

POTENTIAL FINDING REPORT
SONGS 2&3 SEISMIC DESIGN VERIFICATION

PFR NO. 2408-PFR-F003

REVISION _____ A

REPARATION BY GA INITIATOR

AFFECTED ITEMS: 408 volt Motor Control Centers (MCC). Seismic Category I (BPC Spec. S023-302-4 + B Addendum)

REQUIREMENT REFERENCE DOCUMENTS:

IEEE Std. 344 1971 "Seismic Qualification of Class I Electric Equipment for Nuclear Power Generating Stations". IEEE Std 344 1975 "Seismic Qualification of Class IE Equipment for Nuclear Power Generating Stations".

BASIC REQUIREMENT: IEEE 344 71 Para. 3.2.3.1 states that "if the assembly is too large to be mounted on the vibration generator, then other approved means may be used. IEEE 344 75 Section 7 includes acceptable methods to qualify large or complex equipment (such as in situ test and analysis, lab test on similar equipment and analysis).

DESCRIPTION OF POTENTIAL FINDING: The vendor had seismic qualification tests run on a single and a 5 unit array. Because 5 units are stiffer than 1 unit, they (Bechtel, Vendor, Wyle) assume that arrays with 6 or more units are increasingly stiffer.

Information on the vibration of cantilevered rectangular steel plates shows that, for certain modes of vibration, long plates are not necessarily stiffer than short plates.

PREPARED BY: Alan Middleton *AM* DATE: 3-15/82

REJECTION OF GA TASK LEADER COMMENTS BY: _____ DATE: _____

REJECTION OF ORIGINAL DESIGN ORG. COMMENTS BY: Alan Middleton *AM* DATE: 3-15-82

B. REVIEW BY GA TASK LEADER

COMMENTS

Of the 3 concerns identified in the original issue of this PFR, 2 have been resolved to the satisfaction of the reviewer. This revision retains the one concern which is considered valid. The description of the PF has been re-stated for clarity.

☒ AGREE PF IS VALID

BY

FLORIAN

DATE

3/17/82

☐ REQUEST RE-REVIEW

BY

DATE

☐ DISAGREE

BY

DATE

☒ REVIEW OF ORIGINAL DESIGN ORGS. COMMENTS BY:

FLORIAN

DATE:

3/17/82

C. REVIEW BY ORIGINAL DESIGN ORGANIZATION

COMMENTS

☐ AGREE PF IS VALID☐ DISAGREE

BY: _____ DATE: _____

D. RECOMMENDATION BY FINDINGS REVIEW COMMITTEE

DEFINITION ADEQUACY:

☒ ADEQUATE☐ INADEQUATE

VALIDITY:

☒ VALID☐ INVALID

CLASSIFICATION:

☒ OBSERVATION☐ FINDINGJUSTIFICATION:

CLASSIFICATION CRITERION NO. RESULTING IN "FINDING" _____

COMMENT ON "OBSERVATION" CLASSIFICATION

In appropriate analysis. However, GA analysis indicates design is adequate.

BY: S. J. Kouz DATE: 3/19/82E. GA PROJECT MANAGER☒ ACCEPT☐ REJECTBY: GH Weisman DATE: 3/20/82

POTENTIAL FINDING REPORT
SONGS 2&3 SEISMIC DESIGN VERIFICATION

PFR NO. 2408-PFR-F003

REVISION _____

A. PREPARATION BY GA INITIATOR

AFFECTED ITEMS: The Seismic Category I Motor Control Centers (MCC)

REQUIREMENT REFERENCE DOCUMENTS: Bechtel Power Corporation Spec. No. 8023-302-4 and
8 Addendum. "Quality Class II & III Spec for Motor Control Centers for San Onofre
Nuclear Generating Station Units 2 & 3.

BASIC REQUIREMENT: Section 4.11.3 Mounting Base: States that the MCC base will be
tack welded to steel channels embedded in the concrete floor, and that the vendor shall
determine the location of the welds to satisfy seismic requirements per 4.92 (i.e.,
Appx 4F).

DESCRIPTION OF POTENTIAL FINDING:

1. The spec is written for fabrication and test of many individual MCC units. No direction
is given on seismic performance of the individual units when mounted in an array.
2. There is no specification of the flexibility of the steel rail support foundation that
the vendor must simulate during MCC seismic qualification.
There is no requirement in the specification to send rail loads measured during
seismic testing back to Bechtel, so that Bechtel can check the structural integrity
of the rail design.

PREPARED BY: Michael Liddell DATE: 1-23-82

REJECTION OF GA TASK LEADER COMMENTS BY: _____ DATE: _____

REJECTION OF ORIGINAL DESIGN ORG. COMMENTS BY: _____ DATE: _____

B. REVIEW BY GA TASK LEADER

COMMENTS

☒ AGREE PFR IS VALID

☐ REQUEST RE-REVIEW

☐ DISAGREE

☐ REVIEW

BY

BY

BY

DATE

DATE

1/25/82

C. REVIEW BY ORIGINAL DESIGN ORGANIZATION**COMMENTS**

See attached sheet.

☐ AGREE PF IS VALID☒ DISAGREEBY: SAFDATE: 1/29/84**D. RECOMMENDATION BY FINDINGS REVIEW COMMITTEE**

DEFINITION ADEQUACY:

☐ ADEQUATE☐ INADEQUATE

VALIDITY:

☐ VALID☐ INVALID

10 CFR 21:

☐ NOT APPLICABLE☐ APPLICABLE

10 CRF 50.55(e):

☐ NOT APPLICABLE☐ APPLICABLE

CLASSIFICATION:

☐ OBSERVATION☐ FINDINGJUSTIFICATION:

CLASSIFICATION CRITERION NO. RESULTING IN "FINDING" _____

COMMENT ON "OBSERVATION" CLASSIFICATION

BY: _____

DATE: _____

E. TPT PROJECT MANAGER☐ ACCEPT☐ REJECT

BY: _____

DATE: _____

1. The minimum number of sections used for MCC's for San Onofre Nuclear Generating Station Units 2 and 3 is six. The qualification tests are performed on arrangements that are less than six sections and this is a conservative approach for testing. As discussed on the seismic qualification report, data obtained in a test of single section MCC's indicates that this is the worst case situation where the highest amplification factors and lowest equipment damping are obtained compared to MCC units tested in arrays. Multiple section MCC configurations will tend to be stiffer resulting into lesser response amplification. Thus, arrangements used for testing that include equal or less number of sections, simulate adequately the actual in-service configuration of the MCC units.
2. The test report for specification no. S023-302-4 indicates that the specimen mountings simulate as closely as practical the actual in-service mountings. The actual mounting details consist of embedded channels in concrete and are for practical purposes fixed. The details are shown on drawing 25125. Thus, the flexibility of support channels are not required for seismic qualification of the MCC units.
3. Specification S023-302-4, Appendix 4F, requires the vendor to submit maximum vertical and horizontal seismic forces and hold down bolts or hold down requirements (Appendix 4F, Section D.1). This information supplied by the vendor is used by Bechtel engineering in the design of the mountings.

ITEM 1. WE STILL BELIEVE THAT THIS IS A VALID POTENTIAL FINDING

ITEM 2. WE HAVE REVIEWED THE RELEVANT SECTIONS IN THE TEST REPORT AND NOW AGREE THAT THE METHOD OF MOUNTING THE TEST HARDWARE DURING THE SEISMIC TESTING WAS BOTH VALID & CONSERVATIVE.

ITEM 3.

WE NOW AGREE THAT THE SPEC. (S023-302-4 APPX F, SECTION D.1) REQUIRES THE VENDOR TO SUBMIT MAXIMUM VERTICAL AND HORIZONTAL FORCES AND HOLD DOWN REQUIREMENTS TO BECTEL. WE HAVE REVIEWED AND FOUND ACCEPTABLE THIS INFORMATION WHICH WAS TRANSMITTED TO BECTEL IN THE TEST REPORT.

REVISION A OF PFR F003 RETAINS ITEM 1.

Alan Middleton 3/17/82.

IMPACT ASSESSMENT

2408-PFR-F003
PFR NO. _____ Rev. A

AFFECTED ITEM: 408 Volt Motor Control Centers (for Motor Operated Valves HV 9301, Hv 9302 and HV 9340)

1. IS THERE THE POTENTIAL FOR REDUCING DESIGN MARGINS TO THE EXTENT DESIGN ALLOWABLES ARE EXCEEDED OR DESIGN REQUIREMENTS ARE NOT MET?

No (see Attachment A)

2. IS THERE THE POTENTIAL THAT THE ITEM MIGHT FAIL OR ENDANGER OTHER ITEMS DURING AN SSE?

No

3. COULD THE FAILURE OF THIS ITEM DURING AN SSE CREATE A SUBSTANTIAL SAFETY HAZARD? No, with three HPSI pumps and 2 HPSI pumps all in parallel, and with two redundant power supplies, failure of power to one set of motor operated control valves is not likely to cause a substantial hazard.

4. COULD THE PROCEDURAL VIOLATION CREATE A SUBSTANTIAL SAFETY HAZARD?

No

5. ARE OTHER SIMILAR DEVIATIONS LIKELY TO EXIST? Yes. There are many other arrays of similar MCCs around the plant. However, since none of the ESF MCCs arrays are greater than 13 units there should be no problem.

6. OTHER COMMENTS:

None

PREPARED BY: Alan Middleton *AM* DATE: 3-13-82

COMMENTS:

Agree with impact assessment.

BY: *FS Jones* DATE: 3/17/82

ATTACHMENT TO PFR-2408-F003 - REVISION A
IMPACT ASSESSMENT

Bechtel's response to Item 1 on PFR-F003 from seismic test data on one and five unit MCC array, is that five units are stiffer with less response amplification than a single unit. Bechtel infers from the data that testing 1 or 5 units is conservative qualification for 6 or more units. This concept is backed up by two analytical reports by S. Levy of G.E., (8/1/81 and 5/3/79). Levy uses information documented in Harris and Crede (Shock and Vibration Handbook, Vol. 1, page 7-31, Table 7.8) on natural frequencies of cantilevered rectangular plates. Unfortunately, Mr. Levy uses only a portion of the data (i.e. equivalent to 5 and 10 unit array and Modes 1, 2 and 4 - see Fig. 1). From this limited set of data points, Levy deduces that for plates the natural frequencies for Modes 2 and 4 for given length to height ratio is always higher than the natural frequency for Mode 1. Levy then states that it is reasonable to assume a similar relationship for the lineup of motor control centers. Unfortunately Mr. Levy did not evaluate what happens when the data is extrapolated to height to length ratios equivalent to 13 or more MCC units. The total data from Table 7.8 for all five mode shapes is plotted in Figure 1. It is evident that for very long rectangular plates that the natural frequencies for Modes 2 and 4 can fall below the natural frequency for Mode 1. Thus Mr. Levy's and Bechtel's premise that the longer the array the higher the natural frequency is invalid.

Fortunately, for the present seismic review the largest MCC array is 13 units. For a unit height of approximately 100 inches (7'6" + a 12 inch pull box) and width of 20", this is a height to width ratio of .38. At this point the natural frequencies of Modes 2 and 4 are still above Mode 1.

The natural frequencies for 1 unit and 5 units from Wyle's test data are also plotted on Fig. 1. This shows good correlation for Mode 1 and reasonable correlation in determining the other resonance peaks. Wyle uses a minimum transmissibility factor of 2 as a cut off in determining resonance peaks. Evaluation of some of the smaller resonance peaks would probably identify other modes. If for conservatism, we use the data for the plate, rather than actual tests of the MCC units, then our lowest natural frequency for a 13 unit array is 3.5 HZ (Fig. 1, Height to Length Ratio = .38). For further conservatism, and to allow for uncertainties in the curves, we reduce this value by a further 10% (i.e. to 3.2 HZ or a period of 0.31 seconds).

If we look at the DBE horizontal acceleration response spectra at damping values of 1%, 2% and 5% and a period of .31 seconds, we get acceleration levels of 2.7 g's; 2.3 g's and 2.0 g's respectively (Fig. 2). Wyle tested the units to 3 g's or better over the frequency range of concern (i.e. ~ 2.5 to 250 HZ).

References

1. Seismic Qualification Report for Model 4 Motor Control Centers Supplied By Square D Company for SONGS Units 2 and 3. November 8, 1976. Bechtel Document No. 302-4-2-S5-3, GA No. AC-1347-9160.

2. "Analysis of Motor Control Center Structure for Withstanding Undulating Movement Laterally and for the Effect of Adding Sections on Stability", by S. Levy, March 5, 1979.
3. "Analysis of Indoor Control Centers for Withstanding Undulating Movement Laterally and the Effect of Adding Sections on Stability", by S. Levy, January 8, 1981 (G.E. Company).
4. "Shock and Vibration Handbook", Harris & Crede, Volume 1, Page 7.31, Table 7.8.
5. "Vibration of Rectangular and Skew Cantilever Plates", by M. V. Barton, Journal of Applied Mechanics, June 1951.

A.M. 3/11/82

Revised 3/13/82

Width of MCC UNITS = 20"

Height (incl. Pul Box) = 100" = a

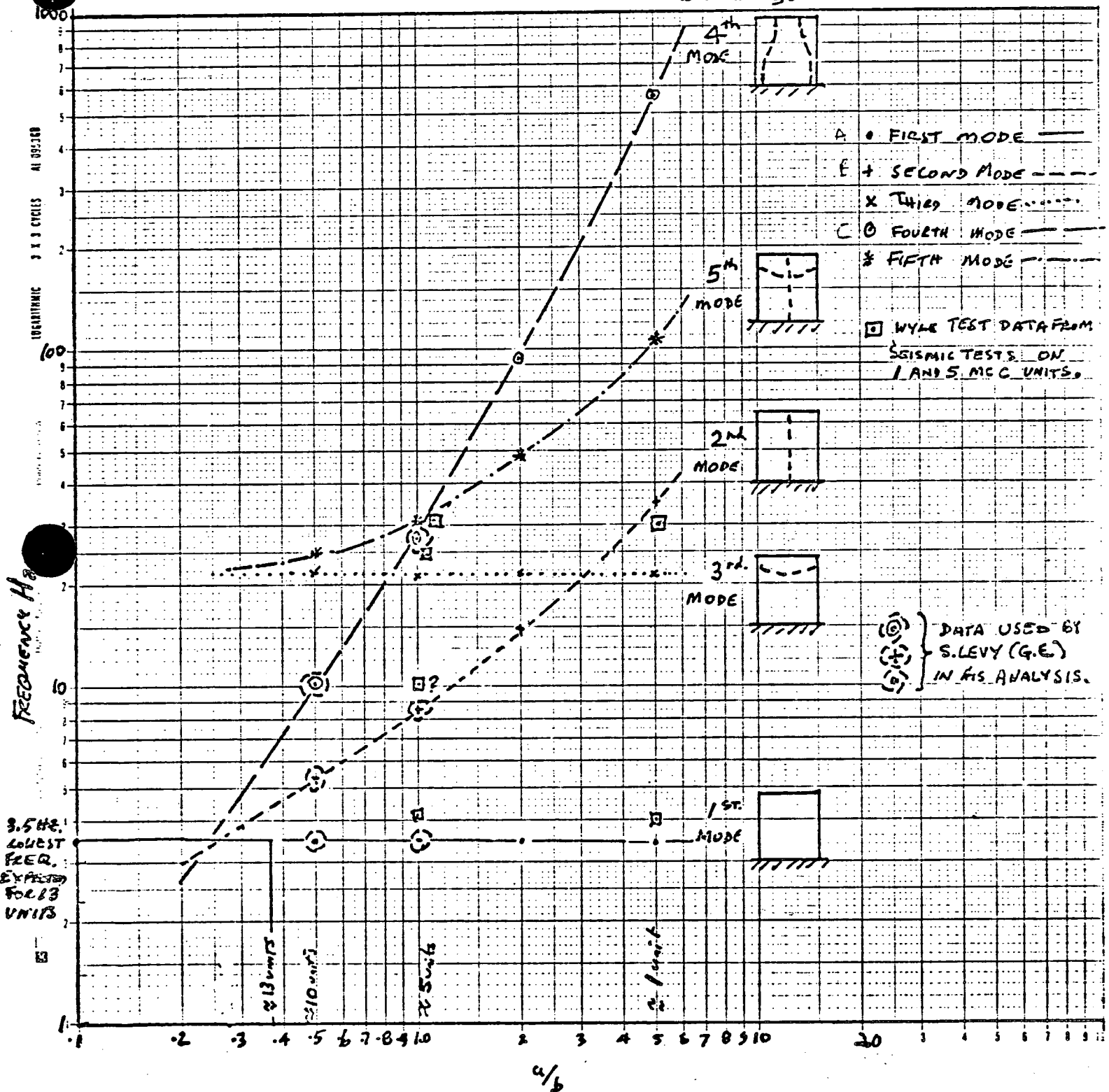
 $\frac{a}{b}$ (1 unit) = 5

3 UNITS = 15

10 UNITS = 50

15 UNITS = 75

FIGURE 1



PLOT OF NATURAL FREQUENCIES FOR CANTILEVERED RECTANGULAR PLATES
 (FROM HARRIS & CREDE VOL. I. PAGE 7-31 TABLE 7.8 - DATA TAKEN
 FROM M.V. BARTON. JOURNAL OF APPLIED MECHANICS, JUNE 1951).

