V.C.H. JAN 2 5 1982

2408 PFR NO. F-004

REVISION --

POTENTIAL FINDING REPORT
SONGS 2&3 SEISMIC DESIGN VERIFICATION

A. PREPARATION BY GA INITIATOR

AFFECTED ITEMS:
Design Control Training

REQUIREMENT REFERENCE DOCUMENTS:

Attachment 3, PSAR, Section II, Paragraph 10

BASIC REQUIREMENT:
"The responsibility for assuring that the personnel performing the activities affecting quality are suitably trained rests with the organization performing that activity"

DESCRIPTION OF POTENTIAL FINDING:

CE Instrumentation Control and Electrical Section Procedure ICE-13 did not address training of engineers in implementation of the design control procedures.

PREPARED BY: George Chandler DATE: 1/25/82

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

REJECTION OF ORIGINAL DESIGN ORG. COMMENTS BY: George Chandler DATE: 2/10/82

B. REVIEW BY GA TASK LEADER COMMENTS

☒ AGREE PF IS VALID BY J Brevard DATE 1/25/82

☐ REQUEST RE-REVIEW BY _____ DATE _____

☐ DISAGREE BY _____ DATE _____

☒ REVIEW OF ORIGINAL DESIGN ORGS. COMMENTS BY: J. Brevard DATE 3/1/82

2408- PFR NO. F004

REVISION -

C. REVIEW BY ORIGINAL DESIGN ORGANIZATION — COMMENTS

Procedure ICE-13, which was issued in March 1971, did not include training since there was no requirement that this to be included in departmental procedures. When MPI-18, Rev. 3, was issued in May 1974 to be responsive to Gray Book requirements, training to departmental procedures was required. Subsequently, ICE-13 was superseded by ICE-100 in May 1975 with training included in the procedure.

☐ AGREE PF IS VALID

☒ DISAGREE (Per telecon S. Brosnick + J. Westhoven - 2/1/82) SB 2/4/82

BY: V C Hall DATE: 1/29/82

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 procedure for training ICE personnel. However, there is evidence that these personnel were provided training

BY: S. A Konitz DATE: 3/3/82

E. GA PROJECT MANAGER

☒ ACCEPT

☐ REJECT

BY: [signature] DATE: 3/5/82

PFR-F004

General Atomic Company

QUALITY ASSURANCE DEPARTMENT

Record of Long Distance Telephone Call

Party: Called ☑ Calling ☐

Date: 2/26/82

Time: Completed 2:10
Started 2:00
On-line 10

Name Bob Jewel

Company Combustion Engineering

Location WINDSOR, CONN.

Telephone No: A/C 203 No. 688-1911 x5452

Discussion

SUBJ: PFR-F004, "Training of Engineers for ICC-13"

This was actually a series of phone calls trying to get CE to add more data to their response to PFR F004

Bob stated it was not real clear if final design work was done in the period involved in the ICC Dept. — designs evolved over the years.

Bob stated CE could find no documented evidence of training but that their engineers in 1970-1975 were knowledgable in design control and ICC 13

TELECOPYING BOB IS ~~TELECOPY~~ A DOCUMENTED RESPONSE PER ABOVE.

Record Made by [signature]

Distribution: S. Bramick, Proj. 2408 File

TEXT OF RESPONSE TO QUESTION 1

ICE Procedure No. 13 was superceded by I & CE Procedure No. 100, "Design Quality Assurance Procedure" on March 18, 1975. The first system designed for SONGS was the Ex-Core Neutron Flux Monitoring System. The original purchase order (#9303771) was sent to E-M on November 30, 1973. With the purchase order, C-E Engineering provides functional design specifications. The manufacturer develops a detailed design which is submitted to C-E Engineering for approval and review. This process normally involves several years of development before final design approval is given to the design drawings. In this case, the design process involved many Requests for Approval and Review (RARs) before the system was built, tested, and finally shipped in 1976. Since the system was installed at SONGS 2, a significant number of Field Action Requests (FARs) have been issued to implement further changes in the design. All changes in the design process after March 1975 were governed by ICE Procedure No. 100 and the Quality Assurance of Design Manual (Rev. 0, May 3, 1976).

All other safety systems for SONGS 2 and 3 have undergone extensive development towards a final design since March 1975.

The relatively few designs developed and reviewed using ICE Procedure No. 13 have been proven by further review and testing using the later, more extensive criteria for demonstrating quality assurance. Therefore, it can be safely concluded that all safety systems designs have been completed in conformance to adequate Quality Assurance of Design procedural guidelines.

TEXT OF RESPONSE TO QUESTION 2

(taken from C-E internal memorandum, dated 2/26/82)

The purpose of this memo is to verify that, during my administration as Manager of the Instrumentation, Controls, and Electrical Department from 1971 through 1975, the subject training was carried out effectively for the purposes defined in the above references.

The responsibilities of the Managers and Supervisors in the Department have always included ensuring that the engineers assigned to them are capable of doing their design development and review according to the required quality assurance procedures. Auditable documentation gives ample evidence that the engineers adhered to the referenced procedures.

C-E Power Systems
Combustion Engineering, Inc.
1000 Prospect Hill Road
Windsor, Connecticut 06095

Tel. 203/688-1911
Telex: 99297

TO: GEORGE CHANDLER
FROM: ROBERT JEWELL

PFR-F004

POWER SYSTEMS

S-CE-7351
February 26, 1982

Southern California Edison Co.
San Onofre Units 2 & 3
SCE Order No. NT800001
Bechtel Job No. 10079
C-E Contracts 1370 & 1470

General Atomic Company
P.O. Box 81608
San Diego, California 92138

Attention: Mr. G. Wessman

Subject: Request for additional information pertaining to Potential Finding Report 2408-PFR-F004

Reference: Telecon, George Chandler (GA) to R. P. Jewell (C-E), 2/24/82

Attached for your use is the information requested in the referenced telecon. The information requested consists of the answers to the following two questions:

1. Was ICE Procedure No. 13 used for final design work for SONGS Units 2 & 3?

2. Could C-E demonstrate that any training in the use of ICE Procedure No. 13 was provided to the design engineers?

I believe that the attached statements sufficiently respond to these questions, and should therefore assist the Review Committee in settling the issue raised in 2408-PFR-F004.

I would like to point out that GA's Quality Assurance team has recently completed their review of C-E's I&CE Quality Assurance procedures, and to date C-E has not received any indication of any problems in that area.

If I can be of any further assistance, please advise.

Sincerely,

V C Hall

V.C. Hall
Project Manager

VCH:RPJ:msr

cc: J. Adrian (SCE) w/att.

PFR-F004

General Atomic Company

QUALITY ASSURANCE DEPARTMENT

Record of Long Distance Telephone Call

Party: Called ☑ Calling ☐

Date: 2/1/82

Time: Completed 8:15
Started 8:35
On-line :20

Name GEORGE HUBA

Company COMBUSTION ENGINEERING

Location WINDSOR, CONN

Telephone No: A/C 203 No. 688 1911 x2696

Discussion

MR. HUBA AND I DISCUSSED CE'S RESPONSE TO PFR'S 0046, 0047, 0048 0049 AND (F004) WE WENT OVER THE RESPONSES POINT-BY-POINT TO HELP ASSURE THAT I UNDERSTOOD THEIR POSITION.

Record Made by George Chandler

Distribution: CC: S. BRENNER DRAFTSMAN FILE

IMPACT ASSESSMENT

2408 PFR NO. -F004

AFFECTED ITEM: Design Control Training

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 ?

   See "other comments" below.

5. ARE OTHER SIMILAR DEVIATIONS LIKELY TO EXIST ?

   N/A

6. OTHER COMMENTS:

   An impact of not training engineers would be a design that is not properly reviewed or interfaced or controlled for changes. Based on documents reviewed at Windsor and CE's letter of 2/26/82 it appear the ICC engineers were aware of and followed the procedures. George Chandler

PREPARED BY: George Chandler DATE: 2/10/82 3/3/82

COMMENTS:

The impact does not appear to be significant based on the CE comments in their letter of 2/26/82.

BY: J. Brunel DATE: 3/1/82

2408 PFR NO. - F010

POTENTIAL FINDING REPORT

REVISION --

SONGS 2&3 SEISMIC DESIGN VERIFICATION

A. PREPARATION BY GA INITIATOR

AFFECTED ITEMS:
Ultimate Heat Sink Auxiliary Intake Structure Specification #41-2055.

REQUIREMENT REFERENCE DOCUMENTS:
Engineering & Construction Dept. QA Procedure 39-20-3 (Section B, Action I) "Preparation, Review, Approval, Verification, and Release of Specifications and Addenda Developed by SCE for SONGS 1,2&3".

BASIC REQUIREMENT: The responsible Group Leader prepares form E4-611 "Project Requirements" which identifies for each specification the appropriate project and SCE standards, QA requirements, supplier documentation requirements, quality class, safety class, seismic category, etc. The Responsible Engineer (spec preparer) reviews the E4-611 and other established design input considerations, and prepares form E4-608 "Input Data Requirements".

DESCRIPTION OF POTENTIAL FINDING:

No evidence could be located that the design input requirements for specification #41-2055 were established or implemented in accordance with the stated requirement. No copies of forms E4-611 and E4-608, or equivalent data sheets, could be located for this specification in the Corporate Documentation Services master files or microfiche.

PREPARED BY: B. L. Coleman DATE: 11/29/82

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. Brevard DATE 1/29/82

☐ REQUEST RE-REVIEW BY _____ DATE _____

☐ DISAGREE BY _____ DATE _____

☒ REVIEW OF ORIGINAL DESIGN ORGS. COMMENTS BY: L. Brevard DATE: 3/4/83

2408 PFR NO. - F010

REVISION

C. REVIEW BY ORIGINAL DESIGN ORGANIZATION

COMMENTS

☒ AGREE PF IS VALID Comments attached

☐ DISAGREE

BY: by RBS for S.L. Rutter DATE: 2/4/82

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

Failed to prepare proper forms. However, proper input was provided.

BY: S L Koutz DATE: 3/5/82

E. GA PROJECT MANAGER

☒ ACCEPT

☐ REJECT

BY: G W Wenzinger DATE: 3/5/82

2408 PFR F010
GDC 3/4/82

PFR NO. F010

The design of the auxiliary intake structure (A.I.S.) and the preparation of the construction specification #41-2055 was initiated by Edison Civil Engineering and integrated into the ongoing construction schedule for the Offshore Circulating Water System (OCWS). The A.I.S. specification was prepared with the foreknowledge that the OCWS contractor would also be performing the A.I.S. work. Therefore, the technical specification for the A.I.S. used much of the technical information contained in the OCWS specification as input.

Design input sheets (E4-611 and E4-608) were not prepared for specification #41-2055 in accordance with QA procedure 39-20-3, and this is acknowledged as a design oversight. However, the design of the A.I.S. and the preparation of the specification were performed by the same registered engineer with the direct involvement of the Project Group Leader. Calculations and the specification were prepared concurrently with direct correlation to ensure that appropriate project design criteria and inputs were incorporated in the specification.

The A.I.S. involved concrete construction for which straight-forward technical specifications were already cited in the OCWS specification. Further, because the design was clearly a single-discipline effort (Civil Engineering), design inputs from other disciplines were not warranted.

The impact of this deviation from procedures on the integrity or performance of the A.I.S. is inconsequential.

Prepared By: J. K. YANN

Approved By: H. L. Richter 2/4/82
H. L. RICHTER

IMPACT ASSESSMENT

2408 PFR NO. F010

AFFECTED ITEM: SCE Specification #41-2055

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, the specification was reviewed by the Nuclear Engineering discipline and Project Engineer, as well as the Civil Engineering discipline.

5. ARE OTHER SIMILAR DEVIATIONS LIKELY TO EXIST ?

   Possibly. However, since SCE was only responsible for the design of three systems, there were very few specifications and calculations prepared.

6. OTHER COMMENTS:

   The SCE "Design Review Responsibility Matrix" lists 28 separate design input requirements which the responsible engineer uses to identify those requirements applicable to his design. The design input forms are SCE's means to assure that appropriate design input requirements have been considered, and listed, and not left to the engineer's memory. Supplemental information received from SCE on 2 March 1982: SCE provided an analysis to show that the design input parameters cited in the supporting calculation (e.g. applicable codes, standards, concrete strength,etc) were, in fact, cited in the specification. It appears that the specification contains the appropriate design parameters, so the lack of documented design input sheets for the specification poses no safety hazard.

PREPARED BY: B. L. Coleman DATE: 2/22/82

B. Coleman 3/4/82

COMMENTS:

OK - re Supplemental Info. S. Brewer 3/4/82

BY: J. Brewer DATE: 2/24/82

2406 PFR F 010
SDC 3/4/82

PFR F-0010

SUPPLEMENTAL INFORMATION:

Request:

Provide information to demonstrate that appropriate design requirements, as called out in the calculations and appropriate construction requirements, were used as input to the specification and included therein.

Response:

We are providing the following table to demonstrate that design input data pertaining to the Auxiliary Intake Structure were incorporated in the construction specification. The table presents specific design parameters cited in the design input sheets for the A.I.S. calculations. It also references to appropriate sections of the specification, showing that these same parameters were used in developing the specification. This correlation is supported by the fact that the same responsible engineer who prepared the design input sheets for the design calculations also prepared Specification #41-2055. It should be noted the inclusion of the 1976 Uniform Building Code as an applicable code was superfluous because the ACI 318-71 code covered the area of concrete design. The reference to the UBC was in recognition that it was included in the original OCWS specification.

We have also provided some pertinent sections of the original OCWS specification which were specifically reiterated in Specification 41-2055. These pertain to Excavation, Special Gravel Bedding, Stone Blankets, Joint Gaskets, and Joint Wrapping Material. These items were accomplished in accordance with standard practice in use during pipe placement activities up to the installation of the AIS. We have also included a copy of the supplier's specification for the Dywidag thread bars, portions of which were used in developing input to Specification 41-2055.

Prepared by: J. K. Yann

Approved by: for H. L. Richter
2/15/82

1348-9662

2408-PFR-F010
JDE 3/4/82

DESIGN PARAMETER AND SOURCE	CORRESPONDING PARAMETER CITED IN A.I.S. SPECIFICATION
Design Input Sheet p. 1 of 7:	
1. Applicable Codes: ACI 318-71 ACI SP-17(73) Manual of Concrete Practice AWS D12.1 AWS D1.1 UBC, 1976 Edition (Source: Design Input Sht. 1 of 7)	Section 3.0 Governing Codes and Standards ACI 318 ACI SP-17 AWS D12.1 AWS D1.1
2. Concrete Compressive Strength Lightweight concrete: f'_c = 4000 psi (Unit wt. = 115 pcf) Granitic concrete: f'_c = 4000 psi (Unit wt. = 145 pcf) (Source: Design Input Sht 4 of 7)	Section 7.0 Concrete "All concrete. . . shall be light-weight aggregate concrete with minimum compressive strength = 4000 psi @ 28 days. Non-lightweight concrete shall also have a minimum compressive strength = 4000 psi"
3. Reinforcing Steel Mild steel A615 Grade 40 High strength steel A615 Grade 60 (Dywidags) (Source: Design Input Sht 4 of 7)	Section 6.0 Reinforcing Steel "Reinforcing steel shall be ASTM A615 Grade 40 for the scope of work specified in Section 4 of this Specification." Section 6.1 Miscellaneous Steel "Dywidag, or equivalent, threaded reinforcing steel shall be Grade 60 conforming to ASTM A615."
4. Structural Steel Yield strength of structural steel (Shear lugs) f_y = 36 ksi (Source: Design Input Sht 4 of 7)	Section 6.1 Miscellaneous Steel "Plate steel and lugs shall be ASTM A36 steel."
5. Minimum Cover Over Reinforcing Steel "Formed concrete exposed to seawater will have a minimum cover of 2" over main reinforcing steel (#5 and larger bars)" (Source: Design Input Sht 5 of 7)	Section 7.0 Concrete "All concrete surfaces exposed to water shall have 2" minimum cover over reinforcing, unless otherwise noted on the drawings."

2408-PFR-F010 for 3/4/82 F010

DESIGN INPUT SHEET

[X] Design Requirements
[ ] Design Input Change

PAGE 1 OF 7

DC 339-

SUBJECT: OCWS AUXILIARY INTAKE STRUCTURE

PROJECT: SONGS 2 & 3

QUALITY CLASS: II

SEISMIC CLASS: I

SPECIFICATION REFERENCE: SCE # 41-2055

Design Input

FUNCTION: ASSURE THE FLOW OF COOLING WATER TO THE NUCLEAR COMPONENT COOLING WATER SYSTEM IN ACCORDANCE WITH SAN ONOFRE 2 & 3 FSAR SECT. 9.2.5. (ATTACHED SHT. 2)

APPLICABLE CODES: ACI 318-71, ACI SP-17(73), ACI MANUAL OF CONCRETE PRACTICE, AWS D12.1, AWS D1.1, UBC 1976 EDITION.

DESIGN BASIS:

1. SEPARATE AUX. INTAKE STRUCTURE PROVIDED FOR EACH UNIT, LOCATED APPROX. 3200 FT. OFFSHORE AND 100 FT. SHOREWARD OF PRIMARY INTAKE STRUCTURE.
2. EACH STRUCTURE DESIGNED TO SUPPLY 34,000 GPM FLOW REQ'D. FOR THE SALTWATER COMPONENT COOLING OF BOTH UNITS, PER FSAR 9.2.5.
3. AUX. INTAKE STRUCTURES DESIGNED TO CORRESPOND IN HEIGHT AND NORMAL INTAKE CONDITIONS TO PRIMARY INTAKE STRUCTURES.
4. ANALYSIS METHODOLOGY, LOADINGS, AND LOAD COMBINATIONS PER STANDARD REVIEW PLAN (SRP) SECTIONS 3.7.2, 3.8.4, AND 3.8.5. STRUCTURAL DAMPING DERIVED FROM NRC REGULATORY GUIDE (RG) 1.61. THESE CRITERIA ARE SUMMARIZED ON SHT. 3.

EDD RESPONSIBLE ENGINEER	DATE	REVIEW ENGINEER	DATE	EDD RESPONSIBLE GROUP LEADER	DATE
[signature]	5/30/78	Alan J. Fothen	5/30/78	[signature]	5/30/78

OBJECT: OCWS AUXILIARY INTAKE STRUCTURE

PROJECT: SONGS 2 & 3

QUALITY CLASS: II

SEISMIC CLASS: I

SPECIFICATION REFERENCE: SCE #41-2055

Design Input

San Onofre 2&3 FSAR

WATER SYSTEMS

9.2.5 ULTIMATE HEAT SINK

The ultimate heat sink provides cooling water for use in the saltwater cooling system described in subsection 9.2.1, during normal, shutdown, and accident conditions.

9.2.5.1 Design Bases

The design bases for the ultimate heat sink are:

A. The ultimate heat sink is capable of providing sufficient cooling for at least 30 days:

   1. To permit simultaneous safe shutdown and cooldown of both nuclear reactor units and to maintain them in a safe shutdown condition, or

   2. To mitigate the effects of an accident in one unit, and to permit safe shutdown and cooldown of the other unit and to maintain it in a safe shutdown condition.

B. The complex of the ultimate heat sink consists of one water source, the Pacific Ocean, with a capability to perform the safety functions required by the design basis of listing A during and after one of the following events:

   1. The most severe natural phenomena including the DBE, tornado, flood, or tsunami taken individually

   2. Nonconcurrent site-related events including transportation accidents, oil spills, and fires

   3. Any credible single failure of any man-made structure.

C. The ultimate heat sink provides cooling water to both units to support power generation.

All components associated with the ultimate heat sink that are required to meet the design basis of listing A are Seismic Category I.

EDG RESPONSIBLE ENGINEER	DATE	REVIEW ENGINEER	DATE	EDG RESPONSIBLE GROUP LEADER	DATE
[signature]	5/30/78	[signature]	5/30/78	[signature]	5/30/78

DESIGN INPUT SHEET

☒ Design Requirements
☐ Design Input Change

PAGE 3 OF 7

DC 339-F010

SUBJECT: OCWS AUXILIARY INTAKE STRUCTURE

PROJECT: SONGS 2 & 3

QUALITY CLASS: II

SEISMIC CLASS: I

SPECIFICATION REFERENCE: SCE # 41-2055

Design Input: SUMMARY OF S.R.P. AND R.G. STRUCTURAL DESIGN CRITERIA

ITEM	REFERENCE	CRITERIA USED
Analysis Methodology	S.R.P. 3.7.2	Equivalent Static Analysis Methodology was utilized.
Structural Damping	R.G. 1.61	Peak response from applicable SONGS 2 & 3 response spectra: D.B.E. - 7% critical damping O.B.E. - 4% critical damping
Structural Loadings	S.R.P. 3.7.2	1.5 x peak response for oscillating elements of structures.
Hydrodynamic Loadings	S.R.P. 3.7.2	Virtual mass of water external to the riser structure assumed to respond at full structural acceleration applied vertically to the velocity cap and horizontally to the riser body. Full mass of water contained by the structures assumed to act with them.
Load Application	S.R.P. 3.7.2	Seismic loadings applied in both horizontal directions simultaneously with vertical. Combination by SRSS.
Load Combinations for Structural Elements	S.R.P. 3.8.4	Ultimate Strength Design U = 1.4D + 1.7L + 1.9E (O.B.E.) U = 1.2D + 1.9E (O.B.E.) U = D + L + E' (D.B.E.) U = D + E' (D.B.E.) U = Strength required to resist design loadings per ACI 318-71 Strength Design Methods. D = Bouyant weight of structural elements L = Storm wave loadings
Load Combinations for Stability	S.R.P. 3.8.5	D + H + E, F.S. > 1.5 (O.B.E.) D + H + E', F.S. > 1.1 (D.B.E.)

