	SUBJECT
8062	821118	DMD	4	830304	SWEC	PER/A	TES	LCN		AFW CONTROL VALVES FCV37, 38, & 95.

COMMENT: VALVES FCV 37, 38, OR 95 MAY NOT FUNCTION UNDER CONDITIONS WHERE DIFFERENTIAL PRESSURE EXCEEDS 805 PSI. IDVP WILL FIELD VERIFY THAT FCV 95 OPERATOR IS CHANGED TO DC POWERED OPERATION AND GEAR MODS HAVE BEEN MADE. ADDITIONAL VERIFICATION FOR DIFFERENTIAL PRESSURE ACROSS POWER OPERATED VALVES IS DESCRIBED IN ITR-34.

FILE NO.	REV. 0 DATE	REV. 0 BASIS	LATEST REV. REV.	LATEST REV. DATE	LATEST REV. BY	LATEST REV. STATUS	ACTION ORG	ACTION TES	PG&E MODS	SUBJECT
8062	821118	DMD	5	830310	TES	ER/A	PG&E	LCN	YES	AFW CONTROL VALVES FCV37, 38, & 95.

COMMENT: VALVES PURCHASED TO OPERATE AT MAX DIFF PRESSURE OF 805 BUT COULD SEE IN EXCESS OF 1100 PSI. CONCERN OF FCV 37 & 38 RESOLVED BY 830210 DCP RESPONSE TO 8062 AND EOI 8018 DATED 830301. CONCERN OF FCV 95 RESOLVED BY MOD TO DC ACTUATOR TO BE VERIFIED BY IDVP. GENERIC CONCERN RE. VALVE DIFF. PRESSURE IN ITR-34.

FILE NO.	REV. 0 DATE	REV. 0 BASIS	LATEST REV. REV.	LATEST REV. DATE	LATEST REV. BY	LATEST REV. STATUS	ACTION ORG	ACTION TES	PG&E MODS	SUBJECT
8062	821118	DMD	6	830601	TES	OIR	SWEC	LCN	YES	AFW CONTROL VALVES FCV37, 38, & 95.

COMMENT: TES REQUESTS SWEC TO REVIEW THE DCP COMPLETION SHEET, SIGNED 830527, AND PROVIDE A RECOMMENDATION FOR FUTURE DISPOSITION.

FILE NO.	REV. 0 DATE	REV. 0 BASIS	LATEST REV. REV.	LATEST REV. DATE	LATEST REV. BY	LATEST REV. STATUS	ACTION ORG	ACTION TES	PG&E MODS	SUBJECT
8062	821118	DMD	7	830601	SWEC	PPRR/CI	TES	LCN	YES	AFW CONTROL VALVES FCV37, 38, & 95.

COMMENT: GEAR MODIFICATIONS HAVE BEEN MADE TO THE ACTUATOR INTERNALS FOR FCV95, AS DOCUMENTED BY PG&E PLANT MODIFICATION FOLLOWER FOR DCN-DCO-E-M-549, REV. 1. THE ACTUATOR WAS FIELD VERIFIED AS DC POWERED.

FILE NO.	REV. 0 DATE	REV. 0 BASIS	LATEST REV. REV.	LATEST REV. DATE	LATEST REV. BY	LATEST REV. STATUS	ACTION ORG	ACTION TES	PG&E MODS	SUBJECT
8062	821118	DMD	8	830602	TES	PRR/CI	TES	LCN	YES	AFW CONTROL VALVES FCV37, 38, & 95.

COMMENT: GEAR MODIFICATIONS HAVE BEEN MADE TO THE ACTUATOR INTERNALS FOR FCV95, AS DOCUMENTED BY PG&E PLANT MODIFICATION FOLLOWER FOR DCN-DCO-E-M-549, REV. 1. THE ACTUATOR WAS FIELD VERIFIED AS DC POWERED.

FILE NO.	REV. 0 DATE	REV. 0 BASIS	LATEST REV. REV.	LATEST REV. DATE	LATEST REV. BY	LATEST REV. STATUS	ACTION ORG	ACTION TES	PG&E MODS	SUBJECT
8062	821118	DMD	9	830602	TES	CR	NONE	LCN	YES	AFW CONTROL VALVES FCV37, 38, & 95.

COMMENT: FCV'S DESIGNED TO OPEN CLOSE AGAINST MAX OF 805 PSI. VALVES COULD BE REQ TO OPERATE AGAINST MAX OF 1100 PSI. VALVE OPERATORS MAY NOT FUNC UNDER COND WHERE DIFF PRESS EXCEEDS 805 PSI. GEAR MODS MADE TO THE ACTUATOR INTERNALS FOR FCV95, AS DOC BY PG&E PLANT MOD FOLLOWER FOR DCN-DCO-E-M-549, R. 1. THE ACTUATOR WAS FIELD VERIF AS DC POWERED. PREV ER/A. CI.

	REV. 0		LATEST REV.				ACTION		PG&E	
FILE NO.	DATE	BASIS	REV.	DATE	BY	STATUS	ORG	TES	MODS	SUBJECT
8064	830215	DMD	5	830407	TES	PRR/DEV	PG&E	RRB		AFW SYS COMPONENTS POM 110, 111, 113, & 115

COMMENT: PG&E RES. AND COMP. SHT. DATED 830322. DESIGN DOCUMENTS IMPROPERLY REPORTED CLASSIFICATION OF POM'S AS S-R. PG&E TO REVISE ENVIRONMENTAL QUALIFICATION FILES AND INSTRUMENT SCHEMATIC 102036 TO REFLECT CL. II STATUS.