100 50 25 10 5 2 1 .5 2

$S_d = 10 T^2 S_a$
 S_d - DISPLACEMENT RESPONSE (INCHES)
 T - PERIOD (SEC.)
 S_a - ACCELERATION RESPONSE (g 's)

DAMPING VALUES
 AS PERCENT OF CRITICAL

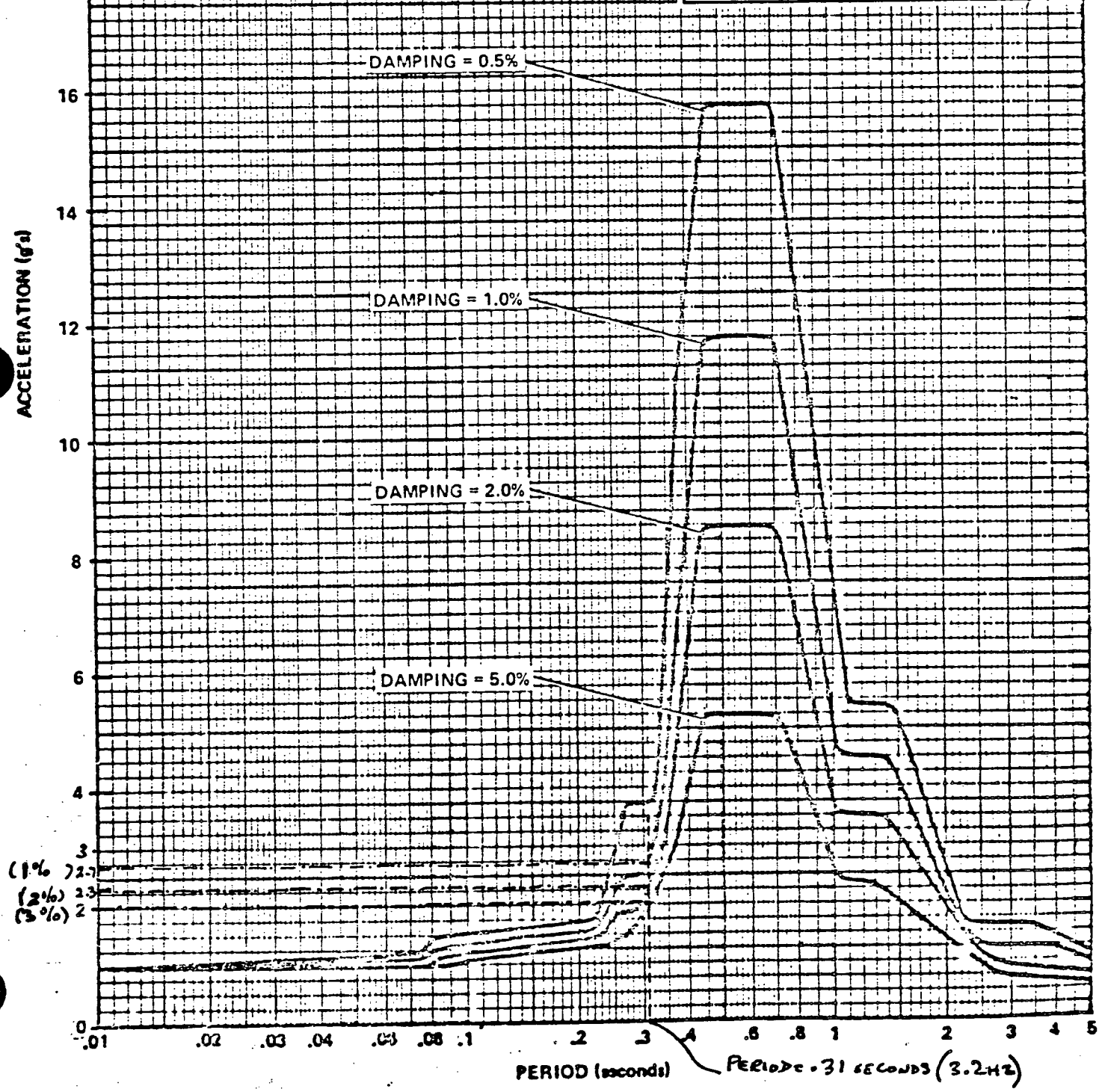


BECHTEL POWER CORPORATION
 LOS ANGELES DIVISION

SOUTHERN CALIFORNIA EDISON COMPANY
 SAN ONOFRE NUCLEAR GENERATING STATION
 UNITS 2 & 3

DESIGN BASIS EARTHQUAKE
 HORIZONTAL ACCELERATION RESPONSE
 SPECTRA AT NODE 9, ELEVATION 50'-0"
 OF AUXILIARY BUILDING

Prepared By: AL	Reviewed By: FLG LGH QB	Approved By: WAB
JOB NO. 1304-803	SKETCH NO. S023-SK-S-701	REV. A 1/24/73



GENERAL ATOMIC COMPANY

2408-PFR-F003
DC 3/16/82From: ALAN MIDDLETONDate: 2/16/82To: FINDINGS
SEISMIC REVIEW COMMITTEE

TELEPHONE COMMUNICATION RECORD

(Please hand letter legibly in black or red ink)

Call Initiated by: ALAN MIDDLETONat GA ☒Other ☐Call Received by: SHELDON H. FREIDat GA ☐Other ☐BECHTEL

Other Participants:

Date 2/16/82 Time 4.00pm Program Name/No. SCE SEISMIC REVIEW/2408 Task or 189 No. 2408-400Subject: SONGS UNITS 2 & 3 SEISMIC REVIEW - PFR 2408-F003 '408volt MCC's

Summary PFR F003 IS CONCERNED WITH 1) LACK OF SPECIFIC DIRECTION FOR SEISMIC TESTING OF AN ARRAY OF PANELS; 2) NO DETAILED INFORMATION ON THE METHOD OF MOUNTING THE PANELS IN PLANT AND 3) NO REQUIREMENT THAT DATA ON RAIL LOAD SHOULD BE SENT TO BECHTEL AFTER TESTING. BECHTEL HAS ALREADY SENT CLARIFICATION OF THESE POINTS.

I TOLD FREID THAT THE ADDITIONAL INFORMATION SATISFIED US ON ITEMS 2 & 3.

I TOLD HIM THAT WE STILL FELT ITEM 1 WAS A VALID FINDING PARTICULARLY WITH THE DETAILED INFORMATION ON VIBRATION OF RECTANGULAR CANTILEVERED PLATES (FROM HARRIS & CREDE, SHOCK & VIB. HOBBS) AND WYLE TEST DATA. HOWEVER THAT OUR ANALYSIS FOR 13 MCC UNITS SHOWS NO IMPACT ON THE SEISMIC QUALIFICATION OF ARRAYS OF MCC UNITS (UP TO 15).

Action Items:	Date Req'd	Responsible

In: _____ File No. _____

From: ALAN MIDDLETON Date: 3-19-82
To: FINDINGS REVIEW COMMITTEE

TELEPHONE COMMUNICATION RECORD

(Please hand letter legibly in black or red ink)

Call Initiated by: ALAN MIDDLETON at GA V Other _____
Call Received by: ERWIN HATZLER at GA _____ Other BECHTEL (WHITNEY) ELEC. BRANCH
Other Participants: 0

Date 3-19-82 Time 10:35 AM Program Name/No. SCE SEISMIC REVIEW/2408 Task or 189 No. 2408-400

Subject: SONGS UNITS 2&3 SEISMIC REVIEW - PFR 2408-FO03 408 VOLT. MCC'S

Summary AFTER A MEETING WITH THE FINDING REVIEW
COMMITTEE ON 3/17/82 CONCERNING PFR FO03 REV. A,
THEY ASKED ME TO CHECK IF ANY IE MCC
PANEL ARRAYS EXCEED THE 13 UNIT LIMIT
EVALUATED IN THE REFERENCED PFR.
I CALLED ERWIN HATZLER
ON 3/18/82 AND ASKED HIM TO CHECK IF
ANYWHERE IN THE PLANT ARRAYS OF MCC'S
EXCEEDED 13 UNITS.
TODAY I CALLED HIM, AND HE WAS
ABLE TO CONFIRM THAT NONE OF
THE CLASS IE MCC'S EXCEED A 13 UNIT
ARRAY ANYWHERE IN THE PLANT.

Action Items:	Date Req'd	Responsible
<u>ERWIN HATZLER IS GOING TO CHECK</u>	<u>0</u>	<u>BECHTEL</u>
<u>FOR NON-IE MCC PANELS.</u>		

Info _____ File No. _____

POTENTIAL FINDING REPORT

SONGS 2&3 SEISMIC DESIGN VERIFICATION

A. PREPARATION BY GA INITIATOR

AFFECTED ITEMS:

Bechtel Site Audit No. 975, conducted 11/2 and 3/77

REQUIREMENT REFERENCE DOCUMENTS:

- 1) SONGS 2&3 FSAR, Appendix 3A, 3A1, "NRC Regulatory Guides"
- 2) Letter, Log BE3092, 10/15/1976, J.D.Houchen, BPC, to D.F.Martin, SCE, subject: Regulatory Guides 1.29 position C.4.
- 3) 10CFR50 Appendix B, Criterion I
- 4) PQPM 10.0 Rev. 2, paragraph 3.1 as of 10/12/77.

BASIC REQUIREMENT: 5) PQPM 1.0, Division organization and responsibilities.

SEE ATTACHMENT I

DESCRIPTION OF POTENTIAL FINDING:

Field engineers perform inspections of erection or installation of safety impact items. Review of reference (5) does not show field engineers "to have sufficient organizational freedom - including sufficient independence from cost and schedule" as required by 10CFR50 Appendix B, Criterion I. (SEE ATTACHMENT I)

THE VALIDITY OF THIS PFR WAS DEPENDENT ON THAT OF 2408-PFR-F069, WHICH WAS DECLARED INVALID 3/10/82, THEREFORE THIS PFR IS ALSO INVALID.
Robert A. Sweig 3/10/82.

PREPARED BY: Robert A. SweigDATE: 3/2/82

REJECTION OF GA TASK LEADER COMMENTS BY: _____

DATE: _____

REJECTION OF ORIGINAL DESIGN ORG. COMMENTS BY: _____

DATE: _____

B. REVIEW BY GA TASK LEADER

COMMENTS

Agree PFR should be included. The Bechtel procedures are internally consistent, and proper with regard to Field Eng. inspections. This PFR was based on a question regarding Bechtel's Quality Classification, which was addressed in PFR F 069.

J. Brennan 3/10/82

☐ AGREE PFR IS VALID

BY _____

DATE _____

☒ REQUEST RE-REVIEWBY J. BrennanDATE 3/4/82☐ DISAGREE

BY _____

DATE _____

☐ REVIEW OF ORIGINAL DESIGN ORGS. COMMENTS BY: _____

DATE: _____

C. REVIEW BY ORIGINAL DESIGN ORGANIZATION

COMMENTS

☐ AGREE PF IS VALID☐ DISAGREE

BY: _____ DATE: _____

D. RECOMMENDATION BY FINDINGS REVIEW COMMITTEE

DEFINITION ADEQUACY:

☒ ADEQUATE☐ INADEQUATE

VALIDITY:

☐ VALID☒ INVALID

CLASSIFICATION:

☐ OBSERVATION☐ FINDINGJUSTIFICATION:

CLASSIFICATION CRITERION NO. RESULTING IN "FINDING" _____

COMMENT ON "OBSERVATION" CLASSIFICATION

BY: S. J. Kouz DATE: 3/19/82E. GA PROJECT MANAGER☒ ACCEPT☐ REJECTBY: A. Weisman DATE: 3/20/82

ATTACHMENT I

BASIC REQUIREMENT:

- 1) "This appendix discusses the conformance of plant design with the guidelines presented in NRC Regulatory Guides 1.1 through 1.96."
- 2) Positions C.2 and C.4 of Regulatory Guide 1.29 require that the pertinent quality assurance requirements of Appendix B to 10CFR50 be applied to those structures, systems and components whose failure during a DBE could result in unacceptable damage to safety related systems (safety impact items). These safety impact items are designated QC III or IV by the project since they are not required to perform a safety function. ...All major permanent plant items receive an installation inspection by cognizant field engineers."
- 3) "Persons performing quality assurance functions shall have sufficient authority and organizational freedom to identify quality problems; to initiate, recommend, or provide solutions... Such persons ... shall report to a management level such that this required authority and organizational freedom, including sufficient independence from cost and schedule when opposed to safety considerations, are provided."
- 4) RESPONSIBILITY

3.1 Field Engineering

Field Engineering personnel who are independent from direct construction craft supervision are responsible for in-process inspection and testing activities in accordance with procedures contained in the Project Work Plans/Procedures Manual.

POTENTIAL FINDING - DISCUSSION:

This audit found safety impact items being installed without QC inspection. Per reference (1) this activity shall be performed per Appendix B to 10CFR50. This requirement is recognized by (2), but the inspection shown is by field engineers instead of QC. Per reference (4) it is stated that the field engineers are independent from the performing activity (complying with 10CFR50 Appendix B Criterion X, independence requirement). However, from a review of Reference (5), it is not clear that the field engineers have the organizational authority, freedom, and independence from cost and schedule required per reference (3).

POTENTIAL FINDING REPORT

SONGS 2&3 SEISMIC DESIGN VERIFICATION

PREPARATION BY GA INITIATOR

AFFECTED ITEMS:

Bechtel Site Audit No. 1855, conducted 12/9-11/80

REQUIREMENT REFERENCE DOCUMENTS:

- 1) Bechtel QA Standard No. 5.1, Rev. 14 issued 8/39/79 "Project Quality Assurance Audits," Section 4.2 "Auditors."
- 2) WPP/QCI-006, Appendix I, Rev. 6, per audit checklist G-6-2, processing of NCRs relating to CE NSSS equipment.
- 3) Same as (1).

BASIC REQUIREMENT:

SEE ATTACHMENT 1

DESCRIPTION OF POTENTIAL FINDING:

- 1) No CAR was issued but deficiency, discovered under characteristic 4, was handled as a minor deficiency.
- 2) ~~No action was taken at all to correct characteristic 4 deficiency noted for NCR (nonconformance report) 731 and NCR 748. (action was taken but not~~
recovered. See BPC response attachment II. This item is invalid. Robert Severey 3/18/82
agree with comment by task leader, Robert@SwG

PREPARED BY: Robert H. SevereyDATE: 3/5/82

3/19/82

REJECTION OF GA TASK LEADER COMMENTS BY: _____

DATE: _____

REJECTION OF ORIGINAL DESIGN ORG. COMMENTS BY: Robert H. SevereyDATE: 3/18/82B. REVIEW BY GA TASK LEADER

COMMENTS

This PFR should be invalid, since item #2 is invalid per above notes and item #1 is covered by PFR AT, which has been classified as a Finding.

SB 3/19/82

☒ AGREE PF IS VALIDBY J. BierredDATE 3/5/82☒ REQUEST RE-REVIEWBY J. BierredDATE 3/19/82☐ DISAGREE

BY _____

DATE _____

☒ REVIEW OF ORIGINAL DESIGN ORGS. COMMENTS BY: J. BierredDATE: 3/18/82

C. REVIEW BY ORIGINAL DESIGN ORGANIZATION

COMMENTS

SEE ATTACHMENT II

☐ AGREE PF IS VALID☒ DISAGREEBY: C. J. Throckmorton F.O. March/1010
A.W. Hurst DATE: 3/10/82D. RECOMMENDATION BY FINDINGS REVIEW COMMITTEE

DEFINITION ADEQUACY:

☒ ADEQUATE☐ INADEQUATE

VALIDITY:

☐ VALID☒ INVALID

CLASSIFICATION:

☐ OBSERVATION☐ FINDINGJUSTIFICATION:

CLASSIFICATION CRITERION NO. RESULTING IN "FINDING" _____

COMMENT ON "OBSERVATION" CLASSIFICATION

BY: S. L. Kouly DATE: 3/19/82E. GA PROJECT MANAGER☒ ACCEPT☐ REJECTBY: A. Weissman DATE: 3/20/82

ATTACHMENT I

BASIC REQUIREMENT:

- 1) "When the deficiency is minor and is corrected prior to completion of auditing, a CAR need not be issued. However, the deficiency and action taken shall be documented in the audit checklist or data collection sheet.

For other deficiencies prepare a CAR in accordance with procedure No. 7.10 and submit to the lead auditor and his immediate supervisor for review."

(Audit checklist)

- 2) Characteristic 4, procedure paragraph 3.1.4, "The Lead Nuclear Field engineer (LNFE) shall transmit a copy of the NCR and a memo recommending a disposition for the NCR to the CE Site Representative."

(Audit checklist)

Characteristic 6, procedure paragraph 3.1.6, "The LNFE shall review and concur with the CE disposition memo and document the disposition and memo file no. in block 23 of the NCR. The LNFE shall also record CE's corrective action to prevent recurrence, as applicable, in block 21 of the NCR. A copy of CE's disposition memo shall be attached to the NCR for permanent record."

- 3) "Review results of the audit, identify individuals responsible for actions to be taken and establish action due dates. In the event corrective action cannot be completed within 30 days, the audited organization's response shall include a scheduled date for the corrective action."

POTENTIAL FINDING - DISCUSSION:

This audit found that, under characteristic 4, "three NCRs (nonconformance reports) N-751, N-749 and N-748 have not been sent to CE as yet", 12/10/80. The auditor treated this as a minor deficiency and informed LNFE of deficiency. The following corrective action was noted on the check sheet:

"A speed memo was transmitted from the LNFE to CE and return for NCRs N-749 and N-751."

The check sheet for characteristic 4 was completed 12/10 and 11/80, and showed an intent to write a CAR for NCRs not being sent to CE for dispositioning at least for NCRs N-731 and N-748. The auditor noted on the check sheet:

"This is finding No. 1 CAR No. ____."

ATTACHMENT I

However, the above quoted line was crossed out by the auditor on 12/22/80. Why was N-731 mentioned? Why wasn't N-748 mentioned in the speed memo above? How were N-731 and N-748 NCRs dispositioned?

Under characteristic 6 these remarks were recorded: "The memo file no. in block 23 of NCRs No. N-749 and N-751 is not shown as required by this procedure paragraph No. 3.1.6." "These NCRs were corrected when the discrepancy was brought out." What about NCRs N-731 and N-748?

Two CARs were issued in conjunction with this audit, CAR F1178: unauthorized use of stick-on decals on a QA document, and CAR F1179: lack of hold tag evidence. The above deficiency was as serious or more so than these, why wasn't a CAR issued?

No action was taken to correct NCR-748 contrary to reference (3) requirements. What of NCR-731, was it deficient also?

SUBJECT: BPC Response to GA Potential Finding Report #PFR-F050.