EDS RESPONSIBLE ENGINEER: [signature] DATE: 5/31/78

REVIEW ENGINEER: [signature] DATE: 5/30/78

EDS RESPONSIBLE GROUP LEADER: [signature] DATE: 5/31/78

SJC 3/4/82

DESIGN INPUT SHEET

☒ Design Requirements
☐ Design Input Change

PAGE 4 OF 7

DESIGN CALCULATION NO. DC 339

FOLD

SUBJECT: OCWS AUXILIARY INTAKE STRUCTURE

PROJECT: SONGS 2 & 3

QUALITY CLASS: II

SEISMIC CLASS: I

SPECIFICATION REFERENCE: SCE # 41-2055

Design Input

DESIGN ASSUMPTIONS:

1. COMPRESSIVE STRENGTH OF CONCRETE

LIGHTWEIGHT ($\gamma = 115$ PCF) $f_c' = 4000$ psi *

15% REDUCTION IN SHEAR ALLOWABLE FOR LIGHTWEIGHT AGG.

$v_c = .85 \times 2\sqrt{f_c'}$

GRANITIC ($\gamma = 145$ PCF) $f_c' = 4000$ psi

* EXCEPT FOR CONDUIT SECTION, ACTUAL DESIGN BASED ON $f_c' = 3000$ psi PRIOR TO FINAL MIX DESIGN

2. YIELD STRENGTH OF REINFORCING STEEL

MILD STEEL A615-40 $f_y = 40$ KSI

HIGH STRENGTH (DYNIDAGS) A615-60 $f_y = 60$ KSI

3. YIELD STRENGTH OF STRUCTURAL STEEL (SHEAR LUGS) $f_y = 36$ KSI

4. VELOCITY CAP, RISER, AND CONDUIT INLET DIMENSIONS WERE ESTABLISHED BY HYDRAULIC CALCULATIONS TO EVALUATE NORMAL AND EMERGENCY FLOW CONDITIONS.

5. CONDUIT DIMENSIONS ESTABLISHED BY MAX. PRACTICAL LIFT AND PLACEMENT CAPACITY OF EXIST. OCWS TRESTLE AND GANTRY CRANE PER G.F. ATKINSON. CONDUIT STRUCTURAL CONFIGURATION INTENDED TO UTILIZE AVAILABLE FABRICATION EQUIPMENT AND TECHNIQUES OF AMERON, INC.

EDD RESPONSIBLE ENGINEER	DATE	REVIEW ENGINEER	DATE	EDD RESPONSIBLE GROUP LEADER	DATE
A K Singhvi	5/30/78	Alan J Fokine	5/30/78	J H Dr J	5/30/78

2408-VPR-1.01
SPC 3/4/82

DESIGN INPUT SHEET

[X] Design Requirements
[ ] Design Input Change

PAGE 5 OF 7

DESIGN CALCULATION NO. DC339-F010

SUBJECT: OCWS AUXILIARY INTAKE STRUCTURE

PROJECT: SONGS 2 & 3

QUALITY CLASS	SEISMIC CLASS	SPECIFICATION REFERENCE
II	I	SCE # 41-2055

Design Input

6. ALL STRUCTURAL COMPONENTS OF THE AUXILIARY INTAKE STRUCTURE WILL BE CAST AND ASSEMBLED COMPLETELY IN THE DRY.

7. FORMED CONCRETE EXPOSED TO SEAWATER WILL HAVE A MINIMUM COVER OF 2" OVER MAIN REINFORCING STEEL (#5 AND LARGER BARS).

8. REINFORCING SPLICES WILL CONFORM TO ACI 318-71. APPROVED MECHANICAL SPLICES WILL BE PERMITTED.

9. CONSTRUCTION JOINTS WILL BE MONOLITHIC WHEREVER PRACTICABLE.

10. STABILITY PARAMETERS FOR ANALYSIS OF AUXILIARY INTAKE STRUCTURE ARE CONTAINED IN LETTER FROM WOODWARD-CLYDE CONSULTANTS (WCC) DATED 3/8/78, ENTITLED "STABILITY EVALUATION FOR AUXILIARY INTAKE STRUCTURE, SONGS UNITS 2 AND 3, SAN ONOFRE, CALIFORNIA." VALUES FROM THIS LETTER ARE USED IN THE CALCULATIONS AND REFERENCED THEREIN.

EDO RESPONSIBLE ENGINEER	DATE	REVIEW ENGINEER	DATE	EDO RESPONSIBLE GROUP LEADER	DATE
D.K. Wright	3/30/78	Alan J. Fohrer	5/30/78	J. M. Y	5/30/78

1408-PFR-F010 SDC 3/14/82 F010

DESIGN INPUT SHEET

[X] Design Requirements
[ ] Design Input Change

PAGE 6 OF 7

DESIGN CALCULATION NO. DC339

SUBJECT: OCNS AUXILIARY INTAKE STRUCTURE

PROJECT: SONGS 2 & 3

CLASS: II

SEISMIC CLASS: I

SPECIFICATION REFERENCE: SCE # 61-2055

Design Input

REFERENCES:

1. N. M. NEWMARK AND E. ROSENBLUETH, "FUNDAMENTALS OF EARTHQUAKE ENGINEERING," PRENTICE-HALL, pp. 201-203 AND pp. 546-548, 1971.

2. FERGUSON, P.M, "REINFORCED CONCRETE FUNDAMENTALS," (3RD EDITION) JOHN WILEY & SONS, 1973.

3. ROARK, R.V, "FORMULAS FOR STRESS AND STRAIN," 4TH EDITION, MCGRAW-HILL, p. 172-180, 1965.

4. KING, H.W., AND E. BRATER, "HANDBOOK OF HYDRAULICS," 5TH EDITION, MCGRAW-HILL, 1963.

5. TENG, W.C., "FOUNDATION DESIGN," PRENTICE-HALL, 1962.

6. GAYLORD, E.H., AND C. GAYLORD, "DESIGN OF STEEL STRUCTURES," MCGRAW-HILL, pp. 350-352, 1972.

EDO RESPONSIBLE ENGINEER: [signature] DATE: 5/30/78

REVIEW ENGINEER: Alan J. Fohrer DATE: 5/30/78

EDO RESPONSIBLE GROUP LEADER: [signature] DATE: 5/30/78

2408-PPR-1 Rev 3/4/82 F010

DESIGN INPUT SHEET

☒ Design Requirements
☐ Design Input Change

PAGE 7 OF 7

DESIGN CALCULATION NO DC 339-

SUBJECT: OCWS AUXILIARY INTAKE STRUCTURE

PROJECT: SONGS 2 & 3

QUALITY CLASS: II

SEISMIC CLASS: I

SPECIFICATION REFERENCE: SCE #41-2055

Design Input

REFERENCES (CONT.)

7. ACI 318-71, "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE," AMERICAN CONCRETE INSTITUTE, 1971.

8. UNIFORM BUILDING CODE, INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS, 1976.

9. 10 CFR PART 50, APPENDIX A, GENERAL DESIGN CRITERION 2, "DESIGN BASES FOR PROTECTION AGAINST NATURAL PHENOMENA."

10. "STABILITY EVALUATION FOR AUXILIARY INTAKE STRUCTURE, SONGS UNITS 2 AND 3, SAN ONOFRE, CALIFORNIA," LETTER FROM WOODWARD - CLYDE CONSULTANTS, MARCH 8, 1978.

EDO RESPONSIBLE ENGINEER: [signature] DATE 5/30/78

REVIEW ENGINEER: [signature] DATE 5/30/78

EDO RESPONSIBLE GROUP LEADER: [signature] DATE 5/30/78

conform to the requirements of ACI Standard 318-71 and Section A2 of this Specification.

b. Gaskets: The gasket used for sealing concrete pipe conduit joints shall be a continuous ring and shall be a sole element depended upon to make the joint watertight and sandtight. The gasket shall be compounded of not less than 50 percent by volume of first-grade natural crude or first-grade synthetic rubber, which shall meet the physical requirements specified in Section 3.4 of AWWA Specification C302-64.

A3.2.3 Design of Concrete Pipe: All concrete pipe shall be bell and spigot joint design with a recessed single rubber gasket. Concrete materials and proportioning shall conform to Section A2 of this Specification.

10, 14 and 18 ft I.D. concrete pipe shall be manufactured by the vertical cast and vibrated method in accordance with Section 3.6 of AWWA Specification C302-64.

Pipe shall be designed and fabricated so that when the pipe is laid it will be self-centering and the gasket will keep the joint tight under all normal conditions of service, including expansion, contraction, and settlement.

The pipe vendor may choose any joint design that will satisfy the requirements of the Specification with the limitation that for 18 ft. I.D. pipe placed

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A4.3 SITE CLEARING:

All waste materials removed during site clearing operations shall be disposed of by Atkinson in a manner approved by the Engineer.

A4.4 PROTECTION OF EXISTING IMPROVEMENTS:

It shall be the responsibility of Atkinson to take whatever measures may be necessary to prevent damage to existing improvements lying outside the limits of actual construction, or within construction limits if such improvements are to remain in service. Repair of existing improvements damaged by Atkinson's operations shall be made by Atkinson.

A4.5 EXCAVATIONS:

Trenches shall be excavated to a uniform grade and shall be free of any large rocks or boulders. Side slopes shall be kept as steep as possible while maintaining safe working conditions. It is anticipated that the slopes of any cuts into the San Mateo Sand Formation will remain stable with slopes steeper than 1/2:1 (Horiz:Vert) unless the slope face is disturbed by construction operations. Unconsolidated materials which overlie the San Mateo Formation may require milder slopes. Unconsolidated soils may be composed of gravel, cobbles, and ocean bottom sediments (loose silts). Preliminary investigation suggests that the depths of the unconsolidated material may reach ten feet near shore with thicknesses generally diminishing seaward along the alignment to three to five feet.

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All trenches shall be overexcavated a minimum of three (3) feet. Atkinson shall note in its log the elevation and stationing along the trench prior to any backfill. Elevations shall be taken at least every ten (10) feet. Trenches may be backfilled to grade before or after pipe is placed. Shoring and other supports shall be provided as necessary to support all excavated surfaces. Excavated material not immediately used for backfill shall be stockpiled or disposed of by spreading on the Offshore Construction Pad as allowed by the Engineer, or by dumping in the surf landward of the mean lower low water line. Surf dumping shall only be done South of both conduit alignments in those areas identified by the Engineer as being acceptable for sand disposal. Cobbles larger than four (4) inches in diameter shall not be dumped in the surf but shall be removed from the site or spread along the backfilled trench.

A daily log shall be kept which estimates the amount of conduit construction spoil disposal and the location of disposal referenced to the Unit 1 outfall and Mean Lower Low Water (MLLW). The log shall be submitted quarterly to the Regional Water Quality Control Board via the Engineer.

A4.6 ALIGNMENT:

The alignment shall be as shown on the Drawings. Any change from the alignment shown on the Drawings shall be approved by the Engineer prior to construction.

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F010

A4.7 BACKFILL:

Immediately after placing of conduit sections, they shall be adequately supported and braced and the trench backfilled with gravel or well graded fine to coarse sand to provide a firm bedding until the trench can be completely backfilled.

A4.7.1 Special Gravel Bedding and Backfill: Gravel shall be used as bedding and backfill along the length of both intake and discharge conduits from the interface (Station W9+75) seaward to station W21+00. Gravel shall be placed in a manner which will assure uniformity and dense packing around the pipe and prevent sand from filling the voids. The completed gravel backfill shall conform with the dimensional restrictions shown on the approved Drawings. Where gravel backfill is specified, it shall be the only fill used between the undisturbed San Mateo sand and the natural ocean bottom prior to any disturbance.

Gravel shall be either crushed stone or river-run aggregate which conforms to the grading and soundness standards established by ASTM C33, "Specifications for Concrete Aggregates." Any nominal size between one inch (1") and three and one-half inches (3-1/2") may be used. 100% must pass the four inch (4") screen and not more than 10% may pass the one inch (1") screen. ASTM C33 size numbers 1, 2, or 3 are acceptable.

Rip-Rap may be substituted for gravel where specified. Rip-rap placed over gravel backfill shall have voids filled with gravel. Pea gravel may be used as bedding in lieu of gravel specified.

A4.7.2 Sand Bedding and Backfill: Excavated San Mateo sand shall be used as bedding and backfill along the length of both intake and discharge conduits from station W21+00 seaward. All sand backfill below the spring line of the pipe shall be well graded fine to coarse sand (San Mateo) placed as a continuous support under the conduit, and shall be brought up gradually on each side simultaneously to obtain a firm uniform bedding. The balance of backfill may be placed with random excavated material by any method that will not injure the conduit.

Backfill around the diffuser discharge structures and offshore intake structures shall be placed gradually to allow natural sand particle packing. Backfill above the pipe crown can be random excavated material and may be placed by any method that will not injure or endanger the structures.

Pea gravel may be used as bedding in lieu of excavated sand.

A4.8 STONE BLANKETS:

All stone shall be sound, durable, hard, free from laminations, weak cleavages, and undesirable weathering, and of such character that it shall not disintegrate from the action of sea water. Stone shall have a minimum specific

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SOC 3/4/82

gravity of 2.50. Suitable sources for obtaining stone are available from operating quarries at Catalina Island and Riverside, California as well as other local quarries. Stone shall be angular quarry run material 600# minus through fines having the following approximate graduation:

20 percent by weight varying uniformly from 1/4" to 100 lbs.

30 percent by weight varying uniformly from 100 lbs. to 300 lbs.

50 percent by weight varying uniformly from 300 lbs. to 600 lbs.

The quarry stone blankets shall be minimum 3 feet thick, unless otherwise specified. The surface of the stone blankets shall approximate the position of the ocean bottom before construction except as otherwise shown on the Drawings and the graded stone shall be uniformly distributed in the blanket.

the pipe sections to withstand any forces created on them during fabrication, movement and placement of the assembled units. After placement, Atkinson must release any assembled units that exceed 100 ft. in length so that there is an articulating joint at least every 100 ft. Permanently assembled units left in place may not exceed 100 ft. The joint design (flexible and non-flexible) must meet the criteria set forth in Section A3.2.3. It is left to the discretion of Atkinson to construct the conduit sections in the most economical method possible within the range of proven construction procedures.

For those flexible joints located in the area of the special gravel backfill (Sta. W9+75 to W21+00) a 3 foot wide sheet of 1/2 inch thick neoprene or PVC shall be wrapped circumferentially around the joint and securely fastened together. Wrapping shall follow the acceptance of the joint closure prior to beginning the backfilling. The neoprene or PVC sheet shall be evenly centered over the external joint opening and shall provide a seal against gravel entry in the event of joint movements.

A5.4.3 Manholes: Construction and Permanent Access Manholes shall be located as shown on the Drawings. Minor changes in location to facilitate construction shall be acceptable with the approval of the Engineer. The manhole risers on top of the conduits shall be precast

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How to specify mechanical splices for reinforcing bars.

1.
The splice shall meet the latest ACI code requirements.

2.
Depending on the design requirements the splice shall develop in tension and, or compression not less than 125 percent of the minimum yield strength, or 90 or 100 percent of the specified minimum ultimate tensile strength of the unspliced reinforcing bar.

3.
The total slip of the reinforcing bars within the splice sleeve after loading in tension to 30,000 psi and relaxing to 3,000 psi shall not exceed 0.01 in. for # 14 bars or smaller or 0.03 in. for # 18 bars.

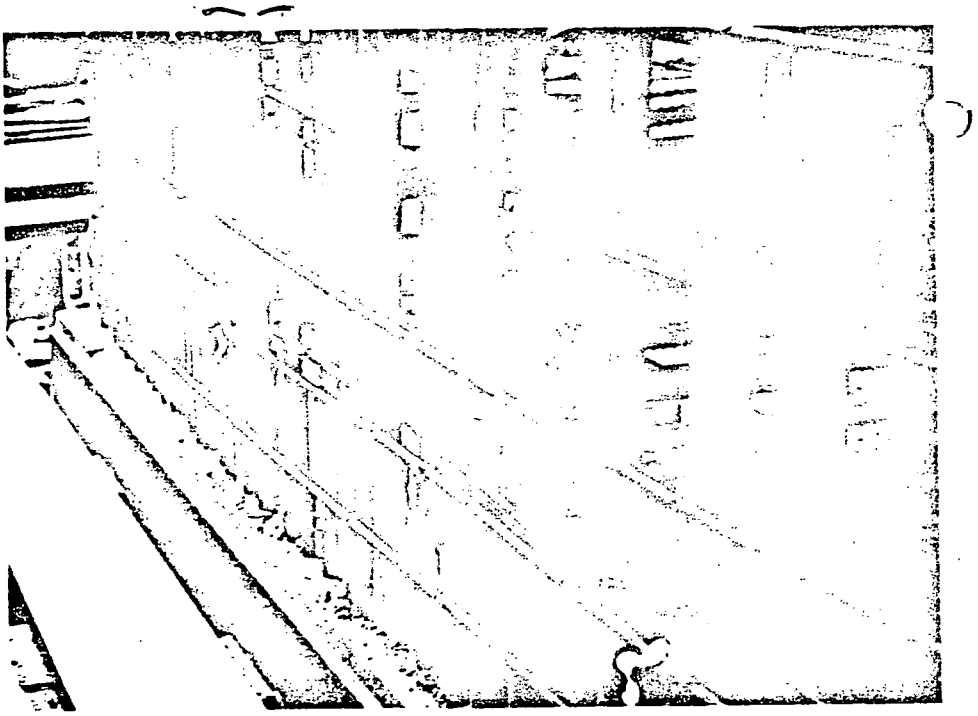
4.
The ultimate strength of the splice sleeve shall be greater than the other components of the completed mechanical splice.

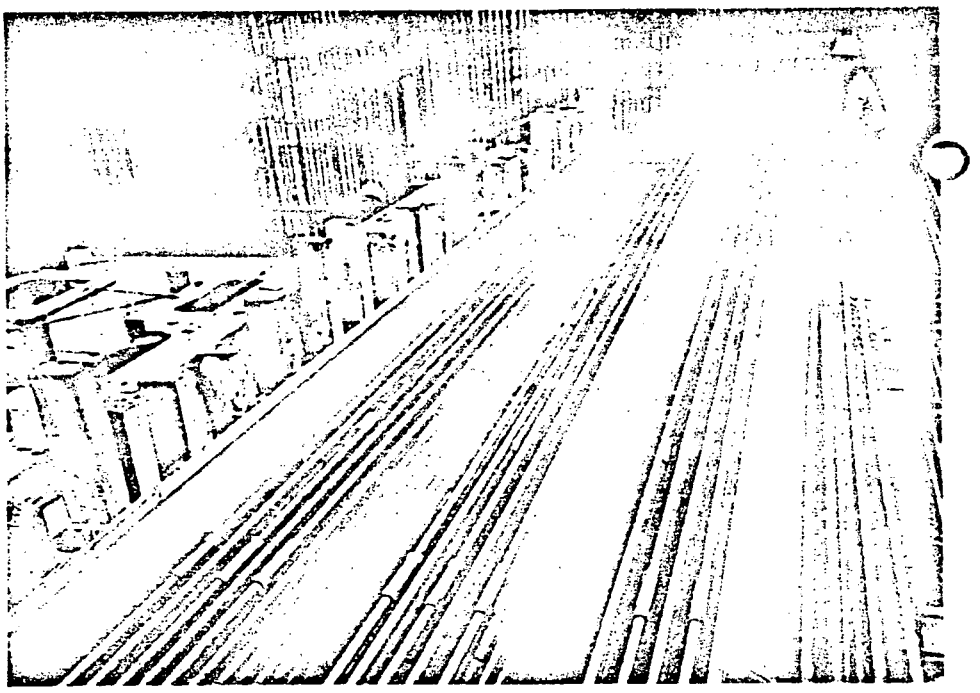
5.
All splicing procedures shall be in accordance with the manufacturers recommendations, except as modified or approved by the engineer.

6.
Splices shall be made using only manufacturers standard hardware and equipment.

7.
Mill test reports shall be submitted for the threadbars, couplers and jam nuts.

8.
Field inspection shall verify proper centering of the couplers by checking the paint marks and shall ascertain that the jam nuts are torqued with the specified torque moment. No field tests of the splice are required.





Dyckerhoff & Widmann, Inc.

