2408 PFR NO. F027

REVISION A

POTENTIAL FINDING REPORT
SONGS 2&3 SEISMIC DESIGN VERIFICATION

A. PREPARATION BY GA INITIATOR

AFFECTED ITEMS: Piping Analysis for Segments 78, 57, 74, 117

REQUIREMENT REFERENCE DOCUMENTS:

Bechtel's PIPM Section 14. Calculations

BASIC REQUIREMENT:

14.2 General, Paragraph 1 - "Calculations are required to develop the various engineering designs used in power plant construction."

Calculations shall be completed and approved in a timely manner. As a design develops, calculations shall be revised, as required, and as appropriate, revisions are coordin-

DESCRIPTION OF POTENTIAL FINDING: ated with interfacing calculations.

SEE ATTACHMENT I

PREPARED BY: N C Hopkins DATE: 3-5-82

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

REJECTION OF ORIGINAL DESIGN ORG. COMMENTS BY: N C Hopkins DATE: 3-16-82

B. REVIEW BY GA TASK LEADER COMMENTS

☒ AGREE PF IS VALID BY S. Brent DATE 3/8/82

☐ REQUEST RE-REVIEW BY _____ DATE _____

☐ DISAGREE BY _____ DATE _____

☒ REVIEW OF ORIGINAL DESIGN ORGS. COMMENTS BY: S. Brent DATE: 3/16/82

2408 PFR NO. F027 A

REVISION

C. REVIEW BY ORIGINAL DESIGN ORGANIZATION

COMMENTS

SEE ATTACHMENT II

☐ AGREE PF IS VALID

☒ DISAGREE

SWF

BY: F.B. Marsh for DATE: 3-12-82

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

Minor procedural violation with no impact on design.

BY: S. A. Konig DATE: 3/18/82

E. GA PROJECT MANAGER

☒ ACCEPT

☐ REJECT

BY: A.W. Wiseman DATE: 3/18/82

ATTACHMENT II
Bechtel Response to
2408-PFR-F027,
Revision A

The following paragraphs are numbered to respond to the same paragraphs in the IPT Summary:

1. We agree that the piping analysis packages were assembled over a period of years. This is the nature of this type of work and does not compromise quality. Many calculations are integrated over the design period as a conceptual layout and system definition is refined and detailed. The checking is only meaningful when performed on the integrated package.

2. Although construction of a particular line, area or system may be essentially completed prior to EGL or EGS final review of the piping analysis package, the plant construction is not complete and many items remain to be finished. This work remains under Bechtel control.

3. The 15 day time limit for logging a calculation begins when the final sign-off is made on the fully approved and dated calculation and not when individual sections are signed by the checker.

4. The fact that a formal revision procedure was not in effect during calculation development does not violate any procedures or indicate a weakness in design coordination. The fact that coordination is required between calculations that are in different stages of design is inevitable no matter how the calculations are approved and controlled. This is a basic characteristic of this type of work and does not compromise quality.

In summary, we agree that the PIPM, Section 14 may not clearly describe this process as applied specifically to piping analysis packages. However, we do not agree that the handling of these calculations are in violation of the intent of this procedure or of good engineering practice.

5/

ATTACHMENT I

Summarizing Procedural Violations:

(1) Piping analysis packages were assembled over a period of up to 5 years prior to EGL and EGS review.

(2) Construction is likely to be complete prior to EGL and EGS review.

(3) Checking and approval of calculations did not occur in 15 days.

(4) Formal revision procedure was not in effect during calculation development, causing informal attention to interface coordination.

Generally, holding a calculation open for several years creates a potential weakness in proper coordination of design changes and makes checking and review difficult because calculations are from different stages of design.

Further details of the potential finding are attached.

DISCUSSION OF POTENTIAL FINDING:

Bechtel's comment suggests that a misunderstanding of their procedures is responsible for this PFR. Their comment and a verbal discussion of at Bechtel-Whittier indicates their position is that a calculation is not complete until the review of the calculation is signed and approved. Thus, their view allows a calculation to remain on hold for any length of time and there is no requirement prior to final approval to follow the procedures of PIPM Section 14 with regard to control and documentation. This Bechtel view is not consistent with the statements and intent of PIPM, Section 14. Under Section 14.2 General, paragraph 5, the final sentence states "When the calculation is completed, it is transmitted, sequentially, the checker, EGL, and EGS for check, review and approval, as required." Further, paragraph 8 states "Upon completion of the calculation, the EGS or designee will transcribe the current approval and completion information into the control logs. This logging must be done within 15 working days after completion of the calculation." The PIPM procedure defines a calculation as "complete" when it is transmitted to the checker.

A review of piping analysis packages shows that they consist of several calculations spanning several years, with approval and logging only occuring late in plant construction. Tables I, II, III and IV show dates when the originator, the checker, and the supervisors signed various sheets of the calculation package. Numerous violations of the 15 day time limit are evident.

Further, since page dates are not in chronological order for consecutive page numbers, it is deduced that the page numbering occurred after the final calculation date. This is a violation of Section 14.4.4 Calculation Page Numbering:

> "The calculation pages are numbered to maintain page order and to prevent loss of pages. The normal procedure is to number the pages of the original calculation consecutively."

The calculation was page numbered during the final review, but this was too late to help maintain order and prevent possible page loss during active revision and interface coordination.

Finally, the revision process has been circumvented by maintaining the piping analysis calculations in an informal state for several years. PIPM Section 14.7, Revision states:

> "Some calculations provide a basis for other analysis or calculations. Therefore, when revising a calculation, the Group supervisor or designee must determine whether or not interfacing or reference calculations are affected, and take appropriate action as required."

Without a revision to trigger the examination of effects on interfaces, inconsistancies are more likely to occur. Stricter adherence to the form and intent of the PIPM procedures by approving calculations promptly will eliminate the indirect violation of the revision procedures.

The above PFR is an observation of how a specific discipline handles calculations that creates a potential weakness in coordination, checking and review.

TABLE I

DOCUMENT PSG #78 CALC. NO. M-1204-043-2 A&B

Page(s)	Signature Dates RE	Checker	EGL	EGS
Title Sheet, Rev. 0	4/1/77	10/8/79	3/16/81	3/24/81
1AA, 1A, 1B,1C	2/26/81	2/26/81		
2	4/1/77	10/4/79		
3	3/30/77	5/9/77		
4-9	4/2/77	5/8/77		
10	7/14/80	8/26/80		
11	10/19/78	10/8/79		
12-16	10/19/78	10/19/78		
17-20	2/26/81	2/26/81		
21-24	6/18/80	8/27/80		
25	3/31/77	5/9/77		
26	10/20/76	5/9/77		
27	7/22/75	10/19/78		
28	8/19/75	8/26/75		
29	10/15/76	5/9/77		
30	6/18/80	8/27/80		
31	6/18/80	12/9/80		
32-42	2/27/81	2/27/81		
43	7/21/80	8/27/80		
45-45	11/9/78	11/30/78		
46-47	5/1/79	5/2/79		
48-49	11/29/78	11/30/78		
50	7/23/80	8/27/80		
51-52	9/22/78	11/30/78		
53-54	7/14/80	8/27/80		
55	8/28/80	8/30/80		
50-61 (Isometrics)	2/29/81			
62-64	7/16/80	8/26/80		
65-68	7/23/80	8/30/80		
69	12/12/80	12/13/80		
70-71	7/15/80	8/28/80		
72-74	6/23/79	10/4/79		
75-91	2/27/81	2/27/81		

TABLE II
DOCUMENT PSG #57 CALC NO. M-1204-038-AA

Page(s)	Signature Dates RE	Checker	EGL	EGS
Title Sheet, Rev. 0*	6/20/77	7/29/77	10/10/79	1/15/79
Title Sheet, Rev. 1*	7/21/79	7/21/79	7/21/79	7/21/79
Title Sheet, Rev. 2	8/11/80	8/11/80	8/11/80	8/11/80
Title Sheet, Rev. 3	6/10/81	6/10/81	6/10/81	6/10/81
1AA,1A, 1B	4/17/80	4/22/80		
2-7	6/20/77	7/28/77		
8-9	7/14/79	10/23/79		
10/12	8/18/77	8/18/77		
13-25	7/12/79	10/19/79**		
26	7/11/77	7/28/77		
27	11/1/77	11/1/77		
28-29	No date			
30	6/20/77	7/28/77		
31-32	8/17/77	8/18/77		
33-35	6/3/77	7/28/77		
36	4/18/80	4/22/80		
37	7/11/79	10/11/79**		
38-43(Isometrics)	-	-		
44-51	7/16/79	10/11/79**		
52-77	8/12/77	8/18/77		

*Rev. 0 & 1 never issued or processed
**Note date of Rev. 1?

TABLE III
DOCUMENT PSG #74 CALC. NO M-1204-038-5A

Page(s)	Signature Dates RE	Checker	EGL	EGS
Title Sheet, Rev. 0	7/29/77	7/12/78	11/7/78	6/4/80
Title Sheet, Rev. 1	10/2/81	10/2/81	10/2/81	10/2/81
1AA, 1A, 1B	4/18/80	5/27/80		
2	7/29/77	7/12/78		
3	4/18/77	7/12/78		
4	3/31/77	7/12/78		
5-7	7/29/77	7/12/78		
8	7/12/78	7/12/78		
9	7/22/77	7/12/78		
10	3/31/77	7/12/78		
11-14	4/4/77	5/23/80		
15-17	No date			
18	6/8/77	6/10/77		
19-22	9/27/78	10/23/78		
23	6/26/79	6/26/79		
24	6/26/79	4/17/80		
25	7/28/77	7/12/78		
26-32(Isometrics)				
33-37	7/12/77	7/12/78		
38	2/22/80	3/3/80		
39	5/10/79	5/25/79		
40-44	No date			

TABLE IV
DOCUMENT PSG #117 CALC. NO. M-1204-037-AA

Page(s)	Signature Dates RE	Checker	EGL	EGS
Title Sheet, Rev. 0	6/21/79	6/27/79	7/11/80	7/15/80
Title Sheet, Rev. 1	7/1/81	7/1/81	7/1/81	7/1/81
1A, 1AA, 1B, 1C	5/1/80	7/9/80		
1-12	6/21/79	6/23/79		
13-21	6/27/79	6/27/79		
22	12/8/75	3/5/76		
23-30	No date			
31	6/26/79	6/23/79?		
32-35	1/17/76	2/23/76		
36-37	6/21/79	6/27/79		
38-55(Isometrics)	6/23/80			
56-61	6/21/79	6/27/79		
62	10/31/79	11/9/79		
63-66	2/22/80	3/3/80		
67	No date			

2408-PFR-F027A
Loc 3/4/82

General Atomic Company

QUALITY ASSURANCE DEPARTMENT

Record of Long Distance Telephone Call

Party: Called ☒ Calling ☐

Date: ~~3-2-82~~ 3-3-82

Time: Completed 8:30

Started 8:05

On-line 25 min.

Name Mitch Mitchhart(POE) ← Fred Marsh (PE)

Company Bechtel

Location Whittier

Telephone No: A/C 213 No. 946 1819 x 352

Discussion ~~Line Bus. ##~~

PFR-F027A ~~#~~ reviewed revision A. Marsh thanked me for comments and did not find fault with observations. Generally agreed that comments were in order and that Bechtel will consider improving operating methods. Marsh felt that group methods of handling calculations were satisfactory. but methods were not completely spelled out in that PIPM and therefore not auditable by an outside reviewer.

PFR-F020A - reviewed revision A Marsh made no particular comment. Agreed that not referencing Calc No. M-DSC-50 left a hole in this Quality Class I Calculation that would leave the documentation ~~incorrect~~ incomplete. A problem ~~may~~ might arise if review and evaluation of PSG ~~#~~ were required after Bechtel had complete the SONGS job.

Record Made by N C Nayfield

PFR 2408 - F027A

General Atomic Company

QUALITY ASSURANCE DEPARTMENT

Record of Long Distance Telephone Call

Party: Called ☒
Calling ☐

Date: March 16, 1982
Time: Completed 10:15
Started 10:00
On-line 15 min

Name Mitch Mitchhart
Company Bechtel
Location Whittier
Also Stu Bresnick (GA)

Telephone No: A/C 213 No. 946 1819 x 352

Discussion Re PFR F024A & F097 & IA for F027A

- Mitchhart explained nature of revisions to Pipe analysis and pipe support analysis; Bechtel is checking calculations in these areas after SCE technical audit found single questionable pipe support. Check activities agreed to by SCE & Bechtel and is now nearly complete.
- Mitchhart can provide documentation but needs a written request.
- Hopkins will send Telex requesting documentation on the nature of revisions.

- Hopkins is rejecting Bechtel comment on F027A, based on procedural deviation from PIPM. Verbal assurances from Mitchhart that calculation were handle according to good engineering practice are not acceptable for ~~as~~ justifying procedure deviation. Review Impact Assessment with Mitchhart - No comment

Record Made by N. C. Hopkins

S. Bresnick J. Sharmahd, R. Larche

IMPACT ASSESSMENT

2408 PFR NO. F027A

AFFECTED ITEM: Piping Analysis 78, 57, 74, 117

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 ?

   Unlikely

5. ARE OTHER SIMILAR DEVIATIONS LIKELY TO EXIST ?

   Yes

6. OTHER COMMENTS:

This PFR identifies a potential weakness in the execution of pipe analysis calculations and it is recommended that this PFR be classified as an observation.

An essential element of an improvement should be a formal check, review and approval of individual calculations as these are completed by the responsible engineer. When the piping analysis package is assembled from individual calculations, the current accuracy should be checked, reviewed and approved.

PREPARED BY: W C Hopkins DATE: 3-10-82

COMMENTS: None

BY: J. Brunel DATE: 3/16/82

PFR NO. 2408-PFR-F028

REVISION _____

POTENTIAL FINDING REPORT
SONGS 2&3 SEISMIC DESIGN VERIFICATION

PREPARATION BY GA INITIATOR

AFFECTED ITEMS: Safety injection line to reactor coolant loop 1A, pipe support at node 116, calculation TAG:S2-S1-043-H-020.

REQUIREMENT REFERENCE DOCUMENTS:

Piping stress analysis package PSG-78, M1204-043-2B.

BASIC REQUIREMENT:

Calculation should reflect the effects of all field change requests /DCN/SCN.

DESCRIPTION OF POTENTIAL FINDING:

Changes shown in DCN Sub No. 07 and 08, S-7295 and S-7450 dated 1/23/81 and 2/5/81 are not included in calculation report: TAG:S2-SI-043-H-020, P450-150-169 dated 4-10-80. This change modified the support to interface with jet impingement bracing. There is no indication that loads imposed by jet impingement bracing have been evaluated ~~or~~ in conjuction with seismic loads and compared with loads used in original calculations. R.S.

PREPARED BY: R. Salavatcioglu R.Salavat DATE: 2-4-82 R.S.

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 _____ DATE 2/18/82

☐ REQUEST RE-REVIEW BY _____ DATE _____

☐ DISAGREE BY _____ DATE _____

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

C. REVIEW BY ORIGINAL DESIGN ORGANIZATION COMMENTS

The calculation report for tag S2-SI-043-H-020 (P450-1.50-169) was provided to TPT without a check of the as-built calculation file which contains calculation (P450-1.190-[illegible].79 - attached) that addresses the addition of the jet impingement bracing. FCR number S-7295 is included in the attached calculation. FCR number S-7450 was dispositioned as not requiring a calculation as shown in the as-built calculation log for startup system BBB.

This answers my question on the PFR. This PFR can be invalidated.
3/12/82 Roberta Salavatisch

☐ AGREE PF IS VALID

☒ DISAGREE

NSC

BY: [signature] DATE: 3/1/82

Concur with reviewer's recommendation to invalidate this PFR. FSO 3/12/82

D. RECOMMENDATION BY FINDINGS REVIEW COMMITTEE

DEFINITION ADEQUACY:	☒ ADEQUATE	☐ INADEQUATE
VALIDITY:	~~☒ VALID~~ SRK 3/12/82	☒ INVALID
~~10 CFR 21:~~	~~☐ NOT APPLICABLE~~	~~☐ APPLICABLE~~
~~10 CRF 50.55(e):~~	~~☐ NOT APPLICABLE~~	~~☐ APPLICABLE~~
CLASSIFICATION:	~~☒ OBSERVATION~~ SRK 3/12/82	☐ FINDING

SRK 3/12/82

JUSTIFICATION:

CLASSIFICATION CRITERION NO. RESULTING IN "FINDING" _____

COMMENT ON "OBSERVATION" CLASSIFICATION

BY: S. L. Konz DATE: 3/12/82

E. TPT PROJECT MANAGER

☒ ACCEPT

☐ REJECT

BY: [signature] DATE: 3/13/82

2408 PFR NO. F037

REVISION --

POTENTIAL FINDING REPORT
SONGS 2&3 SEISMIC DESIGN VERIFICATION

A. PREPARATION BY GA INITIATOR

AFFECTED ITEMS: Southern California Edison Corrective Action Request, SCE-CAR-F-194, 11/11-12,15/1976. From Bechtel Job Site Audit, BPCS 44-76, Page 9, Nov. 11-12,15, 1976.
NOTE: This CAR-F-194 covers the same subject as SCE CAR-S-52, 3/18/76.

REQUIREMENT REFERENCE DOCUMENTS:

1) 10CFR50, Appendix B, Criteria XVI, Corrective Action

2) Southern California Edison Quality Assurance Procedures, QAP N16.03, para. 2.2, Rev. 0), 12/5/75.

BASIC REQUIREMENT: 1) "In the case of significant conditions adverse to quality, the measures shall assure that the cause of the condition is determined and corrective action taken to preclude repetition."
2) "The SCE QA organization is responsible for:
- evaluating the corrective action for acceptability.
- providing appropriate verification of corrective action."

DESCRIPTION OF POTENTIAL FINDING:

1. Corrective Action Request F-194 closed (per log) on 7/11/77.
2. Contrary to SCE N16.03, para. 3.4, CAR Blocks 19 & 21 not completed.
3. No objective evidence available (2/1/82) to verify:
   - Implementation of corrective action - complete Blocks 19 & 21
   - Follow up audit per statement in Block 20 of CAR
   - Implementation of commitments (3) by SCE QA to resolve problem. See CAR-S-52 and letter of 6/23/76, Ray (SCE-QA) to Bashore (BPC-QA). IT IS AGREED THAT ITEM 3 IS INVALID - BASED ON ADDITIONAL OBJECTIVE EVIDENCE PROVIDED BY SCE - QA.

PREPARED BY: J. E. Lauer DATE: 2/22/82

REJECTION OF GA TASK LEADER COMMENTS BY: _____ DATE: J. E. Lauer 3/16/82

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

B. REVIEW BY GA TASK LEADER

COMMENTS

Agree that PFR is valid only with regard to PF # 1+2.
PF #3 is invalid per above JA 3/16/82

☒ AGREE PF IS VALID BY J. Brent DATE 2/24/82

☐ REQUEST RE-REVIEW BY _____ DATE _____

☐ DISAGREE BY _____ DATE _____

☒ REVIEW OF ORIGINAL DESIGN ORGS. COMMENTS BY: J. Brent DATE: 3/16/82

2408 PFR NO. F037

REVISION --

C. REVIEW BY ORIGINAL DESIGN ORGANIZATION

COMMENTS

See attachment

☒ AGREE PF IS VALID except as noted on attachment

☐ DISAGREE

BY: J. M. Cisco DATE: 3-3-82

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

CAR not signed per procedure. However, required action was initiated.

BY: S. L. Koontz DATE: 3/17/82

E. GA PROJECT MANAGER

☒ ACCEPT

☐ REJECT

BY: J. H. Wiseman DATE: 3/18/82

2408 PFR No. F037
JMC for TDC. 3/16/82

SONGS 2&3 Seismic Design Verification

Response to 2408-PFR-F037 (Block C)

Review of Description of Potential Finding for Validity

1. Valid statement.

2. Valid statement.

3. This is not a valid statement. By letter from H. B. Ray to J. E. Bashore dated 7-11-77, the requirement for audits of PIPM 8 was stipulated as a followup action to CAR S-194. SCE audit reports BPC-6-77, BPC-9-77, BPC-10-77 and BPC-12-77 include audits of PIPM 8 which are responsive to the commitments presented in the 7-11-77 letter.

   The statement regarding CAR S-52 and the letter from H. B. Ray to J. E. Bashore dated 6-23-76 has been addressed separately in response to 2408-PFR-F038

Review of Significance of Potential Finding

As discussed in response to 2408-PFR-F038, the Bechtel quality assurance program was adequate to control changes to piping system design information. The conditions cited in 2408-PFR-F037 have not significantly affected the design of SONGS 2/3 or the quality assurance program.

J. M. Curran — 3-2-82
J. M. Curran — Date

Attachments:

SCE CAR S-194

Letter from H.B. Ray to J.E. Bashore, Dated July 11, 1977

CORRECTIVE ACTION REQUEST

SAN ONOFRE

2408. PFR No. FO 37
DDR for 7DC 3/16/78

Project _____ Unit 2&3

1. NUMBER: F-194
REV: 0

2. ITEM/SYSTEM DESCRIPTION: ASME Code, Section III, NA3250: Letter: HB.Ray to J.E.Bashore (6-23-76)

3. DATE: 11-11/12/15-76

4. VENDOR/ORGANIZATION NAME, ADDRESS: [redacted]NTEL POWER CORPORATION
NORWALK, CALIFORNIA

5. P.O./SPECIFICATION NO.: U4161001

6. DESCRIPTION OF CONDITION

SEE PAGE 2

7. CONDITION NOTED IN: SCE Audit Report BPCS 44-76, Page 9

8. INITIATOR: Bernard Cooper — DATE: 12-3-76

9. THE ABOVE CONDITION REQUIRES YOUR PROMPT ATTENTION FOR CORRECTION OR RESOLUTION
REPLY REQUESTED FROM: J.E. Bashore, Division Quality Assurance Manager
REPLY DUE DATE: 1-23-77

10. ACTION TAKEN TO RESOLVE PROBLEM

SEE ATTACHMENT

11. EFFECTIVITY DATE: 4/29/77 — SIGNATURE: J.D.Houser — TITLE: PE — DATE: 1/27/77

12. CAUSE OF CONDITION

SEE ATTACHMENT

13. CORRECTIVE ACTION TO PREVENT RECURRENCE

SEE ATTACHMENT

14. SIGNATURE: J.D.Houser — TITLE: PE — DATE: 1/27/77

15. EFFECTIVITY DATE: 4/29/77

16. SIGNATURE: J.D.Houser — TITLE: PE — DATE: 1/27/77

17. CORRECTIVE ACTION ACCEPTABLE
[X] YES [ ] NO (SEE 20)

Paul A Croy — SCE QA — 4-5-77 (DATE)

NA — SCE ENGINEERING — NA (DATE)

18. CORRECTIVE ACTION IMPLEMENTATION VERIFIED

_____ SCE ENGINEER

_____ DATE

20. REMARKS/REFERENCES

Items 1 and 2 accepted. Item 3 will be subject to an audit (reference attached letter).

FINAL REVIEW (CAN CLOSED)

_____ SCE QA SUPERVISOR

_____ DATE

22. DISTRIBUTION

J. E. Bashore — T.S. Lo
W.E. Ferriss — A.D. Sistos
H.B. Ray — J.R. Caldwell
L.D. Hanlin
P.A. Croy
E 101

23. FOR DOCUMENTATION CONTROL CENTER USE

8 - JUN 1977 - 4

1. The following design specifications were certified by a P.E. and cover"....the requirements as described by the ASME B&PV Code, Section III, subsection NA-3255." However, these and all other design specifications (piping) should be certified to be correct and complete and in compliance with the requirements of subsubarticle NA3250 of this code (See NA3255 for this requirement). Specifications with this condition include:

DS-1204 (Rev.0,7-18-75), DS-1206 (Rev. 1,3-2-76), DS-1208 (Rev.1,4-30-76), DS-1218 (Rev.1,2-20-76) and DS-1219 (Rev.1,4-26-76).

2. Design Specification DS-1204 for the "Safety Injection System Piping", Revision 0 (7-18-75), has not been updated as the other specifications listed in paragraph 1 above. Line Designation Lists were not found a part of the specification as the others. Some piping fabrication has commenced.

3. Drawings and associated changes that fall within the definition of design specifications (ASME Code), in sufficient detail to provide the basis for fabrication, include P&ID's and related DCN's. Accordingly, these drawings and DCN's require a Professional Engineer (PE) certification. Initially, P&ID's are certified by a P.E. as required; however, these drawings are not recertified when revisions occur. The original P.E. stamp on the drawing is reused. In addition, pertinent DCN's, which represent design changes to the P&ID's, are not certified by a P.E. even though implementation of the design change governs construction of the nuclear component.

10. Action Taken to Resolve Problem

Item 1

Reference to NA3255 in the Specifications noted on page 2 will be revised to read NA-3250 when the next revision is issued. All piping system Design Specifications will be changed to reference NA-3250.

Item 2

Design Specifications DS-1204 is being updated.

Item 3

It is Bechtel's position that the ASME Code does not require a P.E. to stamp the drawings and DCN's.

13. Cause of Condition

BPC established an original position which was to use subsection NA-3255. This position has been changed as a result of the clients request to use NA-3250.

15. Corrective Action to Prevent Recurrence

The positions as stated in Block 10 above.

2405 PER No. F0 37
JMS for HDC 3/16/77 F-194, Rev. 0

SCE, Corrective Action Request
San Onofre Nuclear Generating Station, Units 2 & 3

Supplement 1 to CAR F-194

Require the following changes and additions to the response to CAR F-194:

Action Taken to Resolve Problem

Item 1

Reference to NA-3255 on the certification page of each specification will be revised to read NA-3250 when the next revision is issued. All piping system Design Specifications will be changed to Reference NA-3250.

Item 2

Design Specifications DS-1204 is being updated and will be issued by April 15, 1977.

Cause of Condition

The correct reference is NA-3250. Subsection NA-3255 contains the direction that the specification will be certified to NA-3250 and NA-3255 was misinterpreted as requiring reference to NA-3255.

Corrective Action to Prevent Recurrence

Item 1

The Codes engineers have been verbally advised, 3/8/77, to carefully read the requirements for documentation required by Code subsections.

Item 2

See item 2, block 10 above.

Item 3

Per SCE letter (Ray to Bashore, dated 6/23/76) and Bechtel response (Bashore to Ray, dated 8/20/76) SCE agreed to advise Bechtel if further action is required by Bechtel on this item.

3/14/77

Z 8 Julian Date: 77252
09-09-77

2408 PFR No. F037 C7707116?1-2
JMS for TDC 3/16/82

Southern California Edison Company

P. O. BOX 800
2244 WALNUT GROVE AVENUE
ROSEMEAD, CALIFORNIA 91770

AC30-QA9
SONGS 2/3

H.B. RAY
MANAGER, QUALITY ASSURANCE

July 11, 1977

Mr. J. E. Bashore, Manager
Division Quality Assurance
Bechtel Power Corporation
12400 East Imperial Highway
Norwalk, California 90650

Dear Mr. Bashore:

Subject: Corrective Action Request F-194, Rev. 0
San Onofre Nuclear Generating Station, Units 2&3

Enclosed is a completed copy of the subject Corrective Action Request (CAR).

This CAR is considered closed. However, Item 3 which refers to the requirement of a Professional Engineer Certification on drawing changes (DCN's and revisions) will be audited within the next 30 days. The Bechtel Project Internal Procedures Manual, Paragraph 8.7.2 & 8.9 will be the basis for this audit. The PIPM reads in part: "Engineering design drawings (except pipe support or pipe hanger drawings, logic diagrams and wiring diagrams) will be stamped by an Engineer registered by the State of California."

Paragraph 8.9 (Drawing Revisions) states in part: "All subsequent major revisions that change the design concept shown on the sketches, preliminary and design drawings will be reviewed, checked and approved by the same procedure as the original drawing. Minor revisions to drawings will be reviewed, checked and approved by the same procedure as the original drawing, except that the Chief Engineers' approval is not required and the revision does not have to be restamped by a registered professional engineer."

The SCE Auditor will form a basis and definition for Major and Minor changes prior to the audit.

2408 PFR NO. F037
JJP for TDC 3/16/82

If you have any questions relative to the above, please let me know.

Sincerely,

JJPantaleo:jp
Enclosure
cc: J. R. Caldwell - BPC
P. Dragolovich - BPC
J. D. Houchen - BPC
L. D. Hamlin
P. A. Croy/B. Cooper
L. L. Seyler/A. E. Talley
J. E. Arnold/QA Files
EDM Center

IMPACT ASSESSMENT

2408 PFR NO. F037

AFFECTED ITEM: Southern California Edison Corrective Action Request CAR-F-194, Nov. 11-12,15, 1976. (Reference PFR No. F038)

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 ?

   N/A

5. ARE OTHER SIMILAR DEVIATIONS LIKELY TO EXIST ?

   Yes, either as procedural nonconformance/administrative oversight

6. OTHER COMMENTS:

   SEE ATTACHMENT

PREPARED BY: J. E. Lauer DATE: 3/15/82

COMMENTS: None

BY: [signature] DATE: 3/16/82

6 a) It is agreed that the concerns addressed in CAR-F-194 and the letter from H. B. Ray to J. E. Bashore do not introduce adverse effects on the final design and construction of piping systems and subassemblies by Bechtel or W. M. Kellog.

b) The requirements for review and approval of design drawing (Section 3311), ASME items (Section 3312), revisions to drawings (Section 3313), and drawing change notices (Section 3314) are set forth in the Project Revision 1, Sept. 1980, to the Bechtel Quality Assurance Manual - ASME, Div. 1, 1977, San Onofre Units 2&3, Bechtel Job #10079. Copy attached. Concurrence to these requirements is verified by the signature of R. M. Staley, September 29, 1980, the Authorized Nuclear Inspector Supervisor & Inspection Specialist to the State of California.