Following is BPC response to the findings reported in PFR-F050:

Audit #1855 - GA Potential Finding Discussion:

This audit found that, under characteristic 4, "three (3) NCR's (nonconformance reports) N-751, N-749 and N-748 have not been sent to CE as yet", 12/10/80. The auditor treated this as a minor deficiency and informed LNFE of deficiency. The following corrective action was noted on the check sheet:

"A speed memo was transmitted from the LNFE to CE and return for NCR's N-749 and N-751."

The check sheet for characteristic 4 was completed 12/10/80 and 11/80/80, and showed an intent to write a CAR for NCR's not being sent to CE for dispositioning at least for NCR's N-731 and N-748. The auditor noted on the check sheet:

"This is finding No. 1 CAR No. _____."

However, the above quoted line was crossed out by the auditor on 12/22/80. Why was N-731 mentioned? Why wasn't N-748 mentioned in the speed memo above? How were N-731 and N-748 NCR's dispositioned?

BPC Response:

- (1) NCR #N-731 was closed (invalidated) because the flow elements covered by this NCR were also covered by NCR #N-745. NCR #N-745 does have CE concurrence for disposition per CE memo, #S-SU-734 dated 1/8/81. This memo is referenced in block #23 of NCR #N-745.
- (2) NCR #N-748 does have CE concurrence for disposition per CE memo, #S-SU-754 dated 1/20/81. This emeo is referenced in block #23 of NCR #N-748.

Therefore, the information regarding these two (2) NCR's was crossed out by the auditor, as it was not a deficient condition. As a result, no corrective action request was issued.

QUALITY ASSURANCE DEPARTMENTRecord of Long Distance Telephone CallParty: Called ☐Calling ☒Date: 3/16/82 (conference call)Time: Completed 1:23Started 1:13On-line 10Name JOHN SHEPHERD (SITE)Company BPC

Location _____

Telephone No: A/C 213 No. 946 1811 EX 273Discussion 714 498 1000 EX 250[For other calls see
PFR F051]

- ① I pointed out to BPC that their response did not even address point ① of this PFR. This is contrary to BPC procedure, and ANSI N45-2 and 10 CFR 50 appendix B requirements. They talked of action being taken before the audit closed so the reports weren't necessary etc. I pointed out that deficiencies per all the requirements had to be reported and the corrective action documented etc.
- ② On PFR Point ② there was no record of any corrective action taken on Nonconformance Reports (NCR) 731 + 748. Their written response explained 731 but how N748 came to be corrected was unknown. John said there was no limit on time of submittal in the procedure and the LNF probably sent it over after the audit was closed.
- I said the evidence of correction in their written response closed out concern for PFR point ②

Record Made by Robert A. Severy

Distribution:

POTENTIAL FINDING REPORT

SONGS 2&3 SEISMIC DESIGN VERIFICATION

PREPARATION BY GA INITIATOR

AFFECTED ITEMS: The following 5 BPC Site audits started on the date shown: 1476, 3/15/79; 1555, 9/15/79; 1567, 8/28/79; 1855, 12/9/80 and 2053, 12/10/81.

REQUIREMENT REFERENCE DOCUMENTS: 1) ANSI N45.2 - 1971, "19 Audits." 2) Same document as (1), "18 Quality Assurance Records." 3) BPC Quality Assurance Standard No. 5.1, Rev. 12/ 3/6/78, "4.2 Quality Assurance Engineers." 4) BPC QA Standard No. 5.1, Rev. 13, 5/10/79, Rev. 14, 8/30/79 and Rev. 15, 11/16/81, "4.0 Responsibilities." 5) Same documents as (4) Revisions 14 and 15, 6.0 & 7.0, "Audit Records."

BASIC REQUIREMENT:

See Attachment I

DESCRIPTION OF POTENTIAL FINDING: (1) A Trend - all of these audits had nonconformances or deficiencies which, were not reported as required per references (1, 3 and 4). Audits 1567 (see PFR-F049) and 1855 (See PFR-F050) treated deficiencies as minor deficiencies, recording results only in the checklist. (2) Since 8/30/79 (reference 5) audit check lists or marked up controlling procedures are nonpermanent records. These audit results are not being stored as required per reference (2).

PREPARED BY: Robert G. Swiney DATE: 3/3/82

REJECTION OF GA TASK LEADER COMMENTS BY: _____ DATE: _____

REJECTION OF ORIGINAL DESIGN ORG. COMMENTS BY: Robert G. Swiney DATE: 3/18/82

B. REVIEW BY GA TASK LEADER

COMMENTS

Problem is that BPC did not record these deficiencies in their Monthly Audit Activity Report as required in ref. 3.
JD 3/11/82

☒ AGREE PFR IS VALID

BY

J. Bernal

DATE

3/3/82

☐ REQUEST RE-REVIEW

BY

DATE

☐ DISAGREE

BY

DATE

☒ REVIEW OF ORIGINAL DESIGN ORGS. COMMENTS BY: J. Bernal

DATE:

3/11/82

C. REVIEW BY ORIGINAL DESIGN ORGANIZATION

COMMENTS

SEE ATTACHMENT II

☐ AGREE PFR IS VALID☒ DISAGREEBY: C.J. Throck for F.D. Mark/opp
L.W. HURST DATE: 3/10/82D. RECOMMENDATION BY FINDINGS REVIEW COMMITTEE

DEFINITION ADEQUACY:

☒ ADEQUATE☐ INADEQUATE

VALIDITY:

☒ VALID☐ INVALID

CLASSIFICATION:

☐ OBSERVATION☒ FINDINGJUSTIFICATION:

CLASSIFICATION CRITERION NO. RESULTING IN "FINDING" _____

COMMENT ON "OBSERVATION" CLASSIFICATION

^{S&K 3/19/82}
Bechtel allows non-conformances which are classified
as "minor" to be not included in the audit report (a ^{S&K} ~~permanent record~~) ^{3/19/82} permanent record even though a
permanent record is required by ANSI N45.2.

BY: S. A. Kouty DATE: 3/19/82E. GA PROJECT MANAGER☒ ACCEPT☐ REJECTBY: G. Weissman DATE: 3/20/82

ATTACHMENT I

BASIC REQUIREMENT:

- 1) "...Audit results shall be documented and reviewed by management having responsibility in the area audited. Responsible management shall take the necessary action to correct the deficiencies revealed by the audit..."
- 2) "...the records shall include, ...audits,...In general, records which correctly identify the "as-built" condition of items in the plant should be maintained for the life of the plant...these records should include... records of nonconformances and their resolution..."
- 3) "Prepare QAFs ...(Quality Assurance Finding)...identifying nonconformances and deficiencies. QAFs are distributed as attachments to the audit report... The report shall be addressed to the project manager for design office audits with copies to the project engineer and project quality assurance supervisor. For field office audits the report shall be addressed to the field construction manager..."
- 4) "Lead Auditor...prepares a monthly audit report"...containing a "...summary of audit results..." and a "summary of (for Rev. 13, a description of) deficiencies..."
- 5) "* o Completed audit element checklist used or
* o Copy of controlling document as completed by the auditor.

*Non-permanent" (quality assurance record)

AUDITS REVIEWED:

Audit No	<u>Deficiency or Nonconformance not Reported (as Required per reference 3 or 4</u>
1476	3 of 60 white drawings and 10 of 140 pink drawings in stick files not to current revision.
1555	ICFE not maintaining missing items list for instruments which are required for panels.
1567	LWQCE not providing vendor with all data required to perform nondestructive examinations.
1855	LNFE not submitting NSS equipment NCRs to CE for dispositioning.
2053	Electrical department not sending any FCR log sheets to CDM.

SUBJECT: BPC Response to GA Potential Finding Report #PFR-F-51

Following is BPC response to the findings reported in PFR-F051:

(1) Audit #1476:

GA Finding: Three (3) of sixty (60) white drawings and ten (10) of one hundred forty (140) pink drawings in stick files not to current revision.

BPC Response: As recorded in attached page 4 of Audit Report #1476; this deficiency was corrected during the course of this audit. Therefore, the Auditor did not issue the corrective action report. This action was in accordance with BPC Quality Assurance Department Procedures, Section 5.0, Procedure 5.1, Rev. 15, paragraph 4.2.8(a), which states as follows:

"When the deficiency is minor and is corrected prior to completion of the audit, a CAR need not be issued. However, the deficiency and action taken shall be documented in the audit checklist or data collection sheet".

(2) Audit #1555:

GA Finding: ICFE not maintaining missing items list for instruments which are required for panels.

BPC Response: As recorded on attached page 1 of Audit Report #1555, this deficiency was considered as minor deficiency since most of the panels were already installed and hence the requirements were not necessary. This decision was in accordance with BPC QADP, Section 5.0, Procedure 5.1, Rev. 15, paragraph 4.2.8(a). Later this requirement was deleted in Rev. 6 of WPP/QCI-702.

(3) Audit #1567:

QA Finding: LWQCE not providing vendor with all data required to perform nondestructive examination.

BPC Response: As recorded on attached page 14 of the Audit Report #1567, the WQCE did not provide weld material thickness for MT or UT examination requests. The LWQCE had instructed the responsible personnel during the course of this audit. Since, the corrective action was taken during the course of the audit, the CAR was not issued. This is in accordance with QADP, Section 5.0, Procedure 5.1, Rev. 15, paragraph 4.2.8(a).

(4) Audit Report #1855:

GA Finding: LNFE not submitting NSSS equipment NCR's to CE for dispositioning.

BPC Response: As recorded on attached page 4 of Audit Report #1855 (G-6-2); this deficiency was noted by the Auditor for NCR #N-731 and N-748, on December 11, 1980. Later this deficiency was struck out in the report by the same Auditor, on December 22, 1980, indicating these deficiencies do not exist. Further investigation revealed that:

(a) NCR #N-731 was closed (invalidated) because items covered by this NCR were duplicated in NCR #N-745. The NCR #N-745 does have CE concurrence for disposition.

(b) NCR #N-748 does have CE concurrence.

(5) Audit Report #2053:

GA Finding: Electrical department not sending any FCR log sheets to CDM.

BPC Response: As recorded on attached page 4 of the Audit Report #2053, this deficiency was known to the electrical department. They already had the training sessions conducted prior to QA audit. The corrective action was underway at the time of the audit. Therefore, the QA Auditor did not issue the Corrective Action Request. This is in accordance with QADP Section 5.0, Procedure 5.1, Rev. 15, paragraph 4.2.8(a).

1012 A 1476

4 5

ADMIT RESERVATION

NA NOT ADEQUATE
NO NO DISCREPANCY
ON DISCREPANCY

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Figure 1. The effect of the concentration of the solution on the rate of the reaction.

[illegible]

Audit # 1567/S-3

14 31

8-20-79

AUDIT RESULT LEGEND

NA - NOT AUDITED
ND - NO DISCREPANCY
DN - DISCREPANCY NOTED

QUALITY ELEMENT CHECKLIST

CONTROLLING DOCUMENT (TITLE, NUMBER, REVISION)		AUDITED ACTIVITY		TYPE OF AUDIT		CHECK LIST NO	REV
CHAR NO.	ELEMENT CHARACTERISTIC	PROCEDURE PARA. NO.	OBJECTIVE EVIDENCE REVIEWED/PERSONNEL CONTACTED	FIELD <input checked="" type="checkbox"/>	PROJECT <input checked="" type="checkbox"/>	OFFICE <input type="checkbox"/>	MGMT <input type="checkbox"/>
WORK PLAN PROCEDURE/QUALITY CONTROL INSTRUCTION FIELD CHANGE REQUEST (FCR) WPP/QCI-018, REV. 18 & PCN's 24 and 25		SONGS 2 & 3 JOBSITE				G-25 4	
3	When all FCR numbers on a page of the FCR LOG have been assigned the respective discipline FEC shall forward an initial copy of the page to CDM; subsequently, when all entry blanks on a page of the FCR LOG have been completed, the respective discipline FEC shall forward a final completed copy of the page to CDM.	5.1.3	REVIEWED DISCIPLINE FCR LOGS AND DISCUSSED PROCEDURAL REQUIREMENT WITH FEC'S. ELECTRICAL DEPT., PRIOR TO 12-4-81, WAS NOT FORWARDING LOG COPIES. ON 12-4-81, PFE PERSONNEL CONDUCTED TRAINING FOR ALL FEC'S (SEE ATTACHMENT A TO THIS REPORT). ELECTRICAL DEPT. IS FULLY AWARE OF THIS DEFICIENCY AND CORRECTIVE ACTION IS UNDERWAY. EFEC IS COORDINATING WITH CDM PERSONNEL AND COMPLETING REQUIRED ACTION. THEREFORE NO CAR REQUIRED.	DN# AW 12-18-81			
	Additionally, a copy of all pages of EXHIBIT WPP/QCI-018-6 maintained by CSC shall be sent to CDM monthly.	5.1.3.1	VERIFIED CSC LOG WAS FORWARDED TO CDM AS REQUIRED				
PERSONNEL CONTACTED:							
	J. CRYER - EFEC						
	C. LIKELY - CFEC						
	D. MOON - IFEC						
	M. MATZ - P, PS, M, & N FEC						
	J. WERTH - CSC FEC						
	L. WERT - CDM DOCUMENTATION CLERK						

ATTACHMENT II
Page 7 of 7
PFR #F-51

A.M. Whitwade 12-9-81

Richard M Reinsel 12/10/81

QUALITY ASSURANCE DEPARTMENT

(1) of 4

Record of Long Distance Telephone CallParty: Called ☒
Calling ☐Date: 3/12/82 3/15/82 ^{never returned my call of 1 PM}Time: Completed 9:10Name SHELLY FREED EX273Started 9:05Company BPCOn-line 5Location WITTIERTelephone No: A/C 213 No. 946 1811Discussion

Per Freed, this audit and FO49 +
FO50 require site personnel for
discussion. Will line up site people
for conference at 1 PM.

Record Made by Robert A. Sings

Distribution:

General Atomic Company

QUALITY ASSURANCE DEPARTMENT

2408 PFR F051

Record of Long Distance Telephone Call

(2) of 4

Party: Called ☐
Calling ☒

Date: 3/15/82

Time: Completed 3:25

Name SHELLY FREED EX 273

Started 3:20

On-line 5

Company BPC

Location WITTIER

Telephone No: A/C 213 No. 946 1811

Discussion

the
Per Freed, the people that brought
data together for the site weren't available
today but he would arrange a conference
call by 10 AM tomorrow with John
Shepherd of the site.

Record Made by

Robert A. Seely

Distribution:

QUALITY ASSURANCE DEPARTMENTRecord of Long Distance Telephone CallParty: Called ☒
Calling ☐Date: 3/16/82
Time: Completed 11:35
Started 11:30
On-line 5Name Shelly Freed EX273Company BPCLocation WITTIERTelephone No: A/C 213 No. 946 1811Discussion

Freed: I tried to get you on conference call at 10:15.

Sweig: I was at my desk since 9:30 till now.

Freed: We have been having problems with the phones this morning (they have computer blew system it down a lot). Can we meet at 1 PM or if you like come to the site tomorrow and we can answer all your questions there.

Sweig: Let's talk at 1 PM and I'll need more data I can go to the site tomorrow. I got you reference to F052 so ask your site people to look that one so we can discuss it also at 1: PM.

Record Made by

Robert Sweig

Distribution:

QUALITY ASSURANCE DEPARTMENT

(4) of 4

Record of Long Distance Telephone Call

Party: Called ☐Calling ☒

Date: 3/16/82 (conference call)

Time: Completed 1:41

Name: SHELLY FREED (WITTER)
JOHN SHEPHERD (SITE)

Started 1:23

On-line 18

Company BPC

Location

Telephone No: A/C 213 No. 946 1811 EX 273

Discussion 714 498 1000 EX 250

They talked of findings versus deficiencies and observations and that only deficiencies need be reported. I said that their procedure only identified deficiencies and non-deficiencies and anything found by the auditor was one or the other per BPC procedure.

There was a lot of talk by BPC that the individual deficiencies were corrected.

① I explained again and again that the PFR was not against the corrective action for the deficiencies of these audits, but against BPC site personnel not following their procedure in regard to reporting deficiencies. The lead auditor is to summarize the deficiencies found. Their procedure does not exempt minor deficiencies.

② I explained that two of the deficiencies handled as minor deficiencies violated their procedure. These should have been handled on CAP corrective action requests per BPC Procedure and ANSI N45.2 & 10 CFR 50 requirements.

Record Made by Robert A. Severing

Distribution:

IMPACT ASSESSMENT

2408 PFR NO. F051

AFFECTED ITEM: Accuracy of Audit Reports

1. IS THERE THE POTENTIAL FOR REDUCING DESIGN MARGINS TO THE EXTENT DESIGN ALLOWABLES ARE EXCEEDED OR DESIGN REQUIREMENTS ARE NOT MET ?

N/A

2. IS THERE THE POTENTIAL THAT THE ITEM MIGHT FAIL OR ENDANGER OTHER ITEMS DURING AN SSE ?

N/A

3. COULD THE FAILURE OF THIS ITEM DURING AN SSE CREATE A SUBSTANTIAL SAFETY HAZARD ?

N/A

4. COULD THE PROCEDURAL VIOLATION CREATE A SUBSTANTIAL SAFETY HAZARD ?

No

5. ARE OTHER SIMILAR DEVIATIONS LIKELY TO EXIST ?

Yes, since early 1979 I estimate that at least 50 audits have results that were not reported per the procedure requirements and that at least 20 of these would be deficiencies.

6. OTHER COMMENTS:

When the lead auditor fails to summarize minor deficiencies (or deficiencies handled by the auditor as minor deficiencies) in the Audit Activity Report, he is not in conformance with BPC audit procedure requirements (Ref. #3).

PREPARED BY: Robert A Seveg

DATE: 3/18/82

COMMENTS:

BY: L B Reed

DATE: 3/18/82

PFR NO. 2408-PFR-F084

POTENTIAL FINDING REPORT
SONGS 2&3 SEISMIC DESIGN VERIFICATION.

REVISION _____

PREPARATION BY GA INITIATOR

AFFECTED ITEMS: Foxboro Power Supply 2ARPS

REQUIREMENT REFERENCE DOCUMENTS:

IEEE 344-1971, Section 3.2.2.3

BASIC REQUIREMENT:

Test devices using a continuous sine or sine beat, the magnitude of the acceleration should be chosen to be that for which the device is to be qualified.