DYWIDAG PRESTRESSED CONCRETE

500 FIFTH AVENUE, NEW YORK, N. Y. 10036 · (212) 221-0700
Cable Address: DYWIDAG NEW YORK

11526 SORRENTO VALLEY ROAD SAN DIEGO, CA. 92121 · (714) 755-6787
Cable Address: DYWIDAG SAN DIEGO

2408 PFR NO. - F012

POTENTIAL FINDING REPORT
REVISION --

SONGS 2&3 SEISMIC DESIGN VERIFICATION

A. PREPARATION BY GA INITIATOR

AFFECTED ITEMS: Ultimate Heat Sink Auxiliary Intake Structure Specification #41-2055 and Calculation #DC-339.

REQUIREMENT REFERENCE DOCUMENTS:

Engineering & Construction Dept. QA Procedure 39-20-3, "Preparation, Review, Approval, Verification and Release of Specifications and Addenda Developed by SCE for SONGS 1, 2&3"; and 24-7-15, "Performing Design Analysis for SONGS 1,2&3".

BASIC REQUIREMENT:

Responsible Engineer is to stamp the Registered Professional Engineer's Seal on the cover page of Civil/Structural specifications and on the table of contents sheet for Civil/Structural calculations.

DESCRIPTION OF POTENTIAL FINDING:

The cover pages of specification 41-2055, Rev. 1 and Rev. 2, do not have the Registered P.E.'s Seal (Rev. 2 is the current issue) nor does the latest revision (5/81) of calculation DC-339.

PREPARED BY: B. L. Coleman DATE: 1/29/82

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. Burrell DATE 1/29/82

☐ REQUEST RE-REVIEW BY _____ DATE _____

☐ DISAGREE BY _____ DATE _____

☒ REVIEW OF ORIGINAL DESIGN ORGS. COMMENTS BY: J. Burrell DATE: 2/1/82

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REVISION -

C. REVIEW BY ORIGINAL DESIGN ORGANIZATION

COMMENTS

☒ AGREE PF IS VALID Comments attached

☐ DISAGREE

BY: R. L. Richter DATE: 2/4/82

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

Spec was not stamped but was reviewed by Registered Professional Civil Engineer.

BY: S. A. Koutz DATE: 3/5/82

E. GA PROJECT MANAGER

☒ ACCEPT

☐ REJECT

BY: J. H. Wiseman DATE: 3/5/82

PFR No. F012

The potential finding is correct. The initial issue of specification 41-2055 was prepared and stamped by D. B. Schone, Licensed Civil Engineer. It was issued in draft form for comments and for preliminary use by Guy F. Atkinson Co. for preparation of bids and construction planning to add construction of the Auxiliary Intake Structure to their existing scope of work. The formal issue of this specification for construction was revision 1 which was dated March 31, 1978. At this point, a new cover sheet was prepared and the P.E. stamp was omitted. Since the specification was prepared by a licensed Civil Engineer under the direction of other registered engineers, failure to affix this seal, although required by procedures, does not affect the quality of this document.

Revision 2 of this specification was prepared to incorporate Configuration Changes which had been previously reviewed and approved. It was prepared in a manner similar to that used to incorporate existing CC's into drawing revisions and the cover sheet was not stamped. The use of a P.E. stamp in this case would be technically superfluous and its omission does not affect the quality of this document.

The 5/81 revision of DC 339 does not form any part of the design basis for the AIS and are retained in this file for record purposes only.

Prepared By: J. K. YANN

Approved By: H. L. Richter 7/9/82
H. L. RICHTER

IMPACT ASSESSMENT

2408 PFR NO. F012

AFFECTED ITEM: SCE Specification #S023-41-2055

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, not if the individuals who prepared and reviewed the specification are Registered Civil Engineers.

5. ARE OTHER SIMILAR DEVIATIONS LIKELY TO EXIST ?

   Unlikely

6. OTHER COMMENTS:

   The relevance of the Registered P.E. Seal on the specification is determined by California State Law as well.

   Supplemental information received from SCE on 2 March 1982: SCE provided additional evidence that the individuals who prepared, reviewed and approved the specification and calculation are Registered Professional Civil Engineers. Therefore, the absence of the Seal on the documents poses no safety hazard.

B. Coleman 3/4/82

PREPARED BY: B. L. Coleman DATE: 2/22/82

COMMENTS:

Agree with Supplemental Info.
S Burns 3/4/82

BY: D. Burns DATE: 2/24/82

PFR No. F012

Supplemental Information

Request:

Provide verification that Revisions 1 and 2 to Specification 41-2055 were prepared by Registered Professional Engineers in light of the fact that the P.E. seal was not affixed to the cover sheet.

Response:

We are providing a copy of the cover sheet for Revision 1 of this specification along with the Design Verification/Release form (EO 166) for this revision. The EO 166 was signed by the preparer, Mr. S. R. Wright, Registered Civil Engineer No. 26,452. Mr. Wright also assisted Mr. D. B. Schone in the preparation of Rev. O to this specification, the cover sheet for which was signed and stamped by Mr. Schone.

We are also providing a copy of the cover sheet and EO 166 for Addendum II of this specification which was, in fact, a revision to incorporate Configuration Changes 1 through 10 which were used in actual performance of construction activities. This revision and CC's 6 through 10 were performed by Mr. A. C. Bose-Roy, Registered Civil Engineer No. 26,018. We are also enclosing cover sheets for the 10 CC's. CC's 1 through 3 are signed and stamped by Mr. S. R. Wright. CC's 4 through 6 are signed by Mr. A. J. Fohrer, Registered Civil Engineer No. 26,195. CC's 7 through 10 are signed by Mr. A. C. Bose-Roy.

Prepared by: J. K. Yang

Approved by: for H. L. Richter
2/25/82

1348-9662

2408-PTR-F012
fdc 3/4/82

QUALITY CLASS II
SCE
CIVIL/STRUCTURAL

CONSTRUCTION SPECIFICATION

FOR THE
SAN ONOFRE NUCLEAR GENERATING STATION, UNITS 2&3
OFFSHORE CIRCULATING WATER SYSTEM

AUXILIARY INTAKE STRUCTURE

TECHNICAL SPECIFICATION
#41-2055 (BPC Spec #211-01)

March 31, 1978

REVISION I

1408-PFR-F012
SDC 3/4/82

FILE NO. (S) BT01-M
SO23

DESIGN VERIFICATION/RELEASE

PROJECT San Onofre Nuclear Generating Station, Units 2&3

DOCUMENT NO. 41-2055 (211-01) REV. "1" QUALITY CLASS II

DOCUMENT TITLE SCE C/S Construction Specification for SONGS 2&3

DESCRIPTION OCWS Auxiliary Intake Structure

SIGNATURE	DATE	COMPANY	RELEASE DATE
(1) ORIGINATOR ENGINEER	4-3-78	SCE	4-3-78
(2) SUPVG. DISCIPLINE ENGINEER	4/3/78	SCE	4/3/78
(3) PROJ. ENGINEER	4/3/78	SCE	4/3/78
(4)			
(5)			
(6)			
(7)			
(8)			
(9) QUAL. ASSUR	4-6-78	SCE	4-6-78

SUPPORTING DATA COMPLETION STATUS BY ORIGINATOR

APPROVAL CONTINGENT UPON ISSUANCE OF UNIT 1 SUPPLEMENT

COMMENTS (INDICATE ORIGIN BY 1,2,3 ETC.)

SCE SO 100 REV 12/79

2/08-PFR-F012
SDC 3/4/82

QUALITY CLASS II
SCE
CIVIL/STRUCTURAL

CONSTRUCTION SPECIFICATION

FOR THE
SAN ONOFRE NUCLEAR GENERATING STATION, UNITS 2&3
OFFSHORE CIRCULATING WATER SYSTEM

AUXILIARY INTAKE STRUCTURES

TECHNICAL SPECIFICATION
#41-2055 (EPC Spec #211-01)

June 6, 1980

ADDENDUM - II

7.03.80

2408 PFR-F 01C
QC 3/4/82 F01 2

FILE NO. (S) 06087

DESIGN VERIFICATION/RELEASE

PROJECT San Onofre Nuclear Generating Station, Units 2&3

DOCUMENT NO. 41-2055 (211-01) REV. II QUALITY CLASS II

DOCUMENT TITLE Construction Specification for the SONGS 2 & 3, OCWS- AIS

DESCRIPTION Change Addendum I to Addendum II

SIGNATURE	DATE	COMPANY	RELEASE DATE
(1) ORIGINATOR ENGINEER	6/10/80	SCE	6/10/80
(2) SUPVG DISCIPLINE ENGINEER	6-10-80	SCE	6-10-80
(3) PROJ. ENGINEER	6/11/80	SCE	6/11/80
(4) GROUP DISCIPLINE ENGINEER	6/10/80	SCE	6/10/80
(5) NUCLEAR ENGINEER	6-11-80	SCE	6-11-80
(6)			
(7)			
(8)			
(9) QUAL. ASSUR	6-11-80	SCE	6-11-80

SUPPORTING DATA COMPLETION STATUS BY ORIGINATOR

Approved CC#1 to CC#10 incorporated in REV- II

COMMENTS (INDICATE ORIGIN BY 1,2,3 ETC.)

5-17-79 CC #1 24-B-AFR-F012

STRCWAAG- -5

CONFIGURATION CHANGE

☐ REQUEST ☒ NOTICE — BTOI-SE

SHEET 1 OF 2

NUMBER

CLASS: ☐ CRITICAL ☒ ROUTINE

DATE 8-22-78

REQUESTED BY: S.R.Wright

☒ SPECIFICATION ☐ DRAWING ☐ PROCEDURE ☐ INSTRUCTION

NUMBER SCE #41-2055 (211-01) REVISION I CLASS II

TITLE: SCE C/S Construction Specification for SONGS 2 & 3 OCWS Auxiliary Intake Structure

VENDOR: ☐ BECHTEL ☒ EDISON

DESCRIPTION OF CHANGE

Page 5 6.0 Reinforcing Steel

Change first sentence to read:

Reinforcing steel shall be ASTM A615 Grade 40 for the scope of work specified in Section 4.0 of this Specification, except as otherwise authorized by the Edison Engineer.

Page 7 6.2 Welding

Change Line 2 to read:

All Edison Engineering approved tack welding shall be performed by MIG process, using double pass technique for #7 bars or larger, and triple pass technique for bars smaller than #7.

Insert the following just prior to the last sentence in the paragraph:

(See Sheet 2)

JUSTIFICATION

The above changes to Specification #41-2055 are required to

1. Clarify design intent.
2. Improve constructibility.
3. Assure control over material and quality of workmanship.

SIGNATURE [signature]

EVALUATION

These changes will assist CMI in verifying conformance to specification and will result in less confusion to the contractors in meeting job requirements.

EVALUATION - ☒ APPROVE ☐ REJECT

REASON: ABOVE

REGISTERED PROFESSIONAL ENGINEER [signature]

REGISTERED PROFESSIONAL ENGINEER STANLEY R. WRIGHT NO. 26,452 CIVIL STATE OF CALIFORNIA

DECISION - ☒ APPROVE ☐ REJECT

COMMENT

PROJECT ENGINEER [signature]

SIGNATURES		APPROVE	REJECT	N/A
DESIGNER	S.R.WRIGHT	✓		
PROJECT GROUP LEADER	[signature]	✓		
QUALITY ASSURANCE ENGR.	[signature]	✓		
		RECEIVED		
		... 0 ...18		

2HR PFR - F012 ... CC-F2 F012

CONFIGURATION CHANGE

[ ] REQUEST [x] NOTICE — SHEET 1 OF 1 — NUMBER 2

CLASS [ ] CRITICAL [x] ROUTINE — DATE 7-17-78

REQUESTED BY: S.R. WRIGHT	[x] SPECIFICATION [ ] DRAWING [ ] PROCEDURE [ ] INSTRUCTION — NUMBER 41-2055 CWT-0138	REVISION 1	CLASS II
TITLE: SCE C/S CONSTRUCTION SPECIFICATION FOR SONGS 2 & 3 OCWS PRIMARY INTAKE STRUCTURE		VENDOR [ ] BECHTEL [x] EDISON	

DESCRIPTION OF CHANGE: COVER SHEET:
CHANGE "REVISION 1" TO "ADDENDUM A"

BTOP-SE
Song 2/3

JUSTIFICATION: NOMENCLATURE CHANGED TO BE CONSISTENT WITH EXISTING SCE/BECHTEL NOMENCLATURE.

SIGNATURE [signature]

EVALUATION: CHANGE WILL ALLEVIATE CONFUSION ABOUT NOMENCLATURE.

EVALUATION: [x] APPROVE [ ] REJECT
REASON: SEE ABOVE

REGISTERED PROFESSIONAL ENGINEER STANLEY R. WRIGHT 7-17-78 CIVIL

REGISTERED PROFESSIONAL ENGINEER [signature]

DECISION: [ ] APPROVE [ ] REJECT
COMMENT:

[signature]

POLICY ENGINEER

SIGNATURES			
DESIGNER: S.R. WRIGHT	✓		
PROJECT GROUP LEADER: [signature]	✓		
QUALITY ASSURANCE ENGR.: [signature]	✓		
OTHER	JUL 27 80		

LINDA PRATT

CC#3

S780810G-1 -2 Z408FFR-F012

CONFIGURATION CHANGE

☐ REQUEST ☑ NOTICE

NUMBER 3

DATE 8-10-78

CLASS: ☑ CRITICAL ☐ ROUTINE

REQUESTED BY	☑ SPECIFICATION ☐ DRAWING ☐ PROCEDURE ☐ INSTRUCTION
S.R. WRIGHT	NUMBER 0911-0D 91-2055 Addendum "A" REVISION 1 CLASS II

TITLE SE C/S CONSTRUCTION SPECIFICATION FOR SONGS #2 & 3 CCWS AUXILIARY INTAKE STRUCTURE

VENDOR ☐ BECHTEL ☑ EDISON

DESCRIPTION OF CHANGE

COVER SHEET:

✓CHANGE "ADDENDUM A" TO "ADDENDUM AD"

BT01-SE

Songs 2/3

JUSTIFICATION

REQ'D. TO PREVENT CONFUSION BETWEEN SCE AND BPC NUMENCLATURES.

SIGNATURE [signature]

EVALUATION

NO CHANGE IN SAFETY-RELATED PROVISIONS OF SPECIFICATION. NOMENCLATURE CHANGE ONLY.

RECEIVED DEC 12 1978

EVALUATION — ☑ APPROVE ☐ REJECT

REASON SEE ABOVE

REGISTERED PROFESSIONAL ENGINEER [signature] (stamp: REGISTERED PROFESSIONAL ENGINEER, STANLEY ..., 8-10-78, STATE OF ...)

SIGNATURES	ACCEPT	REJECT	N/A
DESIGNER S.R. WRIGHT	✓		
PROJECT GROUP LEADER [signature]	✓		
QUALITY ASSURANCE ENGR. [signature] 10-18-78	✓		
OTHER			

DECISION — ☑ APPROVE ☐ REJECT

RECEIVED NOV 10 1978 EDM-SCE

SITE FILE COPY

PROJECT ENGINEER [signature]

RATION CHANGE REQUEST / CONFIGURATION CHANGE NOTICE

CC#4

2408-PFR-F012 Rec 3/4/82

SHEET 1 of 1

EDM USE ONLY

CCR No	CCN No
S-16	4
4-5-79 DATE	5-14-79 DATE

EQUIP. BY [redacted]arke Pile

[X] SPECIFICATION [ ] DRAWING [ ] PROCEDURE [ ] INSTRUCTION

NUMBER 41-2055 BBP S#211-01 REVISION 1 CLASS II

TITLE Auxiliary Intake Structure - Const. Spec
SONGS OCWS 2 and 3

VENDOR
[ ] BECHTEL [X] EDISON

DESCRIPTION OF CHANGE Add to Section 7.0 Concrete

J.O. NO. 9663
W.O. NO. 7836

Procedure for grouting form bolt hole and cosmetic patching shall be as follows:

Drypack Procedure

Drypack shall consist of a mixture (by volume) of 1 part cement to 2½ parts of sand with gradation such that 100 percent will pass the No. 16 sieve. Only enough water shall be used to produce a mortar, which when used, will stick together on being molded into a ball by a light pressure of the hands, and will not exude water but will leave the hands damp. The proper amount of mixing water and the proper consistency shall be that which produces a filling which is at the point of becoming rubbery when the material is solidly packed.

Drypack material shall be placed and packed in layers having a compacted thickness of about 1/2 inch. One portion may follow another immediately, unless appreciable "rubberness" develops, in which case work should be delayed 30 to 40 minutes. Each portion should be solidly compacted over its entire surface by use of a hardwood stick and hammer.

[redacted]ECON APPROVAL : A.J. FOHRER 4/5/79 JMB/DBS

JUSTIFICATION

Procedure required to fill form bolt holes.

DUPLICATE
ORIGINAL
REPORTED LOST

EVALUATION

OTHER AFFECTED DOCUMENTS / DRAWINGS:

CHANGE REQUIRES DESIGN DOCUMENT REVISION [X] YES [ ] NO

DOCUMENT CHANGE REQUIRED FOR :
[X] CONSTRUCTION [ ] AS BUILT [ ] OTHER

FIELD APPROVALS

JMBlanco 4-5-79
D. B. SCHONE CESR 4/5/79 R C Edwards
ENGR. / DISCIPLINE DATE CONSTR. SUPER DATE

[redacted] Rod A Cross 5 Apr 79
ENGR. / DISCIPLINE DATE Q.A. REP. DATE

ENGR. / DISCIPLINE DATE STATION SUPT., POWER

DESIGN APPROVALS

A J Fohrer 5/7/79
RESPONSIBLE ENGR.

Ingwersen 5/8/79
CHECKER

[ ] ARCHITECTURAL DATE
[X] STRUCTURAL 5/8/79 DATE

[ ] MECHANICAL DATE

[ ] NUCLEAR DATE

[ ] CONTROLS DATE

[ ] ELECTRICAL DATE

[ ] QUALITY ASSURANCE DATE
W J Martin 5/11/79
PROJECT ENGINEER DATE

CONFIGURATION CHANGE REQUEST / CONFIGURATION CHANGE NOTICE

CC#5

3408-PFR-F012 3/4/82

SHEET 1 of 1

EDM USE ONLY

CCR No	CCN No.
E1	5
5-4-79 DATE	5-8-79 DATE

REQUESTED BY J. Fohrer

☑ SPECIFICATION ☐ DRAWING ☐ PROCEDURE ☐ INSTRUCTION

NUMBER 41-2055 (211-01) REVISION 1 (3-31-78) CLASS II

TITLE SCE C/S Construction Specification for SONG 2&3 OCWS AUXILIARY INTAKE STRUCTURE

VENDOR

☐ BECHTEL ☒ EDISON

J.O. NO. 9663

W.O. NO.

DESCRIPTION OF CHANGE

1. Page 4, Add the following to the list of governing codes and practices:

✓ CRSI Recomended practices for placing reinforcing bars

Cancels CCR# 2 dated 5-17-78

JUSTIFICATION

1. Incorporation of this document is necessary to assist contractor in proper location of reinforcing steel and embedded items. This change clarifies the tolerances permissible for reinforcing steel placement. This change is within the design intent.

EVALUATION

OTHER AFFECTED DOCUMENTS / DRAWINGS:

CHANGE REQUIRES DESIGN DOCUMENT REVISION ☒ YES ☐ NO

DOCUMENT CHANGE REQUIRED FOR:

☐ CONSTRUCTION ☒ AS BUILT ☐ OTHER

FIELD APPROVALS

ENGR. / DISCIPLINE	DATE	CONSTR. SUPER.	DATE
ENGR. / DISCIPLINE	DATE	Q.A. REP.	DATE
ENGR. / DISCIPLINE	DATE	STATION SUPT., POWER SUPPLY (RECORD REV.)	

DESIGN APPROVALS

RESPONSIBLE ENGR. 5/3/79

CHECKER

☐ ARCHITECTURAL DATE

☐ MECHANICAL DATE

☐ CIVIL / STRUCTURAL 5/8/79 DATE

☐ NUCLEAR DATE

☐ CONTROLS DATE

☐ QUALITY ASSURANCE S-14-79 DATE

☐ ELECTRICAL 5/8/79 DATE

PROJECT ENGINEER 5/16/79 DATE

E&SQ SUPERVISING ENGR DATE

STA SUPT - P.S

CC#6

CONFIGURATION CHANGE REQUEST / CONFIGURATION CHANGE NOTICE

2406-PFR-F012 Rec 3/4/82

SHEET 1 of 1

EDM USE ONLY

CCR No	CCN No.
E2 5479	6 5-14-79
DATE	DATE

RECEIVED BY J. Fohrer

☑ SPECIFICATION ☐ DRAWING ☐ PROCEDURE ☐ INSTRUCTION

NUMBER 41-2055(211-01) REVISION 1 CLASS II

TITLE SCE C/S Construction Specification for SONGS 2&3 Auxiliary Intake Structure

VENDOR ☐ BECHTEL ☑ EDISON

J.O. NO. 9663

W.O. NO.

DESCRIPTION OF CHANGE

1. Revise Sect. 8.1.a page 9 by adding:
"Torch cutting of Dywidag bars for splicing purposes is allowed, providing the bars have been preheated to 200° F.

