PROGRESS REPORT
OF
THE INDEPENDENT DESIGN VERIFICATION PROGRAM
DIABLO CANYON NUCLEAR POWER PLANT
PHASE I

Project P 105-4
Progress Report No. 13
Work Period from 4/24/82 to 5/14/82

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

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

1.1 Task 1 - Review of the Design Chain

The PGandE list of contractors for Diablo Canyon has been completed and the design chain review is continuing.

1.2. Task 2 - Independent Calculations

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

1.1.1 Auxiliary Building

The floor response spectra for the North-South (NS) and East-West (E-W) Auxiliary Building models have been generated and compared to the Hosgri Spectra. The draft report containing these spectra will be finalized in the next period.

Professor Holley's comments on the NS draft report have been addressed. A revised draft report containing both NS and EW results has been forwarded to Professor Holley for review.

1.2.2 Piping Runs and Pipe Supports

The independent analysis of the ten RLCA piping problems has been completed and checked. EOIs 1084, 1085 and 1086 were issued as a result of stress differences greater than 15%.

1.2.3 Equipment

The independent analysis of the Hot Shutdown Remote Control Panel and CCW Heat Exchanger has been completed. EOI 1087 reports stress differences greater than 15% for the Hot Shutdown Remote Control Panel.

Overstress in the CCW Heat Exchanger anchor bolts is reported in EOI 1088.

1.2.4 Conduit and HVAC Duct Supports

The HVAC duct support calculations are continuing.

1.2.5 Small Bore Piping Runs and HVAC Components

The independent analysis of HVAC Damper 7A is complete. Open Item Report 1083 Revision 1 reports an overstress in the damper weld.

1.3 Task 3 - Field Verifications

One field walkdown was conducted with Teledyne participation during this period. The RLCA engineers collected field information for the Supply Fan S-31.

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

Five new EOIs have been issued for this period: 1084 through 1088, Revision 0. In addition, EOI 1062 has been revised to clarify the overstress in RLCA Piping Analysis 100.

2.0 SIGNIFICANT REULTS 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 Design Chain review will continue.

3.2 Task 2 - Independent Calculations

3.2.1 Auxiliary Building

The RLCA Vertical model will be run to calculate the dynamic response culminating in floor response spectra. In addition, the RLCA NS and EW Report will be finalized.

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

3.3.2 Piping Runs and Piping Supports

The ten piping analyses have been completed. Additional reasons for the differences between the RLCA piping analysis and the corresponding design analyses will be determined and reported.

Activity on additional verification will be initiated.

3.2.3 Equipment

The original sample has been completed except for the CCW Pump. Information is being sought for this pump.

Activity for additional verification will be initiated.

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 the Supply Fan S-31, incorporating the field inspection, will be checked and reported.

3.3 Task 3 - Field Verification

At least one field trip to the plant is planned. 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)

Open items will continue to be reported as they are identified.

4.0 ADDITIONAL VERIFICATION

RLCA has prepared an Interim Technical Report for Teledyne review. This report contains the status of the generic sample, recommendations for additional verification and a schedule for completion. A meeting is scheduled for May 19, 1982 with PGandE to discuss the schedule presented in the report.

5.0 CONCLUSION

Recommendations for additional verification have been forwarded in a report form to Dr. W. Cooper. In this report, the completed independent analysis results are examined, recommendations for additional verification given and a schedule for RLCA Phase I completion delineated.

6.0 CORRECTIONS TO PROGRESS REPORT NO. 12

None

7.0 INSPECTION VISITS

R. Wilkinson of Teledyne accompanied two RLCA engineers at Diablo Canyon on April 29, 1982. The field inspection included the Supply Fan S-31.

R. Foti and J. Rydzewski of Teledyne reviewed piping analyses at the RLCA offices on April 27, 28 and 29, 1982.

R. Wray of Teledyne and E. Denison of RLCA met on April 28 and 29, 1982 to discuss the RLCA Auxiliary Building Analysis and EOI status.