DESCRIPTION OF POTENTIAL FINDING:

The test qualification summary in CE document CEN94s states that the qualification g-level was as low as 1g. CE specification 1370ICE0005, covering the associated panel, specifies a 2.0g input in the range of 5-35 Hz. Considering panel flexibility, which is indicated by virtue of (1) other devices qualified to levels up to 10g, and (2) the statement on the attached CE transmittal which states that panel devices were qualified to the local response g-levels of the cabinet, this device was under-tested with respect to input acceleration magnitude.

PREPARED BY J. Rakowski

J. Rakowski

DATE: 2/26/82

REJECTION OF GA TASK LEADER COMMENTS BY: _____ DATE: _____

REJECTION OF ORIGINAL DESIGN ORG. COMMENTS BY: _____ DATE: _____

B. REVIEW BY GA TASK LEADER

COMMENTS

☒ AGREE PFR IS VALID

BY

[Signature]

DATE

3/3/82

☐ REQUEST RE-REVIEW

BY

DATE

☐ DISAGREE

BY

DATE

☐ REVIEW OF ORIGINAL DESIGN ORGS. COMMENTS BY: _____ DATE: _____

C. REVIEW BY ORIGINAL DESIGN ORGANIZATION

COMMENTS

This device was not undertested with respect to the input acceleration magnitude. For verification see Foxboro Report #T6-6020. (Attached)

The testing performed at the frequencies form 3-35 Hz were at a minimum at 2g's input and a maximum of 6.4 g's input. Below 3 HZ, the shake table limitations reduced the test input accelerations.

☐ AGREE PFR IS VALID

☒ DISAGREE

BY: V C HallDATE: 3/15/82

See attachment for
recommendation to
invalidate this PFR.

FSO 3/19

D. RECOMMENDATION BY FINDINGS REVIEW COMMITTEE

DEFINITION ADEQUACY:

☒ ADEQUATE☐ INADEQUATE

VALIDITY:

☐ VALID☒ INVALID

CLASSIFICATION:

☐ OBSERVATION☐ FINDINGJUSTIFICATION:

CLASSIFICATION CRITERION NO. RESULTING IN "FINDING" _____

COMMENT ON "OBSERVATION" CLASSIFICATION _____

BY: S. d. KoubDATE: 3/19/82E. GA PROJECT MANAGER☒ ACCEPT☐ REJECTBY: Sh WusmanDATE: 3/20/82

The Foxboro Company
Quality Assurance Laboratory (Dept. 163)
Test Report No. T6-6020
Date of Report: Aug 1976

2408-PFR-F084
JSC 3/19/82

RAR-49

Seismic Testing of
2ARPS Power Supplies

Tested at
Acton Environmental Testing
Corporation, Acton, Mass.
Date of Test: June 1976

J.C. Childs
Reviewed by:
J.C. Childs
Staff Engineer
Nuclear Power Products

K.G. McCasland
Approved by:
K.G. McCasland
Supervisor
Quality Assurance Laboratory

LWH
Test Conducted by:
L.W. Hewey
Senior Test & Evaluation Engineer
R.L. Andrews
Senior Test Technician

R.L.A.

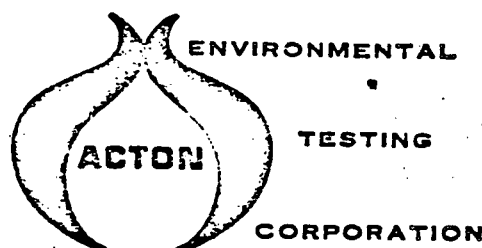
2408-PFR-F084
JSC

Test Report No. 12539

No. of Pages 42

Report of Test on

SEISMIC VIBRATION TESTING
OF 2ARPS POWER SUPPLIES
FOR FOXBORO COMPANY
UNDER PURCHASE ORDER NO. E 30896



Date June 22, 1976

	Prepared	Checked	Approved
By	B. Esposito	R. Gilfoy	M. L. Tolf
Signed	<i>B. Esposito</i>	<i>R. Gilfoy</i>	<i>M. L. Tolf</i>
Date	<i>6-22-76</i>	<i>23 June 76</i>	<i>6/23/76</i>

MLT:BE/hmr

Administrative Data

1.0 Purpose of Test: Qualification seismic vibration testing of 2ARPS power supplies for Foxboro Company.

2.0 Manufacturer: Foxboro Company
Foxboro, Mass.

3.0 Manufacturer's Type or Model No: 2ARPS-A
Styles C&D

4.0 Drawing, Specification or Exhibit: Foxboro Company Test Program for Seismic Vibration Qualification Test of 2ARPS Power Supplies, Rev 1, dated June 9, 1976

5.0 Quantity of Items Tested: Two (2)

6.0 Security Classification of Items: Unclassified

7.0 Date Test Completed: June 17, 1976

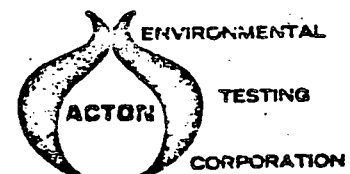
8.0 Test Conducted By: C. Pilotte
D. McLaughlin

9.0 Disposition of Specimens: Returned to Foxboro Company.

10.0 Abstract: There was no evidence of mechanical damage or deterioration to either power supply specified in requirements, as a result of the seismic vibration test specified in para. 3.0 below. Refer to Foxboro Company report for detail of electrical failures or shifts that occurred.

Report No. 12539

Page 1



SAC

1.0 EQUIPMENT TESTED

The following items were submitted by Foxboro Company for seismic vibration testing.

ITEM	MODEL	STYLE	TYPE
1	2ARPS-A	C	Power Supply
2	2ARPS-A	D	Power Supply

2.0 TEST REQUIREMENTS

The power supplies specified in para. 1.0 above are required to pass the seismic vibration test specified in para. 3.0 below without evidence of mechanical damage or deterioration. The test items shall be operated before, during and after the simulated seismic event.

3.0 TEST PROCEDURE

The power supplies were tested in accordance with Foxboro Co. test program for seismic vibration qualification test of 2ARPS power supplies, Rev. 1, dated 6/9/76.

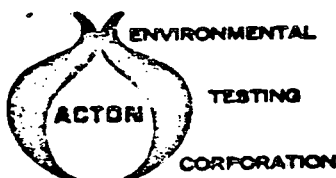
3.1 Test Condition

The power supplies were tested in their operating mode at room temperature and pressure.

3.2 Test Mounting

The power supplies were mounted in two separate test fixtures. The test fixtures were securely bolted to the small biaxial table of the Acton Environmental Testing Corporation (AETC) 45° biaxial seismic test facility such that the fixtures had transmissibilities of 1.0.

Report No. 12539



JDC

3.3 Test Monitoring

Foxboro personnel monitored the electrical outputs to determine any electrical failures or shifts. The power supplies were monitored with triaxial accelerometers to determine mechanical response. The 11 monitoring accelerometers and one (1) control accelerometer were placed on the power supplies in the following locations:

ACCELEROMETER NO.	AXIS	LOCATION
1	Vertical	Triaxial, on front of fixture, centered at top. Fixture which has Style C unit
2	Front-to-back	
3	Side-to-side	
4	Vertical	Triaxial, on rear of Style C unit, mounted on cooling fins, centered in middle
5	Front-to-back	
6	Side-to-side	
7	Vertical	Triaxial, on rear of Style D unit, mounted on cooling fins, centered in middle
8	Front-to-back	
9	Side-to-side	
10	Side-to-side	Triaxial, at rear on base of Style C fixture, near electrical box. No. 12 - control
11	Front-to-back	
12	Vertical	

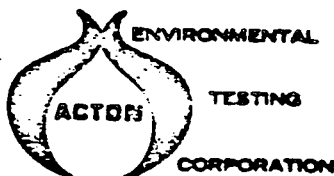
Accelerometers #4 and #12 changed positions for Tests 5 thru 8. No. 12 accelerometer remained the control accelerometer.

The outputs of each of the above accelerometers were recorded on oscillographic recorders.

3.4 Resonance Survey

A resonance survey using a sinusoidal input of 0.3g's

Report No. 12539



Page 3

vertical peak acceleration at frequencies of 1 thru 35 Hz was conducted at a sweep rate of 1 octave/minute. The input was applied to the small biaxial table of the AETC 45° bi-axial seismic test facility in the following sequence:

TEST NO. 1: Front-to-back & Vertical
TEST NO. 2: Left-to-right & Vertical
TEST NO. 3: Back-to-front & Vertical
TEST NO. 4: Right-to-left & Vertical

3.5 Sine Beat Test

The sine beat test consisted of amplitude modulated sinusoids at each integer frequency with a vertical peak acceleration corresponding to that for which the devices was to be qualified. The sine beats consisted of 10 sinusoids at the frequency and amplitude of interest. The test for a given frequency was 5 beats, 10 cycles/beat, with a sufficient pause between beats to preclude any superposition of motion. The test frequency was from 1 to 35 Hz at the acceleration level shown below.

LEFT-TO-RIGHT & VERTICAL RIGHT-TO-LEFT & VERTICAL

FREQUENCY (Hz)	VERTICAL PEAK ACCELERATION (G's)
1	.7
1.7, 2.0	1.5
3, 4, 5, 6	2.0
13, 14, 15	2.5
7, 8, 16, 17, 24, 25, 26, 27, 28	3.0
18	3.5

Report No. 12539

FREQUENCY (Hz)	VERTICAL PEAK ACCELERATION(G's)
9, 10, 12, 19, 29, 30, 31, 32, 33, 34, 35	4.0
20	5.0
11, 21, 22, 23	6.4

FRONT-TO-BACK & VERTICAL
BACK-TO-FRONT & VERTICAL

FREQUENCY (Hz)	VERTICAL PEAK ACCELERATION(G's)
1	0.7
1.7	1.5
2.0	1.8
3, 4, 5	2.0
6, 8, 9, 10, 11, 12, , 13, 14	2.5
7, 24, 25, 26, 27, 28	3.0
15	3.5
28, 29, 30, 31, 32, 33, 34, 35	4.0
16, 17, 18, 19	4.5
20	5
21, 22, 23	6.4

A shock spectrum analysis was made by a Spectral Dynamics SD321 Shock Analyzer of portions of the sine beat tests as follows:

TEST NO.	FREQUENCY (Hz)	ACCELEROMETER NO.
5	1 thru 15	12
6	1 thru 15	4
7	1 and 1.7	4

Report No. 12539

The input was applied to the small biaxial table of the AETC 45° biaxial seismic test facility in the following sequence:

TEST NO. 5: Right-to-left & Vertical
TEST NO. 6: Front-to-back & Vertical
TEST NO. 7: Left-to-right & Vertical
TEST NO. 8: Back-to-front & Vertical

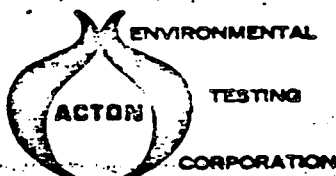
4.0 TEST RESULTS

There was no evidence of mechanical damage or deterioration to either power supply as a result of the simulated seismic event. Foxboro personnel retained all oscillographic recordings and photographs.

After Tests #5 & #6 (sine beat tests), Acton Environmental Testing Corporation (AETC) was informed by Foxboro personnel that the 2ARPS-A Style D power supply had failures. Refer to Foxboro Company's report for detail of electrical failures, or shifts that occurred.

The 20 thru 35 Hz portion of the sine beat tests was repeated in all four axes after Foxboro personnel found a relay socket that appeared to have caused the failures on the Style D unit. Refer to Foxboro Company's report for details.

Report No. 12539



5.0 TEST EQUIPMENT LIST

NAME	MFGR.	MODEL	SER. NO.	RANGE	ACCURACY	INV. #	CAL. FREQ.
Accelerometer	PCB	302A	666	0.25 Hz - 5 KHz	+5%	AC375	3 months
"	"	"	667	"	"	AC376	" "
"	"	"	668	"	"	AC377	" "
"	"	"	669	"	"	AC378	" "
"	"	"	670	"	"	AC379	" "
"	"	"	671	"	"	AC380	" "
"	"	"	672	"	"	AC381	" "
"	"	"	673	"	"	AC382	" "
"	"	"	565	"	"	AC383	" "
"	"	"	694	"	"	AC384	" "
"	"	"	695	"	"	AC385	" "
"	"	"	697	"	"	AC387	" "
VTVM	HP	403A		10 Hz - 1 MHz, 0-300 volts 12 ranges	+3%	MV322	" "
Scope, Storage	Tektronix	564-	11582	DC to 10 MHz	"	OS309	" "
Power Supply	BUBR	506/16	322	+15 VDC, 1 ADC	0.5%	PD372	6 months
Hydraulic Actuator Controller	MTS	204.63S 443.115		DC-300 Hz, 25K force lbs. 25" DA max. DC-2000 Hz	+2% F +5% A +1%	PE367	in use " "
Power Unit Conditioner	PCB	483A	273	Output=22 VDC 12 MA(used w/302A accelerometers)	N/A	PE374	3 months

2408-PCR-10064
JPC

5.0 TEST EQUIPMENT LIST (continued)

NAME	MFGR.	MODEL	SER.NO.	RANGE	ACCURACY	INV.#	CAL.F
Shock Spectrum Analyzer	Spec.Dynamics	SD321	18	0.1 Hz to 10 KHz 31.6 Mv to 100V F.S.	+ .5db	PE381	3 mon
Visicorder	Honeywell	906	9-5235	DC to 2 KHz 12 channel	+1db	RE332	3 mont
Recorder	Honeywell	906C	99078	DC to 2 KHz 12 channel	+1db	RE335	3 mont
Recorder, S-Y	MFE	715E	70154	1-10-100 MV Both channels	+0.5%	RE342	" "
Sweep Oscillator	SDY	SD-104-5	21A	0.005 Hz - 50 KHz	+1%	SG315	6 month
Low Freq.Gen.	HP	202B	397	0.01 Hz - 1 KHz	+5%	SG319	6 month
Tone Burst Gen.	GRC	1396	1052	DC - 2 MHz	N/A	SG326	6 month

2408 PIR - Feb
AEC

~~2408 ER 034~~

~~2408 F084~~ ATTACHMENT.
2408-PFR-F084

RESPONSES TO REQUEST FOR ADDITIONAL INFORMATION

(Teletypewriter message, K. Tong to J. Westhoven, 2/3/82)

~~N/A~~

Response #1 - These panels, and all others, are indeed located by the plant designer (A/E) which is Bechtel. This question should be directed to Bechtel.

Response #2 - All components located in the subject panels were qualified separately as follows:

The panels were tested using different loading (light-heavy) and component distribution configurations. Those locations of highest seismic response were used as the basis for qualifying the components by separate testing.

The documentation of these efforts is found in CEH-94. The subject equipment is titled Process Instrument Rack in the SONGS equipment listing in CEH-94.

Page 2 of 2

POTENTIAL FINDING REPORT

SONGS 2&3 SEISMIC DESIGN VERIFICATION

REVISION _____

PREPARATION BY GA INITIATOR

AFFECTED ITEMS: 1. Rosemount Temperature Transmitter 442H-82-A
2. Foxboro Resistance to Voltage Converter 2AI-P2V

REQUIREMENT REFERENCE DOCUMENTS:

- a) IEEE 344, 1975
- b) IEEE 344, 1971 Section 3.2.2.3

BASIC REQUIREMENT:

- a) The TRS shall envelope the RRS at the equipment mounting location.
- b) Test the devices using a continuous sine or sine-beat input with an acceleration magnitude for which the device is to be qualified.

DESCRIPTION OF POTENTIAL FINDING: Item 1 was separately tested using the method of IEEE 344, 1975 while the panel was tested in accordance with IEEE 344, 1971. Considering panel flexibility, the TRS shown in CEN-94S may not envelope an in-panel RRS as required in a). Since a spectrum does not specify wave shape, a sine beat or dwell at particular frequencies may not have been performed as required in b). Hence, the seismic adequacy of item 1 has not been verified. Item 1 was replaced by item 2 per the attached telecon and no qualification data for item 2 is presented to verify its seismic adequacy.

PREPARED BY: J. Rakowski *J. Rakowski* DATE: 3/3/82

REJECTION OF GA TASK LEADER COMMENTS BY: _____ DATE: _____

REJECTION OF ORIGINAL DESIGN ORG. COMMENTS BY: _____ DATE: _____

B. REVIEW BY GA TASK LEADER

COMMENTS

☒ AGREE PFR IS VALID

BY *[Signature]* DATE 3/3/82

☐ REQUEST RE-REVIEW

BY _____ DATE _____

☐ DISAGREE

BY _____ DATE _____

☐ REVIEW OF ORIGINAL DESIGN ORGS. COMMENTS BY: _____ DATE: _____

C. REVIEW BY ORIGINAL DESIGN ORGANIZATION

COMMENTS

The documentation for the 2A1-P2V module can be found in CEN-94(S) data sheet #6C.

☐ AGREE PFR IS VALID

☒ DISAGREE

BY: V C Hall

DATE: 3/15/82

See attachment for
recommendation to
invalidate this
PFR.

FSO 3/19

D. RECOMMENDATION BY FINDINGS REVIEW COMMITTEE

DEFINITION ADEQUACY:

☒ ADEQUATE

☐ INADEQUATE

VALIDITY:

☐ VALID

☒ INVALID

CLASSIFICATION:

☐ OBSERVATION

☐ FINDING

JUSTIFICATION:

CLASSIFICATION CRITERION NO. RESULTING IN "FINDING" _____

COMMENT ON "OBSERVATION" CLASSIFICATION

BY: S. L. Koutz

DATE: 3/19/82

E. GA PROJECT MANAGER

☒ ACCEPT

☐ REJECT

BY: ShWissman

DATE: 3/20/82

Attachment to 2408-PFR-F085

Per C.E. telecon of 2/26/82 (Wade Cooper C.E. to J. Rakowski, GA), the Rosemount temperature transmitters 442H-82-A (item 1) were replaced by Foxboro resistance to voltage converter 2A1-P2V.

panel. Thus, the concern ^{has been eliminated 3/18/82} that item 1 was separately tested to IEEE-344, 19875, while the power was tested in accordance with IEEE-344, 1971. Item 2 was tested to IEEE 344, 1971, sine beat method which is the same method used to test the panel.