2. Revise Sect. 6.0 page 6 by inserting the following sentence on line 15:
"3/8" Stainless Steel rod may be double pass welded to circumferential bars and to Dywidag couplers as required for construction rigidity."

Concels CCR #3 dated 5-16-78

JUSTIFICATION

1. To adjust bar dimensions because of fabrication tolerances. The splice has been user tested and approved by SCE CMI and C/S Engineering.
2. To increase construction aid rigidity during handling. The chemical composition of couplers allows welding. The overall structural design intent is met.

EVALUATION

OTHER AFFECTED DOCUMENTS / DRAWINGS:

CHANGE REQUIRES DESIGN DOCUMENT REVISION ☒ YES ☐ NO

DOCUMENT CHANGE REQUIRED FOR:
☐ CONSTRUCTION ☒ AS BUILT ☐ OTHER

FIELD APPROVALS

ENGR./DISCIPLINE	DATE	CONSTR. SUPER.	DATE
ENGR./DISCIPLINE	DATE	Q.A. REP.	DATE
ENGR./DISCIPLINE	DATE	STATION SUPT., POWER SUPPLY (RECORD REV.)	

DESIGN APPROVALS

RESPONSIBLE ENGR. J. Fohrer 5/3/79		CHECKER Ingeborg Fohrer	
☐ ARCHITECTURAL	DATE	☐ MECHANICAL	DATE
☐ CIVIL/STRUCTURAL J. Fohrer	5/8/79 DATE	☐ NUCLEAR	DATE
☐ CONTROLS	DATE	☐ QUALITY ASSURANCE J. Thomas	5-14-79 DATE
☐ ELECTRICAL	DATE	PROJECT ENGINEER J.F. Martin	5/16/79 DATE
DISCIPLINE SUPERVISING ENGR. R. Duncan	5/8/79 DATE	STA. SUPT. - P.S.	

J4DNN

2408-PFR-F012
JWC 3/4/82

CONFIGURATION CHANGE

SHEET 1 of 11.

EDM USE ONLY
CC No. 7
7
DATE 3-31-80

-02

TED BY C. BOSE-ROY

☒ SPECIFICATION ☐ DRAWING ☐ PROCEDURE ☐ INSTRUCTION

NUMBER 41-2055 (211-01) REVISION 01 CLASS II

TITLE CONSTRUCTION SPECIFICATION FOR THE SONGS 2 & 3 OFFSHORE CIRCULATING WATER SYSTEM - AUX. INTAKE STR.

SUPPLIER
☐ BECHTEL ☒ EDISON

J.O. NO. 9663
W.O. NO. 7836

DESCRIPTION OF CHANGE
ADD APPX. 'A',
TO ESTABLISH A SYSTEM OF TESTING TO DEMONSTRATE THE CAPABILITIES OF QCII ITEMS TO PERFORM THEIR OPERATIONAL DESIGN FUNCTION.

TITLE OF DOCUMENT: DETAILED PROCEDURE OF TEST PROGRAM
UNIT 3 AUXILIARY INTAKE STRUCTURE REPAIR

EDM SONGS 2 & 3

RECEIVED
APR 09 1980
EDM-SITE

CONTROL

THE REVISION NUMBER ON THIS DRAWING MUST BE CHECKED WITH THE APPLICABLE CONTROLLED STICK FILE DRAWING PRIOR TO FOR CONSTRUCTION PURPOSES.

JUSTIFICATION
TO REPAIR THE UNIT 3 AUXILIARY INTAKE STRUCTURE.

SITE FILE COPY

EVALUATION

OTHER AFFECTED DOCUMENTS / DRAWINGS:

DOCUMENT CHANGE REQUIRED FOR:
☐ CONSTRUCTION ☐ AS BUILT ☒ OTHER TESTING

FIELD APPROVALS

ENGR. / DISCIPLINE DATE — CONSTR. SUPER. DATE

ENGR. / DISCIPLINE DATE — Q.A. REP. DATE

ENGR. / DISCIPLINE DATE — STATION SUPT., POWER SUPPLY (RECORD REV.) DATE

DESIGN APPROVALS

RESPONSIBLE ENGR. 3/21/80

INDEPENDENT REVIEW ENGR.

☐ ARCHITECTURAL DATE
☐ STRUCTURAL 3/24/80 DATE

☐ CONTROLS DATE

☐ ELECTRICAL DATE
☐ INSTRUCTION 3-24-80 DATE

DISC. SUPERVISING ENGR. 3/21/80 DATE

☐ MECHANICAL DATE
☐ NUCLEAR DATE

QUALITY ASSURANCE DATE

PROJECT ENGINEER DATE

☐ CHECKER (AS APPROPRIATE) DATE

STA. SUPT. - P.B.

CE 64-133 REV 9/79

2408-PFR-F012
SDC 3/4/82

CONFIGURATION CHANGE

SHEET 1 of 14

EDM USE ONLY
CC No. 8
DATE 5-1-80

CS-02

REQUESTED BY: A. C. Bose-Roy

[X] SPECIFICATION [ ] DRAWING [ ] PROCEDURE [ ] INSTRUCTION

NUMBER 41-2055 (211-01) REVISION 01 CLASS II

TITLE Construction Specification for the SONGS 2&3, Offshore Circulating Water System- Auxiliary Intake Structure

SUPPLIER
[ ] BECHTEL [X] EDISON

J.O. NO. 9663
W.O. NO. 7836

DESCRIPTION OF CHANGE

Changes to Appendix-A (Title: Detailed Procedure of Test Program- Unit 3 Auxiliary Intake Structure Repair) are described below:

1. Add Sections 3.4, 4.6.3, 4.7, 6.7 and 9.0

2. Add Three (3) Data Sheets (Pages 12, 13 and 14 of 14)

3. Clarify the write-up in Sections 2.4, 3.3, 4.5, 5.2.1,5.1, 5.2.3, 6.4a, 6.6 e(4), 6.6f, 4.6.1, 6.5e, 8.2 and 8.4. Also page 10 of 14- Fig.I and Fig. II.

THE REVISION NUMBER ON THIS DRAWING MUST BE CHECKED WITH THE APPLICABLE CONTROLLED STICK FILE DRAWING PRIOR TO FOR CONSTRUCTION PURPOSES

JUSTIFICATION

To assist in constructibility of the test samples within the design intent, to facilitate the testing and to establish the criteria for user's tests.

EVALUATION

OTHER AFFECTED DOCUMENTS / DRAWINGS :

DOCUMENT CHANGE REQUIRED FOR :
[ ] CONSTRUCTION [ ] AS BUILT [X] OTHER Testing 5/7/80

FIELD APPROVALS

ENGR. / DISCIPLINE DATE — CONSTR. SUPER. DATE

ENGR. / DISCIPLINE DATE — Q.A. REP. DATE

ENGR. / DISCIPLINE DATE — STATION SUPT., POWER SUPPLY (RECORD REV.) DATE

DESIGN APPROVALS

RESPONSIBLE ENGR.

INDEPENDENT REVIEW ENGR. 5/7/80

[ ] ARCHITECTURAL DATE

[X] STRUCTURAL 5/7/80 DATE

[ ] CONTROLS DATE

[X] ELECTRICAL 5-8-80 DATE

[X] CONSTRUCTION 5-8-80 DATE

[X] DISC. SUPERVISING ENGR. DATE

[ ] MECHANICAL DATE

[X] NUCLEAR 5-8-80 DATE

[X] QUALITY ASSURANCE DATE

[X] PROJECT ENGINEER DATE

[ ] CHECKER (AS APPROPRIATE) DATE

STA. SUPT. - P.S.

SCE 64-133 REV 9/79

2408-PFR-F012
Ltr 3/4/82

CONFIGURATION CHANGE

SHEET 1 of 8

EDM USE ONLY
CC No. 9
DATE 5/23/80

REQUESTED BY: S. WRIGHT

[X] SPECIFICATION [ ] DRAWING [ ] PROCEDURE [ ] INSTRUCTION

NUMBER 41-2055 (211-01), ADDENDUM-I REVISION 1 CLASS QC II

TITLE Construction Specification for the SONGS 2 & 3 Offshore Circulating Water System - Auxiliary Intake Structure

SUPPLIER
[ ] BECHTEL [X] EDISON

J.O. NO. 9663
W.O. NO. 7836

DESCRIPTION OF CHANGE

Changes to Appendix A (Title: Detailed Procedure of Test Program - Unit 3 Auxiliary Intake Structure Repair) are described below:

SEE ATTACHED SHEETS

JUSTIFICATION

To assist in constructibility of Test Samples and to clarify design intent with respect to test procedures.

Per Telecon A. Bose - Roy 5/21/80

EVALUATION

OTHER AFFECTED DOCUMENTS / DRAWINGS :

DOCUMENT CHANGE REQUIRED FOR :
[ ] CONSTRUCTION [ ] AS BUILT [X] OTHER TESTING

FIELD APPROVALS

ENGR. / DISCIPLINE — DATE 5/21/80 — CONSTR. SUPER. — DATE 5-21-80

ENGR. / DISCIPLINE — DATE — A. REP. — DATE 5/21/80

ENGR. / DISCIPLINE — DATE — STATION SUPT., POWER SUPPLY (RECORD REV.) — DATE

DESIGN APPROVALS

RESPONSIBLE ENGR.

[ ] ARCHITECTURAL — DATE
[ ] STRUCTURAL — DATE 6/5/80
[ ] CONTROLS — DATE
[ ] ELECTRICAL — DATE
[ ] CONSTRUCTION — DATE 6/5/80
DISC. SUPERVISING ENGR. — DATE

INDEPENDENT REVIEW ENGR. — DATE 6/5/80

[ ] MECHANICAL — DATE 6-5-80
[ ] NUCLEAR — DATE 6-4-80
[ ] QUALITY ASSURANCE — DATE 6/5/80
PROJECT ENGINEER — DATE

[ ] CHECKER (AS APPROPRIATE) — DATE

STA. SUPT. - P.S.

2408-PFR-F012
See 3/4/82

CONFIGURATION CHANGE

SHEET 1 of 4

EDM USE ONLY
CC No. 10
DATE 6/6/80

D BY S. Wright

☒ SPECIFICATION ☐ DRAWING ☐ PROCEDURE ☐ INSTRUCTION

NUMBER 41-2055 (211-01) REVISION 1 CLASS OCII

TITLE Construction Specification for the SONGS 2 & 3 Offshore Circulating Water System-Auxiliary Intake Structure

SUPPLIER
☐ BECHTEL ☒ EDISON

DESCRIPTION OF CHANGE

J.O. NO. 9663
W.O. NO. 7836

Changes to Appendix A (Title: Detailed Procedure of Test Program-Unit 3 Auxiliary Intake Structure Repair) are described below:

SEE ATTACHED SHEETS

JUSTIFICATION

Changes described are needed to facilitate testing and to clarify design intent.

Per telecon approval A. Bose-Roy 6-5-80

EVALUATION

OTHER AFFECTED DOCUMENTS / DRAWINGS :

DOCUMENT CHANGE REQUIRED FOR :
☐ CONSTRUCTION ☐ AS BUILT ☒ OTHER Testing

FIELD APPROVALS			
ENGR. / DISCIPLINE	DATE 6/6/80	CONSTR. SUPER.	DATE 6/6/80
ENGR. / DISCIPLINE	DATE	QA. REP.	DATE 6/6/80
ENGR. / DISCIPLINE	DATE	STATION SUPT., POWER SUPPLY (RECORD REV.)	DATE

DESIGN APPROVALS			
RESPONSIBLE ENGR.	6/10/80	INDEPENDENT REVIEW ENGR.	6/10/80
☐ ARCHITECTURAL	DATE	☐ MECHANICAL	DATE
☒ CIVIL STRUCTURAL	DATE 6/10/80	☒ NUCLEAR	DATE 6-10-80
☐ CONTROLS	DATE	☒ QUALITY ASSURANCE	DATE
☐ ELECTRICAL	DATE	☒ PROJECT ENGINEER	DATE
☐ CONSTRUCTION	DATE	☐ CHECKER (AS APPROPRIATE)	DATE
☒ DISC SUPERVISING ENGR.	DATE 6/10/80	STA. SUPT. - P.S.	

2408 PFR NO. - F014

REVISION --

POTENTIAL FINDING REPORT
SONGS 2&3 SEISMIC DESIGN VERIFICATION

A. PREPARATION BY GA INITIATOR

AFFECTED ITEMS:

Untimate Heat Sink Auxiliary Intake Structure Calculation #DC-339.

REQUIREMENT REFERENCE DOCUMENTS:

Engineering & Construction Dept. QA Procedure 24-7-15, "Performing Design Analyses for SONGS 1, 2&3".

BASIC REQUIREMENT:

Calculations are checked by an independent review engineer, reviewed and approved by the Project Group Leader and Discipline Supervising Engineer, and stamped by a Registered Professional Engineer. Calculation changes are subjected to the same reviews and approvals as the original.

DESCRIPTION OF POTENTIAL FINDING: The original of calculation DC-339 was reviewed, approved, and stamped on 5/30/78. Subsequent to this date (e.g., 11/28/78) additional calculations were performed and added to DC-339, including insertion of these new calculations on the DC-339 Table of Contents, dated 5/30/78, which contained the previous approval signatures. DC-339 was not revised according to procedures, nor is there evidence that the Group Leader, Supervising Engineer or Registered P.E. reviewed the additional calculations that were inserted over their signatures/stamp.

PREPARED BY: B. L. Coleman DATE: 1/29/82

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 S. Brevik DATE 1/29/82

☐ REQUEST RE-REVIEW BY _____ DATE _____

☐ DISAGREE BY _____ DATE _____

☒ REVIEW OF ORIGINAL DESIGN ORGS. COMMENTS BY: S. Brevik DATE: 3/4/82

2408 PFR NO. F014

REVISION --

C. REVIEW BY ORIGINAL DESIGN ORGANIZATION

COMMENTS

☒ AGREE PF IS VALID Comments attached

☐ DISAGREE

BY: By R. A. L. Richter DATE: 2/4/82

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, calculations were reviewed by an Independent Reviewer.

BY: S. A. Kouts DATE: 3/5/82

E. GA PROJECT MANAGER

☒ ACCEPT

☐ REJECT

BY: [signature] DATE: 3/5/82

PFR No. 014

With the exception of 2 calculation sheets (E16 and E17), the calculations which formed the original construction basis for this structure were contained within the 5/30/78 issue of the calculations. Sheets E16 and E17 were performed to evaluate a field request to provide a construction joint in this structure. While the specific review was not documented in the table of contents, the calculations were checked by an Independent Review Engineer and the resultant CC was stamped by the responsible engineer and approved by the Group Leader in accordance with QA Procedures in existence at that time.

Following formal issuance of the calculations, several brief calculations were performed to generate data to respond to NRC inquiries or perform independent design comparisons. These calculations were checked and filed with the original calculations but, since they did not affect information contained on design disclosure documents for this structure, approval which was performed for these revisions was not done in strict accordance with procedures.

Sections G and pages H1 through H10, which were added later to provide the design basis for a repair of a crack in the Unit 2 AIS velocity cap, were approved at the time of drawing issuance in accordance with appropriate procedures.

Prepared By: J. K. YANN

Approved By: H. L. Richter 7/9/82
H. L. RICHTER

IMPACT ASSESSMENT

2408 PFR NO. F014

AFFECTED ITEM: SCE Calculation #DC-339

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 ?

   Possibly. However, there were only three or four calculations prepared as part of the SCE design activity for SONGS 2&3.

6. OTHER COMMENTS:

   Calculation sheets which are added to the body of a specific calculation become a part of it. Although the individual pages may be reviewed by a checker, the Independent Reviewer for the entire calculation is responsible to verify that all parts of the calculation are cohesive, not in conflict, and belong in the calculation. Supplemental information received from SCE on 2 March 1982: SCE provided evidence that the calculation information which had not been reviewed by the Independent Reviewer subsequently became a part of a drawing change which was reviewed and approved by the calculation preparer and Independent Reviewer. This data provides sufficient evidence that no potential safety hazard exists. B. Coleman 3/4/82

PREPARED BY: B. L. Coleman DATE: 2/22/82

COMMENTS:

Open with Supplemental Info. J. Bunel 3/4/82

BY: J. Bunel DATE: 2/2-/82

PFR No. F014

Supplemental Information

Request:

Verify that the calculation pages associated with the construction joint modification were reviewed consistent with the intent of existing QA procedures, as stated in SCE's initial response to this PFR.

Response:

A subsequent check of the calculations demonstrated that only sheet E16 was actually revised following initial approval of original calculations on 5/30/78. We are enclosing this sheet which is dated 6/5/78 and initialed by the preparer, Mr. S. R. Wright, Registered Civil Engineer No. 26,452. This sheet also was initialed by the Independent Review Engineer on 6/6/78, Mr. A. J. Fohrer, Registered Civil Engineer No. 26,195.

The information contained in this calculation revision was incorporated in configuration change No. 3 to drawing No. 5131363, Rev 1. We are enclosing a copy of this CC to demonstrate that it was signed and stamped by Mr. Wright, the responsible engineer and signed by the Group Leader, Mr. J. K. Yann, Registered Civil Engineer No. 18,616. We are also enclosing the Design Review Checklist completed by the Independent Review Engineer, Mr. A. J. Fohrer, who also reviewed the calculations. This form was also signed by the Group Leader. This package demonstrates a clear correlation and review cycle between the calculations and resultant construction information, even though the calculation table of contents was not revised to include the new sheet.

Prepared by: _____
J. K. Yann

Approved by: _____
H. E. Richter
2/25/82

1348-9662

SHEET OF SHEETS

2408-PFR-F014

~~DC~~ 3/4/82

ENGINEERING DEPARTMENT

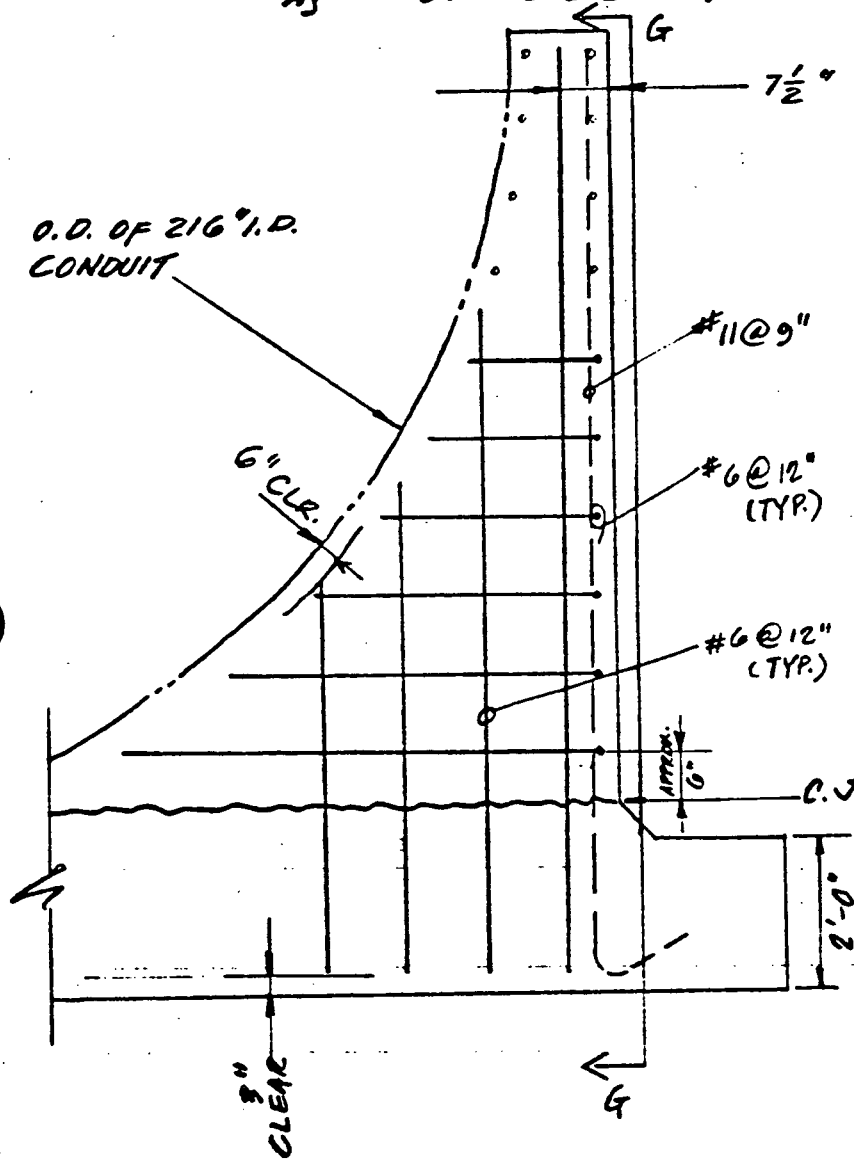
CALCULATION SHEET

SUBJECT: AUXILIARY INTAKE STRUCTURE DESIGN CALCULATION NO. DC 339 - E16 Revised 6-5-78

J.O. NO. 9663 MADE BY S.R. WRIGHT DATE 6/5/78 CHK. BY AJF DATE 6/6/78

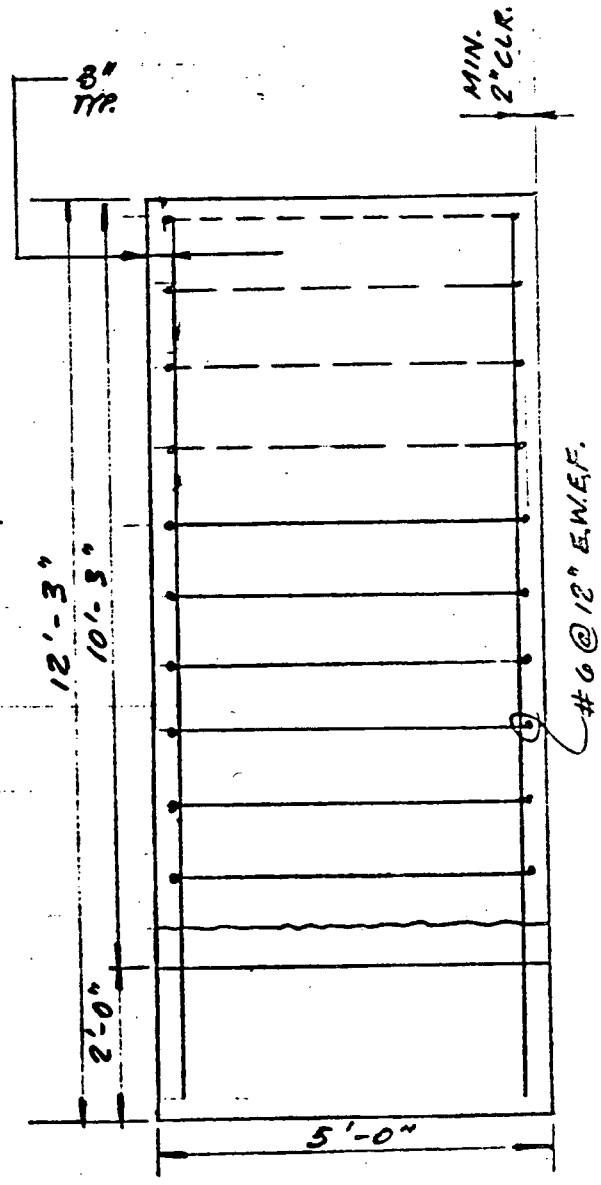
CHECK REQ'T. FOR TEMP. REINF. FOR END FACES

$A_s = 0.002\,bD = .002(12)(10) = 0.24\ in^2/ft.$ (ASSUMED) $< 0.44\ in^2/ft.$ SUPPLIED (OK)



ELEVATION

SYM. ABOUT PIPE ℄.