R. Cloud and E. Denison of RLCA met with W. Cooper, R. Wray, R. May, R. Foti, C. Kano, J. Maher, P. Raju and R. Boentgen of Teledyne on May 5, 1982 in the TES offices to discuss the Interim Technical Report.

E. Denison of RLCA and R. Wray of Teledyne reviewed the seismic inputs into selected Westinghouse analyses at the Westinghouse offices in Pittsburgh, PA on May 7, 1982.

The Phase II participants met on May 14, 1982 to discuss the latest draft program.

ATTACHMENT A

OPEN ITEM REPORT

File No. 1062

File Revision No. 1

1. Date reported to PG&E and TES 4/30/82
2. Scheduled for RLCA (Originator) Semimonthly Report No. 13
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 100

6. Description of Concern:

   The verification analysis shows stresses to exceed allowable.
   Support 58S/23R referenced in EOI 932 (Class A error) causes the overstress. By including support 58S/23R as a rigid vertical, all stresses are below allowable.

7. Significance of Concern:

   The overstress has been attributed to EOI 932. This open item concerns stress differences greater than 15% and under allowable.

8. Recommendation:

   RLCA will establish reasons for these differences.

9. Signature: Edward Tenison 4/30/82 (Originator/Organization)
   RLCA

OPEN ITEM REPORT

File No. 1084

File Revision No. 0

1. Date reported to PG&E and TES 5/14/82
2. Scheduled for RLCA (Originator) Semimonthly Report No. 13
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 102

6. Description of Concern:

   The independently calculated pipe stresses differ from those in the design analysis by more than 15%.

7. Significance of Concern:

   All stresses are below allowable.

8. Recommendation:

   RLCA to determine the reasons for the differences.

9. Signature: Edward Dennon 5/14/82 (Originator/Organization)
   RLCA

OPEN ITEM REPORT

File No. 1085

File Revision No. 0

1. Date reported to PG&E and TES 5/14/82
2. Scheduled for RLCA (Originator) Semimonthly Report No. 13
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 105

6. Description of Concern:

   The independently calculated pipe stresses differ from those in the design analysis by more than 15%.

7. Significance of Concern:

   All stresses are below allowable.

8. Recommendation:

   RLCA to determine the reasons for the differences.

9. Signature: Edward Denison 5/14/82 (Originator/Organization)
   RLCA

OPEN ITEM REPORT

File No. 1086

File Revision No. 0

1. Date reported to PG&E and TES 5/14/82
2. Scheduled for RLCA (Originator) Semimonthly Report No. 13
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 108.

6. Description of Concern:

   The independently calculated pipe stresses differ from those in the design analysis by more than 15%.

7. Significance of Concern:

   All stresses are below allowable.

8. Recommendation:

   RLCA to determine the reasons for the differences.

9. Signature: Edward Jenisson 5/14/82 (Originator/Organization)
   RLCA

OPEN ITEM REPORT

File No. 1087

File Revision No. 0

1. Date reported to PG&E and TES 5/14/82
2. Scheduled for RLCA (Originator) Semimonthly Report No. 13
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:

   Hot Shutdown Remote Control Panel

6. Description of Concern:

   The independently calculated results differ from those in the design analysis by more than 15%.

7. Significance of Concern:

   All stresses are below allowable.

8. Recommendation:

   RLCA to investigate the reasons for the differences.

9. Signature: Edward Jonison 5/14/82 (Originator/Organization)
   RLCA

OPEN ITEM REPORT

File No. 1088

File Revision No. 0

1. Date reported to PG&E and TES 5/14/82
2. Scheduled for RLCA (Originator) Semimonthly Report No. 13
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:

   Component Cooling Water Heat Exchanger.

6. Description of Concern:

   The independently calculated results differ from those in the design analysis by more than 15%.

7. Significance of Concern:

   Anchor bolts are overstressed.

8. Recommendation:

   PGandE to re-evaluate their design analysis.

9. Signature: Edward Denison 5/14/82 (Originator/Organization)
   RLCA