FILE NO.	DATE	BASIS	REV.	DATE	BY	STATUS	ORG	TES	MODS	SUBJECT
8064	830215	DMD	6	830407	TES	CR	NONE	RRB	NO	AFW SYS COMPONENTS POM 110, 111, 113, & 115

COMMENT: NO DOCUMENTATION THAT POM'S LISTED ARE ENVIRONMENTALLY QUALIFIED. PG&E RES. AND COMP. SHT. DATED 830322. DESIGN DOCUMENTS IMPROPERLY REPORTED CLASSIFICATION OF POM'S AS S-R. PG&E TO REVISE ENVIRONMENTAL QUALIFICATION FILES AND INSTRUMENT SCHEMATIC 102036 TO REFLECT CL. II STATUS. DEVIATION.

FILE NO.	DATE	BASIS	REV.	DATE	BY	STATUS	ORG	TES	MODS	SUBJECT
8065	830608	FID	0	830608	SWEC	OIR	SWEC	LCN		JET IMPINGEMENT REVIEW

COMMENT: POSTULATED BREAK ON FEEDWATER LINE NO. 555 MAY IMPINGE UPON HORIZONTAL PORTION OF MAIN STEAM LINE NO. 227. CONDUIT KX-582 MISIDENTIFIED AND MAY BE WITHIN ZONE OF INFLUENCE OF RCP OUTLET. LINE 24 MAY IMPINGE UPON CONDUIT KX-428. RUPTURE OF LETDOWN LINE 24 MAY IMPINGE UPON TWO OF THE VERTICAL SUPPORTS FOR EXCESS LETDOWN LINE 24.

FILE NO.	DATE	BASIS	REV.	DATE	BY	STATUS	ORG	TES	MODS	SUBJECT
8065	830608	FID	1	830608	SWEC	PPRR/OIP	TES	LCN		JET IMPINGEMENT REVIEW

COMMENT: SAFETY EVALUATION SHOULD BE PERFORMED BY THE DCP TO DETERMINE WHETHER IDENTIFIED TARGETS ARE NEEDED TO SAFELY SHUTDOWN THE PLANT UNDER THE CONDITIONS ASSOCIATED WITH THE POSTULATED PIPE BREAKS OR RUPTURES.

FILE NO.	DATE	BASIS	REV.	DATE	BY	STATUS	ORG	TES	MODS	SUBJECT
8065	830608	FID	2	830616	TES	PRR/OIP	PG&E	LCN		JET IMPINGEMENT REVIEW

COMMENT: FOUR ITEMS OF CONCERN HAVE BEEN IDENTIFIED RESULTING FROM DATA OBTAINED DURING THE IDVP 830524-26 SITE VERIFICATION. DCP TO PERFORM A SAFETY EVALUATION TO RESOLVE THE ITEMS.

FILE NO.	DATE	BASIS	REV.	DATE	BY	STATUS	ORG	TES	MODS	SUBJECT
8065	830608	FID	3	830621	TES	OIR	SWEC	LCN		JET IMPINGEMENT REVIEW

COMMENT: SWEC TO REVIEW THE DCP COMPLETION SHEET SIGNED 830617 AND PROVIDE A RECOMMENDATION FOR FUTURE DISPOSITION.

FILE NO.	DATE	BASIS	REV.	DATE	BY	STATUS	ORG	TES	MODS	SUBJECT
8065	0		4	0						

COMMENT: SPACE RESERVED FOR LATER REVISIONS.

FILE NO.	DATE	BASIS	REV.	DATE	BY	STATUS	ORG	TES	MODS	SUBJECT
8065	0		5	0						

COMMENT: SPACE RESERVED FOR LATER REVISIONS.

FILE NO.	DATE	BASIS	REV.	DATE	BY	STATUS	ORG	TES	MODS	SUBJECT
8065	0		6	0						

COMMENT: SPACE RESERVED FOR LATER REVISIONS.