SECTION G-G

NO SCALE

DWG. NO.

CONFIGURATION CHANGE

2408-PFR-F014
DC 3/4/82

SHEET 1 OF 3

☐ REQUEST ☑ NOTICE

NUMBER 3

DATE 7-15-78

CLASS: ☐ CRITICAL ☑ ROUTINE

☐ SPECIFICATION ☑ DRAWING ☐ PROCEDURE ☐ INSTRUCTION

REQUESTED BY S. R. WRIGHT

NUMBER 513363

REVISION 1 7-25-78 CLASS II

TITLE AUXILIARY INTAKE STRUCTURE SECTIONS AND DETAILS

VENDOR

☐ BECHTEL ☑ EDISON

DESCRIPTION OF CHANGE

1- ADD DESIGN CALCULATION AND SPECIFICATION REFERENCES TO REFERENCE BLOCK

	DESIGN CALCULATION DC 339
	S.C.E SPECIFICATION # 41-2055
	Reference Drawings

7-25-78

SCE ENG 89 5/65

2- REVISE BUTTRESS REINFORCEMENT, AND ADD #6 BARS @ 12"
SEE SHEETS NO. 2 & 3.

JUSTIFICATION

1- REQ'D. REFERENCES MISTAKENLY OMITTED FROM DRAWING.

2- REVISED STEEL ON BUTTRESS FACES TO ALLOW CONTRACTOR-REQUESTED OPTION OF CONSTRUCTION JOINT. DETAIL IS REQ'D. TO CLARIFY DESIGN INTENT.

SIGNATURE Stanley R. Wright

EVALUATION

1- COMPLIES WITH EDO 26-8-7 ACTION I.8

2- REVISION ENABLES PLACEMENT OF CONSTRUCTION JOINT TO FACILITATE CONCRETE PLACEMENT. MEETS DESIGN INTENT.

EVALUATION - ☒ APPROVE ☐ REJECT

REASON ABOVE

REGISTERED PROFESSIONAL ENGINEER STAMP

REGISTERED PROFESSIONAL ENGINEER STANLEY R. WRIGHT 7-15-78 NO. [illegible] STATE OF CALIFORNIA

Stanley R. Wright

DECISION - ☒ APPROVE ☐ REJECT

COMMENT

PROJECT ENGINEER Duane F. Martin

SIGNATURES	APPR'D	REJECT	N/A
DESIGNER S. R. WRIGHT	✓		
PROJECT GROUP LEADER	✓		
QUALITY ASSURANCE ENGR.	✓		
OTHER			

FQ-127

CONFIGURATION CHANGE - CONTINUATION

NUMBER

☐ REQUEST ☒ NOTICE 2408-PFR-F014 Sec 3/4/82

DATE 7-15-78

CLASS: ☐ CRITICAL ☒ ROUTINE ☐ SPECIFICATION ☒ DRAWING ☐ PROCEDURE ☐ INSTRUCTION

REQUESTED BY S. R. WRIGHT

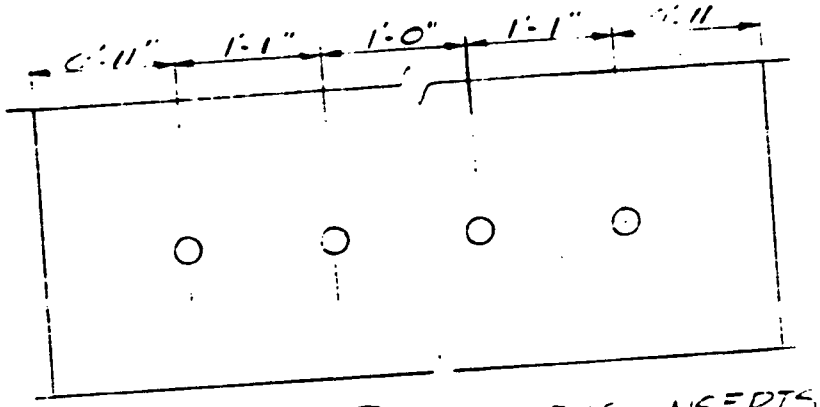
NUMBER 5131363

REVISION 21 CLASS II

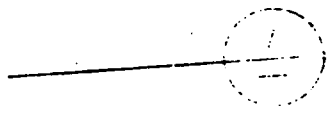
7-25-78

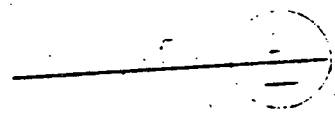
TITLE AUXILIARY INTAKE STRUCTURE SECTIONS AND DETAILS

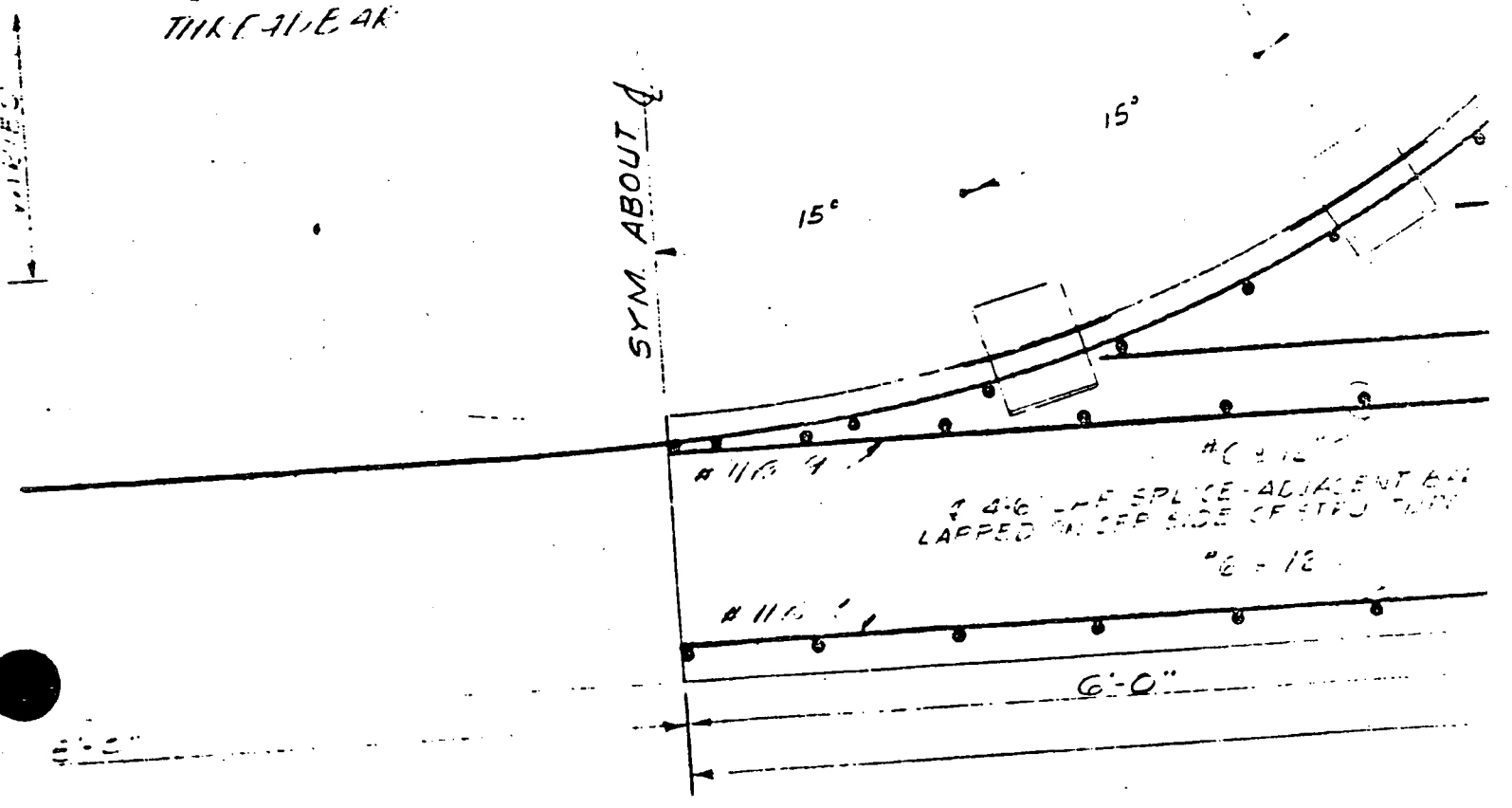
DESCRIPTION OF CHANGE



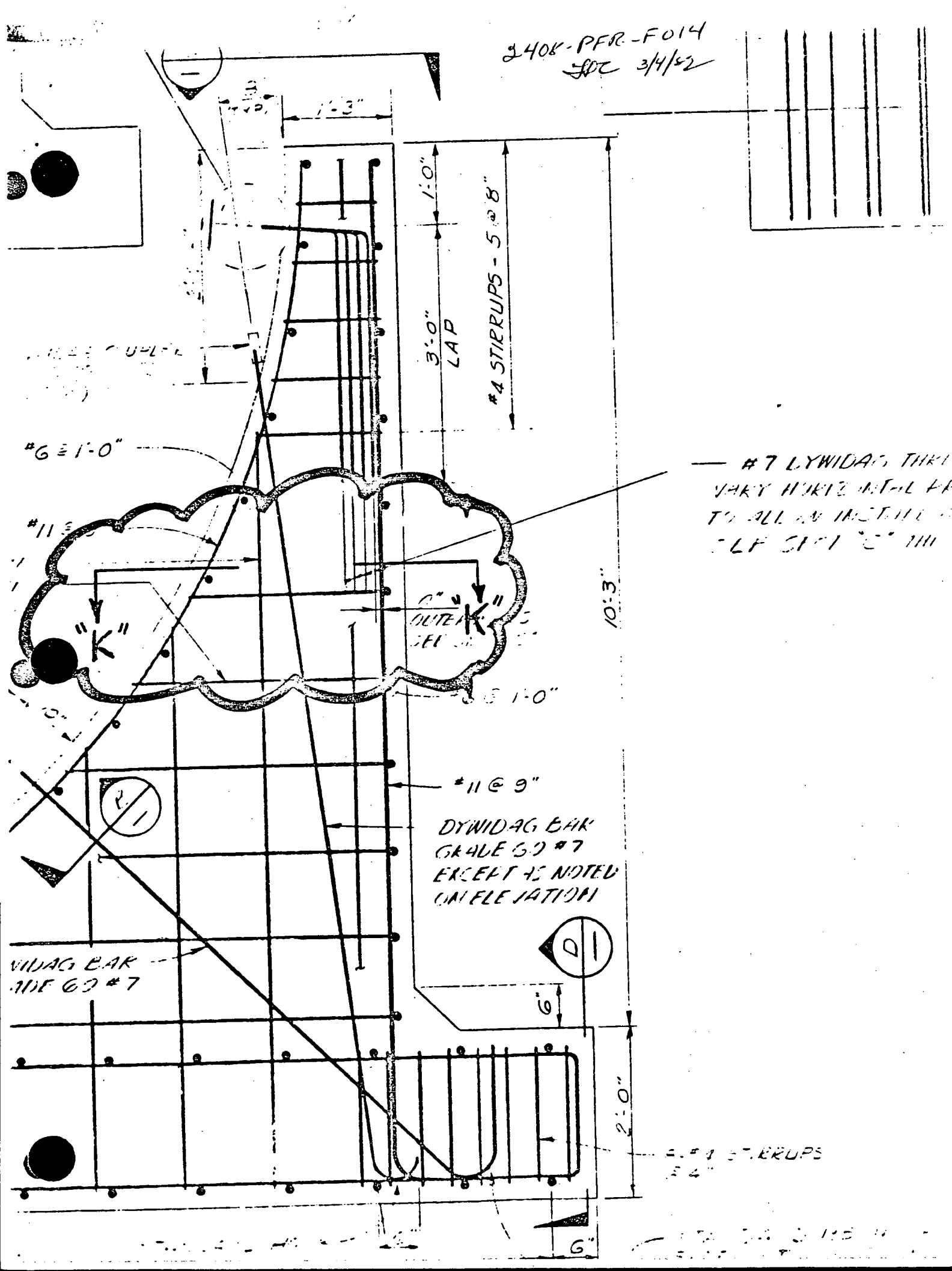
SECTION F







240K-PFR-F014
SDC 3/4/92



SHEET 3 OF 3

CONFIGURATION CHANGE - CONTINUATION

NUMBER 3

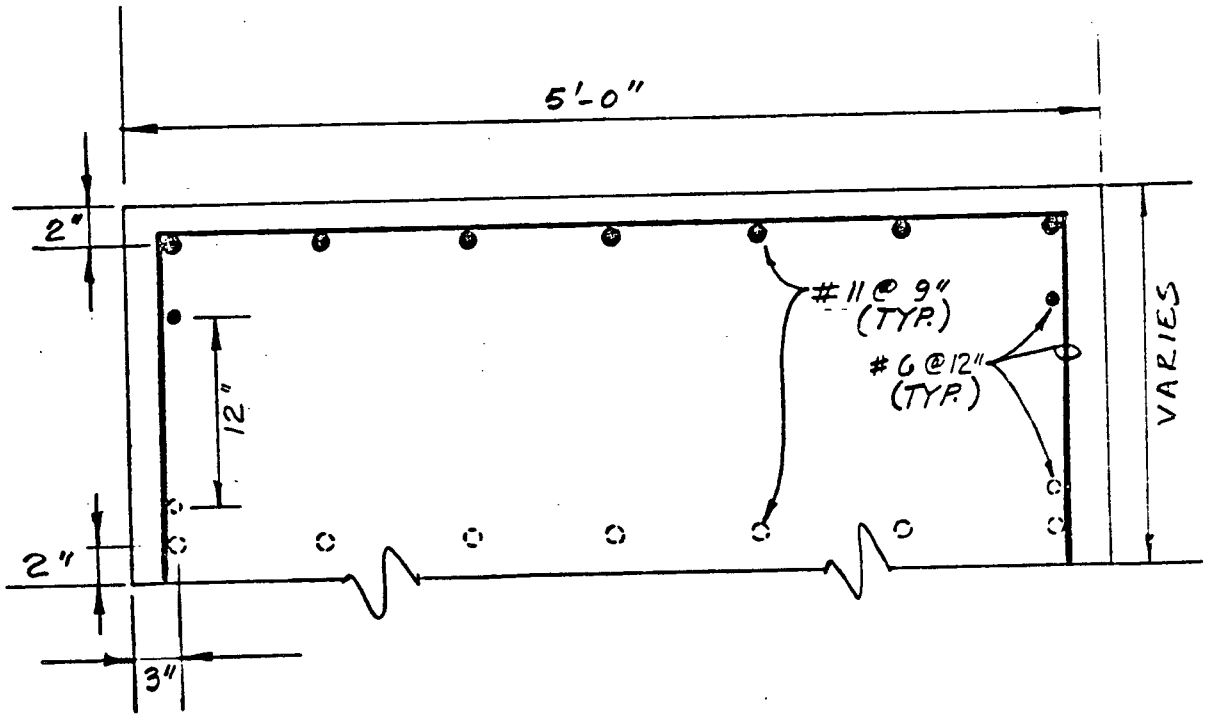
☐ REQUEST ☒ NOTICE 2408-PFR-F014 SDC 3/4/82

DATE 7-15-78

CLASS: ☐ CRITICAL ☒ ROUTINE

[redacted]FED BY S.R. WRIGHT	☐ SPECIFICATION ☒ DRAWING ☐ PROCEDURE ☐ INSTRUCTION			
	NUMBER 5131363	REVISION 1	CLASS II	
TITLE AUXILIARY INTAKE STRUCTURE SECTIONS AND DETAILS		JRD 7-25-78		

DESCRIPTION OF CHANGE



SECTION K-K

DWG. NO.

C780717G - 25
2405-PFR-F014
JPC 3/4/82

DESIGN REVIEW CHECKLIST

File Nos: BTO1-KBC
3023

I Project SONGS 2 & 3

Originating Organization EDO C/S. Date 7/11

Document No 5131363 Rev 1 (CCN#3) Q Class II

Document Title AUXILIARY INTAKE STRUCTURE - SECTIONS AND DETAILS

Description

II Acceptability with regard to the following was considered in the review

✓	1 SAR Compliance/Deviations	✓	15. Design Methods
✓	2 NRC Regulatory Requirements (i.e. 10CFR50.55a)	✓	16. Material of Construction
✓	3 NRC General Design Criteria	✓	17. Constructability/Construction Experience
✓	4 NRC Regulatory Guides	✓	18 Operating Expenence
✓	5 Codes and Standards	NA	19 Accessibility
✓	6 QA/QC Requirements	NA	20 Maintainability
✓	7 Input Parameters	NA	21. Testability
✓	8 Interface Requirements	NA	22 Inservice Inspection
✓	9 Seismic Criteria	NA	23 Radiation Effects
✓	10 Performance Parameters	✓	24 Handling, Storage, Cleaning and Shipping Requirements
NA	11 Operation Modes (startup, shutdown, normal test, abnormal, or emergency)	NA	25 Security Criteria
✓	12 Environmental Conditions (storage, construction, operation)	NA	26 Test Requirements
✓	13 Plant Layout/Arrangement	✓	27 Acceptance Criteria
✓	14 Assumptions	✓	28 Identification and Record Requirements

Comments None

+ Fohrer

III Reviewed by [signature] Engineer — Date 7/17/78 RECEIVED

[signature] Group Leader — Date 7/22/78 JP

2408 PFR NO. - F019

POTENTIAL FINDING REPORT
SONGS 2&3 SEISMIC DESIGN VERIFICATION

REVISION --

PREPARATION BY GA INITIATOR

AFFECTED ITEMS: Containment Structure Seismic Analysis by Bechtel

REQUIREMENT REFERENCE DOCUMENTS:
Calcs: C-257-1.03, Rev. 1; C-257-1.04 (Attach. A,B) and other calcs
EDP-4.36, Rev. 0, Section 4.3, 6.0 (Attach. C)
Standard Computer Program List, Rev. 8, P.13 (Attach. D)
ASHSD (CE803) User's Manual, P.VI, P.i (Attach. E)

BASIC REQUIREMENT:
Computer programs used in calculations shall be validated against benchmark solutions before the calculational results are used or referenced (Attach. C)

DESCRIPTION OF POTENTIAL FINDING:
1. Rev. 0 of the User's Manual (Attach. E) was issued in 1976 but the calcs (A,B) used it in 1973 and early 1976. No reference to early (1969-76) User's Manuals could be found.
2. Attachment D, P.13 lists two ASHSD Verification Reports (1979, 1977). No reference to Verification Reports for 1969-76 could be found.