2408 PFR NO. F038

REVISION --

POTENTIAL FINDING REPORT
SONGS 2&3 SEISMIC DESIGN VERIFICATION

A. PREPARATION BY GA INITIATOR

AFFECTED ITEMS: Southern California Edison Corrective Action Request, CAR-S-52, 3/18/76

REQUIREMENT REFERENCE DOCUMENTS:

1. 10CFR50 Appendix B, Criteria XVI, Corrective Action
2. Southern California Edison Quality Assurance Procedure, QAP No. N16.03, para. 2.2, Rev. 0, 12/5/75.

BASIC REQUIREMENT:

1) "In the case of significant conditions adverse to quality, the measures shall assure that the cause of the condition is determined and corrective action taken to preclude repetition."
2) "The SCE QA Organization is responsible for: - evaluating the corrective action for acceptability; - providing appropriate verification of corrective action."

DESCRIPTION OF POTENTIAL FINDING:
CAR-S-52 was closed on 6/7/76, per signature of B. Cooper, SCE QA Supervisor. The requirement for verification of implementation of corrective action (Block 19 of the CAR) was not signed off, contrary to the requirement of N16.03. Also, Corrective Action Status Log, Page 6, KELL-I-76, CAR-S-52, shows CAR close-out on 6/8/76 without verification of implementation of corrective action.

Three commitments were made by SCE QA in a letter, 6/23/76, Ray (SCE QA) to Bashore (BPC A) to resolve the CAR. As of 1/28/82, objective evidence was not available to verify SCE QA follow-up on any of the 3 commitments above.

PREPARED BY: J. E. Lauer DATE: 2/22/82

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 J. Bunnell DATE 2/24/82

☐ REQUEST RE-REVIEW BY _____ DATE _____

☐ DISAGREE BY _____ DATE _____

☒ REVIEW OF ORIGINAL DESIGN ORGS. COMMENTS BY: J. Bunnell DATE: 3/11/82

2408 PFR NO. F038

REVISION --

C. REVIEW BY ORIGINAL DESIGN ORGANIZATION

COMMENTS

See attachment

☒ AGREE PF IS VALID see attachment for further discussion

☐ DISAGREE

BY: John M. Cirra DATE: 3-2-82

B. 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

CAR not signed per procedure. However, required action was initiated.

BY: S. L. Koutz DATE: 3/17/82

E. GA PROJECT MANAGER

☒ ACCEPT

☐ REJECT

BY: G. L. Wiemann DATE: 3/18/82

2408 PFR No. F038
JMJ for TDC 3/16/1982

SONGS 2&3 SEISMIC DESIGN VERIFICATION
Response to 2408-PFR-F038 (Block C)

In responding to the question of validity of the potential finding, it is necessary to consider the significance of the historical facts relative to the evidence they present regarding the effectiveness of the quality assurance program.

The area in question concerns whether the quality assurance program was effective in obtaining remedial and corrective action to prevent recurrence of conditions which may be adverse to quality.

The potential finding cites a failure by the Quality Assurance Supervisor to indicate on the CAR form that corrective action implementation had been verified by SCE QA. That is clearly the case. The completed CAR form is blank in the block provided for a signature to denote that verification was accomplished. The CAR was closed based on instructions from the Manager, QA as indicated in his letter of June 23, 1976 to Bechtel. The QA Supervisor should have entered the notation "NA" in block 19. The views of the ASME Jurisdictional Authority for ASME Code on the question posed by the CAR were to be pursued by the Manager, QA or his designee as an administrative matter.

The potential finding also refers to "three commitments" made in the June 23, 1976 letter. The intent of all commitments in the letter may be summarized in the point made in the preceding paragraph. The Manager, QA accepted Bechtel's position but wished to ensure that the Jurisdictional Authority for San Onofre Units 2 & 3 also accepted the position. While no evidence in the form of meeting minutes is available to document a statement of acceptance which had been obtained by SCE QA action, the approval of the Bechtel QA Manual (ASME Code) is evidence that the Jurisdictional Authority did accept the Bechtel position.

There follows a detailed analysis of the potential finding and the background information relating to it. This analysis makes use of the following documents which are also attached:

CAR S-52, Revision 0, dated 3-18-76
MEMORANDUM FOR FILE regarding meeting at Bechtel, dated April 22, 1976
Letter from J.E. Bashore to H.B. Ray, dated April, 28, 1976
Bechtel Conference Notes No. 1624, dated May 14, 1976
Letter from H.B. Ray to J.E. Bashore, dated June 23, 1976.

2408 PFR No. F038
JPB for TDC 3/16/78

SONGS 2&3 SEISMIC DESIGN VERIFICATION
Response to 2408-PFR-F038 (block C)

From discussion with the General Atomic reviewer, the description of potential finding can be restated as follows:

1) CAR S-52 block 19 was not completed to show verification of corrective action implementation. The Corrective Action Status Log was also not completed in this area. These omissions are contrary to QAPN16.03.

2) Followup actions regarding three commitments made in a letter from H. B. Ray to J. E. Bashore dated 6-23-76 cannot be identified from review of available documentation. These actions, which were associated with CAR S-52, are listed below:

   a) SCE would accept the Bechtel position that area drawings do not form a part of the Design Specification based on the definition of the contents of the Design Specification as prescribed by the Code. SCE acceptance was conditional subject to further clarification from the Jurisdictional Authority or NRC.

   b) SCE would review the requirements for certification of drawing changes with appropriate industry committee personnel to seek clarification regarding whether this certification is considered a design control measure.

   c) SCE would pursue the role of area drawings with respect to Design Specifications with the Jurisdictional Authority.

The first condition above is valid. The CAR and Log should have indicated "Not Applicable" or "N/A" since no corrective action was proposed by Kellogg or Bechtel.

The second condition above is valid in that SCE cannot produce objective evidence that the three actions indicated were in fact undertaken.

Regarding the implications of the above conditions on the overall control of piping system design information, it is SCE Quality Assurance's position that adequate controls were provided by Bechtel as discussed in the following paragraphs.

ASME Code Requirements (1974 Edition, Summer 1974 Addenda)
NA-3251 requires the Owner or his agent to provide Design Specifications for components (i.e., each piping system). However, Design Specifications are not required for piping subassemblies when these subassemblies are included in the Design Specification for the piping system. The applicable data from the piping system Design Specification in the form of drawings in sufficient detail to provide the basis for fabrication shall be provided to the piping subassembly manufacturer (Kellogg) by the design organization (Bechtel).

NA-3252 describes the contents of Design Specifications to include a) functions, b) design requirements, c) environmental conditions, d) Code classification, e) boundaries, and f) material requirements. The Design Specifications are to contain sufficient detail to provide a complete basis for construction.

NA-3255 requires the Design Specifications to be certified to be correct and complete and to be in compliance with the requirements of NA-3250 by one or more Registered Professional Engineers competent in the applicable field of design and related nuclear power plant requirements.

Bechtel BQAM Requirements

Section 3000 discusses design control. The following revisions were in effect during the 1976-1977 time frame for the SONGS 2/3 project:

a) Revision 1 (August 1974), Amendment 1 (November 1975)

b) Revision 2 (April 1977), Amendment 3 (May 1977)

c) Revision 2 (April 1977), Amendment 4 (July 1977)

Sections 3130 and 3170 requires Bechtel to certify the Design Specifications as required by NA-3255. Section 3140 requires the Bechtel Project Engineer or his designee to review the Design Specifications and to assure that the requirements of the Design Specifications are contained in project specifications, procedures and drawings, as applicable.

Section 3311 requires drawings to be signed or initiated by a checker, design group supervisor(s) and the Project Engineer or their designees. Section 3312 requires an additional approval signature or initial by the Discipline Chief Engineer.

Sections 3313 and 3314 require that changes to drawings are reviewed and approved in the same manner as the original drawing except that the Chief Engineer's approval is not required except for changes in design characteristics required by the Design Specification or the Code. Changes can be made by revision, DCN or FCR.

Bechtel Project Practices

For each piping system, Bechtel provides a Design Specification certified by the Chief Discipline Engineer. These Design Specifications contain the information required by NA-3252 of the ASME Code and reference the following project design documents:

P&ID, area drawings, Line Designation List, Piping Material Classifications. Each reference document is reviewed and approved by the affected design group supervisor(s) and the project engineer, or their designees.

The Design Specifications define the design input requirements as defined in ANSI-N45.2.11. Design output requirements are described in the area drawings, Line Designation List and Piping Material Classifications and are provided to the piping subassembly manufacturer (Kellogg) for preparation of individual piping spool piece drawings.

Implementation of the above has been verified through SCE and Bechtel audits of the Bechtel Design Office, jobsite and Kellogg manufacturing activities. In addition, Bechtel has been audited by ASME Survey Teams during the progress of the SONGS 2/3 project to assure the BQAM requirements were being implemented and were consistent with the Code requirements. These surveys were the basis for use of Bechtel's Certificate of Authorization on the SONGS 2/3 project.

The Bechtel BQAM has been accepted by the Jurisdictional Authority (State of California, Department of Industrial Safety, Division of Industrial Safety) to be a satisfactory quality assurance program to implement Code requirements.

Conclusion

Based on the above, it is concluded that the concerns addressed in CAR S-52 and letter from H. B. Ray to J. E. Bashore dated 6-23-76 did not introduce any adverse effects on the final design and construction of piping systems and subassemblies by Bechtel or M. W. Kellogg. Additionally, the quality assurance program requirements were appropriate to control design information and to assure adequate quality for SONGS 2/3.

J. M. Curran — 3-2-82

J. M. Curran — Date

240 PER No. 5038
DRF for HDC 3/16/1982

Page 1 of 1

SCE CORRECTIVE ACTION REQUEST

Project San Onofre Nuclear Generating Station, Units 2/3

1. NUMBER: S-52
REV.: 0

2. ITEM/SYSTEM DESCRIPTION: Document Control

3. DATE: 3-18-76

4. VENDOR/ORGANIZATION NAME, ADDRESS:
M. W. Kellogg Company
14507 S. Paramount Blvd.
Paramount, CA 90723

5. P.O./SPECIFICATION NO.: N4105541

6. DESCRIPTION OF CONDITION

Drawing Change Notice (DCN) No. 5 to Bechtel Power Corporation. Dwg. No. 40275, Rev. 1, does not have a Registered Professional Engineer's stamp even though this DCN changes a drawing that has a stamp properly applied, dated and signed. This is in violation of the ASME B&PV Code, Section III, Paragraph NA-3255.

7. CONDITION NOTED IN: SCE Audit Report No. KELL-1-76, Page 2

8. INITIATOR: R. E. Hawes REH — DATE: 3-18-76

9. THE ABOVE CONDITION REQUIRES YOUR PROMPT ATTENTION FOR CORRECTION OR RESOLUTION
REPLY REQUESTED FROM: D. E. Cochrane
REPLY DUE DATE: 5-5-76

10. ACTION TAKEN TO RESOLVE PROBLEM

See Attachment for Items 10 thru 17

11. EFFECTIVITY DATE	12. SIGNATURE	TITLE	DATE

13. CAUSE OF CONDITION

15. CORRECTIVE ACTION TO PREVENT RECURRENCE

14. SIGNATURE	TITLE	DATE	16. EFFECTIVITY DATE	17. SIGNATURE	TITLE	DATE

18. CORRECTIVE ACTION ACCEPTABLE
☒ YES ☐ NO (SEE 20)

B. Cooper — SCE QA — 6-7-76 DATE — N/A — SCE ENGINEERING — N/A DATE

19. CORRECTIVE ACTION IMPLEMENTATION VERIFIED
QA ENGINEER
DATE

20. REMARKS/REFERENCES

21. QA FINAL REVIEW (CAR CLOSED)
B. Cooper
SCE QA SUPERVISOR
6-7-76
DATE

22. DISTRIBUTION
J.A. Swanson, D.E. Cochrane
L.D. Hamlin, H.B. Ray
P.R. Belhumeur, B. Cooper
J.E. Arnold, R.E. Hawes
Q.A. Files, EDM Center

23. FOR DOCUMENTATION CONTROL CENTER USE

4-16-16

2408 PFR No. F038

DTS for FDC 3/16/82

Division of
Pullman Incorporated

Power Piping Group
14507 South Paramount Blvd.
Paramount, California 90723
Telephone (213) 531-1370

Pullman Kellogg

REFERENCE: CORRECTIVE ACTION REQUEST S-52

Due to the relief offered in NA-3251 and NA-3256, we have not consdiered it necessary for DCN'S to be certified by a registered professional engineer.

If we are incorrect, please so advise and we will put a hold on all fabricating operations on pieces affected by DCN'S. Said hold to remain in force until the Southern California Edison Company and the engineer define our responsibilities in this area.

D. E. Cochrane
Quality Assurance Manager

Date

DEC/ch

2408 PFR No. FC 38
JNS for TDC 3/11/76

MEMORANDUM FOR FILE

April 22, 1976

Q A File No. AA01
S023

SUBJECT: Meeting at Bechtel Power Corporation Offices at Santa Fe Springs (Building 45) between Southern California Edison (SCE) and Bechtel Power Corporation (BPC)

PURPOSE

To document the subject meeting held to resolve the SCE Corrective Action Request (CAR) S-52 assigned to M. W. Kellogg Company, Paramount, California. This CAR requested that Drawing Change Notice (DCN) be certified by a Registered Professional Engineer as applicable to the original drawing.

INTRODUCTION

This meeting was held on April 16, 1976 with the following people in attendance. BPC Quality Assurance was not present.

BPC	SCE
D. Kinnsch	B. Cooper
S. Burditt	R. Hawes
G. Rodhe	
G. Houchen	
J. Lockner	

DISCUSSION

The following items were discussed with agreements or disagreements noted:

1. Design Criteria must be approved by a Registered Professional Engineer - Agreement.

2. Design Criteria can be included in drawings as well as specifications - Agreement.

2408 PFL No. FO 33
278 for 7DC 3/16/76

3. Drawings other than those referenced in paragraph 2 above, do not require certification - Agreement.

4. Drawing Change Notice No. 5 to Drawing 40275, Revision 5, is an integral part of this drawing which BPC agreed. However, BPC did not agree that the DCN required the same certification that Drawing 40275 possessed. BPC agreed with SCE that revisions would contain the certification (Note: BPC later changed their position which is discussed in item 5 below).

5. Area drawings are used by BPC to transmit the necessary information to the fabricator, (M.W. Kellogg Company, Paramount, California) for preparation of the necessary drawings for pipe fabrication.

   BPC changed their position taken in 4. above and stated that area drawings do not establish or control design criteria; therefore, BPC does not require certification by a Registered Professional Engineer (PE). SCE contended that area drawings, especially DCN's to area drawings, could make changes to the design criteria such as, stress calculations, pipe sizing, wall thickness, materials, etc. These changes would require a re-review of the design criteria by the original P.E. or another from the same group for certification.

   SCE concluded the meeting by stating that this unsolved condition would be referred to SCE management for resolution. CAR S-52 can not be closed out until this philosophy has been resolved.

6. BPC requested that SCE withdraw CAR S-52 and the matter be dropped without requiring any changes to the current BPC procedures. SCE declined and reiterated that this matter would be referred to SCE management.

R. E. Hawes /RC

R. E. HAWES

REH:mm

2408 PFR NO. F038
JMS for JDC 3/16/76 CAR S-52

Bechtel Power Corporation

Engineers - Constructors

12400 East Imperial Highway
Norwalk, California 90650
MAIL ADDRESS
P.O. BOX 60860 - TERMINAL ANNEX, LOS ANGELES, CALIFORNIA 90060
TELEPHONE: (213) 864-6011

April 28, 1976

Mr. H. B. Ray
Quality Assurance Manager
Southern California Edison Company
P. O. Box 800
2244 Walnut Grove Avenue
Rosemead, California 91770

Subject: SONGS 2 & 3 Project
Certification of Design Specifications
Bechtel Job 10079
53-76

Reference 1): Telcon J. D. Houchen/W. E. Ferriss with P. R. Belhumeur, same subject, on April 14, 1976

2): Telcon H. B. Ray with J. E. Bashore, same subject, on April 16, 1976

Dear Mr. Ray:

Responding to your inquiries and in accordance with agreements reached in Reference 1) BPC has re-evaluated the current procedure for compliance with the B&PV Code, Section III, paragraph NA-3255 Certification of the Design Specifications.

Design specifications are being certified to be in compliance with the requirements of NA-3250 by Registered Professional Engineers.

SCE-QA CAR S-52, dated March 18, 1976, issued to M. W. Kellogg Co. indicated that Drawing Change Notice (DCN) No. 5 to BPC drawing was in violation of ASME B&PV Code, Section III NA-3255. Plant Design Piping Area drawings are not a part of the design specification and changes to these drawings are not changes to the specification. BPC drawings are stamped, dated, and signed as a matter of convenience to BPC. There is no ASME B&PV Code Section III Div. I requirement for certifying drawings by a Registered Professional Engineer. The area drawings are adequate for the fabrication of pipe spools at M. W. Kellogg.

2408 PFR No. 1-038
JJB for JDC 3/16/76

BPC Project Quality Assurance concurs with Project Engineering on this position.

If additional information is required, please advise.

Very truly yours,

BECHTEL POWER CORPORATION

Joe Bashore

J. E. Bashore
Division Quality Assurance Manager

JEB:RES:sls

(Rec'd 5-21-76 B.C.)

Bechtel Power Corporation

2408 PFR No 20 38
DNS for 7Dec 3/16/76

AADA-071-B

Songs 2/3

SAN ONOFRE NUCLEAR GENERATING STATION
UNITS 2 & 3
BECHTEL JOB 10079

Conference Notes No. 1624

Issue Date: May 14, 1976

Conference Held: April 16, 1976

Subject: SCE Corrective Action Request S-52

Location: Bechtel Bldg. 45

Present:	Bechtel Power Corp.	Southern California Edison Co.
	S. Burditt	B. Cooper
	J. Houchen	R. Haas
	D. Kinnsch	
	J. Lakner	
	G. Rohde	

Prepared By: S. Burditt/G. Rohde

File: SO23-409-1

Purpose: To review the requirement for PE stamping of DCN's stated in SCE Corrective Action request S-52.

SCE Corrective Action Request (CAR) number S-52 was issued to Kellogg as a result of SCE Quality Assurance Audit Report KELL-1-76. This Corrective Action Request reads as follows:

"Drawing Change Notice (DCN) No. 5 to Bechtel Power Corporation. Dwg. No. 40275, Rev. 1, does not have a Registered Professional Engineer's stamp even though this DCN changes a drawing that has a stamp properly applied, dated and signed. This is in violation of the ASME B&PV Code, Section III, Paragraph NA-3255."

Kellogg had advised Bechtel that as a result of CAR-S-52, piping affected by DCN's would be put on HOLD.

SCE made reference to paragraph NA-3252 of ASME Section III which states that the Design Specification shall contain sufficient detail to provide a complete basis for construction of the component or, in this case, the piping system.

The SCE QA Department position, as stated by Bud Cooper, is that Piping Area Drawings, including all revisions (DCN's), form a part of this basis for construction of the system and must be certified by a Registered Professional Engineer.

? Paragraph NA-3255 was referenced as the justification for this position. ? NA 3255 NA 3256 NA 3256

Bechtel stated that Area Drawings are documents used to provide the manufacturer with the applicable data from the Design Specification in sufficient detail for fabrication and as such are not a part of the Design Specification and are not addressed in paragraph NA-3255.

Existing Bechtel procedures include requirements that all design drawings and their revisions (including DCN's) shall be reviewed and approved by the Project Engineer or Assistant Project Engineer. Since in this case both the P. E. and A. P. E. are Registered Professional Engineers, the SCE requirement has been met - but not because of Code requirements.

Bud Cooper agreed that the Certification of a Registered Professional Engineer can be demonstrated by a means other than stamping. It was his opinion that certification must be demonstrated through a signature accompanied by the registration number. Bechtel does not note registration numbers.

SCE will discuss the question further in-house, after which discussion with Bechtel will resume in order to reach an agreement that will enable the pipe fabrication to continue working.

Note: Subsequent to the meeting Kellogg advised Bechtel that after reviewing the Code they could see no code requirement for a Professional Engineer's stamp on the area drawings or the DCN's and on this basis were proceeding with work. Their response to CAR S-52 will reflect this conclusion.

J. D. Houchen

SB/GR:dc

2405 PFR No. FC 38
2128 for FSC 3/16/82

AD20 AG
SONGS 2/3

June 23, 1976

Mr. J. E. Bashore, Manager
Division Quality Assurance
Bechtel Power Corporation
P. O. Box 60860, Terminal Annex
Los Angeles, California 90060

Dear Mr. Bashore:

Subject: SCE Corrective Action Request (CAR) S-52
San Onofre Nuclear Generating Station, Units 2 and 3

Background for issuance of the subject CAR is provided in Bechtel Conference Notes No. 1624 dated May 14, 1976. This CAR indicates that failure to certify a Drawing Change Notice to a so-called "area drawing" was in violation of Section III, Paragraphs NA-3251 and 3255, of the ASME Boiler and Pressure Vessel Code. Your letter dated April 26, 1976, states that Bechtel does not consider these drawings to be part of the Design Specification and, accordingly, to not require certification.

On June 14, 1976, we met in your office to discuss the matter further. At that time, Mr. Jacques Lakner of Bechtel, who is a member of the ASME Task Force for Design Specifications, discussed the current efforts to clarify the somewhat unclear definition of the contents of the Design Specification. I indicated that SCE would accept the Bechtel position that area drawings do not fall within the scope of this definition, as prescribed in the Code, for the time being and subject to further clarification from the Jurisdictional Authority or NRC. Thus, the referenced CAR S-52 is considered closed.

However, two more general issues have been raised by this episode which require further development. The first is that there are, indeed, drawings which fall within the

2408 PFR No. F038
JMS for JEB 5/14/81

definition of Design Specification in the Code and to which the requirements for certification must apply. These drawings include at least P&IDs. I understand that Bechtel continues to agree with this. Accordingly, such drawings, and all changes thereto (whether they be called revisions, DCNs, FCRs, memoranda, or whatsoever) must be certified in accordance with the Code. Documents which are used to permit work to proceed at variance with approved revisions of such drawings, and which are not certified as required by the Code, will be considered as nonconforming by SCE.

The second is that Bechtel does certify (stamp) drawings beyond those required by the definition of Design Specification in the Code. However, not all changes to these drawings are certified (stamped). We cannot rationalize this practice with the following requirements of our QA program.

> "Design changes, including field changes, shall be subject to design control measures commensurate with those applied to the original design . . ." (10CFR50, Appendix B, Criterion III)
>
> "Documented procedures shall be provided for design changes to approved design documents, including field changes, which assure that the impact of the change is carefully considered, required actions documented and information concerning the change is transmitted to all affected persons and organizations. These changes shall be justified and subjected to design control measures commensurate with those applied to the original design." (ANSI N45.2.11)

If one considers certification to be a design control measure (we do), then the Bechtel practice does not conform with the foregoing. However, I understand Bechtel does not consider certification to be a design control measure. We will review this matter further with appropriate industry committee personnel in an effort to seek clarification.

2405 PFR No. FC 58
JJR for FDE 3/4/8

Finally, we discussed briefly the question of what constitutes "certification." With respect to compliance with the Code, it is whatever acts satisfy the Jurisdictional Authority in this regard. We believe this may involve a statement of certification, application of a stamp, clear signature with license number or clear signature with prior indication of license number on the same document if the certification is for a revision to a document originally certified by the same individual.

We will pursue the role of area drawings with respect to the Design Specification as discussed above with the Jurisdictional Authority at an appropriate time and place (probably the jobsite) such that Bechtel can adequately present its views. If you have any questions or comments concerning the above, please let me know.

Very truly yours,

HBR

H. B. Ray
Manager, Quality Assurance

HBR:fm
cc: L. D. Hamlin
H. B. Ray
P. R. Belhumeur
B. Cooper
Q. A. File
EDM Center

IMPACT ASSESSMENT

2408 PFR NO. F038

AFFECTED ITEM: Southern California Edison Corrective Action Request CAR-S-52 3/18/76 (Reference: PFR No. F037)

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, either as procedural nonconformance/administrative oversight

6. OTHER COMMENTS:

   SEE ATTACHMENT

PREPARED BY: J. E. Lauer DATE: 3/15/82

COMMENTS: N/A

BY: S. Blum DATE: 3/15/82

6 a) It is agreed that the concerns addressed in CAR S-52 and the letter from H. B. Ray to J. E. Bashore do not introduce adverse effects on the final design and construction of piping systems and subassemblies by Bechtel or M. W. Kellog.

b) The requirements for review and approval of design drawing (Section 3311), ASME items (Section 3312), revisions to drawings (Section 3313), and drawing change notices (Section 3314) are set forth in the Project Revision 1, Sept. 1980 to the Bechtel Quality Assurance Manual-ASME, Div. 1, 1977, San Onofre Units 2&3, Bechtel Job #10079. Copy attached. Concurrence to these requirements is verified by the signature of R. M. Staley, September 29, 1980, the Authorized Nuclear Inspector Supervisor & Inspection Specialist to the State of California.

ENCLOSURE 2

2408 PFR No. F-0 58
JJB for TDC 3/16/82

REVIEW NOTICE FOR PROJECT REVISION 1 TO THE BQAM-ASME III, DIV. 1, 1977 EDITION FOR THE SAN ONOFRE PROJECT, UNITS 2 7 3 BECHTEL JOB NO. 10079

In my capacity as Authorized Nuclear Inspector Supervisor and Inspection Specialist to the State of California, I have reviewed Project Revision 1 to the BQAM-ASME III, Div. 1 and concur that this revision may be incorporated into the manual with the reconciliation of the following comments:

COMMENTS:

(1) Section 1000- Table of Contents page i of i- Signatures needed

(2) Section 2000- Control of Design Documents page 12 of 23 - #48 thru # 51 are repetitious with # 52 thru # 55.

(3) Coordination and Direction page 13 of 23 - Rev #1 is missing.

(4) Controls of Tools, Instruments & Equipment page 18 of 23 - #9 is not consistant with the heading. This should be relocated to page 17 under "General" or located above the "Tools" heading.

(5) Section 3000- Design Drawings page 2 of 5- Par. 3312 at end of 3rd line- documents signifys is repetitious and not consistant with project amendment #5.

(6) Section 4000- Supplier Evaluation page 2 of 6-Par 4313 5th line last word typo-should be of.

RECOMMENDATION:

WE RECOMMEND THAT THE TYPICAL EXAMPLES OF FORMS SHOWN IN THIS MANUAL BE REPLACED WITH THE ACTUAL FORMS BEING USED ON THE PROJECT. THIS SHOULD PREFERABLY BE ACCOMPLISHED PRIOR TO THE ASME SURVEY.

R.M. STALEY

September 29, 1980

Senior Safety Engineer
Pressure Vessel Unit
Division of Occupational Safety and Health

2408 PPR No. F038 2408 for TDC 3/16/81

3000 DESIGN CONTROL

3100 DESIGN SPECIFICATION

3110 The owner or his designated agent shall provide or cause to be provided Design Specifications for components, appurtenances, or component supports that are to be constructed in accordance with ASME Section III, Div. 1. The Design Specifications, in their entirety, shall be the principal documents governing the design, fabrication, examination and testing of ASME Section III, Div. 1 items.

3120 Separate Design Specifications are not required for parts, piping subassemblies, appurtenances or component supports when they are included in the Design Specifications for the component. The owner or his agent is responsible for proper correlation of all Design Specifications.

3130 Design Specifications are required to be certified as correct, complete and in compliance with the requirements of ASME III, Div. 1 by one or more Registered Professional Engineers competent in the applicable field of design.

3140 The Project Engineer or his designee is responsible for reviewing the Design Specifications and for assuring that the Design Specifications or the requirements of the Design Specifications are contained in project specification procedures and drawings, as applicable.

3150 A copy of the Design Specification shall be made available to the ANI at the manufacturing or field site before fabrication begins, and a copy shall be filed at the location of the installation and made available to the enforcement authority having jurisdiction at the plant installation before components or appurtenances are placed in service. In the case of parts and piping subassemblies, the Design Specifications need not be filed at the manufacturing site. For parts and piping subassemblies, the Project Engineer is responsible for providing the manufacturer with specifications and drawings of sufficient detail to provide the basis for fabication in accordance with the requirements of ASME Section III, Div. 1 and the Design Specifications.

3160 Certified Design Specifications are required (as permanent records) for Class 1,2, 3, CS and MC. See Section 7000 of this manual for details regarding documentation, records and filing.

3170 When designated by the owner, Bechtel as an agent for the owner, prepares, certifies and issues the Design Specifications in accordance with the requirements of ASME Section III, Div. 1.

3200 STRESS REPORT

3210 When Bechtel is responsible for providing a Stress Report or Load Capacity Data Sheet, they shall be prepared by Bechtel project engineering. Stress Reports for Code items provided by another Certificate Holder are certified by Bechtel when acting as the agent.

3220 The Stress Report shall include a complete set of design calculations and design drawings that show the drawings used for construction comply with the requirements of the Design Specifications and ASME Section III, Div. 1. Computer programs used in the calculations are identified in the Stress Report.

3230 The Project Engineer or his designee is responsible for reviewing the Stress Report or Load Capacity Data Sheet to assure that it complies with the requirements of the Design Specifications and ASME Section III, Div. 1. Both shall be certified by one or more Registered Professional Engineers competent in the applicable field of design.

3240 Any change to any drawing used for construction, from the corresponding drawing used for stress analysis, shall be certified by the person or organization responsible for the stress analysis calculations to have been satisfactorily reconciled with those calculations. Reconciliation of the revised drawing with the Stress Report or design calculations, as applicable shall be documented.

3250 The Stress Report shall be reviewed and certified by the owner or his agent as meeting the requirements of the Design Specification and ASME Section III, Div. 1.

3260 A copy of the certified Stress Report, certified by the owner or his agent, shall be made available to the ANI.

3270 When considered as an Engineering Organization, Bechtel retains the responsibility for structural adequacy including the completeness and adequacy of the Stress Report.