	REV. 0		LATEST REV.				ACTION		PG&E	
FILE NO.	DATE	BASIS	REV.	DATE	BY	STATUS	ORG	TES	MODS	SUBJECT
9026	821110	QAR	5	830309	TES	PRR/CI	TES	LCN		ATTACHMENTS-REACTOR COOLANT SYSTEM PIPING
COMMENT: FRC REVIEWED PRELIM INFO FROM PG&E (830223), PG&E COMP SHT (830224), AND ADDED PG&E INFO (830307),AND RESULTS OF SWEC INDEPENDENT L.P. EXAM OF LUG REMOVAL AREA 14 ON LOOP 1-4. RESULTS INDICATE THAT THERE IS NO SAFETY SIGNIFICANCE REGARDING THIS ITEM.										
9026	821110	QAR	6	830309	TES	CR	NONE	LCN	NO	ATTACHMENTS-REACTOR COOLANT SYSTEM PIPING
COMMENT: NO DOCUMENTATION AVAILABLE THAT LIQUID PENETRANT EXAMINATION WAS PERFORMED AS REQUIRED FOR SOME TEMPORARY ATTACHMENTS TO RCS PIPING. FRC REVIEWED PG&E INFO AND INDEPENDENT SWEC L.P. EXAM OF LUG REMOVAL AREA 14 ON LOOP 1-4 RESULTS INDICATE THAT THERE IS NO SAFETY SIGNIFICANCE REGARDING THIS ITEM. CLOSED ITEM.										
9027	821110	QAR	0	821110	SWEC	OIR	SWEC	LCN		WELDS-BMI TUBING
COMMENT: NO EVIDENCE COULD BE FOUND THAT LIQUID PENETRATION EXAMINATION OF TUBE TO SEAL TABLE WELDS WAS PERFORMED AS REQUIRED BY SPECIFICATION 8752.										
9027	821110	QAR	1	830112	SWEC	PER/C	TES	LCN		WELDS-BMI TUBING
COMMENT: BASED ON ADDITIONAL INFORMATION BY PG&E, IT IS CLEAR THAT LIQUID PENETRANT INSPECTION OF WELDS IN QUESTION WAS NOT REQUIRED. THERE IS NO SAFETY SIGNIFICANCE REGARDING THIS ITEM.										
9027	821110	QAR	2	830117	TES	ER/C	PG&E	LCN		WELDS-BMI TUBING
COMMENT: NO EVIDENCE WAS FOUND THAT LIQUID PENETRANT EXAMINATION OF TUBE TO SEAL TABLE WELDS WAS PERFORMED AS REQUIRED BY SPEC. 8752. ADDITIONAL INFO FROM PG&E ON COMPLETION SHEET SIGNED 821208 INDICATES THAT THIS PARTICULAR WELD WAS EXEMPTED FROM REQ. FOR LIQUID PENETRANT EXAMINATION OF STAINLESS STEEL WELDS.										
9027	821110	QAR	3	830117	TES	CR	NONE	LCN	NO	WELDS-BMI TUBING
COMMENT: NO EVIDENCE WAS FOUND THAT LIQUID PENETRANT EXAMINATION OF TUBE TO SEAL TABLE WELDS WAS PERFORMED AS REQUIRED BY SPEC. 8752. ADDITIONAL INFO FROM PG&E ON COMPLETION SHEET SIGNED 821208 INDICATES THAT THIS PARTICULAR WELD WAS EXEMPTED FROM REQ. FOR LIQUID PENETRANT EXAMINATION OF STAINLESS STEEL WELDS. NO SAFETY SIGNIFICANCE. ERROR CLASS C.										
9028	821119	QAR	0	821119	SWEC	OIR	SWEC	LCN		WELD DOCUMENTATION - BMI SUPPORTS
COMMENT: WELD DOCUMENTATION DOES NOT IDENTIFY WELDER TO SPECIFIC WELDS AS REQUIRED BY SPECIFICATION 8752.										
9028	821119	QAR	1	830112	SWEC	PPRR/CI	TES	LCN		WELD DOCUMENTATION - BMI SUPPORTS
COMMENT: INFO BY PG&E INDICATES THAT CHANGE NOTICE 18 TO SPEC 8752 REVISED THE REQ. FOR WELD NUMBERS AND WELDER ID NUMBERS TO BE AS APPLICABLE PER CODES, STANDARDS, SPECS DWGS, OR CONSTRUCTION DIRECTION. THESE DOCUMENTS DIDN'T INCLUDE THIS REQUIREMENT, THEREFORE, THERE WAS NO VIOLATION OF SPEC 8752.										
9028	821119	QAR	2	830117	TES	PRR/CI	TES	LCN		WELD DOCUMENTATION - BMI SUPPORTS
COMMENT: INFO PROVIDED BY PG&E INDICATES THAT CHANGE NOTICE 18 TO SPEC 8752 REVISED REQUIREMENTS FOR WELD NUMBERS AND WELDER ID NUMBERS TO BE AS APPLICABLE PER CODES, STANDARDS, SPECS, DWGS, OR CONSTRUCTION DIRECTION. THESE DOCUMENTS DIDN'T INCLUDE THIS REQ., THEREFORE NO VIOLATION OF SPEC. 8752.										
9028	821119	QAR	3	830117	TES	CR	NONE	LCN	NO	WELD DOCUMENTATION - BMI SUPPORTS
COMMENT: INFO PROVIDED BY PG&E INDICATES THAT CHANGE NOTICE 18 TO SPEC 8752 REVISED REQUIREMENTS FOR WELD NUMBERS AND WELDER ID NUMBERS TO BE AS APPLICABLE PER CODES, STANDARDS, SPECS, DWGS, OR CONSTRUCTION DIRECTION. THESE DOCUMENTS DIDN'T INCLUDE THIS REQ., THEREFORE NO VIOLATION OF SPEC. 8752. CLOSED ITEM.										
9029	821119	QAR	0	821119	SWEC	OIR	SWEC	LCN		REACTOR COOLANT SYSTEM - WELD DEFICIENIES
COMMENT: NUMEROUS INSTANCES OF ARC STRIKES, WELD SPATTER, RUSTING, PITTING, OVERGRINDING, PAINT SPATTER ON RCS LOOPS AND SURGE LINES.										
9029	821119	QAR	1	830218	SWEC	PER/C	TES	LCN		REACTOR COOLANT SYSTEM - WELD DEFICIENIES
COMMENT: NUMEROUS INSTANCES OF ARC STRIKES,WELD SPLATTER,RUSTING,PITTING,OVERGRINDING,PAINT SPATTER ON RCS LOOPS & SURGE LINES. INFO ON PG&E RESPONSE INDICATES ACCEPTABLE CONDITIONS OF RCS UPON FINISH OF INITIAL WELDING EFFORTS.TECHNICAL EVAL INDIC CONCERNS ARE MINOR & SAFE OPERATION NOT COMPROMISED. PROGRAM BY PG&E TO RETURN RCS TO INITIAL CONDITION REASONABLE.										
9029	821119	QAR	2	830225	TES	ER/C	PG&E	LCN		REACTOR COOLANT SYSTEM - WELD DEFICIENIES
COMMENT: NUMEROUS INSTANCES OF ARC STRIKES, WELD SPATTER, RUSTING, PITTING, OVERGRINDING, PAINT SPATTER ON RCS LOOP AND SURGE LINES. BASED ON INFO IN DCP RESOLUTION SHEET SIGNED 830211, IT IS CONCLUDED THAT CONCERNS WON'T COMPROMISE SAFE OPERATIO OF PLANT.										
9029	821119	QAR	3	830225	TES	CR	NONE	LCN	NO	REACTOR COOLANT SYSTEM - WELD DEFICIENIES
COMMENT: NUMEROUS INSTANCES OF ARC STRIKES, WELD SPATTER, RUSTING, PITTING, OVERGRINDING, PAINT SPATTER ON RCS LOOP AND SURGE LINES. BASED ON INFO IN DCP RESOLUTION SHEET SIGNED 830211, IT IS CONCLUDED THAT CONCERNS WON'T COMPROMISE SAFE OPERATIO OF PLANT. ERROR CLASS C.										

