

PROGRESS REPORT  
OF  
SEISMIC RE- VERIFICATION PROGRAM  
DIABLO CANYON NUCLEAR POWER PLANT

Project 105-4  
Progress Report No. 2  
Work Period from 11/11 to 11/23/81

Report of work performed for Pacific Gas &  
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1. Summary:

The entire seismic design chain for the Diablo Canyon Nuclear Power Plant was mapped to determine the names, work scope, and status of subcontractors who have been involved with the seismic safety-related work. A judgment sample has been chosen which consists of more than 90% of the total seismic design work performed by subcontractors in the seismic design chain.

The plan and section drawings developed from as-built auxiliary building drawings are almost complete. They have been compared with the plan and section drawings used by URS/Blume to develop the building dynamic model. Minor differences were disclosed but no conclusion regarding the significance of these differences has been reached.

The dynamic model of one piping run is nearly complete, and a second piping model is being developed. A total of six systems have been determined from which piping runs will be chosen. Although efforts have been spent on selecting piping supports for independent requalification, the actual selection has not been completed.

The requalification of the selected Boric Acid Tank and the Component Cooling Water Heat Exchanger has begun.

The selection of HVAC duct supports is complete, and nineteen of the twenty selected conduit supports have been identified. A major portion of the conduit and cable tray weights based on as-built conditions were computed and compared well with the weights used by PGandE. Some re-analysis of work for determining stresses in the conduit also has begun.

The sample for independent requalification of HVAC components has been selected. However, the selection of small bore piping runs is not complete.

No field trip was taken in this work period to ensure that the as-built configurations of equipment are the same as were qualified. This was because of the necessary time required to assemble the design information before a field trip can be taken.

The QA/QC procedures have been enforced. An internal document control audit was conducted to check the correct implementation of the QA/QC procedures.

## 2. Work Accomplished:

There are four tasks of the subject re-verification program. The work accomplished for each task in the reported work period is described below:

### 2.1 Task 1 - Review of Sesmic Design Chain for Applicability

The entire seismic design chain for the Diablo Canyon Nuclear Power Plant was mapped to determine:

- . names of PGandE's subcontractors involved in seismic safety-related work
- . work scope of each subcontractor

- . commencement date and status (closed or open) of each subcontractor's work
- . departments within PGandE which were/are responsible for the subcontracts

A judgment sample of the seismic design chain has been selected and is described below:

- . EDS (all seismic related work)
- . EES (piping only)
- . URS/Blume (piping only)
- . Wyle Laboratories (sample examination of test results)
- . Westinghouse (electrical equipment, crane only)
- . Harding-Lawson (soil investigation)
- . Anamet (Post Accident Monitor Panel seismic analysis only)

## 2.2 Task 2 - Independent Re-qualification

The work accomplished for each item in this work period is given below.

### 2.2.1 Auxiliary Building

The dynamic models of the auxiliary building used by URS/Blume for the pre-Hosgri and Hosgri analyses were reviewed.

The plan and section drawings developed from as-built auxiliary building drawings are almost complete. They have been compared with the plan and section drawings used by URS/Blume to develop the building dynamic model. Some minor differences were disclosed from this comparison. Although it is believed that these minor differences may not affect the overall building dynamic response, the significance can be established only after the mass and stiffness of the dynamic models are compared.

#### 2.2.2 Piping Runs and Pipe Supports

A total of six safety-related systems from which some piping runs will be chosen for independent reverification have been determined. They are:

- . Safety Injection System
- . Chemical Volume Control System
- . Residual Heat Removal System
- . Containment Spray System
- . Auxiliary Feed Water System
- . Component Cooling Water System

The dynamic model of one piping run is nearly complete and a second piping model is being developed. Because the models are developed from the as-built drawings, a field trip will be necessary to ensure that the as-built configurations are the same as were qualified. The actual selection of piping supports is not complete.

#### 2.2.3 Equipment

Some of the relevant design drawings have been reviewed and relevant test reports prepared by the Wyle Laboratories

have been obtained.

The requalification of the selected Boric Acid Tank and the Component Cooling Water Heat Exchanger have begun smoothly.

#### 2.2.4 Conduit and HVAC Duct Supports

The selection of HVAC ducts supports is complete and nineteen of the twenty selected conduit supports have been identified. A major portion of the conduit and cable tray weights based on as-built conditions were computed and compared well with the weights used by PGandE. Some re-analysis of work for determining stresses in the conduit also has begun.

#### 2.2.5 Small Bore Piping Runs and HVAC Components

The sample for independent requalification of HVAC Components has been selected. However, the selection of small bore piping runs has not been completed.

#### 2.3 Field Verification

No field trip took place during this work period.

#### 2.4 QA/QC Procedures

The QA/QC procedures have been enforced. An internal document control audit was conducted to check the correct implementation of the QA/QC procedures. In only one instance was a document removed from the controlled area without being signed out. This situation has been remedied by circulating a memorandum to all engineers on this project.

#### 3. Significant Results or Findings

No significant results or findings can be reported for the tasks performed in this work period.

#### 4. Scheduled Work for Next Work Period

##### 4.1 Task 1-Review of Seismic Design Chain for Applicability

The review of seismic design chain for the chosen sample of subcontractors will begin.

##### 4.2 Independent Requalification

###### 4.2.1 Auxiliary Building

It is anticipated that the following will be accomplished in the next work period:

- . Independently developed dynamic models for the auxiliary building
- . Some calculations of mass and stiffness of the dynamic models.
- . Possible field trip to inspect the as-built building configuration

###### 4.2.2 Piping Runs and Pipe Supports

The following are planned for the next work period:

- . A field trip to inspect the as-built piping configurations and piping supports.
- . Development of more dynamic models from chosen systems.
- . Begin seismic stress analysis of the developed piping dynamic models.

###### 4.2.3 Equipment

The following are expected for the next work period:



- . Continue to compile and examine information required for re-analyses.
- . Possible field trip to site to inspect equipment and support configurations and compare them with the drawings.
- . Some analysis results of equipment requalification.

#### 4.2.4 Conduit and HVAC Duct Supports

An independent calculation of the as-built conduit and HVAC duct supports will continue.

#### 4.2.5 Small Bore Piping Runs and HVAC Components

It is anticipated that the following will be accomplished in the next work period:

- . Review the drawings of selected HVAC Components
- . Make a field trip to inspect the as-built configurations of HVAC components and small bore piping runs.
- . Begin independent analysis of HVAC components
- . Select small bore piping runs for independent calculations.

#### 4.3 Field Verification

A field trip is planned to the plant to inspect the auxiliary building and to verify the as-built support conditions for the various equipment and piping runs.



#### 4.4 QA/QC Procedures

The established QA/QC procedures will continuously be enforced to ensure the quality of engineering work.

#### 5. Conclusions:

The emphasis of this work period was on reviewing the gathered design information in order to proceed with the independent requalification of buildings and equipment. The independent requalification has begun and some analysis results will be reported in the next progress report.