The documentation for the tests on item 2 is listed in CEN-94(S) data sheet 6C. This data sheet confirms that the module was tested by sine beat test technique to 10g's in all three axes with no problems (neither electrical nor physical).

I, therefore, recommend that we declare this PFR invalid.

A.M.
Alan Middleton, 3/18/82

Concur with the recommendation to invalidate this PFR. Note that the initiator of this PFR (J. Rakowski) is off site; processing of this PFR has been assigned to A. Middleton in his absence.

F. J. Plus
3/19/82

POTENTIAL FINDING REPORT
SONGS 2&3 SEISMIC DESIGN VERIFICATION

PFR NO. 2408-PFR-F094

REVISION _____

PREPARATION BY GA INITIATOR

AFFECTED ITEMS: Charging inlet nozzle on the cold leg.

REQUIREMENT REFERENCE DOCUMENTS: Specification No. 1370-PE-140 "Project Specification for Reactor Coolant Pipe and Fittings for San Onofre Unit No. 2" Nuclear Power Systems, Combustion Engineering, Inc.

BASIC REQUIREMENT:

That the loads be correctly applied to the charging inlet nozzle.

DESCRIPTION OF POTENTIAL FINDING:

The charging inlet nozzle stress analysis (CE Doc. No. CENC-1365, dated March 1979) was performed using the nozzle loading (forces and moments) given in sheets A315 and A325. These loads were taken directly from the design specification (1370-PE-140) and applied to the charging inlet nozzle. The loads were not rotated into the local coordinate system of the charging inlet nozzle.

PREPARED BY: J. L. Pickering DATE: 3/4/82

REJECTION OF GA TASK LEADER COMMENTS BY: _____ DATE: _____

REJECTION OF ORIGINAL DESIGN ORG. COMMENTS BY: _____ DATE: _____

B. REVIEW BY GA TASK LEADER

COMMENTS

☒ AGREE PFR IS VALID

BY [Signature]

DATE 3/4/82

☐ REQUEST RE-REVIEW

BY _____

DATE _____

☐ DISAGREE

BY _____

DATE _____

☐ REVIEW OF ORIGINAL DESIGN ORGS. COMMENTS BY: _____ DATE: _____

C. REVIEW BY ORIGINAL DESIGN ORGANIZATION

COMMENTS

CE's response was transmitted by telecopy on 3/18/82 (copy attached). CE agreed that PFR is valid. *flw 3/19*

☐ AGREE PFR IS VALID☐ DISAGREE

BY: _____ DATE: _____

D. RECOMMENDATION BY FINDINGS REVIEW COMMITTEE

DEFINITION ADEQUACY:

☒ ADEQUATE☐ INADEQUATE

VALIDITY:

☐ VALID☒ INVALID

CLASSIFICATION:

☐ OBSERVATION☐ FINDINGJUSTIFICATION:

CLASSIFICATION CRITERION NO. RESULTING IN "FINDING" _____

COMMENT ON "OBSERVATION" CLASSIFICATION _____

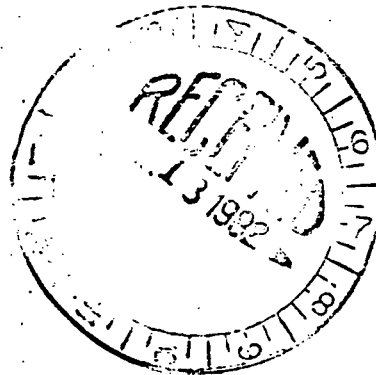
BY: *S. L. Kouty* DATE: *3/19/82*E. GA PROJECT MANAGER☒ ACCEPT☐ REJECTBY: *ShWissman* DATE: *3/20/82*

*The addendum (doc CENC-1474) to the C-E calculations CENC-1865 covered the response to this PFR, therefore, this PFR is considered resolved. *flw 3/19/82**

*Concur with recommendation to invalidate this PFR. *flw 3/19**

Reply: The comment made in PFR #2408-PFR-F094 is a valid one. The loads on sheet A-315 of CE Document CENC-1365 were not rotated into the local coordinate system of the charging inlet nozzle as they should have been. This error was corrected in CE Document CENC-1474, "Addendum to the Analytical Report for Southern California Edison San Onofre Unit No. 2 Piping" (Sheets 68 to 71). The addendum considers the charging inlet nozzle pipe loads given in M.O. 9130345 Supplement No. 42. These M.O. supplement loads supersede the loads on sheet A-315 of CE Document CENC-1365. As shown on sheet 69 of CENC-1474, these new loads were rotated into the local coordinate system of the nozzle. The resultant forces and moments due to these rotated loads are shown on sheet 70 of CENC-1474. These resultant forces and moments are compared to the forces and moments used in CENC-1365 (see sheets 70 & 71 of CENC-1474). The M.O. supplement resultant forces and moments are smaller than the loads used in the CENC-1365 report. Since the pipe load stresses are calculated from the resultant forces and moments and these resultants are conservative, the pipe load stresses in CENC-1365 are themselves conservative. Also, since CENC-1365 shows that ASME Code Section III allowables are met, this comment does not adversely affect the safety of the plant equipment and no corrective action is required.

Agree 3/18/82



POTENTIAL FINDING REPORT
SONGS 2&3 SEISMIC DESIGN VERIFICATION

PFR NO. 2408-PFR-P095

REVISION _____

PREPARATION BY GA INITIATOR

AFFECTED ITEMS:

Charging inlet nozzle on the cold leg.

REQUIREMENT REFERENCE DOCUMENTS:

N/A

BASIC REQUIREMENT:

The stress analysis be complete and well documented.

DESCRIPTION OF POTENTIAL FINDING: The majority of the peak stress intensity range values for the different cuts in the charging inlet nozzle listed in sheets A356-359 (CE Doc. No. CENC-1365, dated March 1979) can be developed from the peak stress values listed on sheets A346-351. However, the calculation on cut A_I (sheet A354) cannot be reproduced for the primary plus-secondary stress intensity "SI - S2" values. A usage factor of 1.7 (versus the published 0.7779 value) is developed when using the peak stress intensity values listed for cut "A, inside" (sheet A346). There is no justification given in the CE document on how the "SI-S2" stress intensity values for cut A_I were developed.

PREPARED BY: J. L. Pickering

DATE: 3/4/82

REJECTION OF GA TASK LEADER COMMENTS BY: _____ DATE: _____

REJECTION OF ORIGINAL DESIGN ORG. COMMENTS BY: _____ DATE: _____

B. REVIEW BY GA TASK LEADER

COMMENTS

☒ AGREE PFR IS VALID

BY [Signature]

DATE 3/4/82

☐ REQUEST RE-REVIEW

BY _____

DATE _____

☐ DISAGREE

BY _____

DATE _____

☐ REVIEW OF ORIGINAL DESIGN ORGS. COMMENTS BY: _____ DATE: _____

C. REVIEW BY ORIGINAL DESIGN ORGANIZATION

COMMENTS

CE's response was transmitted by teletype
on 3/18/82 (copy attached). CE agreed that
PF is valid. f80 3/19

☐ AGREE PF IS VALID☐ DISAGREE

BY: _____ DATE: _____

D. RECOMMENDATION BY FINDINGS REVIEW COMMITTEEDEFINITION ADEQUACY: ☒ ADEQUATE ☐ INADEQUATEVALIDITY: ☒ VALID ☐ INVALIDCLASSIFICATION: ☒ OBSERVATION ☐ FINDINGJUSTIFICATION:

CLASSIFICATION CRITERION NO. RESULTING IN "FINDING" _____

COMMENT ON "OBSERVATION" CLASSIFICATION

Calculational error which does not affect result.

BY: S. A. Kouty DATE: 3/19/82E. GA PROJECT MANAGER☒ ACCEPT☐ REJECTBY: ShWassman DATE: 3/20/82

Reply: The comment made in PFR #2408-PFR-F095 is valid one. The "S1 - S2" peak stresses at cut A₁ shown on sheet A-354 of CE Document CENC-1365 did not come from the table on sheet A-346 of the same document. The peak stresses shown on Sheet A-346 in CENC-1365 are overly conservative. The thermal skin stresses were inadvertently included twice, once by an ANSYS post processing routine and once by a hand calculation. The "S1 - S2" peak stresses used in the fatigue evaluation (sheet A-354) for cut A₁ are calculated by the method shown on Sheet A-342 which means the thermal skin stress is included only once (by a hand calculation). In order to correct this inconsistency, revised sheets A-346 and A-354 are attached for incorporation into the CENC-1365 report. The peak stresses on the revised sheet A-346 are calculated by the method shown on sheet A-342. The peak stresses used in the fatigue evaluation of cut A₁, shown on the revised sheet A-354, come directly from revised sheet A-346. The maximum usage factor at cut A₁ is .7779 (revised sheet A-354) which is less than the ASME Code Section III allowable of 1.0. Thus, this comment does not adversely affect the safety of the plant equipment. The only corrective action necessary is to incorporate the two revised sheets into the CENC-1365 report.

Agree 3/18/82

COMBUSTION ENGINEERING, INC.
ENGINEERING DEPARTMENT, CHATTANOOGA, TENN.

2408-17R-1-575 3/19/62
NUMBER P3-206
SHEET 10 OF 107
DATE 2-5-62
CHECK DATE 2-5-62

CHARGE NO. 71570
DESCRIPTION PIPELINE CHASING HOLE AT NO. 200

S. DETAILED ANALYSIS

G. PIPE STATISTICS

CUT A, INSIDE

TRANS.	S ₁ '	S ₂ '	S ₃ '	S ₁ -S ₂ '	S ₂ -S ₃ '	S ₁ -S ₃ '
A1	-2.25	2.07	5.19	-5.12	-2.02	7.94
B1	-2.25	2.09	5.63	-5.15	-2.79	7.93
C1	-2.25	5.79	15.16	-3.04	5.13	47.91
C2	-2.25	11.29	7.94	-13.54	2.35	11.19
D1	-2.29	12.75	17.46	-21.04	1.29	19.75
D2	-2.29	-2.43	-4.03	5.14	-3.60	-1.71
E1	-2.23	-5.02	-3.1	2.65	-5.07	1.42
E2	-2.21	26.05	24.34	-22.24	1.71	21.55
M1	-2.21	-7.21	-4.22	5.00	-2.99	-2.01
F1	-2.25	22.72	22.72	-21.03	.99	25.04
F2	-2.25	4.29	6.74	-3.54	-1.45	2.99
G1	-2.25	-7.08	-2.54	5.43	-5.34	-.29
H1	-2.50	22.93	23.49	-21.43	4.33	37.10
H2	-1.68	7.72	5.47	-9.4	2.25	7.15
N1	-2.00	-11.17	-5.10	9.17	-6.07	-3.10
I1	-2.25	36.73	22.77	-32.98	5.74	33.22
I2	-2.25	13.64	9.73	-15.09	3.91	11.93
P1	-2.25	-21.17	-12.75	12.92	-8.42	-10.50
J1	-2.25	100.02	82.25	-102.27	10.77	91.50
J2	-2.25	-3.22	-1.13	.97	-2.09	1.12
K1	-2.25	103.15	93.13	-105.40	10.02	95.32
K2	-2.25	14.87	11.17	-17.12	3.70	13.42
S1	-2.25	2.09	5.43	-5.14	-2.79	2.93
S2	-2.25	2.09	5.43	-5.14	-2.79	2.93
T1	-0.50	0.12	1.45	-1.62	-1.33	1.95
T2	-2.25	3.13	5.83	-5.32	-2.75	2.13
U1	-3.13	3.28	7.22	-6.41	-3.94	10.35
R1	0.0	0.0	0.0	0.0	0.0	0.0

ALL STATISTICS ARE IN KSI.

CHARGE NO. 24770

DESCRIPTION: PLATE, CHUCKS, W/OT ATTACH

SHEET 107

DATE 7-5-52 BY J. H. H.

CHECK DATE 7-5-52 BY J. H. H.

2408-PFR-FO-45

5. DETAILED ANALYSIS H. USAGE FACTOR

CUT	STRESS DENSITY	CONDITION		PEAK S.I.	K _e	Q	ALLOWING S.I.	LIFE CYCLES		ALLOWABLE CYCLES	USAGE FACTOR
		i	j					i	j		
A _I	S1-S2	P1	J1	121.19	3.072	1.0	103.20	100	100	150	0.5263
		N1	K1	112.57	2.528	1.0	144.02	500	100	400	0.2500
		N1	C1	62.21	1.0	1.0	31.11	400	500	300,000	0.0013
		G1	C1	58.67	1.0	1.0	22.34	1,000	100	400,000	0.0003
		G1	H1	47.06	1.0	1.0	23.53	1,000	500	∞	0.0
	TOTAL =										.7779
	S2-S3	J1	P1	12.19	1.0	1.0	9.60	100	100	∞	0.0
	S3-S1	J1	P1	102.00	1.881	1.0	95.93	100	100	1,500	0.0067
		K1	N1	73.48	1.535	1.0	75.53	100	500	3,600	0.0278
		C1	N1	51.01	1.0	1.0	25.51	500	100	1x10 ⁶	0.0004
		C1	M1	47.92	1.0	1.0	24.96	100	17,000	∞	0
TOTAL =										0.0749	
A ₂	S1-S2	J1	P1	115.73	2.264	1.0	131.01	100	100	500	0.1052
		K1	N1	72.64	1.747	1.0	87.04	100	500	2100	0.0476
		J1	N1	52.93	1.0	1.0	23.49	100	100	800,000	0.0001
		C1	N1	52.73	1.0	1.0	21.35	500	500	800,000	0.0001
	TOTAL =										0.0004

NOTE: 1. DETAILED ANALYSIS OF CUTS; 2. 1.0 = 1.0, 1.0 = 1.0, 1.0 = 1.0

IMPACT ASSESSMENT

2408-PFR-F095

PFR NO. _____

AFFECTED ITEM: Charging Inlet Nozzle on the Cold Leg Piping

1. IS THERE THE POTENTIAL FOR REDUCING DESIGN MARGINS TO THE EXTENT DESIGN ALLOWABLES ARE EXCEEDED OR DESIGN REQUIREMENTS ARE NOT MET?

No

2. IS THERE THE POTENTIAL THAT THE ITEM MIGHT FAIL OR ENDANGER OTHER ITEMS DURING AN SSE?

No

3. COULD THE FAILURE OF THIS ITEM DURING AN SSE CREATE A SUBSTANTIAL SAFETY HAZARD?

Don't know

4. COULD THE PROCEDURAL VIOLATION CREATE A SUBSTANTIAL SAFETY HAZARD?

Don't know

5. ARE OTHER SIMILAR DEVIATIONS LIKELY TO EXIST?

Did not notice any in the scope of this review.

6. OTHER COMMENTS:

I agree with CE response and that the suggested changes to the stress report (update sheets A346 and A354) will not change the published 0.7779 usage factor for cut A.

PREPARED BY: J. L. Pickering

DATE: 3/19/82

COMMENTS:

Agree with impact assessment.

BY: *[Signature]*

DATE: 3/19/82

POTENTIAL FINDING REPORT
SONGS 2&3 SEISMIC DESIGN VERIFICATION

REVISION _____

PREPARATION BY GA INITIATOR

AFFECTED ITEMS: Reactor Vessel Inlet Nozzle

REQUIREMENT REFERENCE DOCUMENTS: Ref. 1) CE Contract No. 71170: Analysis Report for Southern California - San Onofre Unit 2 Reactor Vessel, CE Calculation No. RS-201: Structural Analysis of the Inlet Nozzle, CE Calculation No. RS-205: Analysis of the Inlet Nozzle for Faulted Conditions.

BASIC REQUIREMENT:

The appropriate material properties shall be used when performing a structural analysis.

DESCRIPTION OF POTENTIAL FINDING:

see attached

PREPARED BY: C. F. Dahms *C. F. Dahms* DATE: 3-8-82

REJECTION OF GA TASK LEADER COMMENTS BY: _____ DATE: _____

REJECTION OF ORIGINAL DESIGN ORG. COMMENTS BY: _____ DATE: _____

B. REVIEW BY GA TASK LEADER

COMMENTS

☒ AGREE PF IS VALIDBY *FSoper*

DATE 3/8/82

☐ REQUEST RE-REVIEW

BY _____

DATE _____

☐ DISAGREE

BY _____

DATE _____

☐ REVIEW OF ORIGINAL DESIGN ORGS. COMMENTS BY: _____ DATE: _____

C. REVIEW BY ORIGINAL DESIGN ORGANIZATION

COMMENTS

CE's response was transmitted by telecopy on 3/18/82 (attached). CE agrees with PF as being valid. fgo 3/19

☐ AGREE PF IS VALID☐ DISAGREE

BY: _____ DATE: _____

D. RECOMMENDATION BY FINDINGS REVIEW COMMITTEE

DEFINITION ADEQUACY:

☒ ADEQUATE☐ INADEQUATE

VALIDITY:

☒ VALID☐ INVALID

CLASSIFICATION:

☒ OBSERVATION☐ FINDINGJUSTIFICATION:

CLASSIFICATION CRITERION NO. RESULTING IN "FINDING" _____

COMMENT ON "OBSERVATION" CLASSIFICATION

Calculational error. However, design allowables are not exceeded

BY: S. L. Koutz DATE: 3/19/82E. GA PROJECT MANAGER☒ ACCEPT☐ REJECTBY: GH Weissman DATE: 3/20/82

Description of Potential Finding

On sheet 4 of 30 (RS-201 of Ref. 1) the geometry and the corresponding material properties are presented for the nozzle. Three different materials are listed. On sheet 17 of 30 (RS-201 of Ref. 1) the locations for specific points of analysis are given. Cut No. 1 is of particular interest because it lies in the material that has the lowest stress allowables of the three material types mentioned above. Now when the maximum stresses for normal operating conditions were checked with the allowables (Sh 23 of 30), the appropriate material was used for Cut No. 1. But when the check was made for the faulted conditions at Cut No. 1 (Sht 21 of 35, RS-205 of Ref 1), a comparison of stresses was made using the wrong material stress allowables. This is also the case on sheet 23 of 35 (RS-205 of Ref. 1). A larger stress allowable was used instead of the appropriate allowable for Cut No. 1.