APPENDIX E

CROSS INDEX OF FINAL REPORT SECTIONS EOIs and ITRs

E.1 ITRs In Numerical Sequence

ITR	REV NO.	ISSUE DATE	ISSUED BY	TITLE
1	1	821022	RLCA	Additional Verification and Additional Sampling (Phase 1)
2	0	820623	TES	Evaluation of the Quality Assurance Program and Implementation Reviews
3	0	820716	RLCA	Evaluation of Initial Tank Sample
4	0	820723	RLCA	Evaluation of Electrical Equipment Qualified by Test (Shake Table Testing Report)
5	0	820819	RLCA	Seismic Design Chain (Hosgri)
6	0	820910	RLCA	Auxiliary Building (Initial Evaluation)
7	0	820917	RLCA	Electrical Raceway Supports (Initial Evaluation)
8	0	821007	RLCA	IDVP Program For Verification of PGandE Corrective Action (Phase I)
9	0	821018	RFR	Contractor List for Non-Seismic Prior to 7806
10	0	821029	RLCA	Hosgri Spectra (Initial Evaluation)
11	0	821102	TES	PGandE NSSS Seismic Interface Review
12	0	821105	RLCA	Initial Evaluation - Piping
13	0	821105	RLCA	Soils Intake Structure
14	1	830509	SWEC	Initial Evaluation P/T Analysis Nuclear Technology Division
15	0	821210	RLCA	HVAC Duct and Supports Report
16	0	821208	RLCA	OWST Soils Review
17	0	821214	RLCA	Additional Activity Piping
18	1	830524	SWEC	Initial Evaluation Fire Protection System
19	0	821216	SWEC	Initial Evaluation Radiation Analysis Nuclear Technology Division
20	1	830426	SWEC	Initial Evaluation CRVP System Power Division Report

E.1 ITRs In Numerical Sequence (Continued)

ITR	REV NO.	ISSUE DATE	ISSUED BY	TITLE
21	1	830503	SWEC	Initial Evaluation High Energy Pipe Line Cracks Report
22	1	830426	SWEC	Initial Evaluation Nuclear Auxiliary Feedwater System Report
23	1	830527	SWEC	Initial Evaluation High Energy Pipe Break Report
24	1	830504	SWEC	Inital Evaulation 4160V Electrical Distribution System Division
25	1	830429	SWEC	Initial Evaluation Auxiliary Feedwater System Electrical Division
26	1	830502	SWEC	Initial Evaluation CRVP System Electrical Division
27	1	830513	SWEC	Initial Evaluation Auxiliary Feedwater System I/C Division Report
28	1	830513	SWEC	Initial Evaluation CRVP System I/C Division Report
29	0	820117	SWEC	Design Chain - SWEC Initial Samples
30	0	830112	RLCA	Initial Evaluation Small Bore Piping
31	0	830114	RLCA	Initial Evaluation HVAC Components
32	0	830401	RLCA	Initial Evaluation Pumps
33	1	830428	RLCA	Initial Evaluation Electrical Equipment
34	1	830324	SWEC	Verification of DCP Efforts by SWEC
35	0	830401	RLCA	Verification of DCP Efforts by RLCA
36	0	830225	SWEC	CQA G.F. Atkinson
37	0	830223	RLCA	Initial Evaluation Valves
38	1	820301	SWEC	CQA Wismer and Becker
39	0	830225	RLCA	Soils: Intake Structure Bearing Capacity and Lateral Earth Pressure
40	0	830309	RLCA	Additional Activity Soils Review, Intake Sliding Resistance

E.1 ITRs In Numerical Sequence (Continued)