3280 The certified Stress Report is required as a permanent record for Class 1, Class 2 vessels to NC-3200, Class CS and Class MC. See Section 7000 of this manual for details regarding documenation, records and filing.

3300 PROJECT ENGINEERING

3310 DESIGN DRAWINGS

3311 Drawings, prepared by engineers, designers, and draftsmen incorporate the design criteria contained in the Design Specifications. Completed drawings are checked by personnel, other than the individual who prepared the drawings, having qualifications comparable to the engineer or designer who originated the work. The checker's signature or initials on the drawing indicates that he has reviewed the drawing and that it is acceptable to him. Following checking, the drawing is reviewed, approved and signed or initialed by the Design Group Supervisor(s), and by the Project Engineer, or their designees. Through this mechanism, management reporting sessions and management review meetings, engineering management is kept informed of inprocess and final status drawings.

1 3312 For ASME items, an additional review shall be performed by the Discipline Chief Engineer. When the Discipline Chief Engineer's review is required, the drawings are transmitted for his review, and his initials on the drawing documents indicate his approval. Exceptions to the above are pipe support and pipe hanger drawings which do not require the Chief Engineer's review.

3313 Revisions to drawings are subject to the same review and approval process as the original drawings except that approval by the Discipline Chief Engineer is not required unless the change is to design characteristics required by the Design Specification or ASME Section III. Approval of design changes shall be documented. Drawings may be modified between revisions by means of Drawing Change Notices (DCN's) as described in paragraph 3314 or by project engineering approved Field Change Requests (FCR's) as described in paragraph 3415 of this manual.

3314 Drawing Change Notices (Exhibit 5) are used to make changes to drawings or to give advance notice of a revision to a drawing. Each DCN receives the same approval and distribution as the drawing it revises with the exception that review by the Discipline Chief Engineer is not required. Drawings shall be revised to incorporate DCN's.

1 3315 A Drawing Control Log is used to record the drawing number, revision and other essential information for each drawing released by project engineering. The Drawing Control Log (Exhibit 6) is kept up-to-date by each responsible design group and is issued monthly by engineering. An ASME Code Class List (Exhibit 2), or equivalent form, is prepared to define the scope and extent of ASME components to be installed.

1 3316 Drawings are distributed in accordance with document distribution lists approved by the Project Engineer. See Exhibit 7. Drawing distribution is by a transmittal which lists the drawing and revision.

3317 Final "as constructed" drawings are required as permanent records for Class 1, 2, 3, CS and MC. See Section 7000 of this manual for details regarding documentation, records and filing.

3320 DESIGN CALCULATIONS

3321 Design calculations are prepared in accordance with engineering procedures. Design calculations, except for preliminary design calculations, are prepared by one engineer and checked by another engineer with comparable qualifications, and are reviewed and approved by the Design Group Supervisor or Design Group Leader, as applicable.

3330 SPECIFICATIONS

3331 Specifications are prepared by engineers in accordance with the requirements of ASME Section III, Div. 1, the Design Specification and the Client. Specifications receive the same checking, review and approval as described in 3311 through 3312 for drawings. Where applicable, specifications shall include the environmental conditions (including radiation) and the requirements for impact testing and the heat treatment of ferritic material test coupons (including the post weld heat treatment of the coupon for at least 80 percent of the time for the actual item). This requirement is also covered in paragraphs 4140 and 4150 of this manual.

3332 Revisions to specifications, including addenda sheets, are subjected to the same review and approval process as the original specifications except that review and approval by the Discipline Chief Engineer is not required unless the change is to design characteristics required by the Design Specification or ASME Section III.

1 3333 A Specification Control Log is used to record the title, number, revision and issue date of each specification released by project engineering. The specification control log is kept up to date and issued monthly by project engineering.

3334 Specifications are distributed by project engineering in accordance with the Master Distribution Schedule approved by the Project Engineer. Specification distribution is by a transmittal which lists the Specification number and revision.

1 3335 Specification Change Notices are used to make changes to specifications or to give advance notice of a revision to a specification. Each SCN receives the same approval and distribution as the specification it revises with the exception that review by the Discipline Chief Engineer is not required. Specifications shall be revised to incorporate SCN's.

3340 PROCEDURES

3341 Welding, heat treating, and nondestructive examination procedures are prepared, reviewed, approved and distributed as described in Section 5000 of this manual.

1 3350 Supplier documents such as drawings, specifications, calculations, procedures and data are submitted to project engineering for review and/or approval. A Contractor/Vendor Print Log (Exhibit 7) is used to record the specification or purchase order number, vendor name, document number, sequnce number, date of receipt, type of document and the approval status as appropriate.

1 3400 FIELD ENGINEERING

1 3410 DESIGN DOCUMENTS

3411 Design documents are sent via a transmittal by the Project Engineer to the Client's Engineering Data Management Center (EDMC) for logging, copying, and distribution. A copy of the transmittal is returned by EDMC to project engineering as notification that the drawings have been received. The QA coordinator works with the EDMC to assure proper handling and distribution of all design documents including DCN's.

3412 Each discipline head provides the QA coordinator with a list of personnel who care to receive certain types of design documents. The QA coordinator prepares a formal distribution listing which is sent to the EDMC.

3413 Upon receipt of drawings from the jobsite EDMC, the field print coordinator/clerk reviews the number of drawings received and the sequence of revision numbers.

3414 The print coordinator/clerk verifies that each drawing received at EDMC is listed in the EDMC respective Print Control Log.

3415 The print coordinator/clerk distributes engineering drawings to field supervisors, field engineering, quality control engineering, and the control station stick files in accordance with a drawing distribution list.

3416 Upon receipt of a new drawing revision, the print coordinator/clerk or his designee removes the superseded drawings and incorporated DCN's from the controlled stick files, and stamps the Superseded drawings "Superseded," and returns the superseded drawings to the jobsite EDMC.

3420 FIELD CHANGES TO DESIGN DOCUMENTS

3421 The Field Change Request (FCR) (Exhibit 10) provides field engineering with the means of reporting to project engineering discrepancies in project drawings, such as interferences or changes in arrangement required by job

conditions. An FCR is not to be used to report on physical conditions or deviations which are nonconformances. Nonconformances are processed in accordance with subsection 5800 of this manual. Generally, the incorporation of FCR's is done by project engineering through either the issuing of a revision to the drawing or a DCN. Occasionally, an FCR is used to identify an approved deviation from the Bechtel specification requirements when a permanent revision to the specification is not desired. In this case, the FCR becomes a part of the quality records.

3500 INDOCTRINATION AND TRAINING OF DESIGN PERSONNEL

3510 Indoctrination and training of design personnel is conducted in accordance with engineering procedures to assure that personnel performing Code-related activities are knowledgeable of the procedures and practices pertaining to the requirements of the project quality program.

3520 During the initial phase of a project, engineering indoctrination programs are conducted for supervisory personnel (Project Engineer, Assistant Project Engineer, Group Supervisors, Group Leaders, Project Administrators). The program covers the procedures for quality assurance, general quality program, project engineering quality program, project activities, and Supplier and Subcontractor Control.

3530 Design group and clerical staff training are conducted by the Group Supervisors, Project Administrator, or other equally qualified personnel as appropriate to the project. Follow-up sessions are conducted when the need for continuing training is estabished by observations or document review by the Project lead personnel.

3600 REQUIREMENTS FOR BECHTEL AS AN "N" CERTIFICATE HOLDER

1 3610 When performing as a "N" Certificate Holder, Bechtel may assume responsibilities that normally are associated with a manufacturer or installer. Examples are activities involving purchasing or contracting for fabrication. These activities are performed in accordance with the applicable sections of this manual. The activities and applicable manual sections shall be designated by the project through the incorporation of appropriate project revisions to this manual.

2408 PER No. [illegible]
[illegible] for [illegible]

1977 EDITION

BECHTEL

QUALITY ASSURANCE MANUAL

ASME SECTION III

DIVISION 1

SAN ONOFRE PROJECT

UNITS 2 & 3

JOB NO. 10079

BECHTEL POWER CORPORATION

ENCLOSURE 1

2408 PAR No F-058
DNS for FDC 3/16/82

Bechtel National, Inc.
Engineers — Constructors

Fifty Beale Street
San Francisco, California
Mail Address: P. O. Box 3965, San Francisco, CA 94119

To: Distribution

Date: October 1, 1980

Subject: Transmittal of Project Revision 1 to the BQAM-ASME III, Div. 1, 1977 Edition, Rev. 0 for the San Onofre Project, Units 2 & 3, Bechtel Job No. 10079

From: W. R. Smith, Sr.

Of: Codes & Standards/R&E

At: 50/18/A15/SF02
(415) 768-5811

Copies:

Distributed as a service to the Quality Assurance Organization is Revision 1 to the San Onofre Project Quality Assurance Manual for ASME III, Division 1, 1977 Edition, Revision 0. Project Revision 1 has been reviewed and approved by the Authorized Inspection Agency performing the Code required inspection at the San Onofre jobsite (State of California).

By a copy of this transmittal, including Enclosure 2 in particular, the Division Quality Assurance Manager for the Los Angeles Power Division, the local Authorized Nuclear Inspector and the Authorized Inspection Agency of Record for the Bechtel Power Corporation are informed of the acceptance of Project Revision 1 by the Inspection Specialist for the jobsite Authorized Inspection Agency.

Revision 1 to the San Onofre Project BQAM-ASME III, Division 1, 1977 Edition includes all of the San Onofre Project Amendments 1 through 10 (note: Amendment 10 was approved, but not issued). The San Onofre Project BQAM Revision 1 is being issued to all manual holders as a complete manual inserted into a new binder. All holders of the former BQAM assigned for use on the San Onofre Project, Units 2 and 3 are instructed to return their old copies of the BQAM complete with binders (blue) to the Manual Distribution Center, c/o I. K. Lee (50/16/D56/SF15), Bechtel National, Inc., P.O. Box 3965, San Francisco, California, 94119.

All recipients of this transmittal are instructed to acknowledge their receipt by immediately signing, dating and returning the attached Transmittal/Acknowledgement Form.

If you have any questions regarding this transmittal or the attached BQAM, San Onofre Project Revision 1, please contact V. K. Malhotra or J. R. Barbee at (415) 768-5811.

J. R. Barbee for
W. R. Smith, Sr.

WRS/VKM/bp

Enclosures

11573

2408 PFR NO. F046

REVISION 0

POTENTIAL FINDING REPORT
SONGS 2&3 SEISMIC DESIGN VERIFICATION

A. PREPARATION BY GA INITIATOR

AFFECTED ITEMS: SCE Audit Reports BPCS-39-77 and BPCS-53-79, regarding U.S. Testing Co. QA procedures (concrete materials testing)

REQUIREMENT REFERENCE DOCUMENTS:

SEE ATTACHMENT I

BASIC REQUIREMENT:

SEE ATTACHMENT I

DESCRIPTION OF POTENTIAL FINDING:

SEE ATTACHMENT I

Concur in SCE's response item 7 re last sentence of initial comments. W.J. Leonard 3/11/82.

PREPARED BY: W. J. Leonard DATE: 2/19/82

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 L Bursel DATE 4/22/82

☐ REQUEST RE-REVIEW BY _____ DATE _____

☐ DISAGREE BY _____ DATE _____

☐ REVIEW OF ORIGINAL DESIGN ORGS. COMMENTS BY: L Bursel DATE: 3/11/82

2408 PFR NO. F046

REVISION 0

C. REVIEW BY ORIGINAL DESIGN ORGANIZATION COMMENTS

See Attachment

☒ AGREE PF IS VALID except as noted on the attachment

☐ DISAGREE

BY: J.M. Cowan DATE: 3-2-82

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

Procedural violation. However, there is evidence that the UST Co procedures & manual were reviewed & approved. The committee notes the statement on the Impact Assessment that similar deviations are cited in F038 and F054 and will be looking for a possible trend when it classifies those PFRs

BY: S. L. Kouts DATE: 3/12/82

E. GA PROJECT MANAGER

☒ ACCEPT

☐ REJECT

BY: A.L. Wiseman DATE: 3/13/82

ATTACHMENT I

REQUIREMENT REFERENCE DOCUMENTS:

1. 10CFR50, Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants"

2. ANSI/ASME N45.2.12, "Requirements for Auditing of Quality Assurance Programs for Nuclear Power Plants"

3. SCE Quality Assurance Procedure N18.04, Revisions 9 (9/1/77) and 11 (3/1/78), "Quality Assurance Organization Audits - Scheduling, Planning, Performance, Documentation, and Followup"

BASIC REQUIREMENT:

Reference Document 1, Criterion 18 (last sentence) states, "Followup action, including re-audit of deficient areas, shall be taken where indicated."

Reference Document 2, Para. 4.3.2.7 states, "Specific attention should be given to corrective action on program deficiencies identified during previous audits." Para. 4.5.2 and 4.5.2.4 state, "When necessary, followup actions shall be performed by the audit team leader or management of the auditing organization to: Confirm that the corrective action is accomplished as scheduled."

Reference Document 3, Para. 4.6 states, "QA Organization personnel shall provide followup on corrective action items as necessary to assure timely implementation." Paras. 5.3.1 and 5.3.1.4 state, "Development of the audit plan shall be based on consideration of the following:

Previous experience with quality assurance-related activities of the organization being audited, including experience with the product or service, records of prequalification and pre-award survey, and existing audit reports, if available."

DESCRIPTION OF POTENTIAL FINDING:

Failure to confirm that corrective action was accomplished.

1. SCE Audit BPCS-39-77 included the following objective as part of the audit plan: "Verify that Bechtel QC is reviewing and/or approving UST Co. Quality Control Procedures. Also verify that Bechtel QA has reviewed and approved UST Co. Quality Assurance Program."

2. The audit report cited lack of evidence of compliance with BPC procedural requirements for review. Corrective Action Request (CAR) No. F-390 was written.

2408-DFR-F046
SCE 3/12/82

3. SCE verified (on the CAR) implementation of corrective action, with a notation that the corrective action had begun (i.e., the required review of the concrete materials testing subcontractor's QA procedures by BPC was in process). No evidence was available to indicate verification of completion of the review.

4. SCE Audit BPCS-53-79, conducted two years after BPCS-39-77, included the same objective as the earlier audit, except that the last sentence states, "Also verify that Bechtel QA has reviewed and approved the current revision of UST Co. Quality Assurance Manual."

5. Again, in BPCS-53-79, SCE reported lack of evidence of compliance by the auditee and CAR No. F-864 was written.

6. SCE verified implementation of corrective action, with a notation referring to BPC letter of July 16, 1976, which confirmed that BPC had reviewed and approved a single revision to a single procedure.

7. It appears that neither corrective action response adequately resolved the findings. The first, CAR F-390, was evidently not followed-up to verify accomplishment of the stated corrective action and the later CAR, F-864, apparently did not consider the earlier stated corrective action. The response for CAR F-864 only partially addressed the requirement for review and did not satisfy the audit objective regarding review and approval of the current QA Manual.

Review of Description of Potential Finding for Validity

1. Valid Statement.

2. Valid Statement.

3. Valid Statement.

4. Valid Statement.

5. Valid Statement.

6. Valid Statement.

7. This statement is valid except for the last sentence. Audit report BPCS-53-79 did verify that the USTC QA Manual was reviewed and approved by Bechtel. CAR F-864 was written regarding the lack of review and approval of the USTC QC Procedures. The QC Procedures are separate from the QA Manual.

Review of the Significance of the Potential Finding

The statements included in the description of potential finding do not indicate any significant impact on quality or control of material testing activities by Bechtel or USTC. Included in Tables I and II is a complete history of the review and approval activities associated with the USTC QA Manuals and QC procedures. From review of these Tables, it is evident that the required reviews and approvals were provided. Responsibilities for review and approval were assigned to Bechtel from 11-17-75 to 6-18-81. SCE was responsible for the review and approval function prior to 11-17-75 and after 6-18-81.

Table I - USTC QA Manual Reviews/Approvals

Revision	Date	Approval By	Approval Date
0	7-26-74	SCE QA	8-21-74
1	10-28-75	SCE QA	11-17-75
2	3-10-76	BPC QA	9-27-76
3	12-12-77	BPC QA	3-4-78
4	6-6-78	BPC QA	9-15-78
5	1-11-79	BPC QA	1-25-79
6	8-27-79	BPC QA	9-12-79
7	6-17-80	BPC QA	6-27-80

Table II - USTC QC Procedures Reviews/Approvals

Procedure	Revision	Date	Approval By	Approval Date
2	0	9-16-74	SCE QA	11-11-74
2	1	3-20-75	SCE QA	3-20-75
3	0	9-16-74	SCE QA	11-11-74
3	1	3-20-75	SCE QA	3-20-75
3	2	7-6-76	BPC QC	7-30-76
4	0	9-16-74	SCE QA	11-11-74
4	1	7-3-79	BPC QC	8-21-79
5	0	9-16-74	SCE QA	11-11-74
6	0	9-16-74	SCE QA	1-15-75

Note: QCP # 1 is not applicable to SONGS 2/3. QCP #2 rev 2, QCP # 3 rev 3, QCP #4 rev 2 and QCP # 6 rev 1 all dated 2-80 were prepared by USTC and submitted to BPC (Norwalk Office) for approval. These QCP were never approved by BPC or used by USTC.

A review of ten consecutive CAR's prior to and ten following F-390 (F-380 through F-389; F-391 through F-400) was performed to determine whether F-390 might have represented a typical practice of SCE QA on verification of corrective action. The review reveals a generally consistent pattern of review and documentation of completion of the corrective action reported or proposed by the recipient of the CAR.

J. M. Curran

3.2-82

J. M. Curran

Date

IMPACT ASSESSMENT

2408 PFR NO. F046

AFFECTED ITEM: SCE Audit Reports BPCS-39-77 and BPCS-53-79

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

   Not applicable.

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

   Not applicable.

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

   Not applicable.

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

   Conceivably. Any instance of failure to follow-up to assure implementation of effective corrective action could result in lack of resolution of conditions constituting or contributing to safety hazards.

5. ARE OTHER SIMILAR DEVIATIONS LIKELY TO EXIST ?

   Yes, PFRs F038 and F054 cite other examples.

6. OTHER COMMENTS:

PREPARED BY: W O Brand DATE: 3/11/82

COMMENTS: None

BY: J Bellard DATE: 3/11/82

2408 PFR NO. F047

REVISION --

POTENTIAL FINDING REPORT
SONGS 2&3 SEISMIC DESIGN VERIFICATION

A. PREPARATION BY GA INITIATOR

AFFECTED ITEMS:
Bechtel Site audit No. 934, conducted 10/20/77.

REQUIREMENT REFERENCE DOCUMENTS:
1) ANSI N45.2-1971
2) Bechtel QA Standard No. 5.1, Rev. 11, issued 10/17/77, "Project QA Audits".
3) 10CFR50.71(e), Revised 1/1/81, "Maintenance of Records, Making of Reports".

BASIC REQUIREMENT:

SEE ATTACHMENT I
SEE ATTACHMENT II (3/11/82 after tel/con R.A. Sevig)

DESCRIPTION OF POTENTIAL FINDING:

SEE ATTACHMENT I
This PFR is invalid because the current FSAR has a change to reflect the as built plant design even though the audit and BPC engineering said a change was not considered necessary. R.A. Sevig 3/17/82

PREPARED BY: Robert A Sevig DATE: 2/15/82

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

REJECTION OF ORIGINAL DESIGN ORG. COMMENTS BY: Robert A Sevig DATE: 3/11/82

B. REVIEW BY GA TASK LEADER

COMMENTS

Agree PFR should be invalid per above.
J Bunnell 3/17/82

☒ AGREE PF IS VALID BY J Bunnell DATE 2/22/82

☐ REQUEST RE-REVIEW BY _____ DATE _____

☐ DISAGREE BY _____ DATE _____

☒ REVIEW OF ORIGINAL DESIGN ORGS. COMMENTS BY: J Bunnell DATE: 3/17/82

C. REVIEW BY ORIGINAL DESIGN ORGANIZATION

COMMENTS

The requirements of 10CFR50.71(e) do not apply to the construction phase but are a requirement for operating nuclear plants.

2. Each deviation to a statement in the FSAR does not require an FSAR change. The function of Non-Conformance Reports (NCR's) is to technically disposition deviations from design criteria. Only when the required changes were to be used consistently in the design or construction process were FSAR changes implemented.

☐ AGREE PF IS VALID

☒ DISAGREE

BY: [signature] DATE: 3/2/82

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: L. L. Kontz DATE: 3/17/82

E. GA PROJECT MANAGER

☒ ACCEPT

☐ REJECT

BY: [signature] DATE: 3/18/82

[redacted]IC REQUIREMENT:

1) 19 Audits
..."Responsible management shall take necessary action to correct the deficiencies revealed by the audit."...

2) 4.2 Quality Assurance Engineers (Auditors) para. 11. "Perform follow-up of open items to assure..., acceptable corrective action is defined, ...and verify that corrective action is implemented. Verification actions will be documented..."

3) (e) Each person licensed...shall update periodically...the (FSAR) originally submitted... to assure that...the FSAR contains the latest material developed...The updated FSAR shall be revised to include the effects of: all changes made in the facility or procedures as described in the FSAR;...

DESCRIPTION OF POTENTIAL FINDING:

The potential finding is that the corrective action accepted was incomplete. Bechtel Engineering basing their decision to update the FSAR for facility or procedure changes on whether or not they consider such a change necessary, does not comply with 10CFR50.71(e) FSAR update requirements, stated above. If the concrete placement temperature was important enough for inclusion in the FSAR, then a change to that temperature must be updated in the FSAR per 10CFR50.71(e).

This audit found concrete placement for the containment #3 dome with field temperatures [redacted]eraging approximately 61.3°F and a range from 56°F to 67°F. This is in contrast to the [redacted]uirement "FSAR 3.8.1.6.1.8(F)...as close to 50°F as possible and not to exceed 55°F."

The recommended corrective action was as follows:

"1. Follow requirements for temperature control per Spec. Cs-C2 and FCR 1099-C.

2. Investigate records for temperature on previous placements of Containment 2 & 3 and write NCRs as required.

3. Project Engineer to evaluate lack of temperature control on an engineering basis, (and)

4. Evaluate Quality Program deficiency (FSAR) as per QPAM 15.1

5. If evaluation required a program (FSAR) change, initiate change notice as per P.I.P.M., etc."

The stated corrective action taken was the following:

"1. FCR No. 8571C has been written allowing the use of 70°F concrete in the Buttresses of the containment bldgs.

2. An NCR will be written for all concrete placements placed prior to the issuance of FCR No. 8571C concerning the exterior wall of containment bldgs. 2 & 3.

3. Engineering has evaluated temperature conditions on subject pours (see NCR C-1642).

4. This item has been evaluated by Engineering and is not considered to be significant in the context of PQAM 15.1.

5. An FSAR change is not considered necessary."

[redacted]

DEC 29 1977.

SAN ONOFRE NUCLEAR GENERATING STATION — NONCONFORMANCE REPORT — NO C-1642 — PAGE 1 OF 3

1. UNIT	2. MO DAY YR	3. DRAWING/PART NO.	REV.	4. ITEM DESCRIPTION	5. ITEM LOCATION
2&3	11 / 16 / 77	23000	5	CONCRETE PLACEMENT	UNIT #2&3 CONTAINMENT - EXTERIOR WALL

6. Q CLASS	7. STARTUP SYSTEM NO.	8. SERIAL NO	9. CONTRACTOR SUPPLIER	10. P. O. OR SPEC NO	11. REPLACEMENT PART
II	N/A	N/A	BECHTEL	N/A	P N N/A REV SER. NO.

12. INSPECTION CRITERIA/PLAN NO. LIST NO. CS-C2 — ☐ DWG ☒ SPEC ☐ OTHER
13. DISCOVERED DURING: ☐ REC'G ☒ CONST ☐ TEST
14. ASME AUTHORIZED INSPECTION REQ'D: ☐ YES ☒ NO
15. SKETCH ATTACHED: ☐ YES ☒ NO
16. EQUIP FURNISHED BY: ☐ CLIENT ☐ ENG ☒ FLD

ITEM	17. DESCRIPTION — LIST IN ORDER: NO. PCS., DWG/SPEC REQMT., PRESENT CONDITION	22. FIELD ENGR DECISION	23. DISPOSITION COMMENTS ☐ F. E. ☐ E. R. B.
1	SPEC. STATES THAT THE TARGET TEMP. OF CONCRETE SHALL BE LESS THAN 55°F FOR PLACEMENTS WHICH EXCEED 6 FEET IN THICKNESS; THE LEAST DIMENSION IN ANY DIRECTION. SEVERAL CONCRETE PLACEMENTS ON THE EXTERIOR OF UNITS #2&3 CONTAINMENTS HAVE BEEN PLACED	USE AS IS	TYPICALLY THE THICKNESS OF ALL BUT A VERY SMALL PORTION OF THE PLACEMENT [I.E. THE BUTTRESSES] IS 4'-4". THE AMOUNT OF CONCRETE GREATER THAN 6' FEET THICK THAT WAS PLACED AT A TEMPERATURE GREATER THAN 55°F IS NEGLIGABLE AND

QC DISCIPLINES AFFECTED: CIVIL ✓ ELECT ____ INSTR ____ MECH ____ WELDING ____

18. REPORTED BY: Kevin J. Sullivan
20. INSPECTION/VALIDATION/REVIEW DATE: H. A. Davis 11/16/77
24. PROJ. FIELD ENGR. REVIEW: W. S. Clem for R. H. CUTLER DATE 12/22/77
25. TWX/TELETON APPROVAL FOR REPAIRS/USE AS IS: EGS, PE/ERB L. MOON DATE 24-Nov-77

19. APPARENT CAUSE OF DISCREPANCY: C.F.E & Q.C.E OVERSIGHT
SIGNATURE Kevin J. Sullivan TITLE Q.C.E. DATE 11/16/77

26. QAE REVIEW (REF BLOCK 25): Burley W. Sizemore 12/22/77 DATE
L. Moon 12-29-77

27. DISPOSITION APPROVALS: PROJ. FIELD ENGR. W. S. Clem for R. H. CUTLER DATE 12/22/77 — PROJ. ENGR. DATE 12/30/77
AUTHORIZED INSPECTOR ____ QA ENGR. ____

21. RECOMMENDATION TO PREVENT RECURRENCE: COGNIZANT PERSONNEL HAVE BEEN MADE AWARE OF THIS NCR AND HAVE BEEN ADVISED TO GAIN PROPER CLARIFICATION ON ANY UNCLEAR DETAILS.
SIGNATURE Jon Liden TITLE CFE DATE 21-DEC-77

28. ACCEPTANCE OF NEW WORK/REWORK/REPAIRS:
QC ENGR ____ DATE ____ AUTHOR. INSP ____ DATE ____

29. QAE FINAL REVIEW ____ DATE ____

PF-864 (10079) 7/76

2408 PFR-FC47 JDR 3/15/82

CONTINUATION SHEET

SAN ONOFRE NUCLEAR GENERATING STATION — NONCONFORMANCE REPORT — NO. C-1642 — PAGE 2 OF 3

1. UNIT	2. MO DAY YR	3. DRAWING/PART NO.	REV	4. ITEM DESCRIPTION	5. ITEM LOCATION
2 & 3	11 16 77	23000	5	CONCRETE PLACEMENT	UNIT "2 & 3 CONTAINMENT - EXTERIOR WALL

ITEM	17. DESCRIPTION LIST IN ORDER: NO.PCS., DWG/SPEC REQMT., PRESENT CONDITION	22. FIELD ENGR DECISION	23. DISPOSITION/COMMENTS ☐ F.E. ☐ E.R.D.
	WHERE THE WIDTH OF THE BUTTRESS SECTIONS EXCEEDS 6 FEET AND "55° CONCRETE" WAS NOT USED. SEE ATTACHED SHEET FOR LIFT NUMBERS AND AVERAGE OF CONCRETE TEMPERATURES TAKEN.		WILL NOT AFFECT THE INTEGRITY OF THE STRUCTURE. W/L SE 12/23/77 ~~This nonconformance also deviates from ESAR 3.8.1.6.1.8(F).~~ ~~Bechtel QAE 12/23/77~~

PF-864 1 (10079) 9/75

4468-PFR-F047 SRE 3/15/78

2406 PFR-F047
JAC 3/6/82

UNIT #2			UNIT #3		
DATE OF PLACEMENT	LIFT NUMBER	AVERAGE CONC. TEMP.	DATE OF PLACEMENT	LIFT NUMBER	AVERAGE CONC. TEMP.
12-15-75	23-301-A	51°	9-2-76	23-311-A	67°
1-16-76	23-302-A	54°	9-23-76	23-312-A	62°
2-4-76	23-303-A	63°	10-7-76	23-313-A	65°
2-23-76	23-304-A	58°	10-28-76	23-314-A	60°
3-5-76	23-305-A	57°	11-10-76	23-315-A	64°
3-19-76	23-306-A	54°	12-1-76	23-316-A	57°
4-1-76	23-307-A	64°	12-13-76	23-317-A	63°
4-14-76	23-308-A	65°	12-22-76	23-318-A	61°
4-26-76	23-309-A	68°	1-5-77	23-319-A	59°
[redacted]-76	23-416-A	60°	8-19-77	23-426-A	63°
1-11-77	23-417-A	60°	9-2-77	23-427-A	63°
1-25-77	23-418-A	61°	9-16-77	23-428-A	58°
2-9-77	23-419-A	61°	9-29-77	23-429-A	59°
3-2-77	23-420-A	53°	10-12-77	23-430-A	60°
3-21-77	23-421-A	52°			
4-6-77	23-422-A	55°			
4-20-77	23-423-A	57°			
5-13-77	23-424-A	54°			

 N.C.R # C-1642

2405-PFR-F047

FIELD CHANGE REQUEST
SAN ONOFRE NUCLEAR GENERATING STATION
UNITS 2 & 3

NOV 07 1977

NO. 10079

1. PAGE 1 OF 1 — UNIT NO. 3

2. No. 8571-C

3. DATE 10/25/77

4. DWG. OR SPEC. 051 — REV. 3

5. TITLE CONTAINMENT DOME

DESIGN ORIGIN: ENGRG ☒ VENDOR ☐ (IDENTIFY) NAME

7. EXISTING CONDITION: CS-C2 PARA 9.7.1 REQUIRES 50°F CONCRETE FOR PLACEMENTS WHICH EXCEED 6' IN THE LEAST DIMENSION. THE CONTAINMENT SHELL PLACEMENTS EXCEED THE 6' LIMIT TYPICALLY IN 3 PLACES, AT THE BUTTRESSES.

