PROGRESS REPORT
OF
SEISMIC SERVICE-RELATED CONTRACTS
PRIOR TO JUNE 1978
DIABLO CANYON NUCLEAR POWER PLANT

Project P 105-4
Progress Report No. 11
Work Period from 3/24/82 to 4/9/82

Report of Work Performed for
Pacific Gas and Electric Company by
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1. WORK ACCOMPLISHED

There are four tasks of the Seismic Verification Program. The work accomplished for each task in the report work period is described below:

1.1 Task 1 - Review of Seismic Design Chain

The design chain review has been halted pending receipt of the PGandE list of contractors for Diablo Canyon.

1.2. Task 2 - Independent Verification

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

1.2.1 Auxiliary Building

The floor response spectra for the NS Auxiliary Building model has been generated and compared to the Hosgri Spectra. These spectra are being checked and will be reported in the next period.

1.2.2 Piping Runs and Pipe Supports

The independent analysis of RLCA piping problems 103 and 104 has been completed and checked. Comparisons will be reported in the next period.

1.2.3 Equipment

The independent analysis of Valve FCV-95 has been completed and checked. An independent review will be conducted and results will be reported in the next period.

1.2.4 Conduit and HVAC Duct Supports

The Raceway Support Calculations have been temporarily suspended

pending resolution of EOI 930 (Raceway Criteria).

1.2.5 Small Bore Piping Runs and HVAC Components

The independent analysis of HVAC Damper 7A is complete and is being checked.

1.3 Task 3 - Field Verification

A field inspection was conducted during this week period to examine electrical equipment location and mounting, CCW Pump, one Pipe Support and HVAC components.

1.4 Task 4 - Error and Open Item Reports (EOIs)

Three Error and Open Item Reports have been issued for this work period (EOI Numbers 1075 through 1077).

Two EOI Reports have been revised during this work period (910 and 964).

2.0 SIGNIFICANT RESULTS AND FINDINGS

Significant results and findings are listed in the EOI reports.

3.0 SCHEDULED WORK FOR NEXT WORK PERIOD

3.1 Task 1 - Review of Seismic Design Chain

The Seismic Design Chain will be finalized upon receipt of PGandE's contractor list.

3.2 Task 2 - Independent Verification

3.2.1 Auxiliary Building

The RLCA vertical model will be run to calculate the mode shapes and the dynamic response culminating in floor response spectra. This model incorporates the field information concerning the Fuel Handling Building slotted holes. In addition, the RLCA NS Spectra will be reviewed.

Professor Holley will continue to review the Auxiliary Building dynamic model.

3.2.2 Piping Runs and Piping Supports

The remaining three piping analyses will be completed by April 21, 1982. Reasons for the differences between the seven completed analyses and the corresponding PGandE analyses will be determined and reported.

3.2.3 Equipment

The analysis for the CCW Heat Exchanger and the Hot Shutdown Remote Control Panel will be checked. The analysis of FCV95 will be reviewed.

3.2.4 Conduit and HVAC Duct Supports

The independent calculations of the two HVAC duct samples will continue.

3.2.5 Small Bore Piping Runs and HVAC Components

The independent analysis of HVAC Damper 7A will be completed.

3.3. Task 3 - Field Verification

At least one field trip to the plant is planned to inspect pipe supports. It is expected that the NRC Diablo Canyon Resident Inspector and Teledyne engineers will accompany the RLCA engineers on this trip.

3.4 Task 4 - Error and Open Item Reports (EOIs)

Errors and open items will continue to be reported as they are identified.