ITR	REV NO.	ISSUE DATE	ISSUED BY	TITLE
41	0	830419	RFR	QA Review and Audit of DCP Corrective Action Program and Design Verification
42	0	830415	RFR	Phase II QA and Design Control Practices
43	0	830414	RLCA	Initial Evaluation CCW Heat Exchanger
44	0	830415	RFR	Shake Table Mounting
45	0	830517	SWEC	Additional Verification of Redundancy of Equipment and Power Supplies in Shared Safety-Related Systems
46			SWEC	Additional Activity Design Conditions
47			SWEC	Additional Activity Environment Outside Containment
48			SWEC	Additional Activity Jet Impingement Inside Containment
49			SWEC	Additional Activity Separation and Independence
50			TES	Containment Annulus Structure
51			TES	Corrective Action - Containment Annulus
52	Replaced by ITR-68			
53	Replaced by ITR-68			
54			RLCA	Corrective Action Containment Building
55			RLCA	Corrective Action Auxiliary Building
56			RLCA	Corrective Action Turbine Building
57			RLCA	Corrective Action Fuel Handling Building
58			RLCA	Corrective Action Intake Structure
59			RLCA	Corrective Action Large Pipe Stress
60			RLCA	Corrective Action Large Pipe Support

E.1 ITRs In Numerical Sequence (Continued)

ITR	REV NO.	ISSUE DATE	ISSUED BY	TITLE
61			RLCA	Corrective Action Small-Bore Piping
62			RLCA	Corrective Action Small Bore Pipe Supports
63			RLCA	Corrective Action HVAC Duct and Supports
64			RLCA	Corrective Action Raceways and Support
65			RLCA	Corrective Action Rupture Restraints
66			RLCA	Corrective Action Instrument Tubing and Supports
67			RLCA	Corrective Action Equipment
68			RLCA	Verification of HLA Soils Work

E.2A ITR/EOI CROSS REFERENCE

ITR	EOI
1	Defines Phase I Additional Verification/Sample
2	968, 969, 970, 981, 982, 984, 992, 993, 1009, 1010, 1014, 1022, 1027, 1028, 1029, 1040, 1041, 1042, 1052, 1064, 1065, 1066, 1067, 1068, 1070, 1079, 3000, 3001, 3002, 3003, 3004, 3005
3	1011, 1012, 1015, 1017, 1030, 1053, 1054
4	1005, 1007, 1013, 1049
5	Defines Design Chain Network - Phase I
6	920, 985, 986, 987, 990, 991, 1027, 1028, 1029, 1070, 1079, 1091, 1092, 1093, 1095, 1097
7	910, 930, 983, 1010, 1026, 1093, 1097
8	Defines Verification Program that RLCA Will Use in Performing Verification of DCP Phase I Corrective Action
9	Development of the Service-Related Contractor List for Non-Seismic Design Work Performed for DCNPP-1 Prior to June 1, 1978
10	920, 967, 976, 978, 981, 983, 986, 1002, 1004, 1005, 1007, 1008, 1009, 1010, 1011, 1013, 1014, 1015, 1020, 1022, 1025, 1026, 1028, 1049, 1053, 1055, 1062, 1063, 1065, 1068, 1071, 1072, 1074, 1080, 1081, 1084, 1085, 1086, 1093, 1097, 1102, 1103, 3004, 3005
11	976, 978, 1004
12	931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 994, 995, 996, 997, 1000, 1001, 1009, 1014, 1019, 1021, 1023, 1025, 1031, 1032, 1050, 1051, 1057, 1060, 1062, 1063, 1069, 1071, 1074, 1075, 1076, 1080, 1081, 1084, 1085, 1086, 1098, 1103, 1105, 1106
13	968, 969, 970, 981, 1070, 1094, 1100, 1101, 3000
14	8001 thru 8006, 8033, 8034, 8040
15	1003, 1077, 1110

E.2A ITR/EOI CROSS REFERENCE

ITR	EOI
16	968, 969, 970, 981, 1070, 1094, 1100, 1101, 3000
17	1009, 1098, 1104, 1106, 1107, 1108
18	8019, 8020, 8021, 8035, 8036, 8037, 8038, 8039
19	NONE
20	8012, 8016
21	8011, 8014, 8028, 8029, 8030, 8031, 8050
22	8009, 8010, 8015, 8027, 8048, 8060, 8062
23	8007, 8008, 8049
24	8013, 8022, 8023, 8024, 8025, 8026, 8045
25	8011, 8042, 8043, 8044, 8061, 8063
26	8011, 8041, 8042, 8044, 8061
27	8018, 8032, 8047, 8049, 8051, 8052, 8054, 8055, 8057, 8058, 8059, 8060, 8064
28	8017, 8046, 8053, 8056, 8057, 8059
29	Design Chain - Non Seismic
30	1024, 1043 thru 1048, 1058, 1059
31	1018, 1061, 1083, 1096, 1102
32	1020, 1022, 1072, 1073, 1113, 1114
33	949, 1004, 1006, 1007, 1008, 1087, 1117
34	Verification of DCP Efforts by SWEC
35	IDVP Verification Plan for DCP Activities by RLCA
36	9008, 9015, 9016, 9021
37	950, 998, 999, 1082, 1116
38	9001 thru 9007, 9009 thru 9014, 9017 thru 9020, 9022 thru 9029
39	1112

E.2A ITR/EOI CROSS REFERENCE

ITR	EOI
40	NONE
41	NONE
42	7001 thru 7006
43	978, 1088, 1099
44	1118, 1119
45	8012, 8016
46	8009, 8010, 8062
47	8001
48	7002, 8065
49	8017, 8057
50	1014
51	1014
52	See ITR-68
53	See ITR-68
54	1014
55	1028, 1097, 1124, 1132
56	1026
57	1092
58	1022
59	1098, 1126, 1133, 1135
60	1098, 1122, 1129, 1131
61	1098

E.2A ITR/EOI CROSS REFERENCE

ITR	EOI
62	1098
63	1003, 1134
64	983
65	1098
66	1123
67	1128, 1130, 1136
68	None

NOTE:

The information on this Table excludes tabular material and appendixes.