Reply: The values for S_m on pages 21 and 23 of RS-205 were checked and were found to be in error. The correct value used is $S_m = .7S_u = .7(70) = 49$ ksi. The value used is $S_m = .7S_u = .7(80) = 56$ ksi. This error will be corrected.

All ASME Code stress intensity allowables for faulted primary stresses have been met after comparison to the appropriate revised S_m allowable of 49.0 ksi as noted below.

- I. The maximum primary general membrane stress intensity at cuts 1 and 2 (see page A-493) are:

$$S_1 \text{ max} = 16.53 \text{ ksi} \quad S_m = 49.0 \text{ ksi}$$

- II. The maximum primary local membrane plus bending stress intensity at cuts 1 and 2 (see page A-496) are:

$$S_1 \text{ max} = 34.95 \text{ ksi} \quad 1.5S_m = 1.5(49) \text{ ksi} = 73.5 \text{ ksi}$$

Agree 3/10/82

IMPACT ASSESSMENT

2408-PFR-F096

PFR NO. _____

AFFECTED ITEM: Reactor Vessel Inlet Nozzle

1. IS THERE THE POTENTIAL FOR REDUCING DESIGN MARGINS TO THE EXTENT DESIGN ALLOWABLES ARE EXCEEDED OR DESIGN REQUIREMENTS ARE NOT MET?

No

2. IS THERE THE POTENTIAL THAT THE ITEM MIGHT FAIL OR ENDANGER OTHER ITEMS DURING AN SSE?

No

3. COULD THE FAILURE OF THIS ITEM DURING AN SSE CREATE A SUBSTANTIAL SAFETY HAZARD?

Yes

4. COULD THE PROCEDURAL VIOLATION CREATE A SUBSTANTIAL SAFETY HAZARD?

No

5. ARE OTHER SIMILAR DEVIATIONS LIKELY TO EXIST?

Cannot be judged on this case alone

6. OTHER COMMENTS:

The error was agreed upon and will be corrected according to CE. The correction is not a substantial change and the decrease in margin will not be significant.

C. F. Dahms 3/18/82

PREPARED BY: C. F. Dahms

DATE: 3/18/82

COMMENTS:

Agree with impact assessment.

BY: *[Signature]*

DATE: *3/19/82*

GENERAL ATOMIC COMPANY

2406 PFR-F096
JDC 3/19/82

From: _____ Date: _____

To: _____

TELEPHONE COMMUNICATION RECORD

(Please hand letter legibly in black or red ink)

Call Initiated by: Charles F. Dahus at GA Other _____

Call Received by: Jake Westhoven at GA Other Combustion Engineering

Other Participants: _____

Date 3/19/82 Time 11:30am Program Name/No. _____ Task or 189 No. _____

Subject: PFR-F096

Summary In the response to PFR-F096 that CE returned, there seemed to be an error in item # 2. $S_{max} = 34.95 \text{ ksi}$ should read $S_{max} = 33.67 \text{ ksi}$ and this is found on page A-495 not A-496 as indicated. CE understood the clarification and will look into it.

Action Items:	Date Req'd	Responsible

Info cc: _____ File No. _____

COMBUSTION ENGINEERING, INC.
ENGINEERING DEPARTMENT, CHATTANOOGA, TENN.

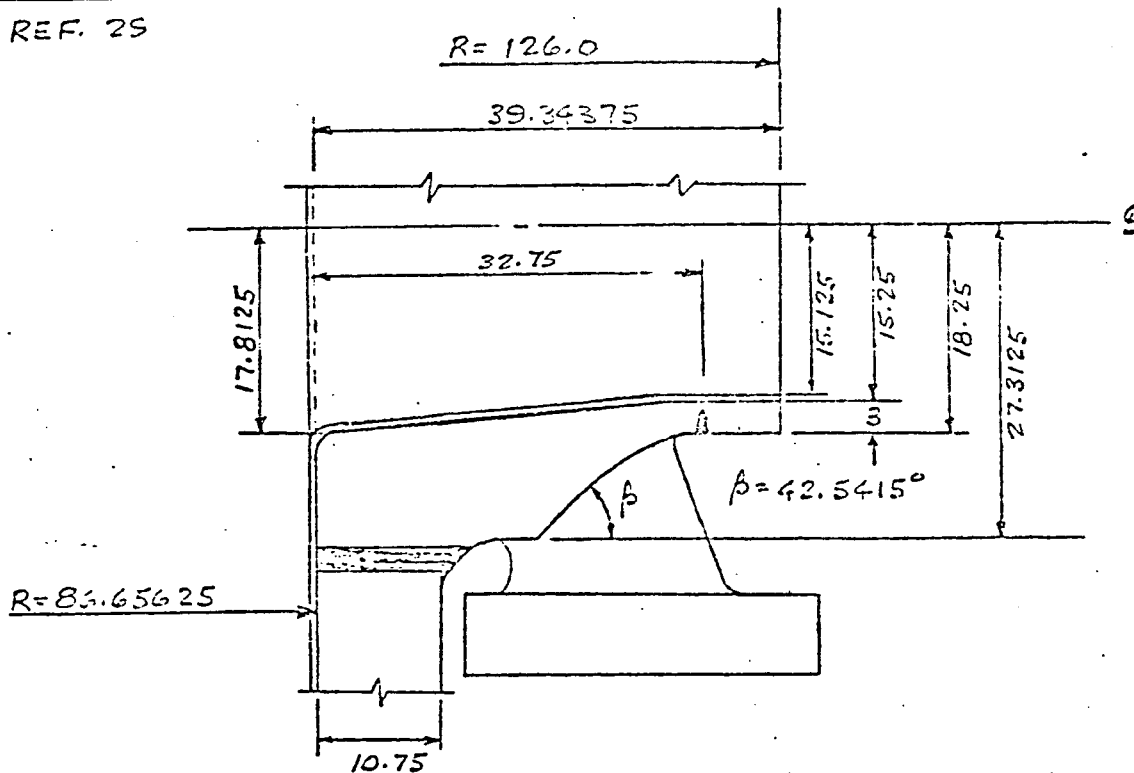
2408-KFIC-0074
NUMBER 25-201 1A-221
SHEET 4 OF 30
DATE 7-20-76 BY W. J. J. J.
CHECK DATE 8-11-76 BY W. J. J. J.

CHARGE NO. 71170
DESCRIPTION STRUCTURAL ANALYSIS OF THE
INLET NOZZLE

G. DETAILED ANALYSIS

A. GEOMETRY

REF. 25



MAT'L PROPERTIES @ 650°F, REF. 1

	<u>MAT'L</u>	<u>S_m, KSI</u>	<u>E, KSI</u>
NOZZLE FORGING	SA-508-CLII	26.7	27,000
NOZZLE EXTENSION FORGING	SA-508-CLII	17.0	26,050
VESSEL WALL	SA-533-GRB-CLII	26.7	27,000

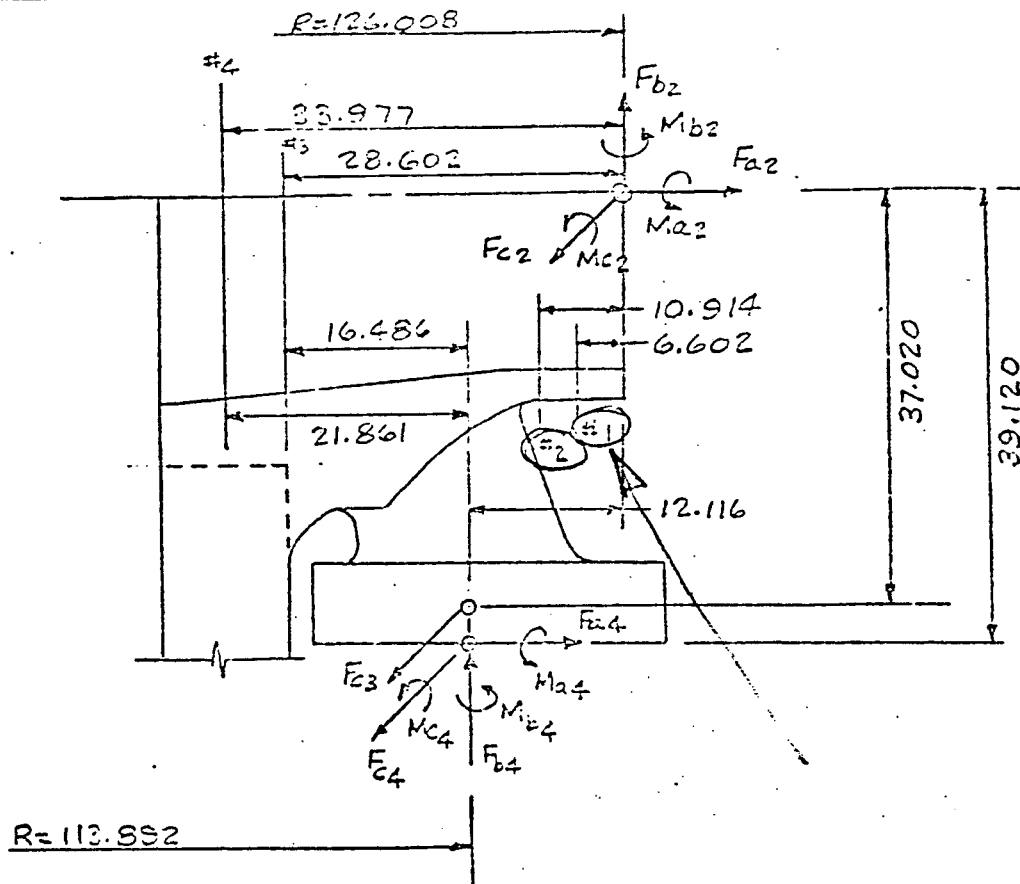
COMBUSTION ENGINEERING, INC.
ENGINEERING DEPARTMENT, CHATTANOOGA, TENN.

2408-17K-1096
NUMBER RS-201 *Rev* 1-2-62
SHEET 17 OF 30
DATE 7-20-76 BY *J. J. J.*
CHECK DATE 8-11-76 BY *M. J. J.*

CHARGE NO. 71170
DESCRIPTION STRUCTURAL ANALYSIS OF THE
INLET NOZZLE

6. DETAILED ANALYSIS

F. TRANSPOSING EXTERNAL LOADS TO CUTS



TRANSFER EQUATIONS ; $F, K \text{ \& } M, \text{ IN-K}$

CUT #1

$$F_x = F_{a2} \quad M_x = 12 M_{a2}$$

$$F_y = F_{b2} \quad M_y = 12 M_{b2} - 6.602 F_{c2}$$

$$F_z = F_{c2} \quad M_z = 12 M_{c2} + 6.602 F_{b2}$$

$$\bar{F} = [F_y^2 + F_z^2]^{1/2} \quad \bar{M} = [M_y^2 + M_z^2]^{1/2}$$

COMBUSTIONENGINEERING, INC.

ENGINEERING DEPARTMENT, CHATTANOOGA, TENN.

2408-11-K-F09L
NUMBER 88-701 A-168 220C

SHEET 23 OF 30

CHARGE NO. 71170

DATE 7-20-76

DESCRIPTION INLET NOZZLE STRUCTURAL ANALYSIS OF THE

CHECK DATE 8-11-76 BY [signature]

6. DETAILED ANALYSISH. STRESS EVALUATIONSH.1 CUT-#1NORMAL OPERATING $F_x = 108 \text{ K}$

STRESS, KSI

COND.	PRESS.			EXT. LOAD			PRIN.						$P_m, S.T.$		
	$\bar{\sigma}_x$	$\bar{\sigma}_\theta$	$\bar{\sigma}_r$	$\bar{\sigma}_x$	T	P	P_1	P_2	P_3	$P_1 - P_2$	$P_1 - P_3$	$P_2 - P_3$	$P_1 - P_2$	$P_1 - P_3$	$P_2 - P_3$
N.O.	5.69	12.60	-1.25	.34	1.69	13.01	5.63	-1.25	7.39	14.26		6.23			

 $14.26 \text{ KSI} < S_m = 17.0 \text{ KSI}$ $F_x = 108 \text{ K}$ $\bar{F} = 200.33 \text{ K}$ $\bar{M} = 14973.3 \text{ "K}$ $M_x = 8260.8 \text{ "K}$ $P_m + P_3 (S.T.)$

N.O.	5.69	12.60	-1.25	6.47	2.55	15.34	9.43	-1.25	5.91	16.59	10.68
	5.69	12.60	-1.25	-5.78	-4.2	12.62	-1.1	-1.25	12.73	13.87	1.14

 $16.59 \text{ KSI} < 1.55 S_m = 25.5 \text{ KSI}$

COMBUSTION ENGINEERING, INC.
ENGINEERING DEPARTMENT, CHATTANOOGA, TENN.

2408-PFR F096
NUMBER 81-205 1-453
SHEET 21 OF 35
DATE 8-27-76 BY John
CHECK DATE 9-12-76 BY John

CHARGE NO. 71170
DESCRIPTION ANALYSIS OF THE INLET NOZZLE
FOR FAULTED CONDITIONS

6. DETAILED ANALYSIS

F. STRESS EVALUATIONS FOR CUTS 1 & 2

F.1 $P_m < S_m$

F.1.1 EXTERNAL AND TRANSPOSED UNRUPTURED LINE CASE LOADS

CASE	EXT.		TRANS	
	F_{a2}	M_{a2}	F_x	M_x
I	7085	843.4 ^{FT-K}	708K	10120.8 ^{IN-K}
II → VII	1411.4	1980.5	1411.4	23766

F.1.2 STRESS INTENSITIES, KSI

CASE	PRESS.			EXT.		PRIN.			S.I.		
	σ_x	σ_y	σ_z	σ_x	T	P_1	P_2	P_3	$P_1 - P_2$	$P_1 - P_3$	$P_2 - P_3$
I	5.12	11.34	-1.13	2.24	2.07	12.22	6.40	-1.13	5.73	13.35	7.62
II & VII	5.12	11.34	-1.13	4.47	4.25	15.40	5.54	-1.13	9.86	16.53	6.67

$(S.I.)_{MAX} = 16.53 \text{ KSI} < S_m = 56.0 \text{ KSI}$

49 ksi

for material
SA 508-CLII

for material
SA 508-CLII

should use
for cut 1

COMBUSTION ENGINEERING, INC.
ENGINEERING DEPARTMENT, CHATTANOOGA, TENN.

2408-12FR-1096-*etc*
NUMBER PS-205 1-65
SHEET 25 OF 35
DATE 8-27-76 BY Juan
CHECK DATE 9-14-76 BY Juan

CHARGE NO. 71170
DESCRIPTION ANALYSIS OF THE WET NOBLE
FOR FAULTED CONDITIONS

G. DETAILED ANALYSIS

F. STRESS EVALUATIONS FOR CUTS # 1 & 2 (CONTINUED)

F.2.2 STRESS INTENSITIES

CUT # 1

CASE	PRESS.			EXT.		PRIN.			S.I.		
	σ_x	σ_y	σ_z	σ_x	σ_z	P_1	P_2	P_3	$P_1 - P_2$	$P_1 - P_3$	$P_2 - P_3$
I	5.12	6.39	-1.13	10.26	4.80	17.46	4.31	-1.13	13.15	18.59	5.44
				-5.77	.67	6.45	-.71		7.16	7.58	.42
II				21.46	12.45	22.54	.43		32.11	33.67	1.56
III	5.12	6.39	-1.13	-12.52	2.77	-7.24	6.93	-1.13	14.87	6.81	2.06

$$(S.I.)_{MAX} = 33.67 \text{ KSI} < 1.5 S_m = 1.5 (0.7 S_u) = 34.0 \text{ KSI}$$

CUT # 2

I	5.12	5.29	-1.13	10.39	4.80	17.35	3.46	-1.13	14.39	18.98	4.59
				-6.41	.67	5.26	-1.36		6.72	6.49	.23
II				23.29	12.47	23.86	-.16		34.02	34.53	.97
III	5.12	5.29	-1.13	-14.35	2.77	-9.74	5.21	-1.13	15.55	8.61	6.94

$$(S.I.)_{MAX} = 34.53 \text{ KSI} < 1.5 S_m = 34.0 \text{ KSI}$$

POTENTIAL FINDING REPORT
SONGS 2&3 SEISMIC DESIGN VERIFICATION

PFR NO. 2408-PFR-F099

REVISION _____

PREPARATION BY GA INITIATOR

AFFECTED ITEMS: Reactor Coolant Pumps

REQUIREMENT REFERENCE DOCUMENTS:

San Onofre 2 and 3 FSAR, Section 3.7, Seismic Design

BASIC REQUIREMENT: Design loadings on reactor coolant pumps must include maximum DBE loadings in order to assure integrity of reactor coolant pressure boundary during and following DBE.

DESCRIPTION OF POTENTIAL FINDING: DBE "Lower Support" Fy loads listed in CE Project Specification 1370-PE-480, Rev. 5, Table 19, 20, 23 and 24 are less than both "calculated maximum" and "specified for design" pump hangers Fy loads listed in FSAR Table 3.7-23, sheets 9 and 10. (Per Byron Jackson report TCF-1025-STR the loads listed in the CE Project Specification were used for design.) It appears that the DBE Fy loads used for pump design are less than required.

PREPARED BY: J. D. Stanley DATE: 3/4/82

REJECTION OF GA TASK LEADER COMMENTS BY: _____ DATE: _____

REJECTION OF ORIGINAL DESIGN ORG. COMMENTS BY: _____ DATE: _____

B. REVIEW BY GA TASK LEADER

COMMENTS

☒ AGREE PF IS VALID

BY FSople

DATE 3/5/82

☐ REQUEST RE-REVIEW

BY _____

DATE _____

☐ DISAGREE

BY _____

DATE _____

☐ REVIEW OF ORIGINAL DESIGN ORGS. COMMENTS BY: _____ DATE: _____

C. REVIEW BY ORIGINAL DESIGN ORGANIZATION

COMMENTS

The "Lower Support" Fy loads in Specification 1370-PE-480, Rev. 5 and the pump hanger (vertical column) Fy loads in FSAR Table 3.7-23 refer to loads at different locations and are not directly related.