8. CHANGE REQUEST / SKETCH

THE THICKNESS OF ALL BUT A VERY SMALL PORTION OF THE WALL (IE. THE BUTTRESSES) IS ~4'. THIS MAY BE TAKEN AS THE NOMINAL PLACEMENT THICKNESS AND THE PLACEMENTS MAY BE MADE WITH 70°F CONCRETE.

PLACEMENTS 23-431, 432, 433, 434, & 435

PROJECT ENGINEERING APPROVAL PER TELECON WITH L. MOON LMF 25-OCT-77
SUBJECT TO QAR # 934

10. REVIEWED BY — Date

CIVIL WJ Tuttle 10-25-77 — PIPE ____ ____

ELEC ____ ____ — INSTR ____ ____

MECH ____ ____ — NUC ____ ____

WELD ____ ____ — QAE [signature] 10/25/77

9. LMFISHER. PREPARED BY

11. APPROVAL OF FLD DISPOSITION

W.T. Quinn for R. H. CUTLER
Project Field Engineer
Date 10/25/77

PROJECT ENGRG APPROVAL: YES ☒ NO ☐ PROJ ENGR: [signature] Date 11/9/77

REMARKS: No Revision will be made to Dwgs 3031R3 & 3032R3
11-9-77

13. QUALITY ASSURANCE ENGINEER (FIELD): ____ Date ____

PP-924 11

2408-PFR-F047
~~3/15/82~~

BECHTEL

FIELD CHANGE REQUEST
SAN ONOFRE NUCLEAR GENERATING STATION
UNITS 2 & 3

NOV 20 RECD

NO. 10079

1. PAGE 1 OF 1

2. No. 1099-C

UNIT NO. 2&3

3. DATE MO 11 DAY 18 YR 75

4. F. DWG. OR SPEC. CS-C2 REV. 2

5. TITLE CONSTRUCTION SPECIFICATION - CONCRETE PLACEMENT TEMPERATURE

6. DESIGN ORIGIN: ENGRG ☒ VENDOR ☐ (IDENTIFY) NAME

7. EXISTING CONDITION:

PAR. 2.9.7 - THE TARGET TEMPERATURE OF CONCRETE SHALL BE LESS THAN 50°F FOR PLACEMENTS WHICH EXCEED 6 FEET IN THICKNESS, I.E., THE LEAST DIMENSION IN ANY DIRECTION.

8. CHANGE REQUEST / SKETCH

THIS CHANGE REQUEST APPLIES TO SPECIFICATION CS-C2 AND ALL RELATED DOCUMENTS.

CHANGE PARAGRAPH 2.9.7 TO READ

THE TARGET TEMPERATURE OF CONCRETE FOR:

A. PLACEMENTS WHICH EXCEED 6 FEET IN THE LEAST DIMENSION.

B. CONSECUTIVE PLACEMENTS WHICH EXCEED A TOTAL OF 6 FEET IN THICKNESS AND FOR WHICH THE ELAPSED TIME BETWEEN PLACEMENTS IS LESS THAN 14 DAYS,

SHALL BE AS CLOSE TO 50°F AS POSSIBLE.

AS MUCH ICE AS POSSIBLE SHALL BE USED TO MAINTAIN A CONCRETE TEMPERATURE AS CLOSE TO 50°F AS POSSIBLE BUT NOT EXCEEDING 55°F.

10. REVIEWED BY:

CIVIL Bodert Date 11.19.75

ELECT. _____ _____

MECH _____ _____

WELDING _____ _____

QAE [signature] for 11/19/75

9. PREPARED BY: D. P. GALLAHER

11. APPROVAL OF FIELD DISPOSITION:

[signature] 11-19-75

Project Field Engineer Date

PROJECT ENGRG APPROVAL: YES ☒ NO ☐ PROJ ENGR: [signature] Date 12/4/75

REMARKS: TELECON APPROVAL PER L. HERSH 11/18/75 DPJ

Document will be revised accordingly [signature] 12/3/75

13 QUALITY ASSURANCE ENGINEER: _____ Date _____

B. Clean-Up Preparation

Before depositing concrete, all equipment is cleaned. Debris is removed from spaces to receive concrete. Reinforcement and other metal to be embedded is thoroughly cleaned of all loose rust, scale, and/or coatings that might impair the bond. All compacted soil, rock, or concrete surfaces to receive concrete are thoroughly wetted before placement.

C. Construction Joint Placement

To the maximum extent possible, concrete is deposited continuously to provide monolithic units in the construction as shown on the approved engineering design drawings. Construction joints are provided in accordance with details as shown on the approved engineering design drawings where the size of large slabs or lengths of continuous strips so dictate. Adjacent vertical placements have a minimum curing time of 3 days. In all cases, concrete is deposited in such a way as to prevent water from collecting at the ends and corners of forms and along form faces during placement.

All contiguous vertical concrete construction joints to receive additional lifts of concrete are moist cured. Newly placed concrete is moist cured by continuous application of water for the first 7 days after the concrete has been placed. As soon as unformed surfaces of concrete have hardened sufficiently to prevent surface damage through application of curing procedures, an intermittent fine spray of water is applied as necessary to keep such surfaces continually moist for not less than 7 days.

D. Placement Limitations

Concrete is deposited in horizontal layers between 12 to 24 inches, and is not allowed to flow a distance of more than 5 feet from point of deposition.

E. Segregation

Concrete is not dropped through dense reinforcing steel, which might cause segregation of the coarse aggregate. Concrete is not dropped free from a height of more than 6 feet.

F. Concrete Temperature Control

19 | The target temperature of concrete shall be less than 50F for placements that exceed 6 feet in thickness; i.e., the least dimension in any direction

The target temperature for placements greater than 3 feet in the least dimension and less than or equal to 6 feet in the least dimension shall be 70F. The target temperature for placements less than or equal to 3 feet in the least dimension shall be 85°F and the maximum temperature for placement shall not exceed 90°F. 19 26

The total thickness for consecutive placements shall be determined by adding all placements made within a lapsed time of 14 days. This total thickness in the least dimension shall be used in determining the target temperature as indicated in the above paragraph. 19

G. Weather Precautions

During cold weather, if the air temperature drops below freezing at night, or if the mean daily temperature falls below 40F for more than 1 day during the period when concrete is being placed, concrete is placed in accordance with the Recommended Practice for Cold Weather Concreting, ACI 306. The concrete shall be maintained at a temperature no lower than 50F for at least 72 hours after it is placed. No additional protection from freezing will be required if that temperature is maintained for that length of time by means of insulation in contact with the form or concrete surfaces. Foundation forms can be stripped 24 hours after concrete is placed.

Concrete, when deposited in the forms during cold weather, is required to have a temperature of not less than the following:

Air Temperature (°F)	Less than 2-1/2 feet in Least Dimension (°F)	Mass Concrete In excess of 2-1/2 feet Least Dimension (°F)
30 to 45	60	50
0 to 30	65	55

During hot weather, when the ambient temperature is greater than 80F, concrete is placed in accordance with ACI 305, Recommended Practice for Hot Weather Concreting.

Before depositing concrete in any form or on any surface, cool water is sprinkled on all surfaces and reinforcement steel. Wind breakers are used to prevent wind from blowing over the concrete surface prior to the initiation of curing.

2408-PFR-F047 SE 3/15/82

SAN ONOFRE NUCLEAR GENERATING STATION UNITS 2 & 3	PROCEDURE
TITLE FIELD CONTROL OF NONCONFORMING ITEMS	NO. 15.0 REV 11
	PAGE 1 OF 5
	ISSUED 10-11-74
QUALITY PROGRAM	REVISED 10-7-80

QUALITY ASSURANCE MANAGER	PROJECT MANAGER		
GBlum	PKnapheide		

1.0 PURPOSE

To describe the procedure for the identification, control and dispositioning of items or services that do not conform to the requirements of the purchase order, specifications, drawings and applicable regulatory requirements.

2.0 GENERAL

2.1 This procedure applies to all Quality Class I and II and ASME Code nonconformances discovered in receiving, storage, construction, fabrication, installation and test. These nonconformances shall be identified, segregated from acceptable material (if practical), documented on a Nonconformance Report (NCR), shown as Exhibit 15.0-1, and dispositioned as outlined in this procedure.

- NCRs may be initiated by Project Field Quality Control, Project Field Engineering, Project Field Quality Assurance and Startup.
- Quality Class I, II and ASME Code nonconformances are generally reported by Project Field Quality Control.
- Nonconformances may be procedural (document deficiencies) as well as physical (dimensional deficiencies).
- NCRs shall be initiated when Items are received with a Supplier Deviation Disposition Request (SDDR) that contains any deviations that are open after delivery.
- Dispositions affecting ASME Code items will require concurrence by the Authorized Nuclear Inspector (ANI).
- Nonconformances that affect the Client's scope of responsibilities shall be processed in accordance with the Client's Quality Assurance Program.
- Nonconformances may be dispositioned by the Project Field Engineer (PFE) as "rework" or "reject" (return to Supplier or scrap) or by an Engineering review as "repair", "use as is". Nonconforming items may be "conditionally released" under certain conditions as specified in WPP/QCI-006.

2408 PFR F047
SDC 3/15/82

General Atomic Company

QUALITY ASSURANCE DEPARTMENT

Record of Long Distance Telephone Call

Party: Called ☒ Calling ☐

Date: 3/10/82

Time: Completed 4:20
Started 10:20, 1:20, 3:10, 4:05
On-line 115 minutes

Name ~~FRED MARSH~~ → SHELLY FREED 6X273

Company BPC

Location WITTIER

Telephone No: A/C 213 No. 946 1811

Discussion BPC position is that changes, other than physical size (some of these may also not get reported) resulting from a NCR are acceptable without an FSAR update if analyses can show that the deviation can be allowed without affecting the design bases of the plant.

I explained that per Reg. Guide 1.70 rev. 2 pg. IV, "the FSAR should describe in detail the final design of the plant as constructed", and since via an NCR a field change was made to the procedure to allow concrete placement in the buttress end of both domes 2 & 3 at temperatures to 70°F in lieu of 50°F, that this should be reflected in FSAR Paragraph 3.8.1.6.1.8 (F) Concrete Temperature Control.

He said it was a matter of a difference in philosophy, & said that since all the buttresses of both domes had concrete placed at a higher temperature than called out in the FSAR, this constituted an as built condition which should be reflected in the FSAR.

Record Made by Robert A Jewett

Distribution: S. Bresnick

2408 PFR F047

ATTACHMENT II

I discussed with Shelly Freed of BPC on 3/10/82 the FSAR update requirements of Regulatory Guide 1.70, which are the same as stated from Reference (3) Attachment I. He said that on deviations from the FSAR, unless the design basis of the plant is affected, an update is not necessary.

All the buttress areas in the walls of the domes of SONGS 2&3 were placed with concrete temperatures above the FSAR maximum for the buttress thickness. Per the last sentence of the original design organization's Statement No. (2), this change was consistently used for the buttress construction and should be covered by an FSAR change.

The following quote from Regulatory Guide 1.70 talks of changes from the criteria, design and bases. There is no qualification that these are limited to those items impacting the validity of the original design.

> "Changes from the criteria, design, and bases set forth in the PSAR, as well as any new criteria, designs, and bases, should be identified in the FSAR. The reasons for and safety significance of each change should be discussed. The FSAR should describe in detail the final design of the plant as constructed."

Robert C Seeley
3/15/82

IMPACT ASSESSMENT

2408 PFR NO. F047

AFFECTED ITEM: "As-built" Accuracy of FSAR

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 ?

   N/A

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

   No

5. ARE OTHER SIMILAR DEVIATIONS LIKELY TO EXIST ?

   Yes

6. OTHER COMMENTS:

   The FSAR supporting the application for operating license does not accurately reflect the criteria and design data of SONGS 2&3 as built. This is contrary to Regulatory Guide 1.70 requirement that the FSAR "describe in detail the final design of the plant as constructed." Also, it could impede the NRC's work, when tracking problems between like plants after SONGS 2&3 are operating.

PREPARED BY: Roberta Serig DATE: 3/15/82

COMMENTS: None

BY: J. Bramel DATE: 3/15/82

2408 PFR NO. F056

REVISION --

POTENTIAL FINDING REPORT
SONGS 2&3 SEISMIC DESIGN VERIFICATION

A. PREPARATION BY GA INITIATOR

AFFECTED ITEMS:

Pipe Support 203, 178, 466 (GA item: 30, 28, 31)

REQUIREMENT REFERENCE DOCUMENTS:

PIPM Section 8.14.2, Rev. 24 dated 10/16/81

cancelled; see Impact Assessment H C Hopkins 3-12-82

BASIC REQUIREMENT:

"EGS or designee shall note in Block 12 if they approve the FCN and initial or sign the appropriate space."

"The PE or designee shall then initial or sign and date the document as well as PE space in line 14."

DESCRIPTION OF POTENTIAL FINDING:

Block 12 - no EGS initials or signature were noted. Block 14 - no PE initials or signature were noted.

GA Item	FCN without initial or sign.
30	7
28	1
31	1

PFR - F056 - Invalid Bechtels Authorized Signature List (sample attached) designates single person to sign for Project Engineering H C Hopkins 3-11-82

PREPARED BY: H C Hopkins JT DATE: 2-15-82

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

REJECTION OF ORIGINAL DESIGN ORG. COMMENTS BY: H C Hopkins JT DATE: 3-10-82

B. REVIEW BY GA TASK LEADER

COMMENTS

Agree PFR should be Invalid based on comment above.

S Bennett 3/11/82

Above comment deleted - PFR is valid since work is not per PIPM. SB 3/15/82

☒ AGREE PF IS VALID BY S Bennett DATE 3/19/82

☐ REQUEST RE-REVIEW BY _____ DATE _____

☐ DISAGREE BY _____ DATE _____

☒ REVIEW OF ORIGINAL DESIGN ORGS. COMMENTS BY: S Bennett DATE: 3/16/82

C. REVIEW BY ORIGINAL DESIGN ORGANIZATION COMMENTS

The FCN's were developed to make minor field modifications to pipe support or hanger designs. Section 8.14.2 stated that blocks 12 and 14 through 16 are to be completed as appropriate to complete the conversion. Since the use of this document (FCN) has severe limitations on its use we have deemed it inappropriate to require both the EGS and the PE designee (same person) to sign twice in block 12. We have also decreed it not appropriate to complete blocks 14 and 16.

☐ AGREE PF IS VALID

☒ DISAGREE

BY: Keith R Mark DATE: 3/3/82

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

Procedural violation. However, FCN was reviewed

BY: S. L. Koutz DATE: 3/17/82

E. GA PROJECT MANAGER

☒ ACCEPT

☐ REJECT

BY: A K Mawson DATE: 3/18/82

8.12.3 VOIDING A DCN

A DCN may be voided by the following methods:

- Issuing a drawing revision and stating "VOID DCN NO._____" in the revision block.
- Issuing another DCN and stating "VOID DCN NO._____" in the Description of Change block.
- Stamping the word "VOID" in the Description of Change or Change request/Sketch block of an original DCN or a copy of an FCR converted to a DCN and adding a letter "V" after the DCN subnumber. The EGS or authorized designee must then initial and date the DCN under the VOID stamp and forward the DCN to DDC for filming, distributing and filing.

8.12.4 DCN PREPARATION PROCEDURE (Refer to the DCN form, Exhibit 8-B and Figure 8-2, DCN PREPARATION FLOW DIAGRAM)

8.13 REQUESTING OF PRINTS FROM SUPERSEDED OR VOID DRAWINGS

Prints requested from "superseded" or "void" stamped microfilm aperture cards shall be stamped "superseded" or "void", as appropriate, on the face of the print.

8.14 FIELD CHANGE NOTICE

The Field Change Notice (FCN) (Exhibit 8-F) is used by Field Engineering to notify Project Engineering of changes to the Engineering design documents and to Supplier Drawings approved for construction. They are to be prepared in accordance with WPP/QCI-038 and require PFE or designee approval before proceeding with the work.

NOTE

The use of FCN's is restricted to Pipe Hanger or Pipe Support activities.

2408-PFR-F056
SQE 3/12/82

Bechtel Power Corporation

Interoffice Memorandum

To L. W. Hurst

File No. S023-704-AF

Subject San Onofre units 2 & 3
Bechtel Job 10079
Authorized Signature
for FCR, FCN, NCR

Date September 16, 1981

From R. L. Rogers

Of Engineering

At LAPD, B-47E Ext. 201

Copies to C. Mitchhart
W. D. Nichols
A. Stenersen
C. Wreath

This IOM is to confirm verbal authorization previously given for the following individuals who are authorized to sign FCR's and FCN's for Plant Design and Pipe Support drawings and specifications.

D. Radcliffe _____ Signature _____ DLR Initials

D. Letcher _____ Signature _____ DL Initials

The following individual is the authorized EGS for Plant Design.

D. Capito _____ Signature _____ DJC Initials

R. L. Rogers

CM:jv

MAR 1 1 1982
rec'd
MAR 1 1 1982
HCN

LAD-0600 (STANDARD) 11/76

1347-9234

Name Printed	Signature	Initial	Project Position	Employee No.	Discipline
C. Mitchhart			Project Quality Engr.	713740	Q.E.
H. Nazarian			Deputy EGS	313394	C/S
M. Noesges			EGS Designee	712981	Plant Design
J. Purucker			Deputy EGS	620068	Nuclear
T. E. Richardson			EGS	370772	Nuclear
R. L. Rogers			Project Engineer	403458	Engineering
A. G. Sassi			Deputy EGS	407682	Mechanical
E. A. San Jose			EGS Designee	502948	Control Sys.
R. A. Schilling			EGS Designee	789666	Nuclear
[redacted] Schilling			EGS	617830	Architectural
A. G. Syriotis*				S94800	
R. Walia			EGS	316091	Control Sys.
K. Walvekar			EGS	713929	Mechanical
G. Wickenberg			EGS Designee	619582	Mechanical
L. Wiedemann*				304921	Mechanical
K. Williams			Deputy EGS	408263	Plant Design
J. Woo			EGS Designee	616583	Electrical

* Also authorized to sign all discipline's FCR's, FCN's, DCN's, SPR's, TER's, Drawings, NCR's and Conditional Releases past fuel load for Project Engineer.

** Also authorized to sign all discipline FCR's, FCN's, DCN's, SPR's, TER's, Drawings, NCR's in absence of L. Wiedemann.

[redacted] Also authorized to sign Conditional Releases past fuel load.

2408-PER-F056
DC 3/12/82

Revision 34

SAN ONOFRE NUCLEAR GENERATING STATION
UNITS 2 & 3

AUTHORIZED ENGINEERING SIGNATURE LIST

Name Printed	Signature	Initial	Project Position	Employee No.	Discipline
L. Allen	L. M Allen	LMA	Deputy EGS	A34040	Control Sys.
R. Armour**	R Armour	RFA	EGS Designee	404160	Mechanical
H. Campos	H. A. Campos	HAC	Deputy EGS	C06360	Electrical
D. Capito	David H. Capito	DHC	EGS	711748	Plant Design
W. Drummond**	William Drummond		Senior Engineer	288103	Plant Design
B. Duncil[xxx]	B Duncil	BD	FSAR Deputy Supv.	564737	Nuclear
D. Edgar**	Dan Edgar	DE	Eng.-S/U Interface	E15228	Electrical
H. Forster	H Forster	HF	Quality Engineer	310905	Q.E.
S. Freid	S. W. Freid	SWF	APE	417610	Engineering
A. Garza[x]	Armando Garza, Jr.	AG.	Pipe Support Coordinator	502648	P/S
J. E. Gutmann	J E Gutmann	JG	APE	791849	Engineering
E. Hatzler	Erwin Hatzler	EH	EGS	315753	Electrical
R. Hermann	R. W. Hermann	RWH	EGS Designee	792616	Plant Design
R. Johnson[xx]	R Johnson	RJ	Environmental Coordinator	582311	Electrical
K. Lee	Ken Lee	KL	EGS Designee	L32082	Electrical
A. Lopez	Alfredo Lopez	AL.	EGS	408786	C/S
J. MacKinnon	J MacKinnon	JMK	APE Designee	M04480	Engineering
[illegible]ahlmeister	J. Muehlmeister	JEM	APE	618136	Engineering

2408-PFR-F032
LTC 3/12/82

Bechtel Power Corporation

Interoffice Memorandum

To L. Hurst

File No. S023-704-AF Log OF-2386

Subject San Onofre Units 2 & 3
Bechtel Job 10079
Authorized Engineering
Signature List, Rev. 34

Date December 22, 1981

From R. L. Rogers

Of Engineering

At LAPD, B-47E Ext. 201

Copies to C. A. Blum
D. Lobree
E. Luder
J. Sheppard
C. Unick
Individuals on list

Attachment: (1) Authorized Engineering Signature List, Revision 34

The attached list supersedes only Revision 33 of this list and indicates those individuals authorized by Project to approve Project documents in accordance with the Project Internal Procedures Manual and the notations on the attached signature list.

R. L. Rogers

CM:jv

Rec'd
MAR 1 1 1982
NCH

LAC-0600 (STANDARD) 11/74

1347-9225

Also authorized to sign their discipline FCR's, FCN's, DCN's, SPR's, TER's, Drawings and N[redacted]

Authorized to sign environmental documentation only.

x Authorized to sign all FSAR documentation only.

Project Engineering and QAE approval are required before an FCN becomes valid for installation acceptance.

8.14.1 FCN LIMITATIONS

FCN's may be used except for the limitations given below.

The relocation of Engineering designed pipe supports beyond allowances given in CS-P207 require Engineering approved FCR's.

The pipe supports and characteristics of pipe supports listed below require Engineering approved FCR's:

1. Project Class A and B pipe supports.
2. Main Steam and Main Feedwater pipe supports for 18" diameter and larger pipe.
3. Pipe supports for Steam Generator Blowdown lines inside the Containment Buildings.
4. Type and size of pressure boundary welds on piping.
5. Bearing and reinforcing collars on Schedule 10S and 20S piping.
6. Pipe supports with loading conditions for which the PE does not have design guidelines.
7. Pipe supports that will become inaccessible at a later date.

8.14.2 RESPONSIBILITY

The FCN is submitted to the Project Engineering office through Project Administration for approval.

Project Administration will maintain a log of FCN's to track the submittal, disposition, and return of the original to the CDM. Project Administration will distribute the original to the appropriate Discipline EGS, if required, after making a copy to keep in a pending file for reference and backup in the event of loss or damage of the original. (This copy can be removed and disposed of when the original is returned to the CDM.)

DRAWING PREPARATION

Prior to returning the original FCN to the CDM, a copy of the dispositioned FCN will be made for distribution to Quality Engineering (QE) and Project files. In the event that the FCN is converted to a Specification Change Notice (SCN) or DCN, copies will also be given to the Project Control Center or DDC as appropriate.

Project Engineering Office may convert an FCN to a DCN or SCN as necessary.

In the event that no conversion is made to the FCN, the Discipline Engineer, Project Engineer, or designees shall cross out blocks 12B through 12E on the FCN and complete block 12 on the form by noting in the remarks that the FCN will be incorporated in the next revision to the document it is written against.

If the FCN is to become an SCN or DCN, the Discipline Engineer, Project Engineer or designees shall complete blocks 12B through 12E, 14, 15 and 16 as appropriate to complete the conversion. The EGS or designee shall note in block 12 if they approve the FCN and initial or sign the appropriate space. The PE or designee shall then initial or sign and date the document as well as the PE space in line 14.

The Quality Engineer or Quality Assurance representative shall sign line 15 and date the document.

After completion of all necessary approvals, the FCN or converted FCN/SCN/DCN is returned to Project Administration for processing as noted above.

NOTE

All Pipe Support FCN's must be incorporated into DCN's within 90 days of the sign off of the FCN unless a written extension is granted by the Project Engineer. The same personnel authorized to sign approval of FCR's may also approve FCN's.

2408-PFR-F056
JR 3/12/82

Rev. 23 Date 06-25-81

DRAWING PREPARATION

SAN ONOFRE NUCLEAR GENERATING STATION
UNITS 2 & 3

FCN /DCN/SCN

JOB NO. 10079

1. FCN NO.
DATE
2. PAGE ___ OF ___
1 UNIT NO.

12A. QUALITY CLASS
12B. SPEC ADDEND NO.
12C. DCN SUB NO.
12D. DATE
12E. SCN NO.

4. REF. DWG. OR SPEC SHEET NO. REV. 5. TITLE

6. DESIGN ORIGIN ENGRG ☐ VENDOR ☐ (IDENTIFY) NAME

7. EXISTING CONDITION.

8. CHANGE NOTICE/SKETCH

TYPICAL

10. REVIEWED BY DATE

CIVIL ___ ___ PIPE ___ ___
ELEC ___ ___ INSTR ___ ___
MECH ___ ___ NUC ___ ___
WELD ___ ___ QAE ___ ___

9. ___
PREPARED BY

11. APPROVAL OF FLD DISPOSITION
___
PROJECT FIELD ENGINEER
DATE ___

12. PROJECT ENGRG APPROVAL YES ☐ NO ☐ EGS ___ P.E. ___ DATE ___

REMARKS ___

13. QUALITY ASSURANCE ENGINEER (FIELD) ___ DATE ___

14. SCE ENGINEERING APPROVAL ___ P.E. ___ DATE ___

15. DESIGNEE QUALITY ENGINEER QUALITY ASSURANCE ___ DATE ___

16. ADDITIONAL DISTRIBUTION

Exhibit 8-F FIELD CHANGE NOTICE/DCN/SCN (Sheet 1 of 2)

2408-PFR-F056
3/12/82

General Atomic Company

QUALITY ASSURANCE DEPARTMENT

Record of Long Distance Telephone Call

Party: Called ☒
Calling ☐

Date: 3-4-82

Time: Completed 1645
Started 1600
On-line 15 min

Name Mitch Mitchhart

Company Bechtel

Location Whittier

Telephone No: A/C 213 No. 946 1819 x352

Discussion Line Busy 1111

PFR F077 - agreed to invalidate on basis of Bechtel comment.

PFR F056 - Bechtel comment insufficient to invalidate F056. Practice not per PEPM. Mitch stated there is an approval list that authorizes same person to sign for EGS and PE. Mitch will review / modify Bechtel comment and send sample of approval list. This may provide information to invalidate F056.

Record Made by W C Norris

(ILLUSTRATION NCN)

SAN ONOFRE NUCLEAR GENERATING STATION
UNITS 2 & 3

FCN /DCN/SCN

002-1 JOB NO. 10079 C/(OCII)

1. FCN NO. 161-S	12a. QUALITY CLASS I	12c. DCN SUB NO. 06
DATE 4-12-79		12d. DATE AUG 6 1980
2. PAGE 1 OF 1	12e. ACCESS NO.	12f. SCN NO.
3. UNIT NO. 2		

4. DWG. OR SPEC. SHEET NO. REV. 5. TITLE
SI-033-H-002 0 PIPE SUPPORT ASSEMBLY

6. DESIGN ORIGIN: ENGRG ☒ VENDOR ☐ (IDENTIFY)

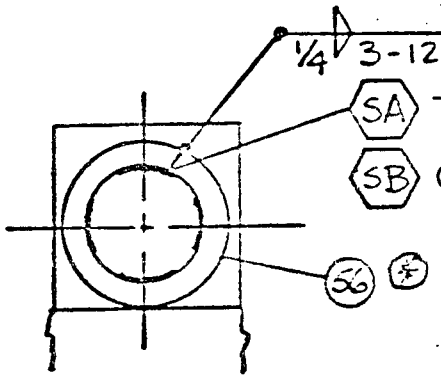
7. EXISTING CONDITION:

ADD FIELD WELD IDENTIFIERS.

8. CHANGE NOTICE/SKETCH

CHANGE "PLAN @ EL. (-) 10'-1" " PARTIALLY AS SHOWN:

LATE CONVERSION



PLAN @ EL. (-) 10'-1"

SITE FILE COPY

NOTE: NO NEW MAT'L. REQ'S.
WORK IN CONJUNCTION
WITH FCR 20715-S.

PL 2754

PROJECT ENGINEERING APPROVAL PER

10. REVIEWED BY DATE

CIVIL ____ ____
ELEC ____ ____
MECH ____ ____
WELD ____ ____
PIPE [signature] 4-27-80
INSTR 0 ____
NUC ____ ____
DAE [signature] 5-6-80

9. PAUL FORBES PREPARED BY [signature]

11. APPROVAL OF FIELD DISCIPLINE PROJECT FIELD ENGINEER [signature]
DATE 4-12-79

12. PROJECT ENGRG APPROVAL YES ☑ NO ☐ EGS ____ P.E. R.L. [illegible] DATE 5-3-80

REMARKS: TO BE INCORPORATED CONCRETE ____ DATE ____

QUALITY ASSURANCE ENGINEER (FIELD) [signature] DATE 5-6-80

ENGINEERING APPROVAL ____ P.E. [signature] DATE ____

15. BECHTEL QUALITY ENGINEER QUALITY ASSURANCE ____ DATE 8-13-80

16. ADDITIONAL DISTRIBUTION ____

IMPACT ASSESSMENT

2408 PFR NO. F056

AFFECTED ITEM: Pipe Supports 203, 178, 466

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 ?

   Very unlikely

5. ARE OTHER SIMILAR DEVIATIONS LIKELY TO EXIST ?

   Yes

6. OTHER COMMENTS:

   Bechtel's practice of designating one individual to sign for Project Engineering approval on FCNs is not according to the PIPM. Bechtel's authorized signature memos do not explicitly sanction this practice but suggest that indirectly this is the intent of the memos. This practice is very unlikely to degrade safety.