E.2B EOI/ITR CROSS REFERENCE

EOI	ITR	EOI	ITR
910	7	971	None
920	6, 10	972	None
930	7	973	None
931	12	974	None
932	12	975	None
933	12	976	10, 11
934	12	977	50, 51
935	12	978	10, 11, 43
936	12	979	None
937	12	980	58
938	12	981	2, 10, 13, 16
939	12	982	2
940	12	983	7,10, 64
941	12	984	2
942	12	985	6
943	12	986	6, 10
944	12	987	6
945	12	988	58
946	12	989	56
947	12	990	6
948	12	991	6
949	33	992	2
950	37	993	2
951	12	994	2, 12
952	12	995	12
953	12	996	12
954	12	997	12
955	12	998	37
956	12	999	37
957	12	1000	12
958	12	1001	12
959	12	1002	10
960	12	1003	15, 63
961	12	1004	10, 11, 33
962	12	1005	4, 10
963	12	1006	33
964	12	1007	4, 10, 33
965	12	1008	10, 33
966	12	1009	2, 10, 12, 17
967	10	1010	2, 7, 10
968	2, 13, 16	1011	3, 10
969	2, 13, 16	1012	3
970	2, 13, 16	1013	4, 10

E.2B EOI/ITR CROSS REFERENCE

EOI	ITR
1014	2, 10, 12, 50, 51, 54
1015	3, 10
1016	None
1017	3
1018	31
1019	12
1020	10, 32
1021	12
1022	2, 10, 32, 58
1023	12
1024	30
1025	10, 12
1026	7, 10, 56
1027	2, 6
1028	2, 6, 10, 55
1029	2, 6
1030	3
1031	12
1032	12
1033	None
1034	None
1035	None
1036	None
1037	None
1038	None
1039	None
1040	2
1041	2
1042	2
1043	30
1044	30
1045	30
1046	30
1047	30
1048	30
1049	4, 10
1050	12
1051	12
1052	2
1053	3, 10
1054	3
1055	10
1056	None

EOI	ITR
1057	12
1058	30
1059	30
1060	12
1061	31
1062	10, 12
1063	10, 12
1064	2
1065	2, 10
1066	2
1067	2
1068	2, 10
1069	12
1070	2, 6, 13, 16
1071	10, 12
1072	10, 32
1073	32
1074	10, 12
1075	12
1076	12
1077	15
1078	None
1079	2, 6
1080	10, 12
1081	10, 12
1082	37
1083	31
1084	10, 12
1085	10, 12
1086	10, 12
1087	33
1088	43
1089	None
1090	None
1091	6
1092	6, 57
1093	6, 7, 10
1094	13, 16
1095	6
1096	31
1097	6, 7, 10, 55
1098	12, 17, 59, 60, 61, 62
1099	43

E.2B EOI/ITR CROSS REFERENCE

EOI	ITR
1100	13, 16
1101	12, 13, 16
1102	10, 31
1103	10, 12
1104	17
1105	12
1106	12, 17
1107	17
1108	17
1109	17
1110	15
1111	None
1112	39
1113	32
1114	32
1115	60, 62
1116	37
1117	33
1118	44
1119	44
1120	67
1121	67
1122	60
1123	66
1124	55
1125	67
1126	59
1127	67
1128	67
1129	60
1130	67
1131	60
1132	55
1133	59
1134	63
1135	59
1136	67
1137	59

EOI	ITR
3000	2, 12, 13, 16
3001	2
3002	2
3003	2
3004	2, 10
3005	2, 10
3006	50, 51
3007	50, 51
3008	50, 51
6001	59, 60, 61, 62
6002	65
7001	42
7002	42, 48
7003	42
7004	42
7005	42
7006	42

E.2B EOI/ITR CROSS REFERENCE

EOI	ITR
8001	14, 47
8002	14
8003	14, 47
8004	14
8005	14
8006	14, 47
8007	23
8008	23
8009	22, 46
8010	22, 46
8011	21, 25, 26
8012	20, 45
8013	24, 27
8014	21
8015	22
8016	20, 45
8017	28, 49
8018	27
8019	18
8020	18
8021	18
8022	24
8023	24
8024	24
8025	25
8026	24
8027	22
8028	21
8029	21
8030	21
8031	21
8032	27
8033	14, 47
8034	14, 47
8035	18
8036	18
8037	18
8038	18
8039	18
8040	14
8041	26
8042	25, 26
8043	25
8044	25, 26
8045	24
8046	28
8047	27
8048	22
8049	23
8050	21
8051	27
8052	27
8053	28
8054	27
8055	27
8056	28
8057	27, 28, 49
8058	27
8059	27, 28
8060	22, 27
8061	25, 26
8062	22, 46
8063	25
8064	27
8065	48

E.2B EOI/ITR CROSS REFERENCE

EOI	ITR
9001	38
9002	38
9003	38
9004	38
9005	38
9006	38
9007	38
9008	36
9009	38
9010	38
9011	38
9012	38
9013	38
9014	38
9015	36
9016	36
9017	38
9018	38
9019	38
9020	38
9021	36
9022	38
9023	38
9024	38
9025	38
9026	38
9027	38
9028	38
9029	38

NOTE:

The information found on this table excludes tabular material and appendixes.