The vertical column loads given in FSAR Table 3.7-23, sheets 9 and 10 refer to a maximum load to which a single column is subjected during the duration of the earthquake. Both "calculated maximum" and "specified for design" loads are less than the design loads specified in C-E Project Specification for Reactor Coolant Pump Support Columns, Specification 1370-PE-513, Rev. 1.

☐ AGREE PFR IS VALID☒ DISAGREE

The DBE "Lower Support" Fy loads given in C-E Project Specification 1370-PE-480, Rev. 5, Tables 19, 20, 23, and 24 are design loads at

BY: UC Hall / GDB DATE: 3/12/82

D. RECOMMENDATION BY FINDINGS REVIEW COMMITTEE

DEFINITION ADEQUACY:

☒ ADEQUATE☐ INADEQUATE

VALIDITY:

☐ VALID☒ INVALID

CLASSIFICATION:

☐ OBSERVATION☐ FINDINGJUSTIFICATION:

CLASSIFICATION CRITERION NO. RESULTING IN "FINDING" _____

COMMENT ON "OBSERVATION" CLASSIFICATION

BY:

S. L. Koutz

DATE:

3/19/82

E. GA PROJECT MANAGER

☒ ACCEPT☐ REJECT

BY:

Shl Werman

DATE:

3/20/82

the reactor coolant pump support skirt/pump casing interface for the design loading conditions identified. These Tables account for different loads, both in magnitude and sign, for each of the vertical and lower horizontal columns for these loading conditions.

In summation, the F_y loads referred to are for different components, each with its own project specification. The different specifications list load cases and load combinations for each component. These load values are not intended to be consistent, but are intended to be a conservative design input for each component.

Attachment to
2408-PFR-F099

Comments on CE Response to 2400-PFR-F099

The CE response to 2400-PFR-F099 indicates that design loads in Specification 1370-PE-480 represent loads transmitted between the pump support skirt and the pump case, while loads listed in FSAR Table 3.7-23 represent maximum loads on individual columns supporting the pump skirt, and that these are not directly comparable since some support column loads are positive and some negative. Reference was made to the Reactor Coolant Pump Support Column Specification 1370-PE-513 for column design load specifications.

The support column specification does not list DBE loadings on the columns, but it was determined by telephone communication with L. Gerdes of CE that the Pump Support Skirt Specification 1370-PE-512 (not available at GAC) does list these loadings. Applicable pages of Specification 1370-PE-512 were subsequently telecopied to GAC and it was confirmed that the algebraic sums of the four column loadings on the support skirts are consistent with the values for skirt-to-pump loadings listed in the pump specification, and that the maximum column loadings specified are consistent with the "specified for design" values listed in FSAR Table 3.7-23. It is therefore concluded that the pump specification values for vertical DBE loadings are satisfactory and that 2400-PFR-F099 is not a valid finding.

It should be noted that limiting values for loads between the pump case and pump support skirt are determined by pipe rupture accidents combined with DBE and normal operation loads, with the pipe rupture reactions by far the largest contributor and DBE loadings only a small fraction of the total loads, and that these total loadings appear to be very conservatively specified.

A. D. Stanley
3/19/82

Concur with the recommendation to invalidate
this PFR.

Spencer 3/19/82

FROM: J.D. Stanley LOCATION: _____ DATE: 3/17/82

TO: _____ LOCATION: _____ DATE: _____

RECEIVED
F. S. OPLE, JR.

Attachment to 2408-PFR-F099

TELEPHONE COMMUNICATION RECORD

(PLEASE HAND LETTER LEGIBLY IN BLACK OR RED INK)

ROUTE _____
COPIES _____

CALL INITIATED BY: L. Gerdes 203-688-1911 AT GAC ☐ OTHER: CE
X 5609

CALL RECEIVED BY: J. Stanley AT GAC ☒ OTHER: _____

OTHER PARTICIPANTS: _____

DATE: 3/17/82 TIME: 11:00 AM PROGRAM NAME: SONGS SEISMIC REVIEW PROGRAM NUMBER: 2408400

SUBJECT: PFR-F099, Reactor Coolant Pump Support Skirt Vertical DBE Loadings

SUMMARY: Gerdes called in response to my request to CE through John Krase
for more information on the CE response to PFR-F099.

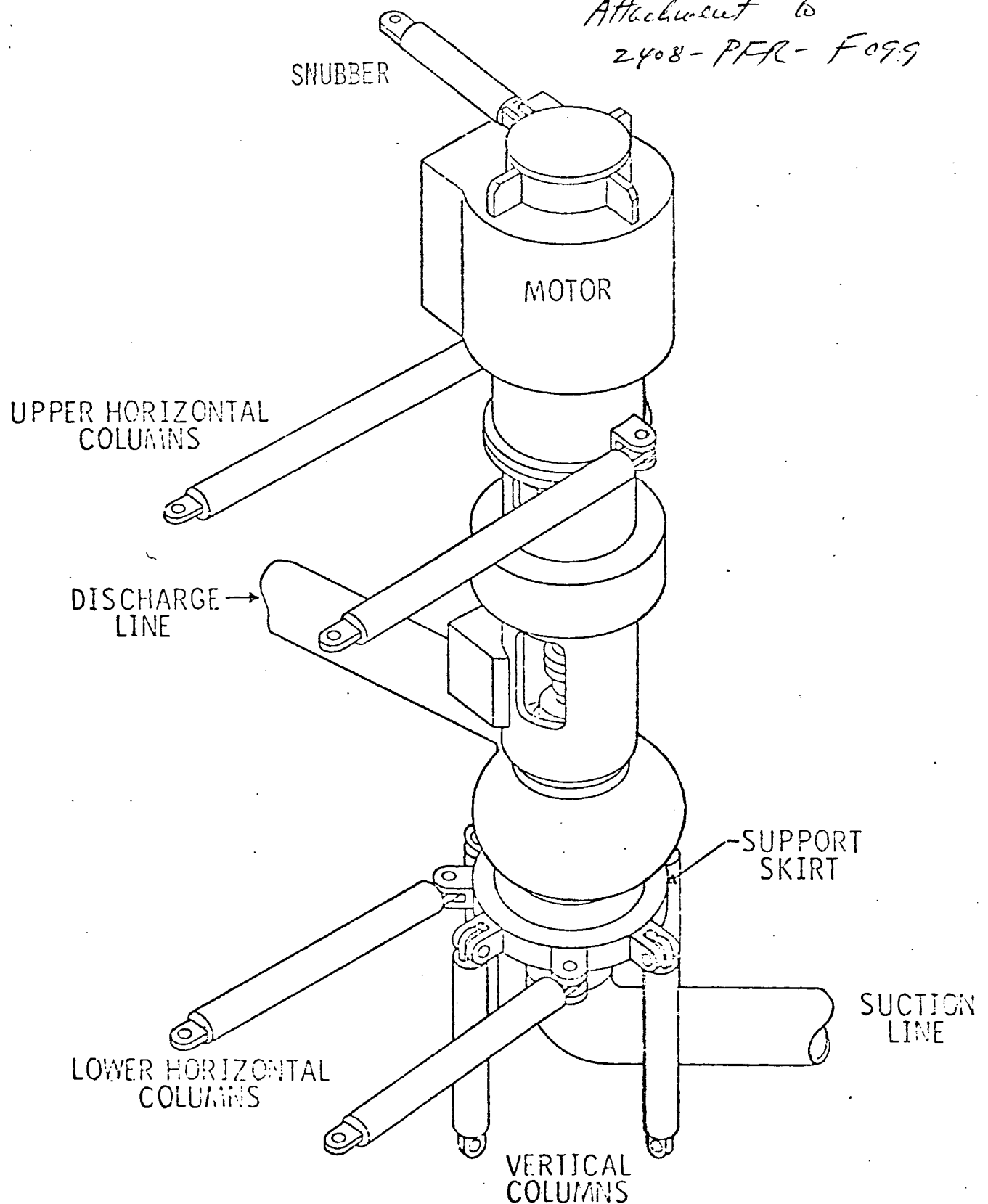
He confirmed that ^{specified} F_y values for DBE loads are loads imposed on the
pump case by the pump support skirt and represent the algebraic
sum of loads imposed on the skirt by the four support columns. As
an example he said that the specified F_y load on pump 1A for X+Y
DBE loads of -174 kips represents the sum of column loadings of -300k,
+500 k, -207 k and -187 k. I asked where individual DBE column
loadings were specified and he indicated this was in the specification
for the support skirt. I asked that copies of the pages in this
specification indicating these loads be telecopied to GAC since the
specification was not available at GAC.

ACTION ITEMS:	Date	Person
	Required	Responsible

DISTRIBUTION: Ople, Veca, Phelps, Koefed

File No.: _____

Attachment to
2408-PFR-F099



SAN ONOFRE
NUCLEAR GENERATING STATION
Units 2 & 3

REACTOR COOLANT
PUMP SUPPORTS

Figure 5.4-17

Attached To
2448 - PFR - FOI 3

To: G. Wassman /

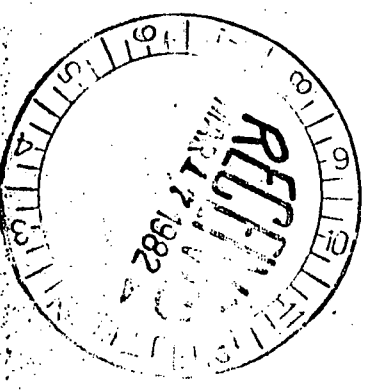
J. Stanley
(xt. 2649)

From: R.R. Jewell (CE)

SUBJECT: Request for information
related to PFR-99

3/17/82

Page 1 of 5



In compliance with the requirements of the
ASME Boiler and Pressure Vessel Code, Section
III, Nuclear Vessels

Registration No. 6373
State of Connecticut
Date 3/14/77

PROJECT SPECIFICATION

FOR

REACTOR COOLANT PUMP
SUPPORT SKIRTS

FOR

SOUTHERN CALIFORNIA EDISON
SAN ONOFRE UNITS NO. 2 AND No. 3

SPECIFICATION NO. 1370-PE-512, REV. 02

Nuclear Power Department
Combustion Division
COMBUSTION ENGINEERING, INC.

PREPARED BY C.C. Eule DATE 3/7/77
Cognizant Engineer
APPROVED BY W.W. Albert DATE 3/10/77
Supervisor
APPROVED BY T. R. Young DATE 3/16/77
Application Engineer
APPROVED BY R.W. Moore DATE 3/21/77
Project Manager

QA Status: Verified
The safety related design information contained in this document has been reviewed and satisfies (where applicable) the items contained on check-list(s) 6 and of the Quality Assurance of Design Manual. This review is so certified.
Independent Reviewer C. J. R.
Date 3-13-77
Document Rev. No. 02

THIS DOCUMENT IS THE PROPERTY OF
COMBUSTION ENGINEERING, INC. (C-E)
WINDSOR, CONNECTICUT
AND IS TO BE USED ONLY FOR THE PURPOSE
OF THE AGREEMENT WITH C-E PURSUANT TO
WHICH IT IS FURNISHED.

PUMP 1 A

Corresponds to Table 19 of
 1370-PE-480, Rev. 05
 CONDITION X+Y SSE

LOCATION	IDENT CODE #	KIPS			FT-KIPS		
		F _X	F _Y	F _Z	M _X	M _Y	M _Z
SKIRT/CASE	1175	-148	194	-279	-2540	1	-2123
HOR.COL.	1155	84	0	139			
HOR.COL.	1165	84	0	139			
VERT.COL.	1113	0	-300	0			
VERT.COL.	1117	0	500	0			
VERT.COL.	1123	0	-207	0			
VERT.COL.	1127	0	-187	0			
STOP	1169	0	0	0			

PUMP

Corresponds to Table 20 of
 1370-PE-480, Rev. 05
 CONDITION 2+Y SSE

LOCATION	IDENT CODE #	KIPS			FT-KIPS		
		F _X	F _Y	F _Z	M _X	M _Y	M _Z
SKIRT/CASE	1175	-213	-182	-352	-2707	2	-263
HOR.COL.	1155	106	0	176			
HOR.COL.	1165	106	0	176			
VERT.COL.	1113	0	100	0			
VERT.COL.	1117	0	500	0			
VERT.COL.	1123	0	-209	0			
VERT.COL.	1127	0	-209	0			
STOP	1169	0	0	0			

Title: SKIRT LOADS

Appendix I

Specification No. 1370-PE-512

Revision 02

Figure 11

PUMP 10

Corresponds to Table 23 of
 1370-PE-470, Rev 5
 CONDITION X+Y SSE

LOCATION	IDENT CODE #	KIPS			FT-KIPS		
		F _X	F _Y	F _Z	M _X	M _Y	M _Z
SKIRT/CASE	2175	-381	588	631	-457	915	2757
HOR.COL.	2155	261	0	-432			
HOR.COL.	2165	120	0	-199			
VERT.COL.	2113	0	206	0			
VERT.COL.	2117	0	-156	0			
VERT.COL.	2123	0	-494	0			
VERT.COL.	2127	0	-144	0			
STOP	2169	0	0	0			

Corresponds to Table 24 of
 1370-PE-470, Rev 5
 CONDITION Z+Y SSE

PUMP 10

LOCATION	IDENT CODE #	KIPS			FT-KIPS		
		F _X	F _Y	F _Z	M _X	M _Y	M _Z
SKIRT/CASE	2175	-70	-254	116	-242	2042	-4081
HOR.COL.	2155	185	0	-306			
HOR.COL.	2165	-115	0	-191			
VERT.COL.	2113	0	-247	0			
VERT.COL.	2117	0	50	0			
VERT.COL.	2123	0	500	0			
VERT.COL.	2127	0	-48	0			
STOP	2169	0	0	0			

Title: SKIRT LOADS

Appendix I

Specification No. 1370-PE-512

Revision 02

Figure 12

Maximum Calculated Loads from
final seismic analysis provided K. Ling on
March 8, 1982

Maximum RCP Vertical Column Loads

$$X \pm Y = 71.1^k \text{ OBE}$$

$$SSE = 2 \times OBE = 142.2 \text{ kips}$$

244 reported: FSAR

$$Z \pm Y = 59.4^k \text{ OBE}$$

$$SSE = 2 \times OBE = 118.8 \text{ kips}$$

248 reported: FSAR

POTENTIAL FINDING REPORT

SONGS 2&3 SEISMIC DESIGN VERIFICATION

REVISION --PREPARATION BY GA INITIATOR

AFFECTED ITEMS: Vendor approval of Field Change Requests to vendor originated design documents.

REQUIREMENT REFERENCE DOCUMENTS:

10CFR50, Appendix B, Criterion III, Design Control

BASIC REQUIREMENT:

"Design changes, including field changes, shall be subject to design control measures commensurate with those applied to the original design and shall be approved by the organization that performed the original design unless the applicant designates another responsible organization."

DESCRIPTION OF POTENTIAL FINDING:

Contrary to above requirements, SCE procedure, SO2 26-8-13 EDM, Rev. 1 6/16/80 does not provide for vendor approval of Field Change Requests in the field. Specifically, Section B - "Procedural Actions" does not provide for verification of vendor approval.

INITIATOR AGREES THAT PFR F112 IS INVALID. SEL 3/18/82
 - BPC HAS BASIC RESPONSIBILITY FOR PREPARATION, REVIEW AND APPROVAL OF FCR'S PER BPC PROJ. QA MANUAL & PROJECT INTERNAL PROCEDURE MANUAL PER ANSI 45.2.11-1 974
 SCE SITE EDM CENTER REVIEWS BPC APPROVED FCR'S ONLY FOR COMPLETENESS, APPROVED & PREPARED BY: J. Laven DATE: 3/8/82 * SEE BELOW
 REJECTION OF GA TASK LEADER COMMENTS BY: _____ DATE: _____
 REJECTION OF ORIGINAL DESIGN ORG. COMMENTS BY: [Signature] DATE: 3/18/82

B. REVIEW BY GA TASK LEADER

COMMENTS

Agree PFR is invalid. SEL 3/18/82

* SIGNATURES, LEGIBILITY, ETC. AND PROVIDES DOCUMENT RETENTION & DISTRIBUTION
 - THEREFORE SCE SITE DOCUMENT CONTROL CENTER (EDM) PROCEDURE SO2-26-8-13 EDM HAS NO REQUIREMENT FOR A RESPONSIBILITY TO DETERMINE VENDOR APPROVAL OF FIELD CHANGE NOTICES INITIATED BY SITE VENDORS. SEL 3/18/82
 SCE HAS DELEGATED THE RESPONSIBILITY FOR PREPARING CHANGES TO SUPPLIER DOCUMENTS AS STATED IN THE BECHTEL PROJECT INTERNAL PROCEDURES MANUAL - SEC. 26.7.5. SEL 3/18/82
☒ AGREE PFR IS VALID BY [Signature] DATE 3/18/82
☐ REQUEST RE-REVIEW BY _____ DATE _____
☐ DISAGREE BY _____ DATE _____
☒ REVIEW OF ORIGINAL DESIGN ORGS. COMMENTS BY: [Signature] DATE: 3/18/82

C. REVIEW BY ORIGINAL DESIGN ORGANIZATION

COMMENTS

(See Attachment I)

☐ AGREE PF IS VALID☒ DISAGREEBY: [Signature]DATE: 3/12/82D. RECOMMENDATION BY FINDINGS REVIEW COMMITTEE

DEFINITION ADEQUACY:

☒ ADEQUATE☐ INADEQUATE

VALIDITY:

☐ VALID☒ INVALID

CLASSIFICATION:

☐ OBSERVATION☐ FINDINGJUSTIFICATION:

CLASSIFICATION CRITERION NO. RESULTING IN "FINDING" _____

COMMENT ON "OBSERVATION" CLASSIFICATION

BY: [Signature]DATE: 3/19/82E. GA PROJECT MANAGER☒ ACCEPT☐ REJECTBY: [Signature]DATE: 3/20/82

Attachment I

PFR-F112

Bechtel Power Corporation (BPC) generates the FCR in the Field and obtains Home Office approval prior to implementing the requested changes. As stated in the BPC Project Internal Procedures Manual (PIPM), section 26, paragraph 26.7.5 there are three techniques available to BPC for changing supplier data. One of these techniques allows for BPC to change the original design without obtaining vendor concurrence. Since BPC does not notify CDM of this decision, and the FCR form does not provide for a clearly defined supplier approval blank, this activity cannot be verified by CDM.