4.0 ADDITIONAL VERIFICATION

To date, RLCA has recommended the following additional verification consistent with the program criteria:

- Harding-Lawson work - based on QA Findings 968, 969 and 970
- Conduit supports with additional tubing weight - EOI 910
- Conduit support calculations - EOI 983
- Piping isometrics and valves - Progress Report Number 9
- Applicable items for the Outdoor Water Storage Tanks and buried Diesel Fuel Oil Tanks - Progress Report Number 9
- Locations, mountings and test spectra for all electrical equipment qualified by testing - Progress Report Number 9
- Small Bore Piping isometrics, axial runs and certain other specific design issues - Progress Report Number 9
- Control and review of the plant design Hosgri floor response spectra - Progress Report Number 9

As a result of the errors and open items developed to date, for piping further independent calculations are required. It has been concluded that additional independent analysis of piping is needed in view of the overstressed lines reported in EOI 1071 and 1062. Detailed justification, criteria and approach is being developed and will be reported in the next period.

5.0 CONCLUSION

The transition from Robert L. Cloud Associates to Teledyne Engineering Services as Program Manager has been completed. Progress Report Number 12 will serve as the generic sample report. In this report, the completed independent analysis results will be examined, recommendations for additional verification given and a schedule for RLCA Phase I completion delineated.

6.0 CORRECTION TO PROGRESS REPORT NUMBER 10

None

7.0 INSPECTION VISITS

R. Wilkinson of Teledyne and John Carlsen of the NRC Resident Office accompanied two RLCA engineers at Diablo Canyon on April 7, 1982. The field inspection included electrical equipment location and mounting, CCW Pump, Pipe Supports and HVAC Components.

M. Barham and D. Aaron of PGandE conducted an audit of the RLCA Quality Assurance Program and implementation during this work period.

R. Wray, J. Maher, R. Foti and R. Wilkinson of Teledyne reviewed Building, Piping and Pipe Support analyses at the RLCA offices on March 31 through April 2, 1982.

ATTACHMENT A: EOI Reports for Work Period 3/24/82 to 3/9/82

OPEN ITEM REPORT

File No. 1075

File Revision No. 0

1. Date reported to PG&E and TES 3/31/82
2. Scheduled for RLCA (Originator) Semimonthly Report No. 11
3. Responsive to PG&E Technical Program: Task _____ (if applicable)
4. Prepared as a result of:
   a. ☐ QA Audit and Review Report of _____
   b. ☒ Field Inspection Deficiency
   c. ☐ Independent Calculation Deficiency
   d. ☐ Seismic Input Deficiency
   e. ☐ Design Methodology Deficiency
   f. ☐ Other Deficiency
5. Structure(s), system(s) or component(s) involved:

   RLCA 104, Piping Line 104, supports 5007-R and 18-5R

6. Description of Concern:

   Supports 5007-R and 18-5R are labeled on PGandE Design Review Isometric 449316, Rev. 3, as being active in the Y and Z directions. RLCA field verification showed the support to be active in both the X and Y directions.

7. Significance of Concern:

   The significance of this item can be better assessed upon completion of the RLCA analysis and comparison with PGandE results.

8. Recommendation:

   A recommendation will be provided upon completion of the RLCA analysis.

9. Signature: Edward Denison/RLCA (Originator/Organization)
   3/30/82

OPEN ITEM REPORT

File No. 1076

File Revision No. 0

1. Date reported to PG&E and TES 3/31/82
2. Scheduled for RLCA (Originator) Semimonthly Report No. 11
3. Responsive to PG&E Technical Program: Task _____ (if applicable)
4. Prepared as a result of:
   a. ☐ QA Audit and Review Report of _____
   b. ☒ Field Inspection Deficiency
   c. ☐ Independent Calculation Deficiency
   d. ☐ Seismic Input Deficiency
   e. ☐ Design Methodology Deficiency
   f. ☐ Other Deficiency
5. Structure(s), system(s) or component(s) involved:

   RLCA 104, Piping Line 103, support 55S-3R

6. Description of Concern:

   Support 55S-3R is labeled on PGandE Design Review Isometric 449314, Rev. 3, as being active in the Y direction. RLCA field verification showed the support to be active in both the X and Y directions.

7. Significance of Concern:

   The significance of this item can be better assessed upon completion of the RLCA analysis and comparison with PGandE results.

8. Recommendation:

   A recommendation will be provided upon completion of the RLCA analysis.