PREPARED BY: H C Hopkins DATE: 3-16-82

COMMENTS: None

BY: J. Bunnell DATE: 3/16/82

PFR NO. 2408-PFR-F057

REVISION _____

POTENTIAL FINDING REPORT
SONGS 2&3 SEISMIC DESIGN VERIFICATION

A. PREPARATION BY GA INITIATOR

AFFECTED ITEMS: Control Room Relay Panels 2L-71 and 3L-71

REQUIREMENT REFERENCE DOCUMENTS: Quality Class II Specification for Quality Class II Panels, Relays and Devices for the Southern California Edison Company San Onofre Nuclear Generating Station, Units 2 and 3, San Onofre, California. Specification Number SO23-306-1, SCE Number 3274, July 31, 1975.

BASIC REQUIREMENT: Section 3.10A in Appendix 3.10A of the FSAR requires that the actual service mounting condition of equipment be accounted for in seismic qualification by test or analysis.

DESCRIPTION OF POTENTIAL FINDING:

Although paragraph 4.6.3.3 of this specification states that flexibility of the foundation anchorage detail must be considered in the calculation of the system natural frequencies, there is no information provided in the specification from which the anchorage flexibility could be included in the analysis or test.

PREPARED BY: J. Rakowski DATE: 2/25/82

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 _____ DATE 2/24/82

☐ REQUEST RE REVIEW BY _____ DATE _____

☐ DISAGREE BY _____ DATE _____

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

C. REVIEW BY ORIGINAL DESIGN ORGANIZATION COMMENTS

See attached sheet.

☐ AGREE PF IS VALID

☒ DISAGREE

BY: Fred B Maslak DATE: 3/2/82

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: L. A. Kouts DATE: 3/17/82

E. GA PROJECT MANAGER

☒ ACCEPT

☐ REJECT

BY: [illegible] DATE: 3/18/82

nent to
?R-F057

The provisions of Paragraph 4.6, the flexibility of the foundation aunt for the composite flexibility of thcion to the rigid mounting surface provi surface is designed generically by Bechng of structural steel embedments anclial flexibility under consideration face, within the base frame and conneupplier. Therefore incorporation into the the embedded rigid mounting interfac the equipment base flexibility by th

The embedded steel anchorage is id it consists of C6 X 10.5 (rolled st 16 inch spacing. The base frame ogs S023-306-1-7 and -31, and it con fillet weld on 6 inch lengths at 12 1/

The integrated mounting detail ously rigid for the light weight panethe seismic qualification of the pasider a fixed boundary condition at thporate any refinement to account for tteel interface embedded in the concre

X 201 F

[illegible] X [illegible]
3/2/82

As shown on the a[illegible] [illegible] design has assessed the [illegible] the drawings organization and [illegible] of the steel anchore [illegible] the concrete flor. [illegible] may be considered [illegible] flexibility referenced the [illegible] be that above the fl[illegible] [illegible] therefore [illegible]
5/82

Concur with [illegible] invalidate this [illegible] [illegible] (J. [illegible]) is [illegible] this [illegible]

ATTACHMENT TO
2408 - PFR - F057
~~JC~~ 3/18/82

FO 57: J. RAKOWSKI'S NOTES

I agree with F. Maud's statement that the base can be treated as rigid. From my viewpoint, the Bechtel C6 x 10.5 channel in the concrete is rigid compared to the C3 x 4.1 channel making up the base of the cabinet, therefore their statement in the pre-encasing anchorage flexibility should pertain to the cabinet base rather than the heavier floor railing design. However, before writing the final PFR version, vendor drawings 5023-306-1-7631 should be received to verify the base connection. These drawings were requested from Shelly Freid of BPC by JER on 3/4/82.

The subject drawings were received on 3/5/82 and the connection of C3 x 4.1 cabinet base channel to the embedded C6 x 10.5 channel was verified. Hence this PFR 057 can be declared invalid.

2408 PFR NO. F066

REVISION --

POTENTIAL FINDING REPORT
SONGS 2&3 SEISMIC DESIGN VERIFICATION

PREPARATION BY GA INITIATOR

AFFECTED ITEMS: Pipe Support: 167, 203, 826, 116, 178, 93, 77, 466, 146, 52, 200, 152, (GA Item #23, 30, 32, 21, 28, 26, 25, 31, 22, 24, 29, 27)

REQUIREMENT REFERENCE DOCUMENTS: PIPM Section 14.4.4 Rev. 10 dated 3-9-81

BASIC REQUIREMENT: Attachments must be numbered, dated, identified with a title and the calculation number, and initialed by the responsible engineer to indicate approval of the contents.

JM 3/16/82

DESCRIPTION OF POTENTIAL FINDING: Attachments to the calculations as follows: Drawings and change notices/requests were not initialed by the R.E. nor dated. See attached Table.

PREPARED BY: John N. Shaumann DATE: FEB 16, 1982

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

REJECTION OF ORIGINAL DESIGN ORG. COMMENTS BY: John R. Shaumann DATE: 3/9/1982

B. REVIEW BY GA TASK LEADER COMMENTS

☒ AGREE PF IS VALID BY J. Burrid DATE 2/17/82

☐ REQUEST RE-REVIEW BY _____ DATE _____

☐ DISAGREE BY _____ DATE _____

☐ REVIEW OF ORIGINAL DESIGN ORGS. COMMENTS BY: J. Burrid DATE: 3/10/82

2408 PFR NO. F066

REVISION - -

C. REVIEW BY ORIGINAL DESIGN ORGANIZATION COMMENTS

The reference material does not contain any portion of the calculation. These sheets were included in the calculation package for reference convenience only as indicated by the "Reference Material Only" stamp on the face of the page. These pages serve to aid in latter review of the calculation, however, they are not required to complete the calculation. The calculation cover sheet does indicate these attached reference sheets by FCR or DCN number.

☐ AGREE PF IS VALID

☒ DISAGREE

BY: Fred B Marsh DATE: 3/2/82

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

Procedural violation of minor importance

BY: S. L. Koutz DATE: 3/12/82

E. GA PROJECT MANAGER

☒ ACCEPT

☐ REJECT

BY: [illegible] DATE: 3/13/82

2408 PFR No F066

Attachment 1

Description of Potential Finding

ATTACHMENTS TO CALCULATIONS NOT TABLED
PER PIPM SECTION 14.4.4

GA ITEM	PIPE SUPPORT NUMBER	SUPPORT TAG NO.	CALC. NO.	PAGES LACKING R.E. INITIALS & DATE
23	167	S2-S1-059-H-008	P 450-1.44-570	4
30	203	S2-S1-033-H-007	P 450-1.44-415	3
		S2-S1-033-H-002	P 450-1.44-413	3
32	826	S2-S1-002-H-029	P 450-1.44-180	2
21	116	S2-S1-043-H-020	P 450-1.50-169	12
28	178	S2-S1-031-H-003	P 450-1.44-410	4
26	93	S2-S1-004-H-013	P 450-1.44-211	6
25	77	S2-S1-002-H-020	P 450-1.44-171	6
31	466	S2-S1-038-H-031	P 450-1.44-458	5
22	146	S2-S1-059-H-009	P 450-1.50-211	6
24	52	S2-S1-109-H-005	P 450-1.44-654	7
		S2-S1-109-H-003	P 450-1.44-653	8
29	200	S2-S1-063-H-005	P 450-1.50-222	3
27	152	S2-S1-067-H-002	P 450-1.44-580	4

2408-PFR-F066
Ltr 3/12/82

General Atomic Company

QUALITY ASSURANCE DEPARTMENT

Record of Long Distance Telephone Call

Party: Called ☑ Calling ☐

Date: MARCH 10, 1982

Time: Completed 9:20
Started 9:10
On-line 10 MINUTES

Name DAVE CAPITO

Company BECHTEL

Location WHITTIER - SONGS PROJECT OFFICE

Telephone No: A/C 213 No. 946 1819 X-201

Discussion REVIEW OF FACTS, PROCEDURAL REQUIREMENTS STATED IN PIPM SECTION 14.4.4, AND DISAGREEMENTS ON SUBJECT PFR F066 PER GA PROJECT PROCEDURE 2408-PD-3 DATED 1/22/1982.

F066 - DAVE CAPITO TO CHECK AND FIND OUT WHY ATTACHMENTS TO THE SUBJECT F066 WERE NOT DATED AND INITIALED BY THE RESPONSIBLE ENGINEER.

DAVE CAPITO CALLED ON 10 MARCH 1982 AT 2:04 PM AND SPOKE WITH THE WRITTER REGARDING THE PFR NO. F066. I POINTED OUT TO HIM THAT IN THE CALCULATIONS FOR PIPE SUPPORT 93, SHEET 12 OF 17 AND SHEET 13 OF 17 WERE INSERTED AS REFERENCE MATERIAL ONLY WITHOUT BEING DATED, IDENTIFIED WITH A TITLE, OR INITIALED BY THE RESPONSIBLE ENGINEER TO INDICATE APPROVAL OF THE CONTENTS.

MR. CAPITO AGREED WITH ME REGARDING THE FINDING SHOWN ON F066, AND STATED THAT BECHTEL WILL REVIEW, INITIAL, AND IDENTIFY THE ATTACHMENTS WITH THE TITLE TO MEET THE REQUIREMENT OF PIPM SECTION 14.4.4. REV. 10 DATED 3/9/81.

BASED ON THE FOREGOING, I FEEL THAT THIS FINDING IS VALID AND BECHTEL DID NOT COMPLY WITH PIPM SECTION 14.4.4 REV. 10 DATED 3/9/1981.

Record Made by John N. Skarmeta

Distribution:

IMPACT ASSESSMENT

PFR NO. F066

AFFECTED ITEM: Pipe Support: 167, 203, 826, 116, 178, 93, 77, 466, 146,52, 200 and 152.

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 ?

   Unlikely

5. ARE OTHER SIMILAR DEVIATIONS LIKELY TO EXIST ?

   Yes

6. OTHER COMMENTS:

   I FEEL THAT THIS IS A PROCEDURAL VIOLATION AND DOES NOT CONSTITUTE ANY SAFETY HAZARD.

PREPARED BY: John D. Shumaker DATE: 3/10/1982

COMMENTS: None

BY: J. Brand DATE: 3/10/82

2408-PFR-F06G
SDE 3/12/82

CALCULATION SHEET

SO23-1.44-21
CALC NO.

SIGNATURE _____ DATE 3/6/80 CHECKED SP DATE 3/7/80

PROJECT SONGS UNITS 2 & 3 JOB NO. 10079-003

SUBJECT PIPE SUPPORTS SHEET 1 OF 17 SHEETS

RECEIVED: 3-5-80 BHA

IAG: S2-SI-004-H-012

FCR # S-1551 REV. 3

13867-S REV. 3

DESIGN VERIFICATION

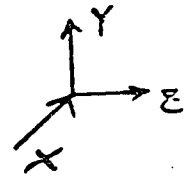
☐ DESIGNED BY ENGINEERING JUDGEMENT

☒ DESIGNED BY CALCULATION REF. SEE ATTACHED SHEETS

REFERENCE DESIGN DATA

STRESS PROBLEM NO. S 82 REV. 3 PR. NO. 93

STRESS ISO NO. 1204-008-1 REV. NO. _____



	DL	TL	MOVTS
Y:	-1287	+3357/-2243	X: +.01/-.308
Z:	+19	+3928/-546	

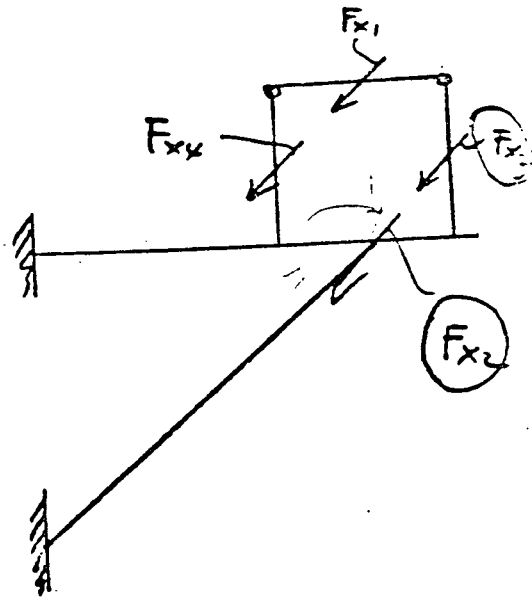
FRICTION LOADS

$F_{x1} = .3\ (3357) = 1007^{\#}$

$F_{x2} = .3\ (2243+1287) = 1059^{\#}$

$F_{x3} = .3\ (3928+19) = 1184^{\#}$

$F_{x4} = .3\ (546) = 164^{\#}$



9-26-80

LATEST LOADS PER PR.# 82, REV. 1 ARE:

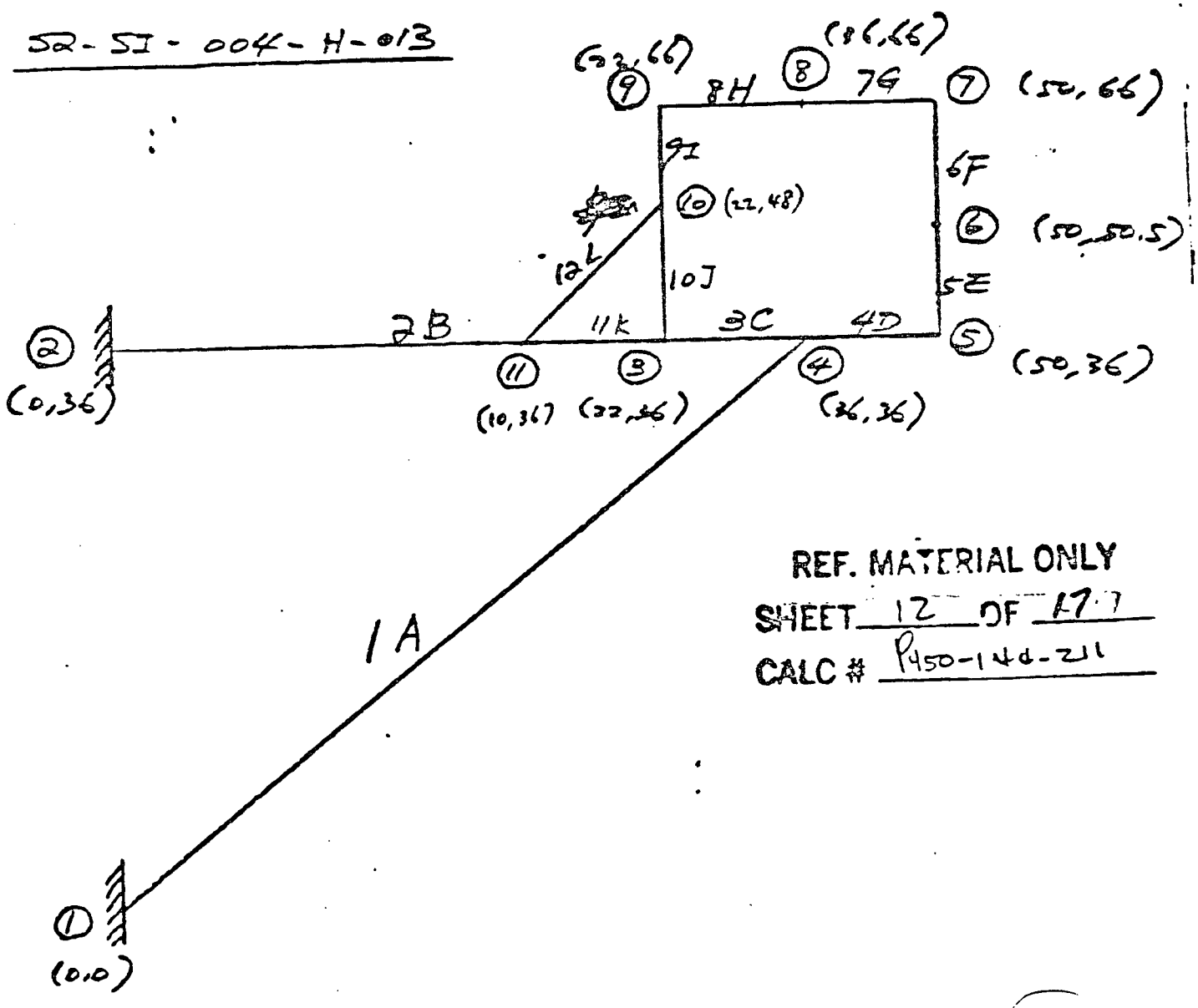
$F_Y = +6,603 \ / \ -8,063$

$F_Z = +7,001 \ / \ -8,600$

THESE CALCULATIONS WERE PRODUCED BY
INTERNATIONAL CONSULTING ENGINEERS

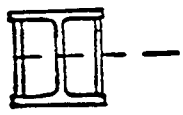
2405-PFR-F066
Sec 3/12/82

(2) 52-SI-004-H-013



REF. MATERIAL ONLY
SHEET 12 OF 17
CALC # P450-144-211

1) AGHL I = 11.3 , A = 3.82

2) BCDEFIJK I = 13.9 , A = 6.42 ⟶ 

LOADING COMB.

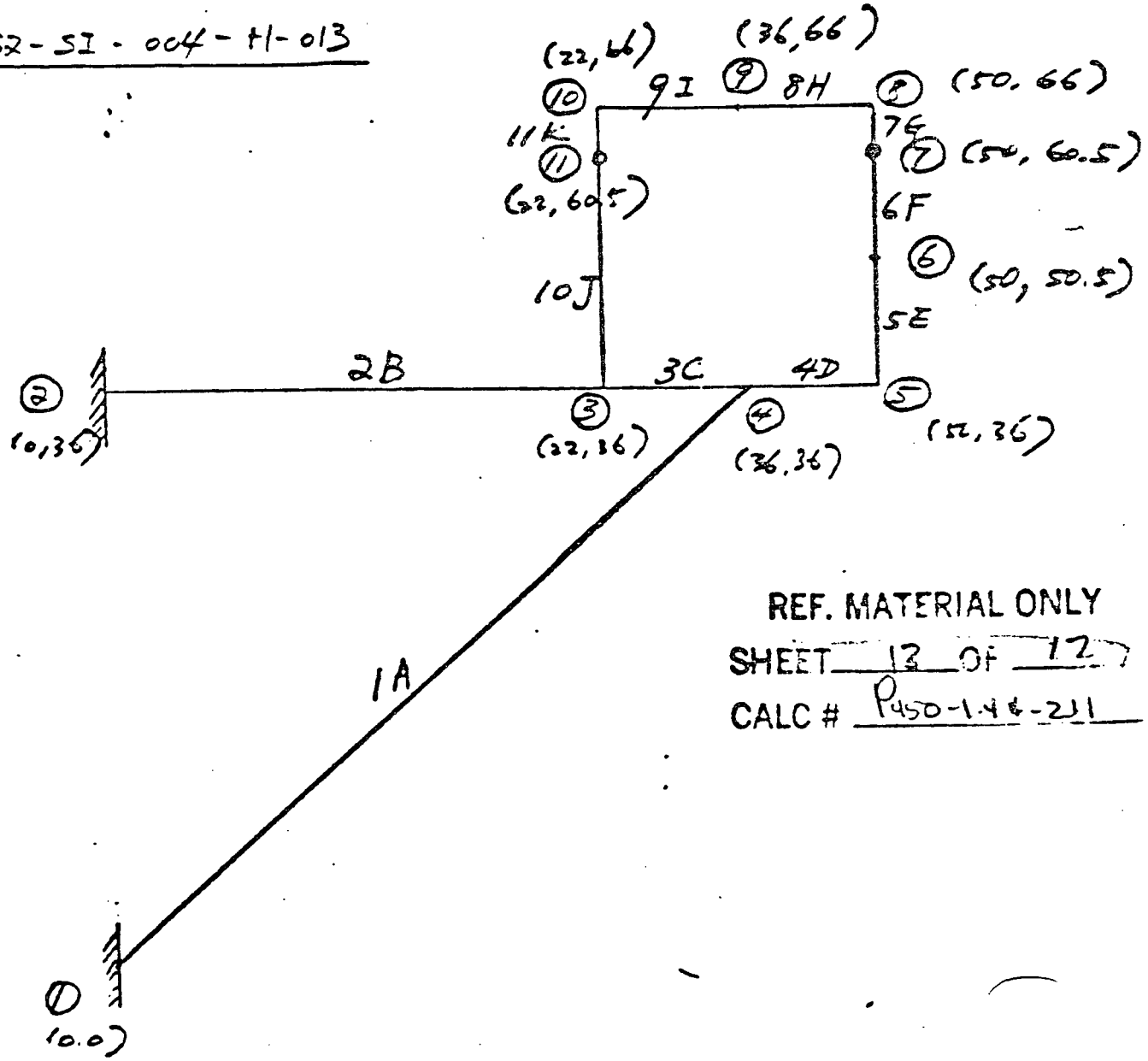
1) { #4 ⟶ 0 ↓ +8500# ↻ 0
   { #6 ⟶ +12500# ↓ 0 ↻ 0

2) { #8 ⟶ 0 ↑ -7000# ↻ 0
   { #6 ⟶ +12500# ↓ 0 ↻ 0

2408-PFR-FOGG
Lde 3/12/82

D

52-SI-004-H1-013



REF. MATERIAL ONLY
SHEET 13 OF 17
CALC # P450-1.46-211

1) A B C D E F H I J I = 11.3 , A = 3.87

2) G K I = .488 , A = .937

LOADING COMB.

1) { #4 → 0° +8500# ↓ 2°
   { #6 +12500# → ↓ 0° 2°

2) { #9 → 0° -7000# ↑ 2°
   { #6 +12500# → ↓ 0° 2°

2408 PFR NO. F069

REVISION

POTENTIAL FINDING REPORT
SONGS 2&3 SEISMIC DESIGN VERIFICATION

A. PREPARATION BY GA INITIATOR

AFFECTED ITEMS: Those portions of structures, systems or components whose continued function is not required but whose failure could reduce the functioning of any Seismic Category I plant feature.
REQUIREMENT REFERENCE DOCUMENTS:

SEE ATTACHMENT I

BASIC REQUIREMENT:

SEE ATTACHMENT I

DESCRIPTION OF POTENTIAL FINDING:

The potential finding is that SCE did not comply with Regulatory Guide 1.29. Position C.4 (quality requirements for safety impact items and from the boundary of all Seismic Category I items to the first seismic restraint) from August 1973 through the present, 2/82. (For the discussion, see Attachment I).
The NRR has accepted these alternate methods via the FSAR for SONGS 2&3 and for regulatory guide 1-29 are within their prerogative to do so, therefore this PFR is invalid. Alberta Lewis 3/10/82

PREPARED BY: Alberta Lewis 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 should be invalid. SCE did not violate the NRC-approved program J Russell 3/10/82

☐ AGREE PF IS VALID BY _____ DATE _____

☑ REQUEST RE-REVIEW BY J Russell DATE 3/10/82

☐ DISAGREE BY _____ DATE _____

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

PFR NO. _____

REVISION _____

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	☐ FINDING

JUSTIFICATION:

CLASSIFICATION CRITERION NO. RESULTING IN "FINDING" _____

COMMENT ON "OBSERVATION" CLASSIFICATION

BY: S. L. Kouts DATE: 3/17/82

E. GA PROJECT MANAGER

☒ ACCEPT I agree that this PFR is INVALID. Further this gets into an area that is outside the scope of this program (i.e. the procedures used in the construction and fabrication process). Therefore any judgement concerning a minute part of the program (e.g. last paragraph of page 6) is of no consequence to this program and of questionable validity, if not invalid, when taken in the context of the entire construction/fabrication program.

☐ REJECT

BY: H. Weinman DATE: 3/18/82

2408 PFR 069

Attachment I Summary

SUMMARY

SCE stated in a PSAR amendment (10/72) that SONGS 2&3 "will be designed to be compatible with applicable portions of AEC Safety Guide 29. Implementation of Safety Guide 29 will be discussed in detail in the FSAR." Regulatory Guide 1.29 Rev. 1 was issued in August of 1973. Regulatory Guide 1.29 position C.4 imposed 10CFR Appendix B, Quality Assurance requirements, on "those portions of structures, systems, or components whose continued function is not required, but whose failure could reduce the functioning of any Seismic Category I plant feature." Position C.1 imposes 10CFR50 Appendix B on all Seismic Category I plant features.

The Regulatory Guide allows submittal of alternate methods or solutions different from those set out in the guide. SCE in their FSAR, 3/77, adopted guide position C.1, as is, and proposed alternate methods for position C.4. which were accepted by the NRR (nuclear reactor regulators).

These alternate methods and solutions are reduced so far from the Appendix B to 10CFR50 requirements that I believe their acceptability is questionable. For example, only 15% of the 13 pertinent activities controlled by Appendix B to 10CFR50 were addressed in the FSAR, namely, designing and inspection.

Only design reviews were mentioned under design control in the FSAR. Nothing was said about control of design approval, release, distribution and revision. Nothing was said about delineation of acceptance criteria for inspection and tests; or design changes including, field changes. Also, appendix B to 10CFR50 Criteria V "Instructions, Procedures and Drawings" and VI "Document Control," which impact criterion III "Design Control," were not addressed in the FSAR alternate method.

Inspection was only partly covered being limited to those inspections performed during plant erection. These inspections are performed by field engineers independent from the performing organization per criterion X requirement, but not having sufficient freedom from cost and schedule, or to take corrective action as required by criterion I of Appendix B to 10CFR50.

However, this review was not conducted to check the performance of the NRR. The NRR has accepted these alternate methods via the FSAR for SONGS 2&3 and are within their prerogative to do so, therefore this PFR is invalid.

Robert A Sweeney 3/12/82

ATTACHMENT I

REQUIREMENT REFERENCE DOCUMENTS:

1) Regulatory Guide 1.29, Rev. 1, August 1973, Regulatory Position C.1.

2) Same document as (1), Positions C.2, C.3 and C.4.

3) 10CFR50 Appendix B, Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants.

4) Paragraph 2 of letter, Log BE 3092, 10/5/76, J. D. Houchen, BPC, to D. F. Martin, SCE, Subject: "SONGS, Unit 2&3, Bechtel Job 10079, Regulatory Guide 1.29 - Positions C.2 and C.4, File S023-600-A."

   NOTE: The following pertinent data referenced by the above letter was not found by CDMC at the site: "(A) CN-1730, 8/10/76, Subject: QA Requirements Imposed on the Design of Safety Impact Items, (B) SCE letter to BPC, 9/9/76, Subject: Compliance with Regulatory Guide 1.29, Rev. 1, and (1) Safety Impact Items Compliance Information" (an enclosure with original BPC letter).

5) Same document as (4), Paragraphs 5, 7 and 8.

6) Same document as (3), Criteria X and VII.

7) ANSI N45.2-1971, 2.0 Quality Assurance Program.

8) SONGS 2&3 FSAR, Appendix 3A, Comparison of Design with NRC Regulatory Guides, 3A.1, NRC Regulatory Guides.

9) Regulatory Guide 1.29, Rev. 2, February 1976, D. Implementation.

10) Letter, 2/22/1982, J. J. Adrian, SCE, to G. L. Wessman, TPT, Subject: Telecopy Memo, dated February 22, 1982, from G. L. Wessman to J. Adrain/ J. K. Thomas.

11) Same document as (8), Section 3A.1.29.3 Paragraph C.2 of the Regulatory Guide.

12) Same document as (8), Section 3A.1.29.4, Paragraph C.3 of the Regulatory Guide.

BASIC REQUIREMENT:

1) "...Seismic Category I.. The pertinent quality assurance requirements of Appendix B to 10CFR Part 50 should be applied to all activities affecting the safety related functions of these structures, systems, and components...".

2) "...Those portions of structures, systems,or components whose continued function is not required but whose failure could reduce the functioning of any plant feature"...(Seismic Category I). (Also, for Seismic Category I items)..."requirements should extend to the first seismic restraint beyond the defined boundaries... The pertinent quality assurance requirements of Appendix B to 10CFR Part 50 should be applied to the safety requirements of those portions of structures, systems and components..."

3) "...The pertinent requirements of this appendix apply to all activities affecting the safety-related functions of those structures, systems, and components; these activities include designing, purchasing, fabricating, handling, shipping, storing, cleaning, erecting, installing, inspecting, testing, operating, maintaining, repairing, refueling and modifying.

As used in this appendix, "quality assurance" comprises all those planned and systematic actions necessary to provide adequate confidence that a structure, system, or component will perform satisfactorily in service..."

4) "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."

5) "...All items, regardless of Q-class, undergo receiving inspection whereby shipments are checked against the packing list and purchase order for count, condition, and identification..."

"Vendors providing Quality Class III and IV items are not required to implement quality assurance programs in accordance with 10CFR50, Appendix B, and source inspection is not required for all standard, commercial items."

"Additional quality assurance provisions for safety impact items are not considered necessary, based on consideration of the following factors (per ANSI N45.2-1971):..."

6) "A program for inspection...shall be established...to verify conformance with the documented instructions, procedures, and drawings for accomplishing the activity. Such inspection shall be performed by individuals other than those who performed the activity being inspected."

"Measures shall be established to assure that purchased material, equipment, and services...conform to the procurement documents. These measures shall include provisions, as appropriate, for source evaluation and selection, objective evidence of quality furnished by the contractor or subcontractor, inspection at the contractor or subcontractor source, and examination of products upon delivery..."

7) "Regardless of the methods or levels used, the program shall provide for the assurance of quality consistent with applicable codes, standards, and other requirements. As a guideline, some factors to be considered in assigning methods or levels of quality assurance are as follows:..."

8) "This appendix discusses the conformance of plant design with the guidelines presented in NRC Regulatory Guides 1.1 through 1.96...Where the design differs from the Regulatory Guide, alternative methods of providing an equivalent level of safety have been utilized:..."

9) and 10) Quoted in the discussion.