E.3A ITR/REPORT SECTION

ITR	SECTION 4.0 SUBSECTIONS
1	Programmatic
2	4.2.1, 4.2.2, 4.2.3
3	4.6.2
4	4.9.1
5	4.1.4, 4.1.5
6	4.4.1, 4.4.2
7	4.6.8
8	Programmatic
9	4.1.4, 4.2.1
10	4.2.3, 4.3.2
11	4.1.3
12	4.5.2
13	4.9.2
14	4.7.6, 4.7.7, 4.8.4
15	4.6.6
16	4.9.2
17	4.5.2
18	4.7.2, 4.7.3, 4.7.4
19	4.7.5
20	4.7.3, 4.7.7, 4.8.2
21	4.7.2, 4.7.3
22	4.1.3, 4.7.2, 4.7.7, 4.8.3
23	4.7.2, 4.7.3
24	4.7.4
25	4.7.2
26	4.7.3
27	4.7.2, 4.7.7
28	4.7.7, 4.8.6
29	4.1.4, 4.1.5, 4.2.1
30	4.5.3
31	4.6.6
32	4.6.4
33	4.6.7
34	Programmatic
35	Programmatic
36	4.2.1, 4.2.4
37	4.6.3
38	4.2.1, 4.2.4
39	4.9.2
40	4.9.2
41	4.2.1, 4.2.3, 4.3.2

E.3A ITR/REPORT SECTION

ITR	SECTION 4.0 SUBSECTIONS
42	4.1.3, 4.2.1, 4.2.2, 4.2.3
43	4.6.5
44	4.9.1
45	4.8.2
46	4.8.3
47	4.8.4
48	4.8.5
49	4.8.6
50	4.4.5
51	4.4.5
52	See ITR-68
53	See ITR-68
54	4.4.4
55	4.4.2
56	4.4.8
57	4.4.3
58	4.4.6
59	4.5.2
60	4.5.2
61	4.5.3
62	4.5.3
63	4.6.6
64	4.6.8
65	4.9.3
66	4.6.8
67	4.6.2, 4.6.4, 4.6.5, 4.6.6, 4.6.7, 4.6.9, 4.9.1
68	4.9.2

E.3B REPORT SECTION/ITR

SECTION 4.0 SUBSECTIONS	ITR
	Report Sections 0.0 through 3.7.3 have no ITRs
4.0	None
4.1	None
4.1.1	None
4.1.2	None
4.1.3	11, 22, 42
4.1.4	5, 9, 29
4.1.5	5, 29
4.1.6	None
4.2	None
4.2.1	2, 9, 29, 36, 38, 41, 42
4.2.2	2, 42
4.2.3	2, 10, 41, 42
4.2.4	36, 38
4.3	None
4.3.1	None
4.3.2	10, 41
4.3.3	None
4.3.4	None
4.4	None
4.4.1	6
4.4.2	6, 55
4.4.3	57
4.4.4	54
4.4.5	50, 51
4.4.6	58
4.4.7	None
4.4.8	56
4.5	None
4.5.1	None
4.5.2	12, 17, 59, 60
4.5.3	30, 61, 62
4.6	None
4.6.1	None
4.6.2	3, 67
4.6.3	37
4.6.4	32, 67
4.6.5	43, 67
4.6.6	15, 31, 63, 67
4.6.7	33, 67
4.6.8	7, 64, 66
4.6.9	67

E.3B REPORT SECTION/ITR

SECTION 4.0 SUBSECTIONS	ITR
4.7	None
4.7.1	None
4.7.2	18, 21, 22, 23, 25, 27,
4.7.3	18, 20, 21, 23, 26
4.7.4	18, 24
4.7.5	19
4.7.6	14
4.7.7	14, 20, 22, 27, 28
4.8	None
4.8.1	None
4.8.2	20, 45
4.8.3	22, 46
4.8.4	14, 47
4.8.5	48
4.8.6	28, 49
4.9	None
4.9.1	4, 44, 67
4.9.2	13, 16, 39, 40, 68
4.9.3	65

The third basis for identifying the IDVP Findings is consideration of the physical modifications made as a result of the IDVP. In some cases a physical modification resulted from the identification of a specific error, but the majority of the physical modifications resulted from generic concerns. Both the DCP corrective action program with respect to seismic considerations and the DCP efforts in response to the SWEC-generated generic concerns were applied to safety-related structures, systems, and components affected by the generic concern regardless of whether or not that item had been previously considered by the IDVP. These DCP activities were verified by the IDVP in accordance with documented plans, but an EOI file would not have been opened unless the IDVP identified some new concern with respect to the DCP activities.

Two other bases were considered for their possible usefulness for identifying the IDVP Findings. The first of these is the evaluation of the QA audits and reviews reported in subsection 4.2. However, these results have been considered in preparing the programmatic ITRs and do not require separate consideration in this section. The second is the possibility that some combination of those files classified as Observations represent a concern as significant as some of the Findings. The EOI Files are analyzed in 5.5 to investigate this possibility.