Invalid because of additional information (see attached E. J. Maxwell 2/25/82

PREPARED BY: K. J. Baylor DATE: Jan. 30, 1982

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 2/26/82

☒ AGREE PFR IS VALID BY J. Burnell DATE 2/1/82

☐ REQUEST RE-REVIEW BY _____ DATE _____

☐ DISAGREE BY _____ DATE _____

☒ REVIEW OF ORIGINAL DESIGN ORGS. COMMENTS BY: J. Burnell DATE 2/26

2408 PFR NO. - F019

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: _____ DATE: _____

E. GA PROJECT MANAGER

☐ ACCEPT

☐ REJECT

BY: _____ DATE: _____

PFR NO. 2408-PFR-P01
REVISION ____

C. REVIEW BY ORIGINAL DESIGN ORGANIZATION — COMMENTS

See attached sheet.

☐ AGREE PF IS VALID

☒ DISAGREE

BY: [signature] DATE: 2/22/82

D. RECOMMENDATION BY FINDINGS REVIEW COMMITTEE

DEFINITION ADEQUACY:	☒ ADEQUATE	☐ INADEQUATE
VALIDITY:	☐ VALID	☒ INVALID
~~10 CFR 21:~~	~~☐ NOT APPLICABLE~~	~~☐ APPLICABLE~~ SdK 2/26/82
~~10 CRF 50.55(e):~~	~~☐ NOT APPLICABLE~~	~~☐ APPLICABLE~~
CLASSIFICATION:	☐ OBSERVATION	☐ FINDING

JUSTIFICATION:

CLASSIFICATION CRITERION NO. RESULTING IN "FINDING" ____

COMMENT ON "OBSERVATION" CLASSIFICATION

BY: S. A. Koutz DATE: 2/26/82

E. TPT PROJECT MANAGER

☒ ACCEPT

☐ REJECT

BY: [signature] DATE: 3/5/82

ATTACHMENT A-1 F019

CALCULATION TITLE SHEET

PROJECT SONGS 2 & 3 JOB NO. 1304-803 SHEET 1 OF 149

DISCIPLINE C/S

SUBJECT CONTAINMENT SHELL ANALYSIS FILE NO. C-257

- SEISMIC ANALYSIS - CALC. NO. C-257-1.03

(1) ORIGINATOR SIG. [signature] DATE 6-15-73 QUALITY CLASSIF. II

(2) CHECKER SIG. R.E. Trojan / K.P. Anderson / K.M. Schechter DATE 10-1-73 NO. LAST PAGE 147

LEVEL OF REVIEW (1)✓ (2)✓ (3)✓ (4)✓ (5) (6)✓ CHECK AS REQUIRED

P.E. STAMP IF REQ'D

ORIGINAL ISSUE

	NAME	DATE	SIGNATURE
(3) GROUP LEADER	K.M. SCHECHTER	10/12/76	[signature]
(4) EGS	L. HERSH	10/19/76	[signature]
(5) SPECIALIST			
(6) CHIEF	W. BRANDES	10/21/76	[signature]
OTHER			

RECORD OF REVISIONS

NO.	REVISION	DATE	ENG.	CKR	EGL	EGS	SPEC.	CHIEF
1	SEE NOTE 1 BELOW FOR REVISION DESCRIPTION	4/13/79	RK	RL	a.f.	a.L.	—	—

Original Calc includes pages 49A & 121A.

NOTE 1 : REVISION (1) IS AN ADMINISTRATIVE REVISION, ONLY. ADDED TITLE BLOCK WITH SIGNATURES & NUMBERING TO SHEETS NOS 7, 12, 49A, 53, 72, 73, 74, 75, 79 THRU 90, 95 THRU 106 AND 111 THRU 121A.

COPY

AC-1347-9206
(previously [illegible])

ATTACHMENT A-2 F019

CALCULATION SHEET

CALC. NO. C-257-1.03

SIGNATURE [illegible] DATE 10-1-73 CHECKED [illegible] DATE 10-1-73

PROJECT SONGS 2 & 3 JOB NO. 1304-803

SUBJECT CONTAINMENT SHELL ANALYSIS — SEISMIC ANALYSIS — SHEET 3 OF 147 SHEETS

1.0 INTRODUCTION & CRITERIA

THE BASIC CRITERIA AND METHODS OF ANALYSIS USED FOR ANALYZING THE SONGS 2 & 3 CONTAINMENT STRUCTURE ARE PRESENTED IN CALCULATION PACKAGE C-257-1.01. THE ASHSD MODEL HAS BEEN DESCRIBED IN THAT PACKAGE. THIS CALCULATION PACKAGE CONTAINS CALCULATIONS FOR DETERMINING THE 'DYNAMIC SOIL MODULUS' TO BE USED IN THE SEISMIC ANALYSIS USING THE ASHSD 'SMALL GRID' COMPUTER MODEL.

THE COMPUTER MODEL HAS BEEN DESCRIBED IN C-257-1.01, SECTION 3.0. THE ANALYSIS WAS DONE USING THE ASHSD CODE'S 'DYNAMIC RESPONSE ANALYSIS' CAPABILITY. THE ANALYSIS GIVES THE MAXIMUM STRUCTURAL RESPONSE DUE TO HORIZONTAL AND VERTICAL EXCITATIONS.

TO DETERMINE THE STRESSES IN THE STRUCTURE, THE MODAL [illegible] MOMENTS DUE TO HORIZONTAL & VERTICAL EXCITATIONS [illegible]. THIS PROCEDURE RESULTS IN UPPER BOUND [illegible] [illegible]TS. SINCE THE VALUES THUS OBTAINED DO NOT HAVE A POSITIVE OR NEGATIVE SIGN, SIGNS WERE ASSIGNED TO THESE FORCES & MOMENTS TAKING INTO CONSIDERATION THE [illegible] ASSOCIATED WITH THE [illegible] MODE RESPONSE DUE TO HORIZONTAL EXCITATION. (THE SRSS RESPONSE UNDER HORIZONTAL SEISMIC EXCITATION IS GREATER THAN THAT OF THE VERTICAL SEISMIC EXCITATION, AND, THE PARTICIPATION FACTOR OF THE FIRST MODE IS SIGNIFICANTLY GREATER THAN THE HIGHER MODES. THUS, USING SIGNS ASSOCIATED WITH FIRST MODE RESPONSE UNDER HORIZONTAL EXCITATION PROVIDES A REASONABLE APPROXIMATION).

COMPUTER [illegible] USED IN DESIGN:

DBE HORIZ. F574[illegible]65 (E_s = 79[illegible] [illegible])

" VERT. F694[illegible] (E_s = 62[illegible] KSF)

OBE HORIZ. F9?8 [illegible] (E_s = 1?[illegible] KSF)

" VERT. F964-[illegible]X (E_s = 9?[illegible] KSF)

JOB NO. 1304-713 C-257-1.03 F019
SHEET 4 OF 147
DATE PREPARED: April 14, 1972
PROJECT: SONGS 2 & 3
SUBJECT: CONTAINMENT SHELL ANALYSIS - SEISMIC ANALYSIS - CHECKED: RDT
DATE: 10-1-73
ATTACH. A-3

SONGS UNITS #2 & #3
150' DIAMETER CONTAINMENT

DYNAMIC SOIL MODULI

The dynamic soil moduli (Modulus of Elasticity and Shear Modulus) are dependent on the soil strain resulting from seismic forces and on the confining-pressure (σ_3) due to the overburden plus the weight of the structure at a depth below

the foundation of 30 feet (this depth was recommended by the soil consultant). The dynamic soil moduli are determined by an iterative process. The soil strain is first estimated, giving soil moduli to use in a seismic analysis by either the ASHSD model or the SMIS stick model. This results in a soil strain which is then checked with the original estimate and the process is repeated as needed. It was felt that the ASHSD model provided the best soil strain value and this resulted in a Modulus of Elasticity of 8200 KSF. This value was used in the lastest SMIS stick model analysis for Combustion Engineering. But with the earlier ASHSD models having a small soil grid, a pseudo Modulus of Elasticity had to be used, resulting in pseudo soil strains. These values then had to be scaled to find the true soil strains. This problem of scaling the soil strains has been eliminated by a new ASHSD model with an expanded soil grid set up by Ricardo Guzman. This grid has a radius of 709 feet and a depth of 641.5 feet, and used a value of 8200 KSF for the soil Modulus of Elasticity and a value of 0.35 for the Poisson ratio.

Therefore the Modulus of Elasticity value of 8200 KSF used in the SMIS stick model will be backchecked by using the expanded soil grid ASHSD model.

F019

ATTACH. B-1

CALCULATION TITLE SHEET

SHEET 1 OF 1

PROJECT [illegible] JOB NO 2511-102 DISCIPLINE C.E.

SUBJECT CONTAINMENT SHELL ANALYSIS - FILE NO [illegible]

FINEL COMPUTER ANALYSIS CALC NO C-257-1.04

(1) ORIGINATOR SIG [signature] DATE JAN 15-76 QUALITY CLASSIF II

(2) CHECKER SIG [signature] DATE JAN-15-76 NO LAST PAGE 1

LEVEL OF REVIEW (1) (2) (3) (4) (5) (6) CHECK AS REQUIRED

PE STAMP IF REQ'D

ORIGINAL ISSUE

	NAME	DATE	SIGNATURE
(3) GROUP LEADER	S. AMBEGAOKAR	8-5-76	[signature]
(4) EGS	L. HERSH	8-6-76	[signature]
(5) SPECIALIST			
(6) CHIEF	W. BRANDES	8-10-76	[signature]
OTHER			

RECORD OF REVISIONS

NO	REVISION	DATE	ENG.	CKR	EGL	EGS	SPEC	CHIEF

NOTE: 1) CALCULATIONS OF THIS PACKAGE ARE CONTAINED IN THE REPORT TITLED "FINAL ANALYSIS OF CONTAINMENT STRUCTURE FOR SAN ONOFRE NUCLEAR GENERATING STATION UNITS 2 & 3", DATED MARCH 1976.

2) MICROFILMS OF COMPUTER PRINTOUTS ARE IN THE MICROFILM FILE

A 15 b

134-1.04.2

E019

ATTACHMENT B-2

FINAL ANALYSIS OF CONTAINMENT STRUCTURE FOR SAN ONOFRE NUCLEAR GENERATING STATION UNITS 2&3

MARCH 1976

Prepared and Checked By: O. GURBUZ

J. M LOVEKAMP

R. S. CHU

Reviewed By: K. M. SCHECHTER

T. D. KOHLI

L. G HERSH

THIS REPORT CONSTITUTES CALCULATION PACKAGE NUMBER C-257-1 04 AND HAS BEEN PREPARED, CHECKED, AND REVIEWED IN ACCORDANCE WITH SONGS 2 AND 3 PROJECT INTERNAL PROCEDURES MANUAL.

ATTACH. B-3

F019

3. METHOD OF SOLUTION

3.1 COMPUTER PROGRAMS

The computer program used in the final analysis of the containment is a two-dimensional finite element (FINEL) code.[1] Its capabilities include thermal analysis under any temperature distribution and nonlinear analysis incorporating bilinear material properties. Both of these features were extensively used in the final analysis.

The FINEL program is for analysis of plane and axisymmetric structures. In the latter case, only axisymmetric loading is permitted. On the other hand, seismic effects, which are asymmetric, must be considered in the loading combinations in accordance with the SONGS 2 and 3 PSAR. Seismic analysis of the containment has already been conducted using an Axisymmetric Shell and Solid (ASHSD) program,[2] which is based on linear elastic response. The results of the independent analyses[3] were incorporated in this report by simple superposition in appropriate loading combination. (Refer to chapter 4)

Another program was used in the final containment analysis. This program (CE-639-2) computes forces and pressures acting on a dome subjected to prestressing.[4] The results of this analysis were used as input data in the FINEL analysis.

3.2 COMPUTER MODELS

As previously mentioned, the containment is idealized as an axisymmetric structure in the FINEL analysis. The computer model is shown in appendix A. General guidelines for modeling are discussed in the following paragraphs.

The computer model consists of quadrilateral or triangular elements of the following materials: concrete, liner plate, reinforcing steel, and soil. Two or more elements may occupy the same location in space; in this way reinforcement can be represented in its actual location. Prestressing tendons were not represented in the model since changes in tendon forces will be minimal under most loading conditions.

Aspect ratios of the elements should be within 3:1 where possible, in order to obtain accurate stress distribution. This rule was maintained for

11 5 F019

THERMAL POWER ORGANIZATION	ENGINEERING DEPARTMENT PROCEDURE		
BECHTEL POWER CORPORATION	SUBJECT: ATTACH. C-1 STANDARD COMPUTER PROGRAMS	EDP-4.36	REV. NO. 0
		PAGE 1 OF 7	
		ISSUED May 13, 1977	
		SUPERSEDES	

PREPARED BY	DATE	APPROVED BY	OFFICE	DATE	APPROVED BY	OFFICE	DATE
S.A.Bernsen	9/3/76		TPM	2-8-77	L.E. Moore	HAO	2/3/77
			SFPD	2-8-77		GPD	2/8/77
		Wilkomerson	LAPD	2-23-77		AAC	2/2/77
		J.E. Barbee LAPD 5-5-78			J.B. Wellette	TA-QA	2/2/77

1.0 PURPOSE

The purpose of this procedure is to define the quality related requirements for documentation, verification, control and use of Standard Computer Programs used by engineering for design calculations. Standard Computer Programs are controlled and verified programs that may be used in individual design calculations without specific, detailed description and verification of the program in the calculation documentation package. The term "Standard Computer Programs" (SCP) is used consistently in this EDP and in EDP-4.37 "Design Calculations."

2.0 SCOPE

2.1 General

This procedure shall apply to all computer programs, whether owned by Bechtel or by others, that are used in engineering design calculations without detailed verification of the calculation theory, method, and results in each calculation package (or set of calculations) on each project. This procedure covers only quality related requirements for control and use of Standard Computer Programs. This procedure does not cover administrative procedures for development, control and use of all computer programs.

2.2 Bechtel and Non-Bechtel Programs

SCP'S may be developed and/or owned by Bechtel or by others. Sections 3 through 8 apply to Bechtel developed and/or owned Programs. Section 9 outlines basic requirements for programs controlled by others.

COPY

3.0 RESPONSIBILITIES

3.1 Program Sponsor

The program sponsor, selected by engineering management is responsible for overall direction of program activities. He

1347-9025

b. Complete description of assumptions, capabilities and limitations.
c. Instructions for preparing problem data deck.
d. Instructions for preparing job control cards for problem execution.
e. List (and explanation) of program error messages.
f. Description of deficiencies or uncorrected errors.
g. Description of output options and interpretations.
h. Sample problem(s), illustrating all input and output options and associated job control cards (These problems should preferably be verification problems.)
i. Machine hardware and software requirements.
j. Reference to ancillary programs.
k. Restart and recovery procedures.

The User's Manual should be signed by the preparer and the Technical Specialist and shall be approved by the Program Sponsor.

4.2 Theoretical Manual

The Theoretical Manual shall present the theoretical basis for the program, detailed description of the mathematical model, empirical data (if any), assumptions used and technical references. The Theoretical Manual shall receive an independent review and be signed by the preparer, reviewer and Technical Specialist, and approved by the Program Sponsor.

4.3 Verification Report

The Verification Report shall describe the verification methods and how they cover all the permitted options and uses of the program. The report shall include the following:

a. Description of the program option(s) validated, and the methods used to accomplish this.
b. Detailed description of test problems, including boundary conditions, mathematical model, and all key parameters.
c. Listing of test problem input data checks and reprint of program input and output, or reference to location where this is stored.

d. Results from benchmark solutions, citing references used.
e. Comparison of solutions, evaluation of program validity and error analysis.

The Verification Report shall receive an independent review for scope and adequacy. The Verification Report shall be signed by the preparer, reviewer and Technical Specialist and approved by the Program Sponsor.

4.4 Revisions

Whenever the program is modified the documentation shall be reviewed and necessary revisions prepared. Each modification shall be identified with a discreet number and revised documentation shall be issued bearing the same modification number. All revisions shall be approved by the program sponsor.

5 SOURCE ADEQUACY

Source coding for Bechtel prepared programs shall be independently reviewed by personnel competent in the program language used. The review shall be sufficient to assure that the source coding executes the engineering and mathematical formulation in an appropriate manner. The review need not consist of a detailed step-by-step check for portions of programs that use previously proven coding. Evidence of this review shall be included in the Verification Report (See 4.3).

6.0 VERIFICATION

Programs shall be verified by demonstration of the program capability to produce results closely matching benchmark solutions for a series of test problems encompassing the full range of permitted capabilities and usage of the program. Acceptable benchmark solutions include hand calculations, analysis by comparable public domaine programs, empirical data, and information from the technical literature. Verification shall be documented in the Verification Report (Sec. 4.3). Whenever the program is modified, sufficient verification shall be repeated to check any existing capabilities affected and additional verification cases developed to check new capabilities.

F019

ATTACH. D-1

Bechtel Power Corporation

Interoffice Memorandum

To: Distribution

File No.

Subject: Standard Computer Program List
Revision 8

Date: July 24, 1981

From: A. L. Cahn

Of: Bechtel Power Management

Copies to

At: 50/11/B3 Ext. 7989

Attached is the list of Standard Computer Programs, Revision 8. All sponsors are requested to review their programs for completeness and accuracy, and to verify that the information shown on this listing is correct.

All SCP programs now have proper alpha-numeric identification, and the programs which formerly had acronym identification only are relocated within the listing. In the future all programs should be registered with the DP Library prior to addition to the list.

The version dates for some programs show the letter R for revision. The letter was added for cases where the change in date exceeded a month from the date shown on Rev. 7. The version date corresponds with the date the program formally became available to the users. Superseded dates corresponded with such dates as registration, user manual approval, maintenance, etc.

We continue to encounter situations where there is lack of correspondence between programs revisions and verification report updates so that users can't readily determine if the verification reports are still valid for the revised programs. It is recommended that all verification reports contain a Record of Revisions page which shows the historical relationship between program versions and verification report revisions.

The major changes to this issue are:

Programs with Classification Code Changes	Programs Added
EE 580, Code 2 to 1	CE 111, vers 1, Code 1
NE 003, Code 2 to 3	TE 801, vers 2, Code 3
NE 810, Code 2 to 1	UE 160, vers 1, Code 2
TE 604, Code 2 to 1	
TE 605, Code 2 to 1	
TE 630, Code 2 to 1	
UE 558, Code 2 to 3	

Copy of Part of 1347-9025

ATTACH. D-2

F019

This list supersedes all other lists showing Standard Computer Programs.

Further distribution of this report within each organization should be handled by the addressees. Should you have any questions or should any corrections come to your attention, please contact me or John Flaherty on Extension 7532.

A. L. Cahn

ALC/sm

Attachment

BECHTEL POWER CORPORATION

BECHTEL POWER MANAGEMENT

STANDARD COMPUTER PROGRAMS AND OTHER ENGINEERING DESIGN AND ANALYSIS PROGRAMS

PURPOSE: This list defines versions of engineering programs which fall into one of the following code categories:

1. Standard Computer Program conforming to EDP 4.36
2. Proposed SCP; EDP 4.36 verification incomplete but scheduled within next 12 months
3. Programs not used to support final design or submittals to regulatory agencies. Also, programs used to reformat input or output without mathematical manipulation.

Programs which are not standard computer programs must be verified by a user/project in accordance with EDP 4.37. It is the program user's responsibility to assure the the option(s) used has been verified.

ATTACH D-3

Legend:

Category Codes

1 = Current standard program
2 = Proposed standard program
3 = Used for preliminary calculations or reformat

System Codes

CDC = Control Data Corporation
UNI = Bechtel Univac
UCC = University Computing Company
HYW = Honeywell
TI = Texas Instruments

Location Codes

SF/DP = San Francisco Corporate DP Library
SFPD = San Francisco Power Division
LAPD = Los Angeles Power Division
GPD = Gaithersburg Power Division
AAPD = Ann Arbor Power Division
HAO = Houston Area Office
R&C = Refinery & Chemical
R&E = Research & Engineering
H&CF = Hydro & Community Facilities
M&M = Mining & Metals
EDS = Engineering Data Services

Other

SCP = Standard Computer Program
EDP = Engineering Department Procedure
Arc = Archived by DP
DP = Data Processing
Prod = Meets DP Library Production Standard
ACT = Active, not on DP Appl. List
ETC = Estimated Time of Completion
NR = Not Required
N/R = Not Reviewed
DEV = Developmental Status
ODAC = Outside Developed & Controlled
R = Revised date

NOTES: (1) Programs noted "Restricted Access" require guidance from program sponsor before use.

(2) Version dates are dates on which that version of the program became available to the users; e.g., the load date on the computer. It may not be the same date it became an SCP. Reference: DP Library form 0306.