11) 3A.1.29.3 Paragraph C2 of the Regulatory Guide

Items that would otherwise be classified non-Seismic Category I, "but whose failure could reduce the functioning" of items important to safety "to an unacceptable safety level," are to be "designed and constructed so that the DBE would not cause such failure." In addition, Paragraph C.4 of the guide recommends that the pertinent quality assurance requirement of Appendix B to 10CFR50 should be applied to the safety requirements of such items. Both of these recommendations are followed by applying the following practices to such items:

A. Design and design control for such items are carried out in a similar manner as that for items directly important to safety. This includes the performance of appropriate design reviews.

B. Field work is performed under the direction of experienced field construction superintendents and is inspected by the staff of field engineers stationed at the site. The field engineers are responsible for verifying that construction is performed in accordance with the design drawings and specifications and with applicable standard codes and specifications.

12) 3A.1.29.4 Paragraph C.3 of the Regulatory Guide

"...to the first seismic restraint beyond the defined boundaries." In addition, Paragraph C.4 of the guide requires that "the pertinent quality assurance requirement of Appendix B to 10CFR50 should be applied to the safety requirements" of such items. Both these requirements are considered to be met adequately by applying the following practices to such items:

A. Design and design control for such items are carried out in a similar manner as that for items directly important to safety. This includes the performance of appropriate design reviews.

B. Field audits are performed by representatives of the originating design group to assure that the final installation of such items is in accordance with documents that formed the basis for the seismic analysis of the items.

POTENTIAL FINDING - DISCUSSION:

This audit was concerned with QC (quality control) inspection of the mounting of safety impact items and the audit is covered by PFR Report No. 2408 PFR F048. The potential finding reported here was discovered during review of data used to verify implementation of the audit's corrective action.

Reference (2), position C.2 imposes the same Quality Assurance (QA) on "Safety Impact Items" as for Seismic Category I and position C.3 does the same from their boundary to the first seismic restraint. Reference (3) defines these "pertinent requirements" as 16 activities from "designing" to "modifying".

Reference (4) acknowledges that the items of (2) require "pertinent" QA per Appendix B to 10CFR50. It further states: "These safety impact items are designated QC III or IV by the project..."

Reference (5) details BPC's QC Class III and IV receiving inspection, and control of purchased material requirements. These do not comply with the 10CFR50 Appendix B, QA requirements for these same quality activities, see Reference (6).

Reference (5) states that based on ANSI N45.2-1971 no additional QA for safety impact items are considered necessary. Reference (7) provides a guideline for establishing quality levels as stated in Reference (5), however the first sentence makes it clear that such a classification must comply with QA requirements of applicable codes, standards, and other requirements.

Reference (7) was presented as the basis for Reference (5) not complying with the reference (2) stated QA requirements. The last sentence of (7) states that the following list was: "a guideline...to be considered in assigning...levels of Quality Assurance..." However, the first sentence states: "Regardless of the...levels used, the program shall provide for the assurance of quality consistent with applicable...other requirements."

Reference (8) adopted the reference (2) QA requirements, and these constitute "other requirements" per Reference (7). Therefore, reference (7) does not establish (5), but (5) shows itself at variance with (7) via (8), as well as (2) per the above discussion.

The verification action taken for this audit, block 17 by BPC QAE, lists reference (4) as the Engieenring justification, and its acceptance by SCE as per "Tel con with R. Rogers verifying SCE acceptance (Ray to Bashore, 10/26/76)." This shows SCE accepting BPC's position on Reference (2).

Via reference (8), "this appendix discusses the conformance of plant design with the guidelines presented in NRC Regulatory Guides 1.1 through 1.96...", SCE has committed to comply with Regulatory Guide 1.29, positions C.2, C.3 and C.4. BPC's quality assurance program for SONGS 2& 3 is deficient in at least 8 of the 16, reference (6), "pertinent" QA activities for safety impact items.

If SCE opted to submit other methods and solutions to those of Position C.4, they were required to submit them to the NRR shortly after August 1973 for evaluation as stated in Reference (1), "Methods and solutions different from those set out in the guides will be acceptable if they provide a basis for the findings requisite to the issuance or continuance of a permit or license by the commission."

Via reference (9) "except in those cases in which the applicant proposes an acceptable alternative method...the method described herein is being and will continue to be used in the evaluation...", the commission makes it clear that if the methods followed are different than the guide, they must be submitted for evaluation.

Reference (10) states that: "The following information is provided to respond to the request contained in the reference memo.

1. PSAR Amendment 16 (10-19-72) Page 1.8-h includes a compliance position with Safety Guide 29 (June 1972). This Safety Guide does not include positions C2, C3 or C4.

2) FSAR appendix 3-A (original Issue of 3-21-77) Pages 3A-8, -9 and -10 includes a compliance position with Regulatory Guide 1.29 Revision 1 (August 1973). This Regulatory Guide Revision introduced positions C2, C3 and C4.

The above reference PSAR/FSAR pages are enclosed for your information. These constitute the only written communications between SCE and the NRC on compliance with Regulatory Guide 1.29 for San Onofre Units 2 and 3."

Reference (11) states that "the pertinent quality assurance requirement of the appendix B to 10CFR50 should be applied..." This misquotes the guide, reference (1) which talks of "...pertinent...requirements...". The pertinent requirements per (3) are 16 activities. Reference (3) has 18 specific criteria of quality assurance which apply to these pertinent activities. The pertinent activities for safety impact items, which should have had alternate methods and

solutions presented in (11) are the following: designing, purchasing, fabricating, handling, shipping, storing, cleaning, inspecting, erecting, installing, repairing, modifying and testing. The criteria of Appendix B to 10CFR50 that apply to safety impact items are the following: 1) organization; 2) quality assurance program (suppliers); 3) design control; 4) procurement document control; 5) instructions, procedures and drawings; 6) document control; 7) control of purchased material, equipment and services; 8) identification and control of materials, parts and components; 9) control of special processes; 10) inspection; 11) test control; 12) control of measuring and test equipment; 13) handling, storage and shipping; 14) inspection, test and operating status; 15) nonconforming materials, parts or components; 16) corrective action; 17) quality assurance records; and 18) audits.

Reference (11) proposes alternate methods and solutions for only 3 of the 13 pertinent reference (3) activities applicable to safety impact items, namely designing, erecting and installing. Reference (11) mentions only design review as the design control measure, while reference (3) criteria 3, 5 and 6 impose many controls on the designing activities.

Reference (11) states that field work is inspected by field engineers. Field engineers are "other individuals...than those who performed the activity being inspected..." as required per Criterion 10, reference (6), but do not have sufficient organizational freedom "including sufficient independence from cost and schedule" as required by Criterion 1, reference (3). (This matter is reviewed in PFR 2408 PFR F048.)

Reference (12) proposes only design review, which is inadequate design control (see above discussion) and auditing, to comply with reference (3) requirements. Many of the pertinent activites and criteria of reference (3) discussed above regarding reference (11), safety impact items, apply to reference (12) quality assurance requirements from the seismic Category I item boundary to the first seismic restraint.

The alternate methods and solutions per (11) and (12) for reference (3) imposed per (2) and adopted by SCE per(8), are inadequate in the area of design control and do not meet Criterion 1 for inspection, and totally neglect to address 70% to 80% of the pertinent activities requiring quality assurance per (3). These alternate methods and solutions are reduced so far from the Appendix B to 10CFR50 requirements per Regulatory Guide 1.29 position C.4, that their acceptability is questioned.

PFR NO. 2408-PFR-F072

REVISION _____

POTENTIAL FINDING REPORT
SONGS 2&3 SEISMIC DESIGN VERIFICATION

A. PREPARATION BY GA INITIATOR

AFFECTED ITEMS: Splice Box 2BB4RZTB03

REQUIREMENT REFERENCE DOCUMENTS:

1. Calculation for junction box supports C270-01-03, Sheets 25 thru 76.
2. Explanation Report Drawing 34705 (Rev. 83 Run 146, Page 11).

BASIC REQUIREMENT:

~~Not Applicable~~

The seismic design adequacy of components should be documented.

DESCRIPTION OF POTENTIAL FINDING: Splice Box 2BB4RZTB03 serves the safety injection tank T008 leakage drain valve HV9341. This box is described in the explanation report, Ref. 2 as being 18x18x8 inches, however, seismic design of the support for this box size is not covered in the calculations contained in Ref. 1.

I AGREE WITH BECHTEL COMMENTS, THIS PFR IS CONSIDERED INVALID. Darwin 3-15-82

PREPARED BY: R. D. Darwin Darwin DATE: 2-24-82

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 [signature] DATE 3/24/82

☐ REQUEST RE-REVIEW BY _____ DATE _____

☐ DISAGREE BY _____ DATE _____

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

PFR NO. 2408-PFR-F072

REVISION _____

C. REVIEW BY ORIGINAL DESIGN ORGANIZATION

COMMENTS

Junction box calculation have been performed for most frequently used boxes and the largest size in a representative group. Thus the analysis for the 18 X 18 X 8 box are covered by the calculations performed for the box 18 X 24 X 12 (Sheets 67-76 of C270-01-03). The analyses are performed for the limiting (i.e., largest) size for a particular group.

Concur with reviewer's recommendation to in-validate this PFR. (See front pages for reviewer's comments ☺.) FSD 3/15

☐ AGREE PF IS VALID

☒ DISAGREE

BY: Zachary Mansk DATE: 3/3/82

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. Kouts DATE: 3/17/82

E. GA PROJECT MANAGER

☒ ACCEPT

☐ REJECT

BY: [illegible] DATE: 3/18/82

PFR NO. 2408-PFR-F082

REVISION _____

POTENTIAL FINDING REPORT
SONGS 2&3 SEISMIC DESIGN VERIFICATION

A. PREPARATION BY GA INITIATOR

AFFECTED ITEMS: Safety Injection Line to Reactor Coolant Loop 1A, pipe support at node 178, calculation TAG S2-SI-031-H-003.

REQUIREMENT REFERENCE DOCUMENTS:

Calculation for integral attachment of pipe support S2-SI-031-H-003, Rev. 1, Node 178, PSG 82, dated 2-3-82 and piping stress analysis package S-82, M1204-002-2B.

BASIC REQUIREMENT:

The shear stress in weld between Item 56 and Pipe should be calculated by acceptable analytical methods.

DESCRIPTION OF POTENTIAL FINDING:

Pipe used in analysis of pipe support is .25" in thickness, (16" - Sch 10) whereas pipe shown in calc No. M1204-002-2B is 0.188" in thickness (16" - Sch 10S). Formula derived for Q is not calculated properly. Formula used to calculate shear stress τ is not correct. Value given to τ cannot be obtained from the values shown in calculation. See attached Bechtel calculation sheet.

PREPARED BY: M. A. Koploy M. Koploy DATE: 2/25/82

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 _____ DATE 2/25/82

☐ REQUEST RE-REVIEW BY _____ DATE _____

☐ DISAGREE BY _____ DATE _____

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

PFR NO. 2408-PFR-F082

REVISION

C. REVIEW BY ORIGINAL DESIGN ORGANIZATION

COMMENTS

We agree that the thickness of pipe used in the subject calculation was incorrect. It should have been 0.188" and not 0.25". The formula for Q is correct however the parameters used were in error. The formula used to calculate τ is correct.

A corrected calculation is attached which describes in more detail the development of the formulas used.

This calculation concludes that the stress in the weld is below the allowable.

☒ AGREE PF IS VALID

☐ DISAGREE

BY: E B Marsh for DJP DATE: 3-5-82

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

Errors in calculations. However, allowables are not exceeded

BY: S. L. Kouts DATE: 3/12/82

E. GA PROJECT MANAGER

☒ ACCEPT

☐ REJECT

BY: A H Weisman DATE: 3/13/82

Attachment To 2408-PFR-F&E

CALCULATION SHEET

LAO 0513 8-73

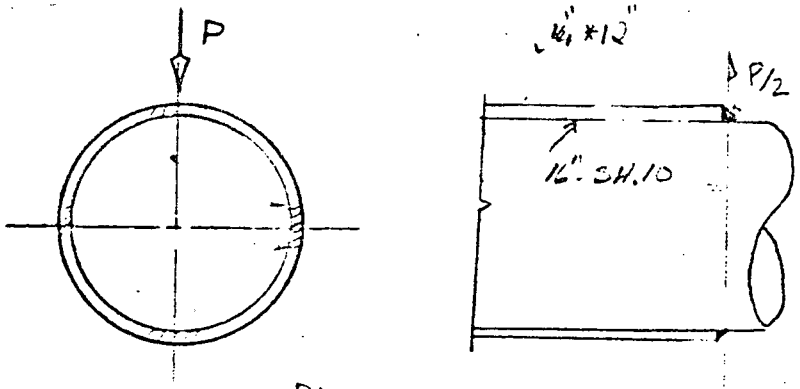
CALC. NO.

SIGNATURE P P Shah DATE 2-3-82 CHECKED RP DATE 2-5-82

PROJECT SONGS 2 & 3 JOB NO. 10079.002

SUBJECT SR-SI-031-H5083 SHEET 8 OF 8 SHEETS

STRESS IN WELD BET^N ITEM 56 & PIPE.



STRESS DUE TO SHEAR P/2 OVER HALF THE SLEEVE LENGTH.

$I_{sleeve} = \pi r^3 t = \pi(8)^3(.25) = 402\ IN^4$

$I_{PIPE} = 384\ IN^4 + 322.4$

$I_T = 786\ IN^4$

$Q = \int_{sleeve} y\,dA = \frac{\pi r^2}{2} \cdot \frac{2r}{\pi} = r^3$

$q = \frac{VQ}{I} = \frac{P/2 \cdot r^3}{786} = \frac{12150 * 8^3}{21736} = 4254.9\ LB/IN$

$\tau = \frac{q}{t} = \frac{4254.9}{.447} = 8080\ PSI < 9570\ PSI$ OK

STRESS DUE TO V_c

TWIST @ PIPE ℓ $= V_c * 19.75"$

$= 70 * 19.75 = 1382\ IN\text{-}LB$

$= 1382/2 = 691\ IN\text{-}LB/END$

$\tau = \frac{T \cdot c}{J}$

$= \frac{691 * 2}{-19.6} = 75\ PSI$

$\tau_{TOTAL} = 8080 + 85 = 8165\ PSI < 9570$

$J = r^2 A$

$= 7^2 \cdot \pi \cdot .447$

$= 69.6\ IN^4$

MOMENT OF INERTIA OF PIPE WALL AS PER ASME CODE

CALCULATION SHEET

Revision 1 date 3/12/82

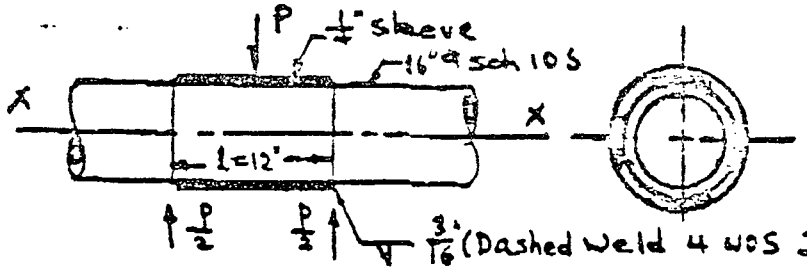
CALC. NO.

SIGNATURE Z. Dash DATE 3-3-82 CHECKED [illegible] DATE 3-3-82

PROJECT SONGS 2 & 3 JOB NO. 10079003

SUBJECT S2-SI-031-H003 SHEET 8 OF 8 SHEETS

Stress In Weld Between Item 56 & Pipe



Stress due to shear P/2 per half of sleeve length: $L/2 = 6"$

$I_{sleeve} = \pi r_s^3 t_s = \pi \cdot 8^3 \cdot 0.25 = 402\ in^4$ ✓

$I_{pipe} = \pi r_p^3 t_p = \pi (7.906)^3 \cdot 0.188 = 292\ in^4$ (16"ø sch 10S). ✓

Total $I = 694\ in^4$ ✓

$dF = \sigma_x dA = \int_A \frac{dM}{I} y\, dA$ * ✓

$q = \frac{dF}{dx} = \frac{1}{I} \int_A \left(\frac{dM}{dx}\right) y\, dA = \frac{V}{I} \int_A y\, dA = \frac{VQ}{I}$ ✓

where, $Q = \int_A y\, dA = \int_0^{\pi} r_s \sin\theta\,(r_s d\theta \cdot t) = 2 r_s^2 t_s = 2 \times 8^2 \times 0.25 = 32\ in^3$

$q = \frac{dF}{dx} = \frac{VQ}{I} = \frac{\frac{P}{2} \cdot 32}{694} = \frac{13156 \times 32}{2 \times 694} = 303$ lb/in length of sleeve

Total force acting on the upper half sleeve: $F = \int_0^{\frac{l}{2}} q\, dx = 303 \times 6 = 1818$ lb/END

This force is resisted by two welds (total 4" long).

$\tau = \frac{F}{4 \times 0.1875 \times 0.707} = \frac{1818}{0.53025} = 3429$ psi < 9570 psi

where, throat size = 0.1875×0.707 (even resisted only by one weld $\tau = 6857$ psi, well below the allowable)

Stress Due to V_c

$T = V_c \times 19.75 = 1382$ in-lb or, 691 in-lb/END

$J = r^2 A = 8^2 \times (8 \times 0.707 \times 0.1875) = 68$ in^4

$\tau = \frac{T \cdot C}{J} = \frac{691 \times 8}{68} = 81$ psi ( ) 2", 3/16" weld #4

$\therefore \tau_T = 3429 + 81 = 3510$ psi

Conclude stress in weld is below allowable.

* Timoshenko, E.P. Popov, "Strength of Materials" Part I, 3rd edition PP 116.117

IMPACT ASSESSMENT

2408-PFR-F082
PFR NO. _____

AFFECTED ITEM: Safety Injection LIne to Reactor Coolant Loop 1A, Pipe Support at Node 178, Calculation Tag S2-SI-031-H-003

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 ?

   ~~NA~~ I DO NOT KNOW. MK.

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

   NA

5. ARE OTHER SIMILAR DEVIATIONS LIKELY TO EXIST ?

   This is the only calculation I have reviewed where this particular deviation occurred. It is possible that it could happen in other calculations but I have not seen any.

6. OTHER COMMENTS:

   See attached sheet. M.K

PREPARED BY: M. Koploy M. Koploy DATE: 3/10/82

COMMENTS:

Agree with impact assessment.

Note that BPC's original calculation is dated 2/3/82, which is late than the date when we initiated the request for the document.

BY: [signature] DATE: 3/10/82

Attachment to Impact Assessment - PFR No. 2408-PFR- F082

Other Comments

There are several concerns identified in PFR No. 2408-PFR-F082. Bechtel's responses are discussed further as follows:

1. "The pipe thickness used in the calculation was incorrect." Bechtel agrees with this.

2. "The formula derived for Q was incorrect." Bechtel's comment on this item is misleading. Even though the general formula for Q is correct, in the original calculation the derivation of the formula for the specific configuration is in error. The corrected calculation provided by Bechtel is valid.

3. "The formula used to calculate τ is incorrect." I agree with Bechtel's response that the formula is correct.

4. "The numerical value for τ cannot be obtained from the values shown in the calculation." Bechtel does not comment on this item but performs a corrected calculation.

M.K

3/11

2408 PFR NO. F086

REVISION --

POTENTIAL FINDING REPORT
SONGS 2&3 SEISMIC DESIGN VERIFICATION

A. PREPARATION BY GA INITIATOR

AFFECTED ITEMS:

Generic Item

REQUIREMENT REFERENCE DOCUMENTS:

Bechtel Project Internal Procedures Manual (PIPM), Section 11.8, "Changes to Purchase Specifications"

BASIC REQUIREMENT: When purchase specifications require a change after the bid award, a "Request for Memorandum of Change Authorization" is prepared by Bechtel if a potential change to material or equipment exists. The Bechtel memorandum informs SCE that a change in the specification purchase order is recommended, and ensures timely SCE authorization to Bechtel to allow Bechtel to proceed with implementing changes in plant design. SCE approves or disapproves the Request for Memorandum of Change Authorization, and returns it to Bechtel. The SCE-approved change letter authorizes Bechtel to proceed accordingly. This requirement has been in existence for the last five years.

DESCRIPTION OF POTENTIAL FINDING:

No evidence could be located that Bechtel has ever informed SCE of potential plant design changes in the manner prescribed, nor obtained authorization from SCE to proceed with the design changes.

PREPARED BY: B. L. Coleman DATE: 3/1/82

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 L. Burnell DATE 3/11/82

☐ REQUEST RE-REVIEW BY _____ DATE _____

☐ DISAGREE BY _____ DATE _____

☒ REVIEW OF ORIGINAL DESIGN ORGS. COMMENTS BY: L. Burnell DATE: 3/15/82

2408 PFR NO. F086

REVISION

C. REVIEW BY ORIGINAL DESIGN ORGANIZATION

COMMENTS

The Request for Memorandum of Change Authorization was designed to be a communication between Bechtel Project Management and SCE Project Management. It was to be used as a method to control costs resulting from potential changes in the physical plant design.

Changes to procurement specifications were controlled using Specification Change Notices (SCN PIPM 11.8.2) and Supplier Deviation Disposition Requests (SDDR's PIPM Section 33). Changes to "A" specifications per Section 33.7 provided for communication between SCE and Bechtel.

☒ AGREE PF IS VALID

☐ DISAGREE

Since this is a cost and schedule related document the fact that none were issued has no impact on the safety of the plant.

BY: F.B Marsh/jhc DATE: 2-5-82

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

Procedural violation. However, plant design not affected.

BY: S A Konz DATE: 3/17/82

E. GA PROJECT MANAGER

☒ ACCEPT

☐ REJECT

BY: G H Weaver DATE: 3/18/82

IMPACT ASSESSMENT

2408 PFR NO. F086

AFFECTED ITEM: Generic

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

   Unknown

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

   Unknown

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

   Unknown

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

   No

5. ARE OTHER SIMILAR DEVIATIONS LIKELY TO EXIST ?

   Yes

6. OTHER COMMENTS:

   It has been verified that Bechtel is deleting from the referenced procedure section the use of the "Request for Memorandum of Change Authorization" form and transmittal of design change information to SCE by this method. A telecon with SCE-QA also verified that SCE has been aware for years that Bechtel has not been implementing this procedural requirement, but that it has no adverse impact on SCE because SCE no longer requires that it review or approve design change information.

PREPARED BY: B. L. Coleman DATE: 3/15/82

COMMENTS: None

BY: J. Brevel DATE: 3/15/82

2408-PFR-F086
3/18/82

General Atomic Company

QUALITY ASSURANCE DEPARTMENT

Record of Long Distance Telephone Call

Party: Called ☒
Calling ☐

Date: 3/11/82

Time: Completed 11:40 AM
Started 11:30 AM
On-line 10 MIN

Name Jim Thomas

Company SCE

Location Rosemead

Telephone No: A/C 213 No. 572 - 1593

Discussion Ref PFR F086

I called Jim to ask him (a) if SCE QA has ever audited Bechtel regarding the use of the "Request for Memorandum of Change Authorization" form, (b) if SCE-QA was aware that Bechtel was not alerting SCE of design changes through the use of this form, (c) if it makes any difference to SCE QA whether or not Bechtel implemented this requirement, and (d) if SCE requires Bechtel to notify SCE of design changes. Jim stated that he and SCE QA are aware that Bechtel has not been implementing this Bechtel requirement, but it is of no great concern to them because SCE does not require Bechtel to transmit design change information in this manner. At one time (8-9 years ago) SCE did require Bechtel to submit design change information via this format, but it has long since been discontinued. He says SCE's only concern is the dollar value of design change information and this data is transmitted to SCE by another method. Jim said that Bechtel should have deleted this procedural requirement years ago.

Record Made by B. Coleman

Distribution: D. Novak, S. Bresnick

2408 PFR NO. F087

REVISION —

POTENTIAL FINDING REPORT
SONGS 2&3 SEISMIC DESIGN VERIFICATION

A. PREPARATION BY GA INITIATOR

AFFECTED ITEMS:

Reactor Vessel Support Specification (CE)

REQUIREMENT REFERENCE DOCUMENTS:

Quality Assurance Design Manual, QADP 5.6.3.5 & .6

BASIC REQUIREMENT:

Specification should be properly formatted and contain all pages.

DESCRIPTION OF POTENTIAL FINDING:

CE Specification 01370-PE-110, Rev. 4, Quality Record copy has page 6 of the Specification missing.

Agree with the explanation provided by Combustion Engineering. This PFR is invalid in view of CE's compliance with procedural requirement.

PREPARED BY: D W Sly DATE: 3-2-82 DTG 3-17-82

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 invalid SD 3/17/82

☒ AGREE PF IS VALID BY J. Bonnel DATE 3/2/82

☐ REQUEST RE-REVIEW BY _____ DATE _____

☐ DISAGREE BY _____ DATE _____

☒ REVIEW OF ORIGINAL DESIGN ORGS. COMMENTS BY: J. Bonnel DATE: 3/17/82

2408 PFR NO. F087
REVISION

C. REVIEW BY ORIGINAL DESIGN ORGANIZATION

COMMENTS

Quality Assurance procedures in effect at the time CE Specification 01370-PE-110 Rev. 04 was issued allowed individual page revisions and did not require that an intercollated specification revision be issued. Consequently, because page 6 was not revised, it was not included as part of the Quality Record copy. For other reasons, this Specification is currently being revised as a complete revision. This will be reissued by June 1,1982.

☐ AGREE PF IS VALID

☒ DISAGREE

BY: for V C Hall DATE: 5/12/82

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. A. Kouts DATE: 3/17/82

E. GA PROJECT MANAGER

☒ ACCEPT

☐ REJECT

BY: A H Weisman DATE: 3/18/82

2408PFR NO. F088

REVISION --

POTENTIAL FINDING REPORT
SONGS 2&3 SEISMIC DESIGN VERIFICATION

A. PREPARATION BY GA INITIATOR

AFFECTED ITEMS:

CE Quality Record; Document Distribution/Approval Form

REQUIREMENT REFERENCE DOCUMENTS:

Quality Assurance Design Manual, QADP 5.3-2.2

BASIC REQUIREMENT:

Upon completion of routing of document (design), Document Distribution/Approval Form will be made a quality record.

DESCRIPTION OF POTENTIAL FINDING:

The Cog. Engineers maintain Document Distribution/Approval forms in their working files rather than forwarding form to Quality Records.

PREPARED BY: _____ DATE: 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 PF IS VALID BY _____ DATE 3/4/82

☐ REQUEST RE-REVIEW BY _____ DATE _____

☐ DISAGREE BY _____ DATE _____

☒ REVIEW OF ORIGINAL DESIGN ORGS. COMMENTS BY: _____ DATE: 3/17/82

2408 PFR NO. F088
REVISION --

C. REVIEW BY ORIGINAL DESIGN ORGANIZATION COMMENTS

☒ AGREE PF IS VALID (Note: valid only within scope of the audit by this PFR initiator)

☐ DISAGREE

BY: R Bennett for VC Hall DATE: 3/12/82

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

Procedural violation. However, no major impact on design control.

BY: S J Kouba DATE: 3/17/82

E. GA PROJECT MANAGER

☒ ACCEPT

☐ REJECT

BY: GH Weisman DATE: 3/18/82

IMPACT ASSESSMENT

2408PFR NO. F088

AFFECTED ITEM: CE Quality Record

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 ?

   N/A

6. OTHER COMMENTS:

   It appears there are two distinct methods being followed by Cog. Engineers in handling Document Distribution/Approval Form. Some of the Cog Engineers are entering the form into the Quality Record File per the QADM while others are maintaining the records in their working file per the note on the form. Since the forms are being maintained, and they are retrievable, this deviation is not considered as having a major impact on the design control.

PREPARED BY: D W Shy DATE: 3-17-82

COMMENTS:

BY: J. Brevard DATE: 3/17/82

2408 PFR NO. F089
REVISION --

POTENTIAL FINDING REPORT
SONGS 2&3 SEISMIC DESIGN VERIFICATION

A. PREPARATION BY GA INITIATOR

AFFECTED ITEMS:

CE Specification S-PEC-111 Rev. 2, Method of Verification (Boric Acid Make-up Tank)

REQUIREMENT REFERENCE DOCUMENTS:

Quality Assurance Design Manual, QADP 5.2-2.2

BASIC REQUIREMENT:

The method of verification is clearly annotated on the front page of the specification.

DESCRIPTION OF POTENTIAL FINDING:

The method of verification block is not filled in.

PREPARED BY: [signature] DATE: 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 PF IS VALID BY [signature] DATE 3/2/82

☐ REQUEST RE-REVIEW BY _____ DATE _____

☐ DISAGREE BY _____ DATE _____

☒ REVIEW OF ORIGINAL DESIGN ORGS. COMMENTS BY: [signature] DATE: 3/17/82

2408 PFR NO. F089

REVISION --

C. REVIEW BY ORIGINAL DESIGN ORGANIZATION

COMMENTS

Reviewer signed off agreeing by his signature and identification of checklists used that the data contained in Revision 2 was complete and accurate but failed to complete method of review and results block on the calculation revision cover sheet. Note: this is considered an exception to the norm.

☒ AGREE PF IS VALID

☐ DISAGREE

BY: [illegible] for VC Hall DATE: 3/12/82

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

Minor procedural violation. However, no impact on design verification.

BY: S L Kouty DATE: 3/17/82

E. GA PROJECT MANAGER

☒ ACCEPT

☐ REJECT

BY: GH Weisman DATE: 3/18/82

IMPACT ASSESSMENT

2408 PFR NO. F089

AFFECTED ITEM: CE Specification S-PEC-111 Rev. 2

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 ?

   Some minor deviation of similar nature may exist.

6. OTHER COMMENTS:

   The deviation is strictly procedural and a lack of verification block not being filled in has no impact on the design verification, provided that the verification was in fact performed.