Each of the three bases for identifying the IDVP Findings described in one of the three preceding paragraphs is addressed by one of the three subsections which follow. These are then considered in performing the evaluations reported in 6.0 of this report.

where the number used is that for the EOI File identified as a Finding. A history of each EOI File is contained in the LISTLOG printout in Appendix D. The ITRs which include a detailed presentation of the subject are identified in Table 5-1 and additional information is available from the cross-indexes in Appendix E. Table 5-1 also references the final report section, or sections, which summarize the technical aspects of the file.

Although each EOI File identified as a Finding has been classified by the IDVP as an ER/A, ER/AB, or ER/B, there are three different bases for that classification, specifically:

- 15 files (932, 938, 949, 963, 983, 1069, 1106, 1107, 8001, 8009, 8010, 8012, 8017, 8057, 8062) were classified on the basis of a technical error identified during verification of the initial sample.
- 1 file (7002) was classified on the basis of the IDVP evaluation of the QA Audits and Reviews.
- 7 files (1003, 1014, 1022, 1026, 1092, 1097, 1098) were classified as a result of the establishment of the DCP Corrective Action Program.

With respect to the last basis, none of these seven EOI Files had been fully resolved by the IDVP at the time the Corrective Action Program (CAP) was established. When the CAP was established, each of these files was redefined to track the generic DCP action and was resolved by verification of DCP activities in accordance with ITR-8 and -35. EOI File 7002 also led to generic DCP action which was verified in accordance with ITR-34.

With respect to the 15 EOI Files which resulted in a Finding on the basis of a technical error, 8 developed from RLCA Phase I work and 7 from SWEC Phase II work. Of the 8 RLCA originated files, one (983)

was redefined to cover generic CAP efforts. Another (1106) was originally defined as a generic concern to be resolved by verification of DCP efforts. The remaining 6 files were concerns specific to the item being evaluated by RCLA, but all were influential in defining expanded IDVP activities in ITRs-1 or -8. All 7 SWEC originated files were specific concerns, and all 7 contributed to the identification of four generic concerns which were verified in accordance with ITR-34.

Several of the Table 5-1 pages indicate that other EOI Files were combined with the file identified as the Finding. The existence of such combined files should not be interpreted as increasing or decreasing the number of Findings. In no case were two or more Findings combined. In all cases, each of the files being combined was tracking a common concern. By combining the files, the overall concern was more readily tracked and each was more certain of proper resolution. When the combination was with an EOI File originated by RCLA, the combined concern was being addressed as part of the CAP and was subject to IDVP verification in accordance with ITRs-8 and -35. There were only two cases (EOI 8001s and 8012) where SWEC originated files were combined; one also included two RFR originated files. The former affected the evaluation of environmental conditions outside of containment and were resolved by DCP activities verified in accordance with ITR-34. EOI 8012 considers separation and single failure criteria of Class 1E CRVP power supplies.

5.3.3 Findings from ITR-34 Verifications

ITR-34 defines the IDVP program for verification of the DCP efforts taken in response to the SWEC and RFR Phase II efforts, see 3.5.6 and 4.8.1. The IDVP efforts performed in accordance with ITR-34 have been summarized in 4.8.2 (redundancy of equipment and power supplies in shared safety-related systems), 4.8.3 (selection of system design pressure and temperature, and differential pressure across power operated valves), 4.8.4 (environmental consequences of postulated pipe ruptures outside containment), 4.8.5 (jet impingement effects of postulated pipe rupture inside containment) and 4.8.6 (circuit separation and single failure review of safety-related electrical equipment).

No additional Findings were identified as a result of the ITR-34 effort.

The Commission Order and the Staff Letter presumed possible significance to dates in the year 1978 as indicating some major change in the DCNPP QA and design processes. The IDVP has not identified an abrupt change in that time frame, although there was an accelerated rate of improvement in the evolutionary process which extended over the entire 1968-1981 period.

There is, however, another approximate division of the time period prior to November 1981 which is of significance to the performance of the IDVP. The originally intended operating date for DCNPP was 1972, so that the majority of the original design effort was intended to be completed by about 1970. For various reasons this intent was not met and design and construction sufficient to permit hot functional testing was not complete until 1975. This was also the year in which the Final Safety Analysis Report (FSAR) was initially approved. Between 1975 and September 1981 the DCNPP-1 effort was primarily concerned with the postulated 7.5M Hosgri seismic event and TMI backfits. The events on and after September 28, 1981 have been previously described in Section 1 of this report.

A significant change following November 30, 1981 was the formation of the DCP as a joint effort of PGandE and BPC as described in 1.4.2 of this report. A major change in the approach of the DCP occurred in the summer of 1982 with the establishment of the Corrective Action Program in response to IDVP and DCP concerns regarding design against seismic effects.

Both the IDVP and the DCP have identified errors that occurred in the original DCNPP-1 design process. The key issue is the effectiveness of the IDVP in identifying uncertainties and in verifying the corrective action of the DCP, so as to reasonably assure an adequate remedy for the deficiencies detected in the original DCNPP-1 design activities.

The following four subsections address subjects requested by the Commission Order and Staff Letter:

Subsection	Topic
6.2	Effectiveness of the IDVP
6.3	Basic Causes
6.4	Significance of Design Errors
6.5	Impact on Facility Design

Finally, 6.6 and 6.7 address, respectively, the specific requirements of the Commission Order and Staff Letter. This is done by repeating the NRC requirement, by giving a very brief response, and by referencing the sections of this report where more information is available.