F019

Item 5 F019

ATTACH. E-1

ASHSD

AXISYMMETRIC SHELL AND SOLID

CONFIDENTIAL & PROPRIETARY

USER'S MANUAL

#16

PREPARED BY

Robert E. Dunn

REVIEWED BY

William A Bolland

APPROVED BY

CE 303

BECHTEL POWER CORPORATION

AI-1711-7122

CODE	PROGRAM No.	Acronym	Description	System	Location Sponsor	Version Date	Libr Stat	DOCUMENTATION STATUS/LOCATION Users Manual	Verification Report	Theory Manual	Remarks
1	CE802	SPECTRA		CDC UCC UNI		D3 01/03/79	Prod	Complete SF/DP	Complete SF/DP	Complete HAO	
						D1 01/05/78	Prod	Complete SF/DP	Complete SF/DP	Complete HAO	
						C3.0 01/31/77	Prod	Complete SF/DP	Complete SF/DP	Complete HAO	
1	CE803	ASHSD	Axisym. struc. under non-axisym. loads	CDC UCC	GPD Arnold	C09 02/11/79	Prod	Complete SF/DP	Complete SF/DP	Complete User Manual	
						C08 09/27/77	Prod	Complete SF/DP	Complete SF/DP	Complete User Manual	Version C08 was never available at UCC.
2	CE823	ASHPOST/ ASHCOMB	Post processor for CE803	CDC	GPD Arnold	C09	Prod	ETC 7/81	ETC 7/81	ETC 7/81	Planned to meet EDP 4.36 in 7/81.
1	CE899	-	Compartment depressurization	UNI	LAPD Kosiba	A3 07/15/76	Prod	Complete SF/DP	Complete SF/DP	Complete User Manual	Verification valid for all versions.
1	CE901	STRUDL	Design & static analysis beams and frames AISC	UNI	GPD Anas	1 11/19/80	Prod	Complete SF/DP	Complete SF/DP	Complete SF/DP	ICES version 2.8. Limited verification of dynamic & finite element options. ACI options not verified. See STRUDL NEWS & Limitation section of user manual.
						F7 06/15/79	Prod	Complete SF/DP	Complete SF/DP	Complete SF/DP	

ATTACH. D-4

F019

ATTACH. E-2

ASHSD MANUAL REVISION RECORD

REVISION NUMBER	DATE ISSUED	DESCRIPTION
0	11/1/76	Original Printing
1	6/1/77	- Corrects numerous typographical and other errors in the original printing. - Adds more detailed explanations for several sections. - Adds capability to use concentrated nodal masses. - Updates Appendix B for use of PLOT2D.
2	11/1/77	- Updates Appendix C for use of SECTION. - Corrects several typographical errors. - Adds section on FILE cards.
3	12/15/77	- Corrects typographical errors. - Updates Appendix B for use of TREPLOT option. - Adds information to existing notes.
4	9/1/78	- Corrects typographical errors. - Adds Appendix G for use of tape output.

ACKNOWLEDGEMENTS

The original Axisymmetric Shell and Solid Program (ASHSD) was developed in 1969 by E. L. Wilson and S. Ghosh at the University of California, Berkeley. The shell element employed by Wilson and Ghosh was later replaced by an isoparametric shell element with interaction stiffness developed by Ralph McChesney of the Los Angeles office. T. D. Kolhi, also of the Los Angeles office was the author of the ASHSD User's Manual released in November 1971.

The ASHCOMB program was written in 1975 by T. A. Ballard of the Gaithersburg office for the SNUPPS project of the Gaithersburg Power Division. The PLOT2D and SECTION programs were written by J. J. Sturkey using the FPLOT program as a basis. His notes were used to write Appencices B and C.

F019

2408 PFR 019

ATTACHMENT F

Since the Bechtel Standard Computer Program List was not started until August 8, 1978 it was impossible for a calculation performed in 1973 and 1976 to reference it and thereby satisfy EDP-4.36. However, Bechtel obtained a copy of an August 1974 ASHSD verification report, which was reviewed by me on February 23, 1982. Thus, the basis requirement has been satisfied at a deeper level than required by EDP-4.36.

D. J. Gayler
Feb. 25, 1982

1. The User's Manual for ASHSD (CE803) was authored by T. D. Kohli and was released in November, 1971. This version of the Manual was used to perform the subject computer runs. The later version of the User's Manual mainly incorporated updated versions of Appendices B and C, and removed numerous typographical errors. A copy of the 1971 version of the ASHSD User's Manual is available in the BPC's data processing library.

2. The official verification manual for ASHSD program was issued in August, 1974. However, the program had been verified much earlier than 1974. In fact, sample problems used for verification were initiated in 1973. A copy of the 1974 verification manual is available in the BPC's data processing library. In general, any program used by engineering is independently verified by the users before applying it to large size structural analysis problems. It is not required to list each phase of documentation since it is maintained in our libraries.

2408 PFR NO. F020

REVISION A

POTENTIAL FINDING REPORT
SONGS 2&3 SEISMIC DESIGN VERIFICATION

A. PREPARATION BY GA INITIATOR

AFFECTED ITEMS:

Piping Analysis for Segment 78

REQUIREMENT REFERENCE DOCUMENTS:

Bechtel PIPM Section 14.2 General (Rev. 10, date 3/9/80)

BASIC REQUIREMENT:

Calculation includes a list of reference information.

DESCRIPTION OF POTENTIAL FINDING: PSG #78 does not reference Calc. No. M-DSC-50. Bechtel's comment indicates a reference is required. (see attached details)

This revision modifies PFR F020 to delete the item regarding the lack of the Chief Engineer's signature and of the P.E. stamp and to clarify the PFR being limited to the lack of reference information in PSG #78.

PREPARED BY: N C Noakes 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

Not sent to Bechtel since this rev. A serves only to clarify & focuses the PF described in PFR 020. Also, see attached contact report, dated 3/3/82.

☒ AGREE PF IS VALID BY S. Burwell DATE 3/4/82

☐ REQUEST RE-REVIEW BY _____ DATE _____

☐ DISAGREE BY _____ DATE _____

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

C. REVIEW BY ORIGINAL DESIGN ORGANIZATION COMMENTS

☐ 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

Minor procedural violation (failure to reference calcs.)

BY: S. L. Konig DATE: 3/5/82

E. GA PROJECT MANAGER

☒ ACCEPT

☐ REJECT

BY: [signature] DATE: 3/5/82

2408 PFR F020

REVISION A

ATTACHMENT I

DESCRIPTION OF POTENTIAL FINDING:

Only the last paragraph of Bechtel's comment ("some of the computer analyses referenced in M-DSC-050 are also required for calculations in PSG #78.") is relevant to the specific PF of F020. Specifically, since M-DSC-050 information is required for #78, it must be included or referenced in #78 (PIPM 14.2) and it is not. This omission is a procedural violation and this was only identified because Bechtel attempted to justify the absence of required approvals on the title sheet of #78 and on the Class I portion of the calculation.

With regard to other paragraphs of Bechtel comments that concern complementary items: (1) the title sheet identifies the calculations as "Quality Classif. 11NA,: clearly Quality Class I (see attached Bechtel Multi-Digit Design Code); (2) PFR F022 finds that the title sheet of PSG #78 indicates that the Chief Engineer's signature is required; (3) PFR F023 finds that the Chief Engineer did not sign any pipe stress calculation although Quality Classes I and II are required to be signed; and (4) further review of PFR F023 finds that the Chief Engineer changed the procedures by memo (Kinnsch to Roger, 6/13/79) rather than by the procedure in PIPM, Section 1.

Note:-

The initial issue of PFR F020 dealt with Section 14.5.2, Computer Program, that states "The Chief Engineer's approval of computer calculation,used to perform design calculations, occurs indirectly when the Chief Engineer approves the individual subject calculation." and the lack of a Chief Engineer's signature. Bechtel explained that the calc No. M-DSC-50 was approved per PIPM. This led to a concern that Calc. No. M-DSC-50 was not referenced in PSG #78.

N C Wopkins
3 - 1 - 82

24108-PFR-F020 A
SDC 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 (PQE) ← Fred Marsh (PE)

Company Bechtel

Location Whittier

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

Discussion ~~Line Busy !!!~~

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 PTPM 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 ~~~~ might arise if review and evaluation of PSG 4 were required after Bechtel had completed the SONGS job.

Record Made by N C Nodrick

Distribution: Bresnick

IMPACT ASSESSMENT

Revision A

2408 PFR NO. F020

AFFECTED ITEM: 13 - Piping Analysis Segment 78

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 ?

   No

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

   Unlikely

5. ARE OTHER SIMILAR DEVIATIONS LIKELY TO EXIST ?

   No

6. OTHER COMMENTS:

   Related to F022 and F023. Otherwise minor violation.

PREPARED BY: N C Hopkins DATE: 3-4-82

COMMENTS:

BY: J. Burnell DATE: 3/4/82

2408 PFR NO. F020

REVISION --

POTENTIAL FINDING REPORT
SONGS 2&3 SEISMIC DESIGN VERIFICATION

A. PREPARATION BY GA INITIATOR

AFFECTED ITEMS:

Piping Analysis for Segment 78

REQUIREMENT REFERENCE DOCUMENTS:

Bechtel's PIPM Section 14.5.2 Required Approvals - Computer Program (Rev. 10 date 3-9-81)

BASIC REQUIREMENT:

ASME nuclear Class 1 design requires check by Chief Engineer or designee. Professional Engineer stamp required on specific pipe stress calculation (per State of California)

DESCRIPTION OF POTENTIAL FINDING:

Segment 78 calc. not signed by Chief Engineer and no P.E. stamp. Later Bechtel personnel produced Calc. No. M-DSC-50 with P.E. stamp on a related stress calc. Calc. No. M-DSC-50 was not included in PSG #78 package or identified in this package.

Problem: Calc. No. M-DSC-50 with approval and P.E. stamp not traceable from PSG #78 package.

PREPARED BY: H C Hopkins DATE: 2-1-82 (Task B Procedural Review)

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

REJECTION OF ORIGINAL DESIGN ORG. COMMENTS BY: H C Hopkins DATE: 2-25-82

B. REVIEW BY GA TASK LEADER

COMMENTS

Bechtel's Quality Classification in the calculation clearly makes it class I. Approval was not performed as required by PIPM.

☒ AGREE PF IS VALID BY J. Bennett DATE 2/1/82.

☐ REQUEST RE-REVIEW BY _____ DATE _____

☐ DISAGREE BY _____ DATE _____

☒ REVIEW OF ORIGINAL DESIGN ORGS. COMMENTS BY: J. Bennett DATE: 2/25/82

2408 PFR NO. F020

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: _____ DATE: _____

E. GA PROJECT MANAGER

☐ ACCEPT

☐ REJECT

BY: _____ DATE: _____

PFR NO. 2408-PFR-F02
REVISION F020

C. REVIEW BY ORIGINAL DESIGN ORGANIZATION

COMMENTS

See attached sheet.

☐ AGREE PF IS VALID

☒ DISAGREE VSE

BY: JEM [signature] DATE: 2/12/82

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

Request a more clear definition of Problem
S A Kouts
2/26/82

JUSTIFICATION:

CLASSIFICATION CRITERION NO. RESULTING IN "FINDING" _____

COMMENT ON "OBSERVATION" CLASSIFICATION _____

BY: _____ DATE: _____

E. TPT PROJECT MANAGER

☐ ACCEPT

☐ REJECT

BY _____ DATE: _____

PSG #78 is not a calculation for the Nuclear Class 1 portion of the subject piping system. It was developed mainly to:

1. Provide an analysis for the Nuclear Class 2 portion of the piping system.

2. Provide a listing (PSDL) of loads for pipe supports design.

3. Provide nozzle loading information.

Therefore, PSG #78 need not be approved and stamped by the Chief Engineer.

The applicable calculation for the Nuclear Class 1 portion of the piping system is M-DSC-050 which has been stamped and approved by the Chief Engineer.

It is not required to identify calculation M-DSC-050 in PSG #78 since M-DSC-050 is a separate calculation that stands on its own. Some of the computer analyses referenced in M-DSC-050 are also required for calculations in PSG #78.

IMPACT ASSESSMENT

2408 PFR NO. F020

AFFECTED ITEM: Piping Analysis for Segment 78

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?

   Yes, but unlikely WCH 2-26-82

5. ARE OTHER SIMILAR DEVIATIONS LIKELY TO EXIST?

   Unknown

6. OTHER COMMENTS:

   The calculation title sheet states "Quality Classif. 11NA" (attached). The Pipe Support Design Manual (attached) defines this as

   Quality Class I (1)
   Seismic Category I (1)
   Nuclear Service (N)
   ASME B&PV Code Section III Class 1 (A)

   The review by Bechtel is not consistant with the stated Quality Class.

PREPARED BY: W C Wopkins DATE: 2-26-82

COMMENTS: None

BY: S. Brevik DATE: 2/26/82

2408-PFR-F020
2/24/82

General Atomic Company

QUALITY ASSURANCE DEPARTMENT

Record ~~of Long Distance Telephone Call~~ of face to face discussion

Party: Called ☒ Calling ☐

Date: Feb 24, 1982

Time: Completed 1700 Started ____ On-line ____

Name Fred Marsh (Project Eng.)

Company Bechtel

Location Whittier

Telephone No: ~~A/C~~ ___ No. ___ ~~_____~~

Discussion included Mitch Mitchhart

Objective - Discussion of Bechtel's comments on PFR F20, 21 & 22 (Marsh signed Bechtel comments and is responsible for Roger comments. Marsh has replaced Roger)

PFR-20 - agreed that outside reviewer would identify calculation as Nuclear Class 1 (based on title sheet Quality Classification - 1 1 N A). Oral designation of EGS to approve for Chief Engineer. Procedure not per PIPM

PFR-21 - Bechtel's practice has been to attach information, such as seismic curves, to calculation without current dating and initialling. Initials and date when Staff approved attachments is sufficient. They will change manual to reflect current practice.

PFR-22 - ~~same~~ similar problem as PFR-20

EGS following C.E. instruction. EGS has final approval

Acknowledge PIPM 14.5.1 states CE must sign but Bechtel practice is to have EGS give final approval.

Record Made by N C Hopkins

Distribution: Bresnik, Sharmahd, Larcher

2406-PFR-F020 SD-073-LD
SEE 3/26/82

CALCULATION TITLE SHEET

SHEET 1 OF 95

PROJECT San Onofre Units 2 & 3 JOB NO. 10079-003 DISCIPLINE MECH/STRES

SUBJECT SAFETY INJECTION FROM PEN'S 340 TO LOOP 1A FILE NO. 251 A

P00349 CALC. NO. M-12.3.4.6.3-2A

(1) ORIGINATOR SIG. Herbert Hermann DATE 4-1-77 QUALITY CLASSIF. 1E/1A

(2) CHECKER SIG. Wasif M. Jatiff DATE 10-8-79 NO. LAST PAGE 91

LEVEL OF REVIEW (1) (2) (3) (4) (5) (6) CHECK AS REQUIRED

P.E. STAMP IF REQ'D

Complete package RTR 12/12/81

ORIGINAL ISSUE

	NAME	DATE	SIGNATURE
(3) GROUP LEADER	R. HERRMANN	3/15/81	R.W. Herrmann
(4) EGS	S. MOHAMED	3/20/81	S. Mohamed
(5) SPECIALIST			
(6) CHIEF			
OTHER			

RECORD OF REVISIONS

NO.	REVISION	DATE	ENG.	CKR	EGL	EGS	SPEC.	CHIEF
1								
2								
3								
4								
5								
6								

This calc. includes sheets 1AA, 1A, 1B, 1C Isos 1204 063-1, 063-2, 055-1

FINAL VERIFICATION	UNIT 2	UNIT 3
AS BUILT PIPE SUPPORTS	NDSC 75	NDSC N/A
NOZZLE LOADS	NDSC 71	NDSC N/A

N/A = not applicable

SEE STRESS CALC M-DSC-050

2405-PFR-F020
Sec 2/20/82

Single letter Design Code	Multi-Digit Design Code
A	11NA
B	21NA
C	21NB
D	21NC
E	22NB
F	31NB
G	31NC
H	32NB
I	32NC
J	32ND
K	43ND
P	21C*
R	32C*
S	32CD
T	43C*
U	43CD
V	4*C*
W	31C*
Y	21NY
Z	21NZ

The Multi-Digit Design Code is explained in the following paragraphs:

The First Digit

The first digit 1,2, 3, or 4 represents Quality Class I, II, III, or IV respectively, and defines the importance of the equipment, piping and valves in the safe operation of the plant and the level of quality assurance required.

The Second Digit

The second digit 1, 2, or 3 represents Seismic Category I, II, or III respectively, to which equipment, piping and valves must be qualified.

*Symbol designates "not applicable" or "not assigned."

The Third Digit

The third digit will generally have a letter "N" or "C".

-"N" designates Nuclear Service, and that the particular item is within the scope of NRC Regulatory Guide No. 1.26.

-"C" designates Non-Nuclear Service; a code or standard established on a basis other than NRC Regulatory Guide 1.26 is to be used.

The Fourth Digit

The fourth digit will generally have a letter "A", "B", "C", or "D" or a symbol "*".

-"A" designates the compliance with Class 1 requirements of ASME B&PV Code Section III.

-"B" designates the compliance with Class 2 requirements of ASME B&PV Code Section III.

-"C" designates the compliance with Class 3 requirements of ASME B&PV Code Section III.

-"D" designates the compliance with ASME B&PV Code Section VIII for pressure vessels and pumps; ANSI B31.1 for piping and valves; API-620 for 0-15 psig storage tanks; and API-650 for atmospheric storage tanks.

"*" symbol designates "not applicable" or "not assigned"; conventional piping and valves can be used in accordance with ANSI B31.1, also manufacturer's standard equipment is acceptable.

-"Y" designates compliance with Code Class 2 requirements of ASME B&PV Section III with exception of Article NC-8000. Article NA-8000 shall apply for the installation.

-"Z" designates compliance with Code Class 3 requirements of ASME B&PV Section III with the exception of Article ND-8000. No Code stamp will be applied to this installation.

27.3 SCOPE AND ORGANIZATION

The scope of this document is to provide the criteria to be used in developing stress and loads requirements for specifications and analyzing piping systems. Criteria for both nuclear and non-nuclear components and supports is provided. The criteria associated with design for the safe shutdown earthquake is also discussed. In addition, Section III of the ASME Boiler and Pressure Code and B31.1, Power Piping, are discussed in terms of piping design criteria. Specific safety criteria associated with licensing minimum commitments are presented and discussed in this document.

Figure 1 describes the structuring of Pipe Stress Criteria and Procedures; and results in a work flow plan. The intent of this document is to build upon the logic of Figure 1.

2408-PFR-1020
HC 2/26/82

General Atomic Company

QUALITY ASSURANCE DEPARTMENT

Record of Long Distance Telephone Call

Party: Called ☒
Calling ☐

Date: Feb 17, 1982
Time: Completed 8:40
Started 8:05
On-line 35 min

Name Mitch Mitchhart
Company Bechtel
Location Whittier - SONG Project Office
Telephone No: A/C 213 No. 946 1819 x 352

Discussion - Review of facts, procedures and disagreements on subject PFR's F020, 23, 24 25, 26 & 27. per GA Project Procedure 49 (1-19-82)

F020 - Mitchhart to check why stated Qual. Class I procedures should not apply.

F023 - Right of chief Mechanical Engineer to change PIPM procedure and responsibility by memo only. No written authority cited. Contrary statements in section 1 of PIPM. No resolution

F029 - Calculation revision at this Late date.
- verbal assurances that these were minor clear-up of calculations. No resolution

F025 - Internal revisions not shown on title sheet
Agreed that final approval covered these

F026 - Incomplete not required form and sheet Labling - agreed that Labling not per PIPM on some sheets. Considering Manual change.

F027 - Page numbering form and intent not followed. Procedures do not forbid present practice. but create potential weakness - actual practice needs to be stated so improvement - GA may be instituted

Record Made by H C Nash

Distribution: J. Sharma, B. Larcher, J Brenick

2408-PTR-F0001
USE 3/26/82

Bechtel Power Corporation

Interoffice Memorandum

To R. L. Rogers

Subject Review of Pipe Stress Calculations

File No.

Date June 13, 1979

From D. L. Kinnsch

Of Plant Design

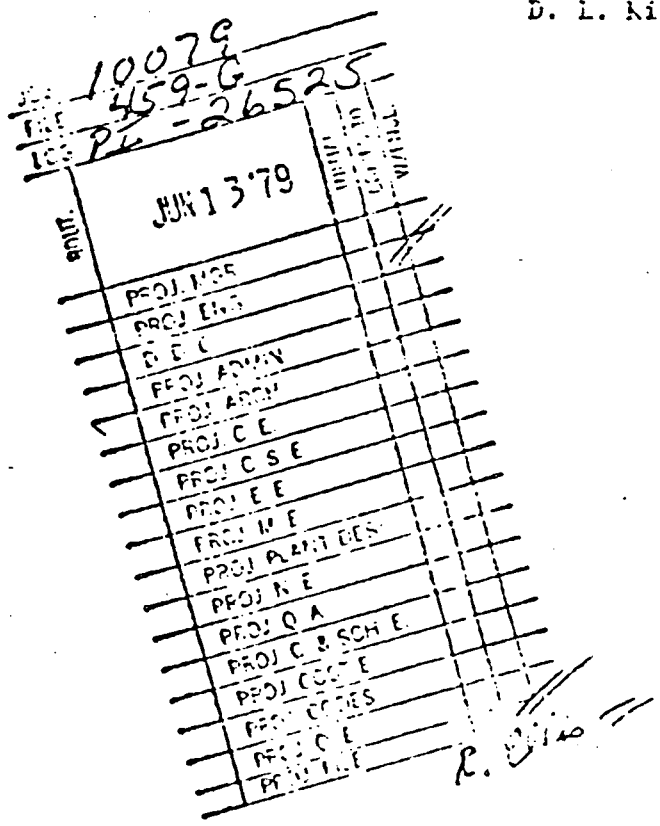
At LAPD Ext. 4192

Copies to J. E. Dempsey
D. J. Freeland
N. W. Evans
R. P. Ellis
H. R. Gavankar

A sufficient number of pipe stress calculations (stress summaries) have been reviewed by the Chief Mechanical Engineer's staff to assure that the criteria and methodology utilized on the SONGS 2 and 3 Project is acceptable. As a result, these documents will no longer be reviewed by the Chief except as outlined in the attached memo from J. E. Dempsey dated February 23, 1979. Please revise any applicable Project procedures that may be affected by this change.