PREPARED BY: [signature] DATE: 3-12-82

COMMENTS: None

BY: [signature] DATE: 3/12/82

2408 PFR NO. F090

REVISION --

POTENTIAL FINDING REPORT
SONGS 2&3 SEISMIC DESIGN VERIFICATION

A. PREPARATION BY GA INITIATOR

AFFECTED ITEMS:

Reactor Coolant Pump Snubbers - Stress Report (Combustion Engineering)

REQUIREMENT REFERENCE DOCUMENTS:

ASME Code, 1977 Edition, Section III, Subarticle NA-3356

BASIC REQUIREMENT:

"The Stress Report shall be certified by one or more Registered Professional Engineers, competent in the applicable field of design."

DESCRIPTION OF POTENTIAL FINDING:

The copy of the Stress Report furnished to GA, Abex Corp. Report A690812 Rev. 0 dated 1/28/78, contained no PE certification. There was a block on the approval sheet for the PE certification, but this block was not filled in.

Agree PFR is invalid based on CE's response regarding the time period involved. George Chandler 3/16/82

PREPARED BY: George Chandler DATE: 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 is invalid JB 3/16/82

☒ AGREE PF IS VALID BY L. Burnell DATE 3/2/82

☐ REQUEST RE-REVIEW BY _____ DATE _____

☐ DISAGREE BY _____ DATE _____

☒ REVIEW OF ORIGINAL DESIGN ORGS. COMMENTS BY: L Burnell DATE: 3/16/82

C. REVIEW BY ORIGINAL DESIGN ORGANIZATION COMMENTS

ASME Section III, Subsection NF is not applicable to the San Onofre Unit 2 Reactor Coolant Pump Snubber Design Report. The code effective date of the snubber is considered to be the code effective date of the reactor coolant pump, since 10CFR50.55a is not applicable to component supports except for ISI requirements. San Onofre Unit 2 RCP's were ordered August 13, 1970. Therefore ASME Code Section III, Subsection NF is not a requirement.

☐ AGREE PF IS VALID

☒ DISAGREE

BY: for VC Hall DATE: 3/12/82

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. Kouty DATE: 3/17/82

E. GA PROJECT MANAGER

☒ ACCEPT

☐ REJECT

BY: GH Weisman DATE: 3/18/82

PFR NO. 2408-PFR-F100

REVISION _____

POTENTIAL FINDING REPORT
SONGS 2&3 SEISMIC DESIGN VERIFICATION

A. PREPARATION BY GA INITIATOR

AFFECTED ITEMS: Containment Interior Structure - Segment of Slab at El 63'-6"

REQUIREMENT REFERENCE DOCUMENTS:

N/A

BASIC REQUIREMENT:

Member Section properties be correctly input to computer programs.

DESCRIPTION OF POTENTIAL FINDING:

1. Sectional property of the moment of inertia (Izz) for concrete beam of containment interior structure computer model was incorrectly computed as 3.375 ft^4. The correct value should be 0.563 ft^4. (Please see attachment No. 1, page 17 of Bechtel Cal C-257-5.01.01).
2. This concrete beam which was used in the computer model (beam element No. 111) is not shown on the containment interior reinforced concrete drawing.

PREPARED BY: R. T. Sun RTS 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 [signature] 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

It is a valid observation that the incorrect numerical value of I_{zz} for element no. 111 was calculated and entered in the computer run. Subsequent to the member-property calculation the subject beam was eliminated from the design as indicated by its absence in the concrete design drawing. The attached marked up drawing no. 23116 shows the location of the deleted beam. The finite element computer run was primarily for the stress analysis of the interior structure, and the deleted beam was not an essential structural element affording lateral support nor interacting with adjoining slabs or walls.

☒ AGREE PF IS VALID

☐ DISAGREE

Therefore the numerical error and subsequent deletion of the beam do not affect the structural design.

BY: Fred B Mark DATE: 3/9/82

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	☐ FINDING

SdK 3/12/82

JUSTIFICATION:

CLASSIFICATION CRITERION NO. RESULTING IN "FINDING" _____

COMMENT ON "OBSERVATION" CLASSIFICATION

Numerical error on a part which was subsequently deleted.

BY: S. D. Kouty DATE: 3/12/82

E. TPT PROJECT MANAGER

☒ ACCEPT

☐ REJECT

BY: J H Wiesman DATE: 3/13/82

SIGNATURE R. Traver DATE 12-18-73 CHECKED R.Ahn DATE 2-21-74

PROJECT SONGS 2 & 3, CONTAINMENT JOB NO. 1304-831

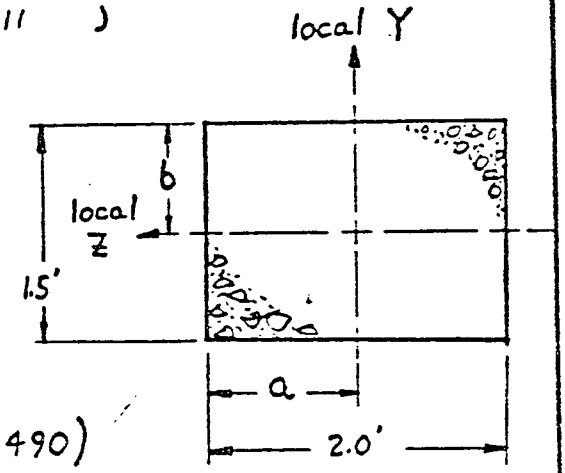
SUBJECT INTERIOR STRUCTURE ANALYSES - COMPUTER MODELS SHEET 17 OF 100 SHEETS

ATTACHMENT NO. 1

II) STRUCTURAL MODELING

C) BEAM SECTION PROPERTIES

2) CONCRETE BEAM - SEGMENT OF SLAB AT EL. 63'5" (SEE P.P 11)



a) SECTION ID = 2

b) $A = (1.5)(2.0) = 3.0\ ft^2$

c) SHEAR AREA

$A_{VY} = A_{VZ} = (.833)(3.0)$

$A_V = 2.5\ ft^2$ (Ref. 12, p. K-490)

d) TORSIONAL INERTIA

$J = ab^3\left[16/3 - 3.36\frac{b}{a}(1 - b^4/12a^4)\right]$ (Ref. 13, p.194, item 4)

$a = 2/2 = 1'$; $b = 1.5/2 = 0.75'$

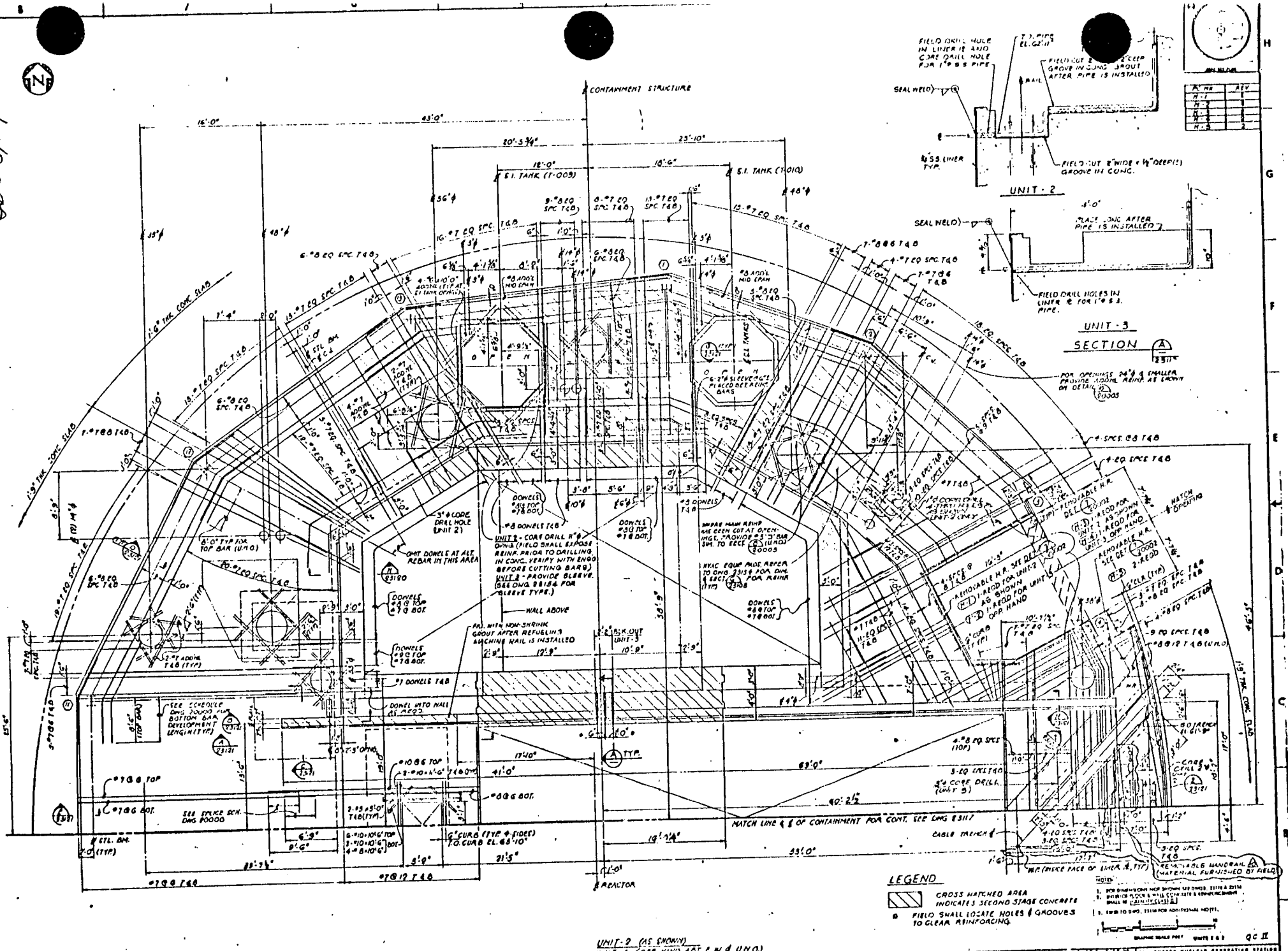
$J = (1)(.75)^3\left[16/3 - (3.36)(.75/1)(1 - (.75)^4/(12)(1)^4\right]$

$J = 1.215\ ft^4$

e) MOMENTS OF INERTIA

$I_{ZZ} = (2)(1.5)^3/12 = 0.563 = 3.375\ ft^4$

$I_{YY} = (1.5)(2)^3/12 = 1.0\ ft^4$


CONTAINMENT STRUCTURE
S.I. TANK (T-009)
S.I. TANK (T-010)
UNIT - 2
UNIT - 3
SECTION
FIELD DRILL HOLE IN LINER ℄ AND CORE DRILL HOLE FOR 1"ø S.S. PIPE
SEAL WELD
FIELD CUT 8"WIDE x ½"DEEP(±) GROOVE IN CONC.
FIELD DRILL HOLES IN LINER ℄ FOR 1"ø S.S. PIPE.
PLACE GROUT AFTER PIPE IS INSTALLED
FOR OPENINGS 24"ø & SMALLER PROVIDE ADDITIONAL REINF. AS SHOWN ON DETAIL
UNIT 3 - CORE DRILL 11"ø DWGS (FIELD SHALL EXPOSE REINF. PRIOR TO DRILLING IN CONC. VERIFY WITH ENGG BEFORE CUTTING BARS)
UNIT 2 - PROVIDE SLEEVE. (SEE DWG 88186 FOR SLEEVE TYPE.)
OMIT DOWELS AT ALT. REBAR IN THIS AREA
3"ø CORE DRILL HOLE (UNIT 2)
WALL ABOVE
DOWEL INTO WALL AS REQ'D
MATCH LINE ℄ & ℄ OF CONTAINMENT FOR CONT. SEE DWG 23117
REACTOR
CABLE TRENCH
REMOVABLE H.R.
REMOVABLE MANRAIL (MATERIAL FURNISHED BY FIELD)
LEGEND
CROSS HATCHED AREA INDICATES SECOND STAGE CONCRETE
FIELD SHALL LOCATE HOLES & GROOVES TO CLEAR REINFORCING.
UNIT-2 (AS SHOWN)
UNIT-3 (OPP HAND ABT ℄ N & UNO)

3/12/82

IMPACT ASSESSMENT

2408-PFR-F100
PFR NO. _____

AFFECTED ITEM: Containment Interior Structure-Segment of Slab at El 63'-6"

1. IS THERE THE POTENTIAL FOR REDUCING DESIGN MARGINS TO THE EXTENT DESIGN ALLOWABLES ARE EXCEEDED OR DESIGN REQUIREMENTS ARE NOT MET? No. Large design margin of more than 30% exists for the columns, slab at floor EL 63'-6" and the secondary shield wall associated with the deleted concrete beam. This design margin should be able to absorb the stress redistributions because of the design change related to this PFR.

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?

N/A

5. ARE OTHER SIMILAR DEVIATIONS LIKELY TO EXIST?

Don't know

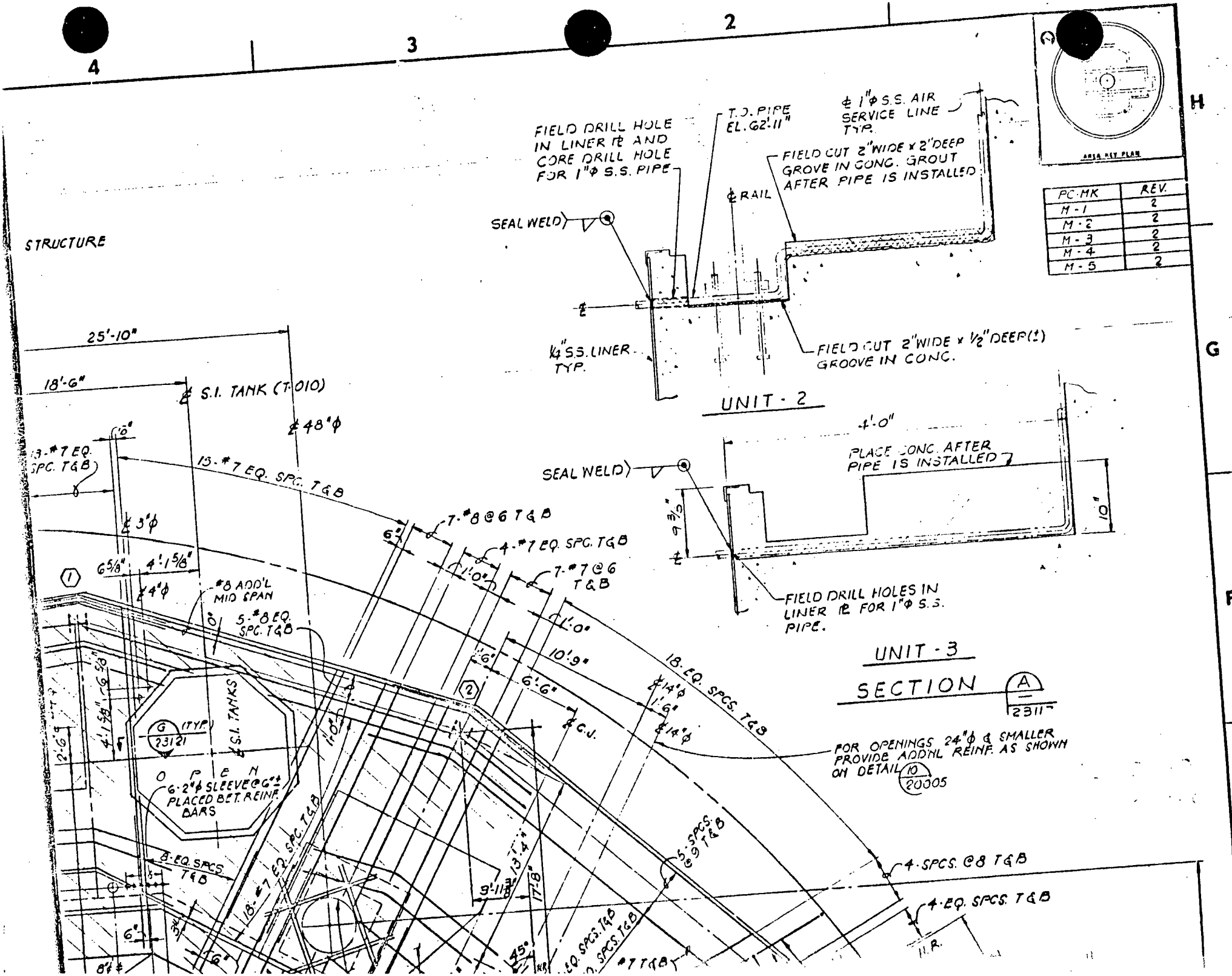
6. OTHER COMMENTS:

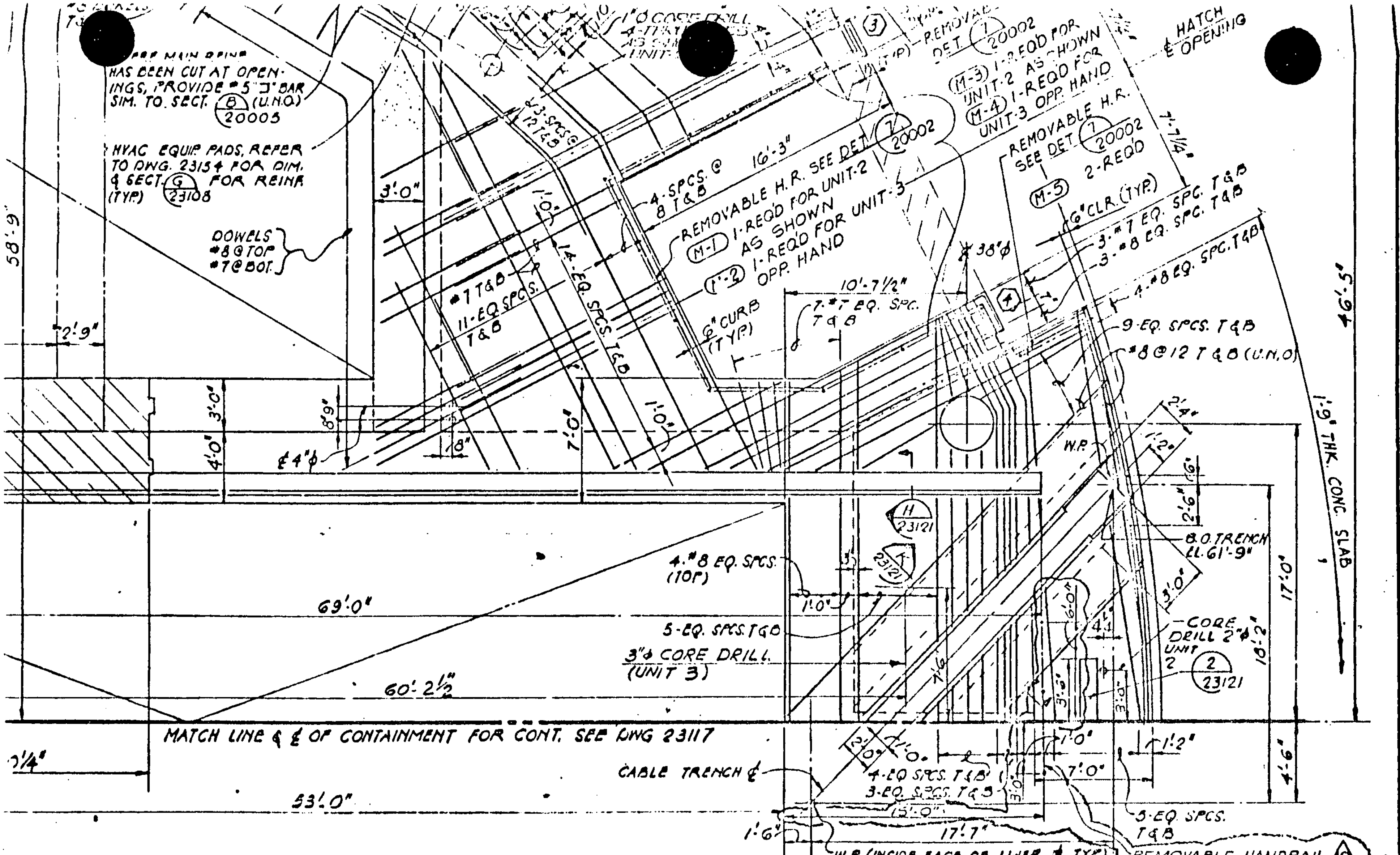
PREPARED BY: R T Sun DATE: 3/12/82

COMMENTS:

Agree with impact assessment.

BY: [signature] DATE: 3/12/82


4
3
2
H
G
F
E
STRUCTURE
AREA KEY PLAN
PC-MK | REV.
M-1 | 2
M-2 | 2
M-3 | 2
M-4 | 2
M-5 | 2
FIELD DRILL HOLE IN LINER ℄ AND CORE DRILL HOLE FOR 1"φ S.S. PIPE
T.O. PIPE EL. 62'-11"
℄ 1"φ S.S. AIR SERVICE LINE TYP.
FIELD CUT 2"WIDE x 2"DEEP GROVE IN CONC. GROUT AFTER PIPE IS INSTALLED
℄ RAIL
SEAL WELD
¼" S.S. LINER TYP.
FIELD CUT 2"WIDE x ½" DEEP(±) GROOVE IN CONC.
UNIT - 2
4'-0"
PLACE CONC. AFTER PIPE IS INSTALLED
SEAL WELD
9 3/8"
10"
FIELD DRILL HOLES IN LINER ℄ FOR 1"φ S.S. PIPE.
UNIT - 3
SECTION A / 2311
25'-10"
18'-6"
℄ S.I. TANK (T-010)
℄ 48"φ
13-#7 EQ. SPC. T&B
15-#7 EQ. SPC. T&B
℄ 3"φ
6 5/8"
4'-1 5/8"
℄ 4"φ
#8 ADD'L MID SPAN
5-#8 EQ. SPC. T&B
7-#8 @ 6 T&B
4-#7 EQ. SPC. T&B
7-#7 @ 6 T&B
1'-0"
10'-9"
6'-6"
18-EQ. SPCS. T&B
℄ C.J.
℄ 14"φ
1'-6"
FOR OPENINGS 24"φ & SMALLER PROVIDE ADD'NL REINF. AS SHOWN ON DETAIL 10 / 20005
S.I. TANKS
G (TYP.) / 23121
O P E N
6-2"φ SLEEVE @ 6"± PLACED BET. REINF. BARS
11'-0"
8-EQ. SPCS. T&B
18-#7 EQ. SPC. T&B
9'-11 3/8"
13'-4"
17'-8"
5-SPCS. @ 9 T&B
4-SPCS. @ 8 T&B
4-EQ. SPCS. T&B
45°
EQ. SPCS. T&B
SPCS. T&B
#7 T&B
H.R.



LEGEND

CROSS HATCHED AREA INDICATES SECOND STAGE CONCRETE

* FIELD SHALL LOCATE HOLES & GROOVES TO CLEAR REINFORCING.

NOTES:

1. FOR DIMENSIONS NOT SHOWN SEE DWGS. 23110 & 23114
2. INTERIOR FLOOR & WALL CONCRETE & REINFORCEMENT SHALL BE QUALITY CLASS II
3. REFER TO DWG. 23110 FOR ADDITIONAL NOTES.

GRAPHIC SCALE FEET 0 5 10

UNITS 2 & 3 QC II

(OWN)

AND ABT. E.W. ℄ U.N.O.)

					NO.	REVISIONS	DATE	DR.	CHK.				
BO		—			4	REV. RAIL TRENCH	7-21-78	H.Y.	BO		—		
BO		—			3	DCN #7	2-13-78	DC	HB		—		
BO	RK	—			2	DCN #1, #2, #3, #4, 5, #6, #7, 8	4-6-77	DC	HB		—		
HB	RK	—			1	RELEASE HOLD, REV. OPNG. LOC. RAIL TRENCH			HB		—		
HB	RK	—			/	G SECT. REF., ADD HVAC EQUIP. PAD REF. & REINF.							
BO	RK	—			0	ISSUED FOR CONSTRUCTION							
	E.O.S.	CHF. E.	P.E.	Q.A.E.	NO.	REVISIONS	DATE	DR.	CHK.			P.E.	Q.A.E.

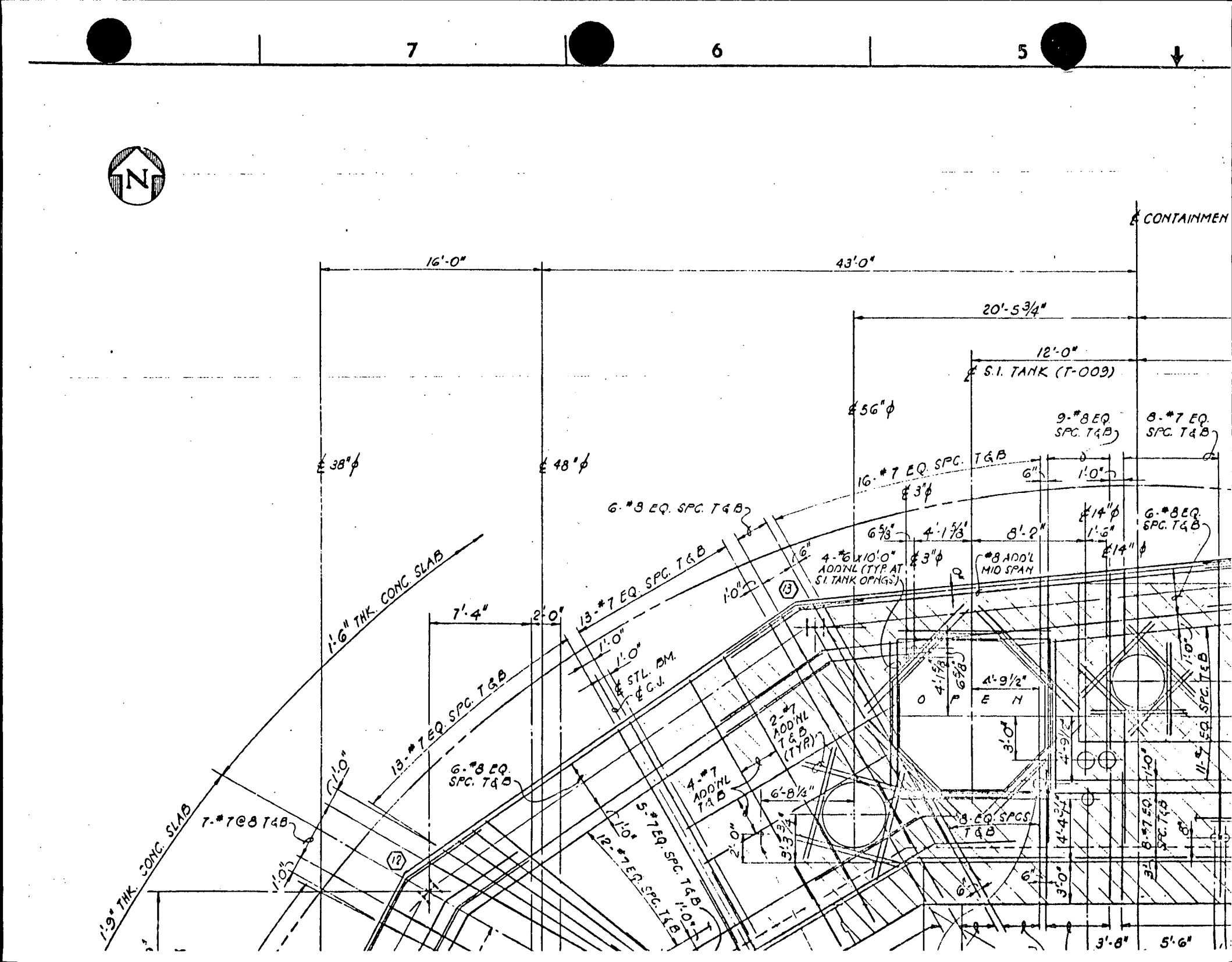
J.O. NO. — FILE

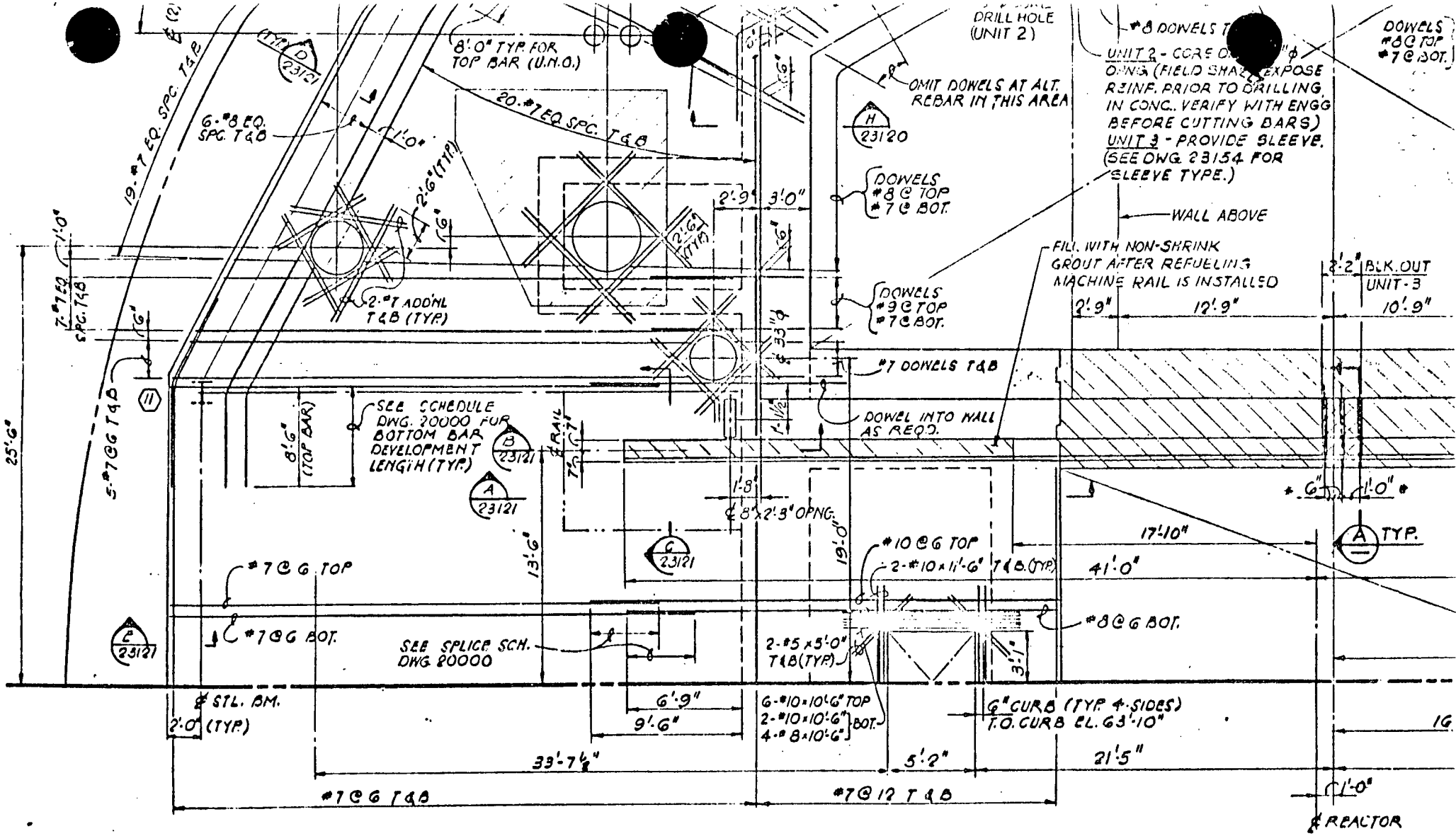
SAN ONOFRE NUCLEAR GENERATING STATION

CONTAINMENT INTERIOR STRUCT. REINFORCED CONCRETE NORTH PARTIAL PLAN, EL. 63'-6"

SOUTHERN CALIFORNIA EDISON COMPANY

SCALE 1/4" = 1'-0"


7
6
5
N
℄ CONTAINMEN
16'-0"
43'-0"
20'-5 3/4"
12'-0"
℄ S.I. TANK (T-009)
℄ 56"ϕ
℄ 38"ϕ
℄ 48"ϕ
9-#8 EQ. SPC. T&B
8-#7 EQ. SPC. T&B
16-#7 EQ. SPC. T&B
6-#8 EQ. SPC. T&B
℄ 3"ϕ
℄ 14"ϕ
6"
1'-0"
6 5/8"
4'-1 5/8"
8'-2"
1'-6"
4-#6 x 10'-0" ADD'NL (TYP. AT S.I. TANK OPNGS.)
#8 ADD'L MID SPAN
1'-6" THK. CONC. SLAB
1'-9" THK. CONC. SLAB
7'-4"
2'-0"
13-#7 EQ. SPC. T&B
1'-0"
℄ STL. BM.
℄ C.J.
7-#7@8 T&B
12
13
6-#8 EQ. SPC. T&B
5-#7 EQ. SPC. T&B
12-#7 EQ. SPC. T&B
4-#7 ADD'NL T&B
2-#7 ADD'NL T&B (TYP.)
6'-8 1/2"
4'-9 1/2"
E
N
3'-0"
8 EQ. SPCS T&B
11-#7 EQ. SPC. T&B
3'-8"
5'-6"



UNIT-2 (AS S...
UNIT-3 (OPP...