CDM did previously have this activity documented in CDS/QA Procedure S02 26-8-13-CDM. However, as a result of SCE Corrective Action Request S023 F-893 this activity was deleted from the CDS/QA procedure. This Corrective Action Request is attached for further clarification.

CDM feels that the current CDS/QA procedures are in compliance with the Bechtel PIPM and no additional action is required.

General Atomic Company

QUALITY ASSURANCE DEPARTMENT

Record of Long Distance Telephone Call

Party: Called ☒ Date: 18 MARCH 1982
 Calling ☐ Time: Completed 10 32 A
 Name RON PRESTON, EDM SUPER. SITE Started 10 30 A
RUTH KURISU, CDS GO. GEN. OFF. On-line 12 MIN.
 Company SO. CAL. EDISON

Location PRESTON (SITE) KURISU (GEN. OFF.)

Telephone No: A/C 714 No. 498 1000 EXT 541

Discussion CONTACT THRU FRANK McPHEE'S OFFICE - CDS

PFR - F111 - VENDOR APPROVALS OF VENDOR

INITIATED FIELD CHANGE REQUESTS

CAR - 5023 F-893

PRESTON (CONFERENCE WITH KURISU) ESTABLISHED POSITION
(PER CAR F-893) THAT EDMC IS SERVICE FUNCTION.

EDM ACTIVITY IS DEFINED BY PROCEDURAL REQUIREMENTS,
ESTABLISHED BY CORP. DOCUMENT SERVICES AT ROSEMEAD.

ANY CHANGES TO BE MADE TO PROCEDURES GOVERNING

SITE EDM MUST COME OUT OF CDS ROSEMEAD. SPECIFICALLY CHANGES

TO BECHTEL PROCEDURES/FORMS USED AT EDM SITE MUST BE

INITIATED BY CDS/PROJECT AT ROSEMEAD. ACCORDINGLY,

DECISION TO REVISE SCE CDS^{QA} PROCEDURE 50 2 26-8-13

TO BE IN COMPLIANCE WITH BECHTEL PIPM SEC. 26, PARA.

26.7.5 WAS CDS LEVEL, ROSEMEAD.

FOLLOW-UP TELECON W/ J. K. THOMAS

DATE 18 MAR. 1982

TIME STD. 10 15 A

SAME SUBJECT. THOMAS NOTED THAT APP. B,

TIME COMP. 10 45 A

TIME ON LINE 7 MIN.

CRITERION III, DESIGN CONTROL DOES NOT ESTABLISH TIME SEQUENCE

FOR APPROVAL OF FIELD DESIGN CHANGES BY ORIGINATING

ORGANIZATION. BECHTEL PIPM SEC. 26.18 PARA. 26.7.5

IS IN AGREEMENT WITH ANSI 45.2 SEC. 4 - INTERFACE,

WHICH PROVIDES FOR "INFORMAL MEANS" FOR COORDINATING

VERBAL

APPROVAL OF FIELD CHANGE REQUESTS WITH DOCUMENTED APPROVAL

FOLLOWING VERBAL AGREEMENT. SCE HAS DELEGATED DESIGN
RESPONSIBILITY TO BECHTEL, EXCEPT AS NOTED IN THE PSAR.

Record Made by J. E. LALLEN

Distribution:

December 27, 1979

MR. R. J. JULIFF

SUBJECT: Southern California Edison (SCE) Quality Assurance
Audit SCES-05-79 AC30-OLQ 12-27-79
San Onofre Nuclear Generating Station Units 2 & 3

Attached are the results of an audit conducted at the jobsite Engineering Document Management Center (EDMC) on December 27, 1979. The audit addressed Corporation Documentation Services (CDS) activities with respect to implementation of Quality Assurance Program requirements responsive to 10CFR50, Appendix B.

The subject audit report and resultant Corrective Action Request (CAR) identify an activity not conducted in accordance with established program requirements. The report also includes one recommendation for your consideration and evaluation. In your letter of response to the CAR, it is requested that you also address this item.

Please complete blocks 10 through 17 of CAR SO 23 F-893 and return the original within thirty (30) days of receipt.


D. E. Nunn

RPFrick:mo

Attachment

cc: H. B. Ray
H. S. Leasure
L. L. Seyler
P. A. Croy/B. I. Sanano
J. E. Arnold/QA File
R. P. Frick
MTS
EDMC ✓

RECEIVED
JAN 11 1980
EDM/GO

SCS CORRECTIVE ACTION REQUEST

San Onofre
Nuclear Generating Station

Unit 2 & 3

2408-PCR-1-11 Page 1 of 1
JAC

I. NUMBER
SQ23 F-893
REV. 0

2. ITEM/SYSTEM DESCRIPTION
Vendor Concurrence of FCR'S
I. DATE
12/28/79

3. SUPPLIER/ORGANIZATION NAME, ADDRESS
Corporate Documentation Services
Jobsite EDMC
4. P.O./SPECIFICATION NO.
U4161001

5. DESCRIPTION OF CONDITION
The following FCR'S do not have vendor concurrence recorded in block 8:
18813C 23848C 17524C 25672M
23781C 17465C 22210M
SO2 26-8-13 EDM, item 8 under Action I states: "FCR'S against vendor drawings or specifications shall have the vendor's concurrence in block 8."

6. CONDITION NOTED IN:
Audit SCES-05-79
7. INITIATOR
R. P. Frick
DATE
12/28/79

8. THE ABOVE CONDITION REQUIRES YOUR PROMPT ATTENTION FOR CORRECTION OR RESOLUTION
9. REPLY REQUESTED FROM:
R. J. Juliff, Manager CDS
10. REPLY DUE DATE
2/8/80

10. ACTION TAKEN TO RESOLVE PROBLEM			
11. EFFECTIVITY DATE		12. SIGNATURE	
13. CAUSE OF CONDITION		14. CORRECTIVE ACTION TO PREVENT RECURRENCE	
15. SIGNATURE	TITLE	DATE	16. EFFECTIVITY DATE
			17. SIGNATURE
			TITLE
			DATE

18. CORRECTIVE ACTION			
ACCEPTABLE			
<input type="checkbox"/> YES <input type="checkbox"/> NO (SEE 25)			
19. CORRECTIVE ACTION IMPLEMENTATION VERIFIED		20. REMARKS/REFERENCES	
21. QA FINAL REVIEW (CAN BE CLOSED)		22. DISTRIBUTION	
23. QA FOR DOCUMENTATION CONTROL CENTER USE			

H. B. Ray R. P. Frick
H. S. Leasure MTS
L. L. Seyler EDMC
P. A. Croy/B. I. Sarano
J. E. Arnold/QA File

CORRECTIVE ACTION REQUEST

San Onofre
Nuclear Generating Station

Unit 2 & 3

1. NUMBER
SO23 F-893
REV. 0

2. DATE
12/28/79

A. PROPOSED DESCRIPTION

Vendor Concurrence of FCR'S

K7912285-588-1

B. SUPPLIER/ORGANIZATION NAME, ADDRESS

Corporate Documentation Services
Jobsite EDMC

3. P.O./SPECIFICATION NO.
U4161001

C. DESCRIPTION OF CORRECTIVE ACTION

The following FCR'S do not have vendor concurrence recorded in block 8:

18813C 23848C 17524C 25672M
23781C 17465C 22220M

SO2 26-8-13 EDM, item 8 under Action I states: "FCR'S against vendor drawings or specifications shall have the vendor's concurrence in block 8."

RECEIVED

JUN 24 1980

D. CONDITION NOTED IN:

Audit SCES-05-79

EDM-SITE

E. INITIATOR

R. P. Frick

DATE

12/28/79

THE ABOVE CONDITION REQUIRES YOUR PROMPT ATTENTION FOR CORRECTION OR RESOLUTION

DEPLY DUE DATE

2/8/80

DEPLY REQUESTED FROM: R. J. Juliff, Manager CDS

F. ACTION TAKEN TO RESOLVE PROBLEM

EDMC personnel were verifying for an approval signature in block eight. They are unable to determine if this signature is BPC or Vendor concurrence. Therefore, CDS/QA Procedure SO2 26-8-13 EDM will be revised to delete this activity.

11. EFFECTIVITY DATE 3/28/80 12. SIGNATURE [Signature] 13. TITLE EDM SITE SUPERVISOR 14. DATE 1/29/80

G. CAUSE OF CONDITION

EDMC personnel do not have the technical expertise to determine if the signature in block eight is Vendor concurrence.

This requirement will be deleted from the procedure and training will be provided to EDM personnel when the revised procedure is approved and published.

15. SIGNATURE [Signature] 16. TITLE EDM SITE SUPERVISOR 17. DATE 1/29/80 18. EFFECTIVITY DATE 3/28/80 19. SIGNATURE [Signature] 20. TITLE EDM SITE SUPERVISOR 21. DATE 1/29/80

H. CORRECTIVE ACTION

ACCEPTABLE

☒ YES ☐ NO (SEE #)

[Signature] 2/24/80 NA

22. CORRECTIVE ACTION IMPLEMENTATION VERIFIED
[Signature]
June 12, 1980

23. COMMENTS/REMARKS
Procedure has been revised to delete requirement and training has been provided to EDM personnel.

24. APPROVAL REPORT (SEE BLOCK 8)
[Signature]
[Signature]

25. DISTRIBUTION
H. B. Ray R. P. Frick
H. S. Leasure MTS
L. L. Seyler EDMC
P. A. Croy/B. I. Sanano
J. E. Arnold/QA File

C7912276 53

5 2408-PFR-F112

QUALITY ASSURANCE ORGANIZATION

San Onofre Nuclear

SCE

AUDIT REPORT

1. Project Generating Station Units 2&3

2. FOR DOCUMENTATION CONTROL CENTER USE ONLY

2. Audit Report No. SCE-05-79

3. Audit Dates 12/26 & 27, 1979

RECEIVED

JAN 16 1980

EDM/GO

4. NAME AND ADDRESS OF COMPANY AUDITED

Corporate Documentation Services
8023 Jobsite

5. CRITERIA BEING AUDITED

II, III, V, VI, VIII,
XVII

6. AUDIT PLAN

AUDIT PURPOSE

To verify compliance with Quality Assurance requirements responsive to 10CFR50, Appendix B, Criteria II, III, V, VI, VIII, and XVII for activities performed by jobsite Corporate Documentation Services (CDS) personnel.

AUDIT PLAN

1. Verify that CDS personnel receive formal training, and indoctrination in the use of applicable procedures, and subsequent revisions, contained in the CDS Quality Assurance Reference Procedures Manual. (CDS 19-17-20)
2. Verify that master fiche and/or diazo films are filed at the Field Document Center and retained in the vault. (EDM 28-8-1)
3. Verify that the Print Control Log (Form 41-85) is prepared or updated as required. (EDM 26-8-12)
4. Verify that, for deficient documents, Form 41-127, "Document Check Out or Rejection Record", is completed and transmitted to either the originator or authorized Quality Assurance (QA) personnel for correction. (EDM 26-8-14)
5. Verify that changes, corrections and/or alterations to project documents (except drawings and specifications) are made in accordance with procedural requirements. (EDM 26-8-45)

Continued.

7. AUDIT PLANNED BY

R. P. Frick

DATE

12/21/79

8. APPROVED

P. A. Croy

DATE

12/21/79

9. PERSONNEL CONTACTED

R. Preston
M. Price

C. Baugher
M. Rooney

10. AUDIT TEAM MEMBERS

R. P. Frick

11. CORRECTIVE ACTION REQUESTS OR NONCONFORMANCE REPORTS ISSUED AGAINST THIS AUDIT REPORT

SCE CAR 8023 F-893

12. AUDIT TEAM LEADER

R. P. Frick

DATE

12/27/79

13. APPROVED

P. A. Croy

DATE

12/27/79

14. DISTRIBUTION

BLOCK 7 AUDIT PLAN CONTINUED

6. Verify that the Engineering Document Management (EDM) Site Processing Clerk checks field generated start-up "For Information Only" drawings for the following items prior to processing:
 - a. Required approvals:
 1. Drawer signature.
 2. Checker signature.
 3. Approval signature.
 - b. Legibility.
 - c. All drawings must be identified "Not for Construction," on the original.
 - d. Identification of each drawing:
 1. Drawing number.
 2. Drawing revision must be alpha.
 3. Sheet number (if applicable).
 - e. Drawing is dated in the revision block.

(EDM 26-8-46)
7. Verify that the EDM Site Processing Clerk checks that Field Change Requests (FCR's) against vendor drawings or specifications have the vendor's concurrence in block 8. (SO2 26-8-13 EDM)

AUDIT HISTORY

None in past twelve (12) months.

16. AUDIT FINDINGS

1. Forms 19-112, "CRDS QA Procedures Training, Program Schedule Coordination: and 19-111, "CRDS QA Procedures Indoctrination Training Attendance Sheet" were reviewed for the following procedures:

EDM 26-8-1 Revisions 0 and 1
EDM 26-8-12 Revisions 1 and 2
EDM 26-8-45 Revisions 0 and 1
CDS 19-17-20 Revision 1

These records substantiate that training and indoctrination of personnel has been conducted on procedures, and subsequent revisions, contained in the CDS Quality Assurance Reference Procedures Manual.

No deficiencies were identified.

ITEM CLOSED

2. The auditor verified that master fiche and diazo films of Construction documents and diazo films of correspondence are retained in the EDM vault. Master fiche of correspondence is filed at the General Office EDM Center.

No deficiencies were identified.

ITEM CLOSED

3. The Print Control Log (Form 41-85) was reviewed for the following drawings:

35126	Revision 0	DCN 1	Revision 1
35174	Revision 0	Revision 1	Revision 2
35135	Revision 0	Revision 1	

The number of copies issued and the date of issuance are recorded. Bechtel Power Corporation (BPC) Drawing Control acknowledged receipt of the drawings by stamping the appropriate column of the form. BPC Drawing Control delivered the controlled prints to Construction personnel, obtained the superseded copies and delogged them in accordance with BPC procedures as referenced in EDM 26-8-12.

No deficiencies were identified.

ITEM CLOSED

4. The "Document Check Out or Rejection Record", Form 41-127 is the vehicle used by EDM personnel to transmit deficient documents to either the originator or authorized QA personnel for correction. The auditor reviewed the following transmittals:

16. AUDIT FINDINGS

2408-PFR-F112
JDC

Type of Document	Deficiency	Transmitted To
Raceway Cards	Incomplete-not signed off.	Originator-D. Jobe
*RIDR-Could Pumps	RIDR cites S/N as S31203MP025. +QVDL sites S/N as S21203MO026.	QA-K. Kauffman
WR-5, Line S2- 1201-ML-043, Sht. 3	Line 27 needs to be signed and dated.	QA-K. Kauffman
*Receiving/Inspection Date Report		
+Quality Verification Documentation		

Deficiencies on the Raceway Cards and the WR-5 have been corrected and returned to EDM. The deficient RIDR is awaiting correction. Deficient documents are being processed in accordance with procedural requirements.

No deficiencies were identified.

ITEM CLOSED

5. The auditor reviewed the following sample of Construction Inspection Data Reports (CIDR's) for Conduit Installation which had not been stamped by the Quality Control Engineer (QCE) or Quality Assurance (QA):

U31UXQ14	U21BXKA4
U31UXQ30	U2HBXQC1
U3PSXQD4	U3IUXR01
U21FXQC3	U3PJXJ39
U2FIXQ47	U2AWXR01

EDM had prepared duplicate copies of the CIDR's, the correction was made on the copies and a memo was submitted to EDM containing a brief explanation for the correction. EDM has joined the original CIDR and the corrected copy for further processing. Procedural requirements have been satisfied.

No deficiencies were identified.

ITEM CLOSED

6. From a discussion with the EDM clerk responsible for processing field generated start-up drawings, the auditor concluded that the drawings are checked for the required approvals and identification. To verify this, the following drawings were reviewed:

PGI-SU-J-008-A
FGD-SU-J-045-A
FGD-SU-J-105-A
FGD-SU-J-174-A
FGD-SU-J-226-A

The above drawings contained the required information.

No deficiencies were identified.

ITEM CLOSED

7. The following PCR's written against vendor specifications were reviewed to verify that the Site Processing Clerk checks for vendor concurrence in block 5:

Dennis Schell 5-32-79



16. AUDIT FINDINGS

SpecificationPCR No.Block 8103-1

18813C

Telecon approval: R. Shilling

23781C

Telecon approval: R. Shilling

23848C

Telecon approval: R. Shilling

204-3

17465C

Telecon approval: L. Moon

207-2

17524C

Telecon approval: A. Lopez

410-6

22220M

Telecon approval: K. Walvekar

407-13

25672M

Telecon approval: K. Walvekar

Concurrence in block 8 has been provided by BPC Project Engineering, not a vendor representative.

Deficiency No. 1 (Corrective Action Request (CAR) SO23 F-893)

The FCR'S listed above do not have vendor concurrence in block 8.

SO2 26-8-13 EDM, item 8, under Action I states: "FCR'S against vendor drawings or specifications shall have the vendor's concurrence in block 8."

Recommendation.

SO2 26-8-13 EDM, item 4.C, under Action II states, in part: "...the superseded FCR is to be invalidated, attached to, and submitted with the new FCR for the review and approval signatures." The BPC procedures governing FCR'S do not have this requirement. As EDM is processing the BPC generated documents, the procedure should be revised to reflect the Bechtel procedures.

AUDIT COMMENTS

A post audit conference was held on December 31, 1979. In attendance were Mr. R. L. Preston, EDM Site Operations Supervisor and Mr. J. M. Price, Documentation Center Supervisor. The audit, resultant CAR and one recommendation were discussed.