9. Signature: Edward Denison/RLCA (Originator/Organization)
   3/30/82

OPEN ITEM REPORT

File No. 1077

File Revision No. 0

1. Date reported to PG&E and TES 4/6/82
2. Scheduled for RLCA (Originator) Semimonthly Report No. 11
3. Responsive to PG&E Technical Program: Task _____ (if applicable)
4. Prepared as a result of:
   a. ☐ QA Audit and Review Report of _____
   b. ☐ Field Inspection Deficiency
   c. ☒ Independent Calculation Deficiency
   d. ☐ Seismic Input Deficiency
   e. ☐ Design Methodology Deficiency
   f. ☐ Other Deficiency
5. Structure(s), system(s) or component(s) involved:
   HVAC Duct Support

6. Description of Concern:

   The qualification calculation for RLCA sample 2 HVAC Duct Support is dated 11/8/81.

7. Significance of Concern:

   Two issues need to be examined with respect to this open item. First, are there required Class I items that were not reviewed for Hosgri? Secondly, does the date on the qualification analysis compromise the chosen sample, and the sampling basis?

8. Recommendation:

   RLCA to continue the independent analysis.

   PGandE to provide the qualification analysis dated prior to 11/8/81.

9. Signature: Edward Denison/RLCA (Originator/Organization)
   4/6/82

ATTACHMENT B: EOI Report Revised During Work Period from 3/24/82 to 4/9/82

OPEN ITEM REPORT

File No. 910

File Revision No. 1

1. Date reported to PG&E and TES 4/6/82
2. Scheduled for RLCA (Originator) Semimonthly Report No. 1
3. Responsive to PG&E Technical Program: Task _____ (if applicable)
4. Prepared as a result of:
   a. ☐ QA Audit and Review Report of _____
   b. ☒ Field Inspection Deficiency
   c. ☐ Independent Calculation Deficiency
   d. ☐ Seismic Input Deficiency
   e. ☐ Design Methodology Deficiency
   f. ☐ Other Deficiency
5. Structure(s), system(s) or component(s) involved:

   Electrical Raceways

6. Description of Concern:

   Four of twenty Raceway Supports were found at variance with the PGandE installation criteria (dwgs 050029 and 050030).

   Sample 03-Documentation to allow field approval of supports larger than design has not been located.

   Sample 04-A communication problem between design and field led to an additional 1" conduit being attached to the support.

   Sample 15-Incorrect bolt configuration.

   Sample 20-Installation in the incorrect area.

7. Significance of Concern:

   The RLCA analysis has not been completed.

8. Recommendation:

   A program has been set up by PGandE to address the communication problem associated with Sample 04.

9. Signature: Edward Jenison/RLCA (Originator/Organization)
   4/6/82

OPEN ITEM REPORT

File No. 964

File Revision No. 1

1. Date reported to PG&E and TES 4/3/82
2. Scheduled for RLCA (Originator) Semimonthly Report No. 11
3. Responsive to PG&E Technical Program: Task _____ (if applicable)
4. Prepared as a result of:
   a. ☐ QA Audit and Review Report of _____
   b. ☒ Field Inspection Deficiency
   c. ☐ Independent Calculation Deficiency
   d. ☐ Seismic Input Deficiency
   e. ☐ Design Methodology Deficiency
   f. ☐ Other Deficiency
5. Structure(s), system(s) or component(s) involved:

   RLCA Piping Analysis 107

   Line 279-8 inches (Line 2519 was incorrectly noted in Revision 0)

6. Description of Concern:

   RLCA field inspection showed a NS rigid support on line 279 to be located 3 feet, 10 inches from the elbow below elevation 100 feet. PGandE Design Review Isometric 446542 Revision 10 does not show this support.

7. Significance of Concern:

   The significance of this item can be better assessed upon completion of the RLCA analysis and comparison with PGandE results.

8. Recommendation:

   A recommendation will be provided upon completion of the RLCA analysis.

9. Signature: Edward Denison/RLCA (Originator/Organization)
   4/3/82