BECHTEL CORPORATION
ENGINEERS & CONSTRUCTORS
LOS ANGELES, CALIF.

JOB NO.	DATE	APPROVED
2079 003		

REGISTERED PROFESSIONAL ENGINEER — RALPH KANE — No. 18931 — REG. 10-FEB — CIVIL — STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER — CIVIL — STATE OF CALIFORNIA

DWG. NO.	CROSS REFERENCES	NO.	REVISIONS	DATE	DR.
23208	REFUELING MACHINE RAIL	10	ADDED HANDRAIL	7-29-31	JF
23118&119	R.C. CROSS SECTIONS	9	INC. FCR #C-367 & #C-368	10-11-79	JT
23114	R.C. NORTH PART PLAN EL 45'0"	8	REVISED DIMENSION	6-29-79	HB
23112	R.C. NORTH PART PLAN EL 20'0"	7	ADDED DET. 2 (SEE DWG 23121) ING. DCN-11	6-18-79	JT
23110	R.C. NORTH PART PLAN EL 45'0"	6	INC. DCN-10	3-23-79	JT
23117	R.C. SOUTH PART PLAN EL 63'0"	5	CORE DRILL AS INDICATED	10-11-78	DC

PFR NO. 2408-PFR-F103

REVISION _____

POTENTIAL FINDING REPORT
SONGS 2&3 SEISMIC DESIGN VERIFICATION

A. PREPARATION BY GA INITIATOR

AFFECTED ITEMS: Dynamic analysis of Reactor Coolant System

REQUIREMENT REFERENCE DOCUMENTS:

1. Calculation No. S-PEC-070 "Reanalysis of SONG with RCS model coupled with building model Sept. 30, 1976.
2. Calculation No. S-PEC-070 Task No. 109340 "SCE Dynamic model and AE Tape Schemes" Jan. 17, 1974.
3. CE Dwg. D-1370-320-056 Rev. 05 "Pump Support Column-Details" San Onofre 2

BASIC REQUIREMENT:

Reactor coolant pump horizontal and vertical supports member proprieties to be computed using the actual design configuration (Dwg. 1370-320-056 Rev. 05).

DESCRIPTION OF POTENTIAL FINDING: The crossectional areas (Ax) used for the R. C. Pump support structure member proprieties (Calc. No. 070 "Reanalysis of SONGS RCS Model coupled with building model model" Sept. 30-1976, page 45) are based upon an older design (Calc. No. S-PEC-070. Task 1370 "SCE Dynamic Model and AE tape schemes" Jan. 17, 1974) and not in the actual design configuration (Dwg D-1370-320-056 Rev. 05 June 16, 1975).

PREPARED BY: I. Almajan DATE: 3-5-82

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 _____ DATE 3/8/82

☐ REQUEST RE-REVIEW BY _____ DATE _____

☐ DISAGREE BY _____ DATE _____

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

PFR NO. 2408-2FR-F0193

REVISION

C. REVIEW BY ORIGINAL DESIGN ORGANIZATION

COMMENTS

The support system for the reactor coolant pumps is designed to maintain the fundamental frequencies of the pump well above the range which is significantly excited by the building response. The reactor coolant pump support structure member properties, Ax, and the related member stiffnesses used in the dynamic analysis of the reactor coolant system (Calculation No. S-PEC-070 Rev. 02) are less than corresponding values subsequently reflected by Dwg. No. D-1370-320-056 Rev. 05 and are therefore conservative. Thus, reanalysis of the reactor coolant system to reflect the actual design configuration was not required.

☐ AGREE PF IS VALID

☒ DISAGREE

I DO AGREE WITH THE EXPLANATION PRESENTED ABOVE, THEREFORE THIS PFR BECOMES INVALID

BY: [signature] DATE: 3/12/82

D. RECOMMENDATION BY FINDINGS REVIEW COMMITTEE

Concur with reviewer's recommendation to invalidate this PFR. 3/16/82

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: 3/17/82

E. GA PROJECT MANAGER

☒ ACCEPT

☐ REJECT

BY: [signature] DATE: 3/18/82

PFR NO. 2408-PFR-F104

REVISION _____

POTENTIAL FINDING REPORT
SONGS 2&3 SEISMIC DESIGN VERIFICATION

A. PREPARATION BY GA INITIATOR

AFFECTED ITEMS: Reactor Coolant Pump Vertical Supports, Horizontal Supports and Stops

REQUIREMENT REFERENCE DOCUMENTS:

N/A

BASIC REQUIREMENT:

Calculation should reflect final loading conditions.

DESCRIPTION OF POTENTIAL FINDING: There is no indication in the BPC calculations for the RCP Supports, i.e., C-257-7.07.01, C-257-07.01.02 and C257-07.01.03, that they have compared final loads obtained from CE with either preliminary loads or those used in the calculations. Note that such a comparison was performed by BPC for the reactor vessel vertical column supports and recorded as revision 2 in their calculation, C-257-7.01.01.

PREPARED BY: R. T. Sun RTS DATE: 3-5-82

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 _____ DATE 3/8/82

☐ REQUEST RE-REVIEW BY _____ DATE _____

☐ DISAGREE BY _____ DATE _____

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

PFR NO. 2408-PFR-FQ-01

REVISION

C. REVIEW BY ORIGINAL DESIGN ORGANIZATION

COMMENTS

The resubmittals of RCP Support load data by CE under Log No. SO23-900B-30 were reviewed by the Civil/Structural discipline in accordance with the Vendor Package review procedure. This review is documented by the C/S Engineer's signature in the Internal Review Sheet of the Vendor Package. During those review cycles, which included the final load submitted by CE, the load data changes were confirmed to be acceptable with respect to the existing BPC design of the RCP Supports. However, it is acknowledged that a formal revision of the calculation was not issued. The corresponding revision documenting the adequacy of the design will be issued.

☒ AGREE PF IS VALID, however, no impact on design.

☐ DISAGREE

BY: Fred B Marsh DATE: 3/15/82

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

No formal revision to calculations. However, design is adequate.

BY: S. L. Koutz DATE: 3/17/82

E. GA PROJECT MANAGER

☒ ACCEPT

☐ REJECT

BY: G. H. Weeman DATE: 3/18/82

IMPACT ASSESSMENT

2408-PFR-F104
PFR NO. _____

AFFECTED ITEM: Reactor Coolant Pump Vertical Supports, Horizontal Supports and Stops

1. IS THERE THE POTENTIAL FOR REDUCING DESIGN MARGINS TO THE EXTENT DESIGN ALLOWABLES ARE EXCEEDED OR DESIGN REQUIREMENTS ARE NOT MET ? No. Design margin of more than 6% still exists after comparing with the latest load revision from CE. Reviewing BPC's Reactor Coolant supports design, additional margin was found in selecting the structural members for the support system.
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 ?

   Don't know

6. OTHER COMMENTS:

PREPARED BY: R. T. Sun RTS DATE: 3/16/82

COMMENTS:

Agree with impact assessment.

BY: _____ DATE: 3/17/82

PFR NO. 2408-PFR-F106

REVISION A

POTENTIAL FINDING REPORT
SONGS 2&3 SEISMIC DESIGN VERIFICATION

A. PREPARATION BY GA INITIATOR

AFFECTED ITEMS: OCWS Auxiliary Intake Structure, Section D

REQUIREMENT REFERENCE DOCUMENTS:

Calculation DC-339

BASIC REQUIREMENT:

The conduit should be designed to the proper loadings.

DESCRIPTION OF POTENTIAL FINDING: There is no justification for combining the moments as shown in page D18, the transverse seismic load from the upper part of the structure should be added also to the loads.

PREPARED BY: M. Kopky DATE: 3/16/82

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

REJECTION OF ORIGINAL DESIGN ORG. COMMENTS BY: M. Kopky DATE: 3/16/82

B. REVIEW BY GA TASK LEADER

COMMENTS

Of the 3 concerns identified in the original issue of the PFR, 2 have been satisfactorily resolved by the Design Org (SCE). This revision retains the one concern considered valid.

☑ AGREE PF IS VALID BY [signature] DATE 3/16/82

☐ REQUEST RE-REVIEW BY _____ DATE _____

☐ DISAGREE BY _____ DATE _____

☑ REVIEW OF ORIGINAL DESIGN ORGS. COMMENTS BY: [signature] DATE: 3/16/82

PFR NO. 2408-PFR-F106
REVISION A

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	☐ FINDING

JUSTIFICATION:

CLASSIFICATION CRITERION NO. RESULTING IN "FINDING" _____

COMMENT ON "OBSERVATION" CLASSIFICATION

Load from riser not included in calculations. However, design allowables are not exceeded.

BY: S. A. Kouba DATE: 3/17/82

E. GA PROJECT MANAGER

☒ ACCEPT

☐ REJECT

BY: H. H. Weisman DATE: 3/18/82

PFR NO. 2408-PFR-F-106

REVISION _____

POTENTIAL FINDING REPORT
SONGS 2&3 SEISMIC DESIGN VERIFICATION

A. PREPARATION BY GA INITIATOR

AFFECTED ITEMS: OCWS Auxiliary Intake Structure Section D

REQUIREMENT REFERENCE DOCUMENTS:

Calculation DC-339

BASIC REQUIREMENT: The conduit should be designed to the proper loadings.

DESCRIPTION OF POTENTIAL FINDING:

The longitudinal overturning moment values in page D04, ($13156^{1K} \pm 3733^{1K}$) are not consistent with page D02, ($13156^{1K} - 1673^{1K}$). Also, there is not justification for combining the moments as shown in pages D18 and D20. The effect on the conduit from the soil pressure is not included in D20.

PREPARED BY: M. Koploy M. Koploy 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 VALID BY [signature] DATE 3/9/82

☐ REQUEST RE-REVIEW BY _____ DATE _____

☐ DISAGREE BY _____ DATE _____

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

PFR NO. 2408-PFR-F-106

REVISION _____

C. REVIEW BY ORIGINAL DESIGN ORGANIZATION COMMENTS

☐ AGREE PF IS VALID

☒ DISAGREE Comments attached

RAB BY: R.L. Richter DATE: 3/11/82

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: _____ DATE: _____

E. GA PROJECT MANAGER

☐ ACCEPT

☐ REJECT

BY: _____ DATE: _____

PFR No. 2408 - PFR - F106
JKY for TDC 3/17/82

PFR F106

The overturning moment obtained on page D04 includes the resistance to overturning provided by passive pressure acting on the buttresses and is the correct design value used in the calculation. The moment obtained in the preliminary calculation on page D02 did not include this pressure and was not correlated with the other value because it was not used further in the calculations. The reinforcing steel provided is adequate to withstand moments determined using either value of overturning moment.

The SRSS calculation page D20 reflects seismic moments developed in the conduit at the buttress section. Moments caused by lateral seismic (39.98'-k-p. D17), longitudinal seismic (14.6'-k-p. D11) and vertical seismic (14.58'-k-p. D20) are combined by SRSS and added algebraically to the moment caused by dead weight of the structure and supported soil. At rest soil pressures acting on this conduit were not included for conservatism since they offset dead load moments and would reduce the overall design moment at the point of interest.

For added conservatism, the conduit section was also analyzed as a closed ring on page D18, neglecting the stiffening provided by the buttress. Maximum moments were combined although they may occur at different locations in the section. In this calculation, the 57.46'-k moment already includes the SRSS effects of all longitudinal and vertical seismic loadings based on overall stability determinations. The 14.6'-k moment included in this calculation represents local moments calculated in the buttress region for longitudinal seismic loadings and this value was conservatively combined by SRSS with the moment calculation. As on page D20, the SRSS seismic moments were algebraically added to the dead load moment and at rest soil forces were not included for conservatism.

Prepared by: J. K. Yann 3/11/82

Approved by: H. L. Richter 3/11/82

JKY:npy

IMPACT ASSESSMENT

2408-PFR-F106

PFR NO. _____

AFFECTED ITEM: Auxiliary Intake Structure, Section D

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 ?

   I do not know

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

   N/A

5. ARE OTHER SIMILAR DEVIATIONS LIKELY TO EXIST ?

   This is the only time I have seen this happen.

6. OTHER COMMENTS: I agree with the explanation given by SCE with respect to the value the longitudinal overturning moment and the combination of loads in page D20. But the loads in D18 should also include the transverse upper loads.

If very conservatively the transverse loads as shown in P. D15 are added to the values in D18, the maximum moment in the conduit will increase. Still, the allowable moment for the section is more than this maximum moment. See attached calculations M.K.

PREPARED BY: M. Kopley DATE: 3/16/82

COMMENTS:

Agree with impact assessment.

BY: _____ DATE: 3/16/82

GA 268 REV. 6-79

GENERAL ATOMIC COMPANY

PFR No. 2408-PFR-F106
JMS for TDC 3/17/82

CALCULATIONS FOR			
EQUIP. NO.	PROJ. NO.	CALC. NO.	PAGE 1 OF 2
PREPARED BY M. Kopley	DATE 3/16/82	REF. DOCUMENTS:	
REVIEWED BY	DATE		
APPROVED BY	DATE		

Attachment to Impact Assessment
PFR No 2408-PFR-F106 A

From p. D18, the moment calculation is as follows:

$$M_{max} = 10.14 + \sqrt{57.46^2 + 14.23^2 + 14.6^2} = 71.1\ ^{1-K}$$

this include

10.14 – dead load moment p. D07
57.46 – vertical seismic + longitudinal overturning
14.23 – transverse horizontal loads (seismic) for conduit SECTION ONLY
14.6 – Local moments produced by longitudinal seismic loads of the upper part of the structure (riser, riser block, + velocitycap)

An upper bound calculation for the maximum moment should include also the transverse seismic loads of the upper part of the structure.
Conservatively assuming this transverse load is the local moment calculated in p. D15 = 22.6 ^{1K}

$$M_{max} = 10.14 + \sqrt{57.46^2 + 14.23^2 + 14.6^2 + 22.6^2} = 75.16\ ^{1K}$$

Using Ultimate Strength Design Handbook ACI SP 17

$$K_u = \frac{M_{max}}{F} = \frac{75.16\ ^{1K}}{.156} = 481.81$$

PFR No. 2408 - PFR-F-106A Attachment to
Ltr for FDE 3/17/82

GA 268 REV. 6-79

GENERAL ATOMIC COMPANY

Impact Assessment

CALCULATIONS FOR			2408-PFR-F106A
EQUIP. NO.	PROJ. NO.	CALC. NO.	PAGE 2 OF 2
PREPARED BY M. Kopley	DATE 3/16/82	REF. DOCUMENTS:	
REVIEWED BY	DATE		
APPROVED BY	DATE		

p. 56

$\rho = .0147 \Rightarrow A_s = .0147(12)(12.5) = 2.21\ in^2$

A_s provided $2.4\ in^2/ft > 2.21\ in^2$

$\therefore 2.4/(12)(12.5) = .016 = \rho_{provided}\ K_U = 522$

$M_{allowable} = 522 \times .156 = 81.4\ 'K > 75.16\ 'K$

M. Kopley

FROM: _____ LOCATION: _____ DATE: _____

TO: Attachment to 2408-PFR-F106A LOCATION: _____ DATE: _____

PFR No. 2408-PFR F106 A
JNB for file
3/17/82

TELEPHONE COMMUNICATION RECORD

(PLEASE HAND LETTER LEGIBLY IN BLACK OR RED INK)

CALL INITIATED BY: M. Koplow AT GAC ☐ OTHER: _____

CALL RECEIVED BY: JM Yann AT GAC ☐ OTHER: SCE

OTHER PARTICIPANTS: _____

PROGRAM NAME PROGRAM NUMBER

DATE: 3/15/82 TIME: 11:00a.m _____ _____

SUBJECT: _____

SUMMARY: I talked to him about why I think the load combination in p. D18 should add the transverse load in D15 of 22.6 kips. M.K. He mantains that the case in D18 is for a closed ring, assuming that the buttress carries no stiffness, the [illegible] from the local moment in the buttress region was added for conservatism and it is not needed there, he aggreed that it would be more consistent to add both transverse and longitudinal loads but not necessary since this is done in the other case in p. D20

At 4:00p.m I called him again to tell him I will put in my assessment that the transverse load should be added in D18 and that the design is still O.K.

ACTION ITEMS:	Date Required	Person Responsible

DISTRIBUTION: _____

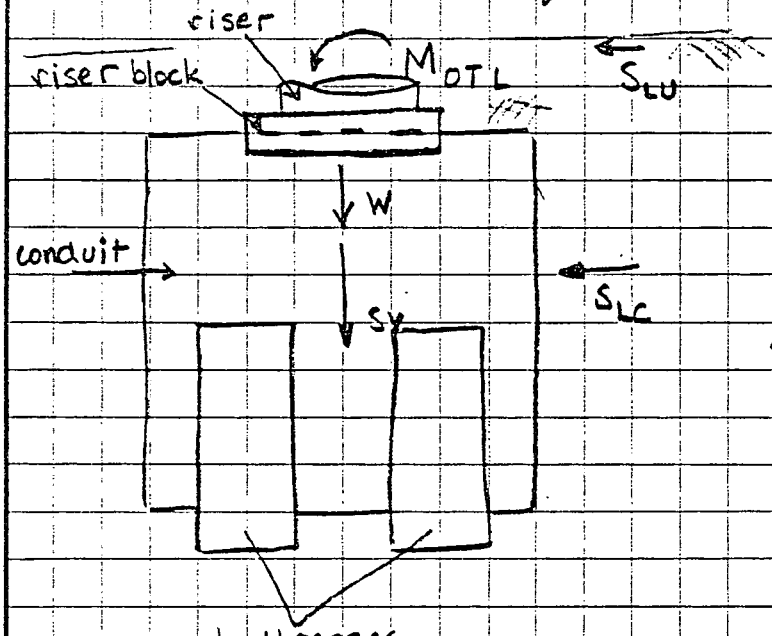
File No.: _____

GA 258 REV. 6-79

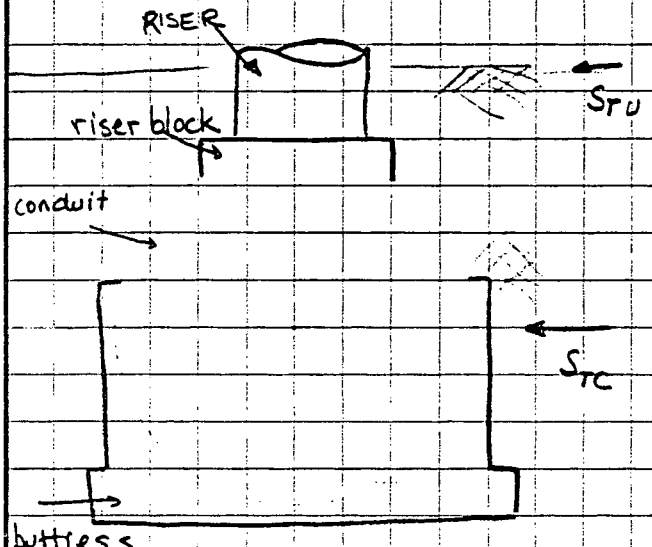
GENERAL ATOMIC COMPANY 2408 PFR-F106 file 3/17/82

CALCULATIONS FOR			
EQUIP. NO.	PROJ. NO.	CALC. NO.	PAGE OF
PREPARED BY M. Koploy	DATE 3/17/82	REF. DOCUMENTS:	
REVIEWED BY	DATE		
APPROVED BY	DATE		

Continue attachment to Impact Assessment
PFR No 2408-PFR-F106A
the design of the conduit should include all these loadings



SIDE VIEW



Front view

M_{OTL} = Longitudinal overturning moment, due to seismic Longitudinal horizontal Load $S_{LU} + S_{LC}$

W = DEAD LOAD

S_V = VERTICAL SEISMIC

S_{LU} = Longitudinal horizontal seismic Loads from the upper part of the structure (riser block, riser, velocity cap)

S_{LC} = Longitudinal horizontal seismic loads from conduit

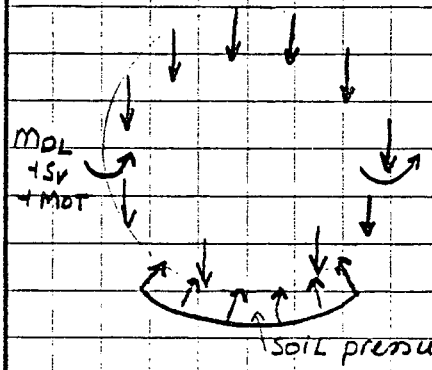
S_{TC} = transverse seismic horizontal loads from the conduit

S_{TU} = transverse seismic horizontal loads from the upper part of the structure (riser block, riser, velocity cap)

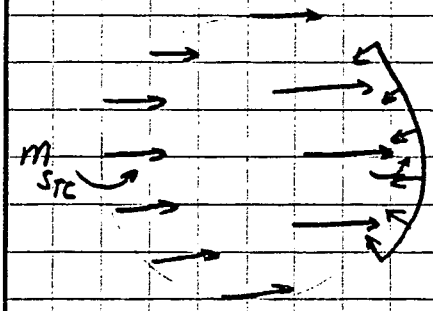
GENERAL ATOMIC COMPANY 2408-PFR-F106
~~YDC~~ 3/17/82

CALCULATIONS FOR			
EQUIP. NO.	PROJ. NO.	CALC. NO.	PAGE OF
PREPARED BY M. Kopley	DATE 3/17/82	REF. DOCUMENTS: PFR No. 2408-PFR-F106A JNS for YDC 3/17/82	
REVIEWED BY	DATE		
APPROVED BY	DATE		

using a closed ring solution, these loads translate into the following loadings in the conduit, in the circumferential direction



$m_{DL+SV+MOT}$ = dead load moment 10.14 [1-K]
+ vertical seismic + Longitudinal overturning 57.46 [1-K]



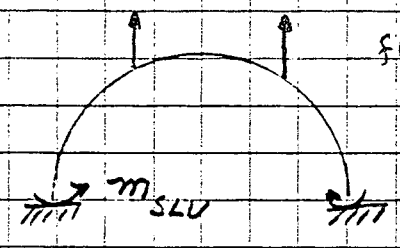
m_{STC} = moment from transverse horizontal seismic load 14.23 [2]

Since the loads from the upper part of the structure are transferred into the conduit by the riser base block, and this has some dywidag bars that transfer load from the block thru the conduit and then to the buttress, it can conservatively be assumed that the local moments in the conduit from the loads caused by the upper part of the structure are as follows:

GA 288 REV. 6-79

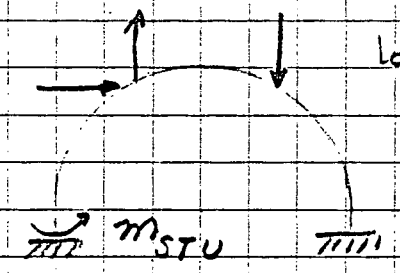
GENERAL ATOMIC COMPANY 2408-PFR-F106 3/17/82

CALCULATIONS FOR			
EQUIP. NO.	PROJ. NO.	CALC. NO.	PAGE OF
PREPARED BY M. Klopfer	DATE 3/17/82	REF. DOCUMENTS: PFR No. 2408-PFR-F106A JMS for YDC 3/17/82	
REVIEWED BY	DATE		
APPROVED BY	DATE		



from Loads in DYWIDAG bars

m_{SLU} = Local moment produced by Longitudinal seismic Load of the upper part of the structure
14.6 'K



Loads from dywiDAG bars and base block

m_{STU} = Local moment produced by transversal seismic loads of the upper part of the structure
22.6 'K

PFR NO. 2408-PFR-F 108

REVISION _____

POTENTIAL FINDING REPORT
SONGS 2&3 SEISMIC DESIGN VERIFICATION

A. PREPARATION BY GA INITIATOR

AFFECTED ITEMS: OCWS Auxiliary intake structure Section C

REQUIREMENT REFERENCE DOCUMENTS:

SCE Document DC 339, Sections A, C01 - C39, D, E, F, H. M.E

BASIC REQUIREMENT:

Computation should be accurately performed.

DESCRIPTION OF POTENTIAL FINDING: When performing moment distribution method to find moments and loads in velocity cap and columns, page C02 in DC-339, the factor used to find K_B for the symmetry case should be 1/2 and not 3/2 as used. Therefore, moments computed will change. In page C15 the equation for calculating moments in the raiser is O.K but the multiplication is wrong. Therefore, moment directions reverse.

PREPARED BY: M. Koploy M. Koploy 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 VALID BY [signature] DATE 3/8/82

☐ REQUEST RE-REVIEW BY _____ DATE _____

☐ DISAGREE BY _____ DATE _____

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

PFR NO. 2408-PFR-F 108

REVISION

C. REVIEW BY ORIGINAL DESIGN ORGANIZATION

COMMENTS

☒ AGREE PF IS VALID Comments attached

☐ DISAGREE

BY: [signature] DATE: 3/11/82

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

Calculation errors. However, design allowables are not exceeded.

BY: S. L. Kouts DATE: 3/12/82

E. GA PROJECT MANAGER

☒ ACCEPT

☐ REJECT

BY: G. H. Weisman DATE: 3/13/82

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The 3/2 multiplier for stiffness factor was developed based on sidesway calculations and erroneously applied to the vertical load case as well. This calculation has been reviewed to evaluate the design significance. The velocity cap design does not change since the moment which controls design is the cantilever moment of the overhang which is unaffected by this change. The column moment is increased for the vertical seismic and dead load case but not for lateral loads. Since overall column moment is dominated by lateral loads, the increased moment is only 2 1/2 per cent greater than the design moment. The moment capacity for this column is calculated to be 530 per cent greater than the design load, neglecting the fact that the No. 7 reinforcing bars assumed in design were replaced by No. 8 bars.

The multiplication on Sheet C15 has also been corrected. As a result, the design moment has been reduced from 0.65 ft.-kips/ft. to 0.55 ft.-kips/ft. The previous design, with moments reversed, was thus more conservative.

Prepared by: J. K. Yamm 3/11/82

Approved by: H. L. Richter
H. L. Richter 3/11/82

JKY:npy

IMPACT ASSESSMENT

2408-PFR-F108
PFR NO. _____

AFFECTED ITEM: OCWS Auxiliary intake Structure, Section C

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

No, the design of the velocity cap is determined by moments unaffected by error. The columns under the velocity cap are so over design that the resultant increase in loads does not decrease the design margins significantly.

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?

I do not know

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

N/A

5. ARE OTHER SIMILAR DEVIATIONS LIKELY TO EXIST?

This PFR refers to the use of an erroneous parameter and to a numerical error. It is possible that deviations like this happen in other calculations but I have not seen any.

6. OTHER COMMENTS:

PREPARED BY: M. Koploy M.A. Koploy DATE: 3/12/82

COMMENTS:

Agree with impact assessment.

BY: [signature] DATE: 3/12/82