D. L. Kinnsch

DLK/DJT



2408-PFR-F020
SEC 2/20/82

Bechtel Power Corporation F020

Interoffice Memorandum

To EGS's

File No.

Subject Review and Approval of Pipe Stress Documents

Date February 23, 1979

From J. E. Dempsey

Of Engineering

Copies to Stress EGL's
D. L. Kinnsch
E. L. Dietze
D. J. Freeland

At LAPD Ext.

The following is presented to clarify and unify the types of documents prepared by the Mechanical Pipe Stress group that shall be considered for approval and/or review by the Chief Mechanical Engineer.

As specified in EDP-4.34, the Design Control Check List (DCCL) designates those documents developed by the project which are selected to be reviewed and approved by the cognizant discipline Chief Engineers. It is intended that this list only include those documents for which it is known that the Chief's approval is required. Unless otherwise agreed upon between the Project and the Chief Mechanical Engineer, it is requested that only the following documents prepared by the Mechanical Pipe Stress group be included on the DCCL:

- Stress Reports for Nuclear Class 1 piping
- Stress summaries for the Main Steam and Feedwater lines
- Specifications for which the Pipe Stress group has responsibility
- Design Criteria for piping system analysis

General pipe stress analysis calculations shall not be included on the DCCL. The prime responsibility for review and approval of calculations which are a basis for establishing design parameters rests with the group leader and group supervisor. However, the Project may submit pipe stress calculations involving exceptional design requirements or analytical techniques to the Chief for review. Similarly, stress calculations may be periodically requested by the Chief for review to assure that the analysis is proceeding on a reasonable and sufficient basis.

J. E. Dempsey

JED/DJF

2408-PFR-F020
Ltr 2/26/82

General Atomic Company

QUALITY ASSURANCE DEPARTMENT

Record ~~of Long Distance Telephone Call~~ of Face to Face discussion

Party: Called ☒
Calling ☐

Date: Feb 24, 1982
Time: Completed 1700
Started
On-line

Name Fred Marsh (Project Eng.)

Company Bechtel

Location Whittier

Telephone No: ~~A/C~~ ~~No.~~

Discussion included Mitch Mitchhart

Objective - Discussion of Bechtel's comments on PFR F20, 21 & 22 (Marsh signed Bechtel comments and is responsible for Roger comments. Marsh has replaced Roger)

PFR-20 - agreed that outside reviewer would identify calculation as Nuclear Class 1 (based on title sheet Quality Classification - 1 1 N A). Oral designation of EGS to approve for Chief Engineer. Procedure not per PIPM

PFR-21 - Bechtel's practice has been to attach information, such as seismic curves, to calculation without current dating and initialling. Initials and date when Staff approved attachments is sufficient. They will change manual to reflect current practice.

PFR-22 - ~~same~~ similar problem as PFR-20

EGS following C.E. instruction. EGS has final approval

Acknowledge PIPM 14.5.1 states CE must sign but Bechtel practice is to have EGS give final approval.

Record Made by W C Hopkins

Distribution: Bresnik, Sharmahd, Larcher

2408PFR NO. F021

POTENTIAL FINDING REPORT
REVISION --

SONGS 2&3 SEISMIC DESIGN VERIFICATION

PREPARATION BY GA INITIATOR

AFFECTED ITEMS:

Piping Analysis for Segments 82, 57, 74, 117

REQUIREMENT REFERENCE DOCUMENTS:

Bechtel's PIPM Section 14.4.4 Calculation Page Numbering (Rev. 10 date 3-9-81)

BASIC REQUIREMENT:

"Pages from other documents must be numbered, dated, identified with a title and calc. number, and initialed by the responsible engineer."

DESCRIPTION OF POTENTIAL FINDING: The required information was missing:

PS	No date	No title	No RE Initials
82	6	0	6
57	26	27	26
74	8	5	8
117	9	1	11

PREPARED BY: H C Hopkins DATE: 2-1-82 (Task B Procedural Review)

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

REJECTION OF ORIGINAL DESIGN ORG. COMMENTS BY: H C Hopkins DATE: 2-25-82

B. REVIEW BY GA TASK LEADER

COMMENTS

Bechtel has agreed with the PF even though they checked "disagree". As indicated in their response they plan to change the PIPM.

☒ AGREE PF IS VALID BY J. Brennel DATE 2/1/82

☐ REQUEST RE-REVIEW BY _____ DATE _____

☐ DISAGREE BY _____ DATE _____

☒ REVIEW OF ORIGINAL DESIGN ORGS. COMMENTS BY: J. Brennel DATE: 2/25/82

2408 PFR NO. F021

REVISION --

C. REVIEW BY ORIGINAL DESIGN ORGANIZATION

COMMENTS

See attached sheet.

☐ AGREE PF IS VALID

☒ DISAGREE

SNF RE

BY: F. B. Marsh DATE: 2/22/82

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

Input not included, dated and titled as required by procedure but calculation which used this input was checked.

BY: S. L. Kouts DATE: 2/26/82

E. GA PROJECT MANAGER

☒ ACCEPT

☐ REJECT

BY: A. Hiltunnen DATE: 3/5/82

The potential finding description does not identify the particular sheets which were missing the date, title and RE initials. From our review of the cited documents we have assumed that the PFR was written against the spectra curves and the "Reference Only" sheets included in the calculation.

The response spectra curves are initialed and dated when originally prepared by staff. The "Reference Only" sheets are typically vendor information which have been approved by the supplier and given a "status" approval by Bechtel. The signatures and date shown on the title sheet of the calculation indicates that all material contained therein has been reviewed for its validity and application at the time the calculation is approved and released.

To prevent further questions of this nature in the future the Calculation Procedure in the PIPM will be changed to clarify that the use of spectra curves and "Reference Only" material do not require the signing and dating of each sheet in a prescribed fashion as long as they have been previously approved or statused.

2408-PFR-F021
-SRE 2/26/82

General Atomic Company

QUALITY ASSURANCE DEPARTMENT

Record ~~of Long Distance Telephone Call~~ of Face to Face discussio

Party: Called ☒ Calling ☐

Date: Feb 24 1982

Time: Completed 1700 Started ____ On-line ____

Name Fred Marsh (Project Eng.)

Company Bechtel

Location Whittier

Telephone No: ~~A/C~~ ___ No. ___ ____

Discussion included Mitch Mitchhart

Objective - Discussion of Bechtel's comments on PFR F20, 21 & 22 (Marsh signed Bechtel comments and is responsible for Roger comments. Marsh has replaced Roger)

PFR-20 - agreed that outside reviewer would identify calculation as Nuclear Class 1 (based on title sheet Quality Classification - 1 1 N A). Oral designation of EGS to approve for Chief Engineer. Procedure not per PIPM

PFR-21 - Bechtel's practice has been to attach information, such as seismic curves, to calculation without current dating and initialling. Initials and date when Staff approved attachment is sufficient. They will change manual to reflect current practice.

PFR-22 - ~~Same~~ Similar problem as PFR-20

EGS following C.E. instruction. EGS has final appr

Acknowledge PIPM 14.5.1 states CE must sign but Bechtel practice is to have EGS give final approval.

Record Made by W C Hayden

Distribution: Bresnik, Sharmahd, Larcher

IMPACT ASSESSMENT

2408 PFR NO. F021

AFFECTED ITEM: Piping Analysis for Segments 82, 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: NONE

PREPARED BY: H C Hopkins DATE: 2-26-82

COMMENTS: None

BY: J. Burnell DATE: 4/26/82

2408 PFR NO. F022

POTENTIAL FINDING REPORT
REVISION --

SONGS 2&3 SEISMIC DESIGN VERIFICATION

A. PREPARATION BY GA INITIATOR

AFFECTED ITEMS:

Piping Analysis for Segment 78

REQUIREMENT REFERENCE DOCUMENTS:

Bechtel's PIPM Section 14.5.1 Required Approvals - Design Approval (Rev. 10 date 3-9-81)

BASIC REQUIREMENT:

Level of Approvals on Title Sheet required Chief Engineer signature.

DESCRIPTION OF POTENTIAL FINDING:

Chief Engineer did not sign original or initial as built check.

PREPARED BY: H C Hopkins DATE: 2-1-82 (Task B Procedural Review)

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 S. Blaine DATE 2/1/82

☐ REQUEST RE-REVIEW BY _____ DATE _____

☐ DISAGREE BY _____ DATE _____

☒ REVIEW OF ORIGINAL DESIGN ORGS. COMMENTS BY: S. Blaine DATE 2/19/82

2408 PFR NO. F022

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: _____ DATE: _____

E. GA PROJECT MANAGER

☐ ACCEPT

☐ REJECT

BY: _____ DATE: _____

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

Inclusion of check mark on level 6 was not required and should not have been so indicated. Calculation M-1204-043-2 (Segment 78) is the source of mechanical loads for Nuclear Class 1 Stress Report M-DSC-050 and is referenced in this report which is approved and stamped by e Chief Engineer.

☒ AGREE PF IS VALID – This has no affect on the use of PSG-78

NAC

☐ DISAGREE

SNK

BY: *[signature]* DATE: 2/8/82

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

SLK 2/26/82

JUSTIFICATION:

CLASSIFICATION CRITERION NO. RESULTING IN "FINDING" ________

COMMENT ON "OBSERVATION" CLASSIFICATION

Procedure not followed but adequate review provided.

BY: *S. L. Koutz* DATE: 2/26/82

E. TPT PROJECT MANAGER

☒ ACCEPT

☐ REJECT

BY *[signature]* DATE 3/5/82

2408-PFE-F032 SO-073-03
Sec 3/26/82

CALCULATION TITLE SHEET

PAGE #1 of 91
SHEET 1 OF

PROJECT San Onofre Units 2 & 3 JOB NO. 10079-003 DISCIPLINE MECH/STRESS

SUBJECT SAFETY INJECTION FROM PEN'S 340 TO LOOP 1A FILE NO. 251 A

P00349 CALC. NO. M-12045 03-2A

(1) ORIGINATOR SIG. Robert Tennent DATE 4-1-77 QUALITY CLASSIF. 11:1A

(2) CHECKER SIG. David M. Tetzlaff DATE 10-8-79 NO. LAST PAGE 91

LEVEL OF REVIEW (1) (2) (3) (4) (5) (6) CHECK AS REQUIRED

P.E. STAMP IF REQ'D

Complete package rec'd 12/22/81

ORIGINAL ISSUE

	NAME	DATE	SIGNATURE
(3) GROUP LEADER	R. HERRMANN	3/16/81	R. W. Herrmann
(4) EGS	S. MOHAMED	3/24/81	S. Mohamed
(5) SPECIALIST			
(6) CHIEF			
OTHER			

RECORD OF REVISIONS

NO.	REVISION	DATE	ENG.	CKR	EGL	EGS	SPEC.	CHIEF
1								
2								
3								
4								
5								
6								

This calc. includes sheets 1AA, 1A, 1B, 1C

Isos included 063-1
063-2
055-1

FINAL VERIFICATION	UNIT 2	UNIT 3
AS BUILT PIPE SUPPORTS	NDSC 75	NDSC N/A
NOZZLE LOADS	NDSC 71	NDSC N/A

N/A = not applicable

Calc No. M-DSC-050

IMPACT ASSESSMENT

2408 PFR NO. F022

AFFECTED ITEM: Piping Analysis for Segment 78

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 ?

   No

6. OTHER COMMENTS:

The problem of the Chief Engineer not approving Quality Class I or II design as required in PIPM 14.5.1 is also identified in PFRs F020 and F023. Bechtel comment that the CE is not required to approve PSG 78 is rejected since it is Class I design and not exempted by the PIPM or internal memo.

PREPARED BY: H C Hopkins DATE: 2-19-82

COMMENTS: None

BY: J. Brevard DATE: 2/19/82

10 mandatory on the title sheet. The Chief Engineer's signature is not required after initial release, unless otherwise decided by the EGS.

Calculations covering those phases of a plant design that are critical to plant performance or safety will be recommended by the EGS for
10 review and approval by the Chief Engineer. Chief Engineer's signature not required after initial release, unless otherwise decided by the EGS.

Calculations that require a professional engineer's stamp, or that support nuclear Quality Class I or II design, must be reviewed and approved by the Chief Engineer or his designee.

14.5.2 COMPUTER PROGRAM

The Chief Engineer's approval of computer calculations used to perform design calculations occurs indirectly when the Chief Engineer approves the individual subject calculation. No signoff approval on the individual computer calculation will be made by the Chief Engineer.

Other computer programs, such as those that use timeshare or desk-type calculators, must be approved to the same level as the applicable calculation unless otherwise specified by the EGS.

NOTE

Computer input data for pipe-stress calculations that require a Professional Engineers stamp, or that support ASME nuclear Class 1 design, must be checked. Computer input data for pipe-stress calculations that support ASME nuclear Class 2 design will be reviewed by the EGL and checked at his discretion.

14.6 CHECKING AND REVIEW

For the purposes of these procedures, the word "check" is used to indicate a complete technical, mathematical, and procedural verification of the calculation.

I408-PIR-F022
LTC 2/26/82

F022

Bechtel Power Corporation

Interoffice Memorandum

To R. L. Rogers

Subject Review of Pipe Stress Calculations

File No.

Date June 13, 1979

From D. L. Kinnsch

Of Plant Design

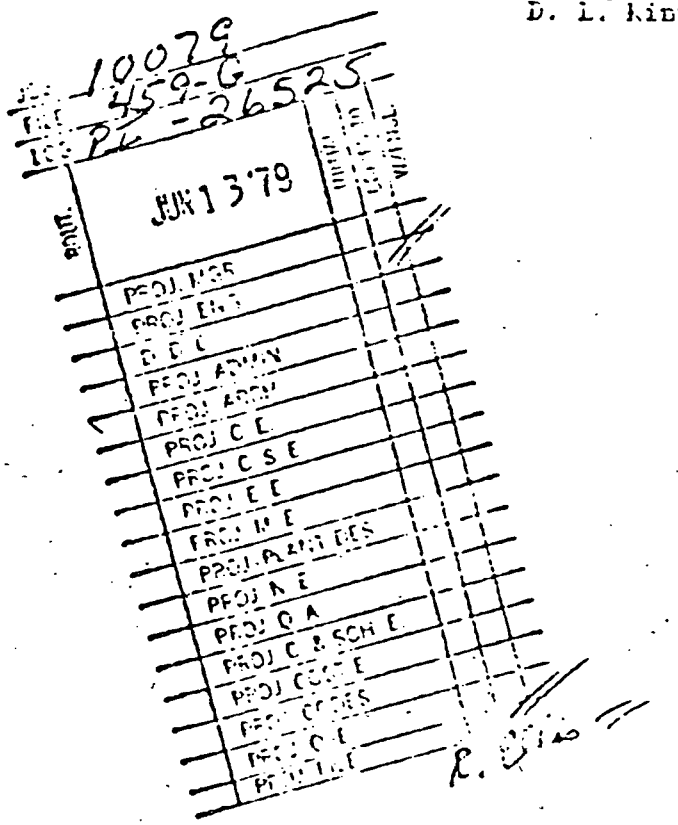
At LAPD Ext. 4192

Copies to J. E. Dempsey
D. J. Freeland
N. W. Evans
R. P. Ellis
H. R. Gavankar

A sufficient number of pipe stress calculations (stress summaries) have been reviewed by the Chief Mechanical Engineer's staff to assure that the criteria and methodology utilized on the SONGS 2 and 3 Project is acceptable. As a result, these documents will no longer be reviewed by the Chief except as outlined in the attached memo from J. E. Dempsey dated February 23, 1979. Please revise any applicable Project procedures that may be affected by this change.

D. L. Kinnsch

DLK/DJT



2408-PFR-F022
Ltr 2/26/85

Bechtel Power Corporation F022

Interoffice Memorandum

To EGS's

File No.

Subject Review and Approval of Pipe Stress Documents

Date February 23, 1979

From J. E. Dempsey

Of Engineering

At LAFD Ext.

Copies to Stress EGL's
D. L. Kinnsch
E. L. Dietze
D. J. Freeland

The following is presented to clarify and unify the types of documents prepared by the Mechanical Pipe Stress group that shall be considered for approval and/or review by the Chief Mechanical Engineer.

As specified in EDP-4.34, the Design Control Check List (DCCL) designates those documents developed by the project which are selected to be reviewed and approved by the cognizant discipline Chief Engineers. It is intended that this list only include those documents for which it is known that the Chief's approval is required. Unless otherwise agreed upon between the Project and the Chief Mechanical Engineer, it is requested that only the following documents prepared by the Mechanical Pipe Stress group be included on the DCCL:

- Stress Reports for Nuclear Class 1 piping
- Stress summaries for the Main Steam and Feedwater lines
- Specifications for which the Pipe Stress group has responsibility
- Design Criteria for piping system analysis

General pipe stress analysis calculations shall not be included on the DCCL. The prime responsibility for review and approval of calculations which are a basis for establishing design parameters rests with the group leader and group supervisor. However, the Project may submit pipe stress calculations involving exceptional design requirements or analytical techniques to the Chief for review. Similarly, stress calculations may be periodically requested by the Chief for review to assure that the analysis is proceeding on a reasonable and sufficient basis.

J. E. Dempsey

JED/DJF

LAD-6001 (STANDARD) 11/78

2404-PFR-F022 F022
Ltr 2/24/82

General Atomic Company

QUALITY ASSURANCE DEPARTMENT

Record ~~of Long Distance Telephone Call~~ of face to face discussion

Party: Called ☒ Calling ☐

Date: Feb 24, 1982

Time: Completed 1700

Started

On-line

Name Fred Marsh (Project Eng.)

Company Bechtel

Location Whittier

Telephone No: ~~A/C~~ ___ ~~No.~~ ___ ~~_____~~

Discussion included Mitch Mitchhart

Objective - Discussion of Bechtel's comments on PFR F20, 21 & 22 (Marsh signed Bechtel comments and is responsible for Roger comments. Marsh has replaced Roger)

PFR-20 - agreed that outside reviewer would identify calculation as Nuclear Class 1 (based on title sheet Quality Classification - 1 1 N A). Oral designation of EGS to approve for Chief Engineer. Procedure not per PIPM

PFR-21 - Bechtel's practice has been to attach information, such as seismic curves, to calculation without current ~~revision~~ dating and initialling. Initials and date when Staff approved attachments is sufficient. They will change manual to reflect current practice.

PFR-22 - ~~same~~ similar problem as PFR-20

EGS following C.E. instruction. EGS has final approval

Acknowledge PIPM 14.5.1 states CE must sign but Bechtel practice is to have EGS give final approval.

Record Made by N C Haydrich

Distribution: Bresnik, Sharmahd, Lorcher

2408 PFR NO. F029

REVISION --

POTENTIAL FINDING REPORT
SONGS 2&3 SEISMIC DESIGN VERIFICATION

A. PREPARATION BY GA INITIATOR

AFFECTED ITEMS:

Cable Tray Hanger Drawing #37185, Rev. 2

REQUIREMENT REFERENCE DOCUMENTS:

Bechtel Project Internal Procedures Manual, Section 8, Paragraph 8.4, Rev. 24, 10-27-81.

BASIC REQUIREMENT:

Checker must verify that the drawing is complete, accurate and conforms to the drafting standards. Checking of engineering drawings prior to use is mandatory and must not be waived.

DESCRIPTION OF POTENTIAL FINDING:

Drawing #37185, Rev. 2, (Attached) is an unauthorized revision signed by the draftman only, with no issue date, thereby indicating a drawing control violation. The drawing control log shows the last revision of this drawing to be Rev. 1.

PREPARED BY: H. L. Lefler / M. J. Dunlap DATE: 2-1-82

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. Brewer DATE 2/2/82

☐ REQUEST RE-REVIEW BY _____ DATE _____

☐ DISAGREE BY _____ DATE _____

☒ REVIEW OF ORIGINAL DESIGN ORGS. COMMENTS BY: L. Brewer DATE: 2/1/82

2408 PFR NO. F029

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: _____ DATE: _____

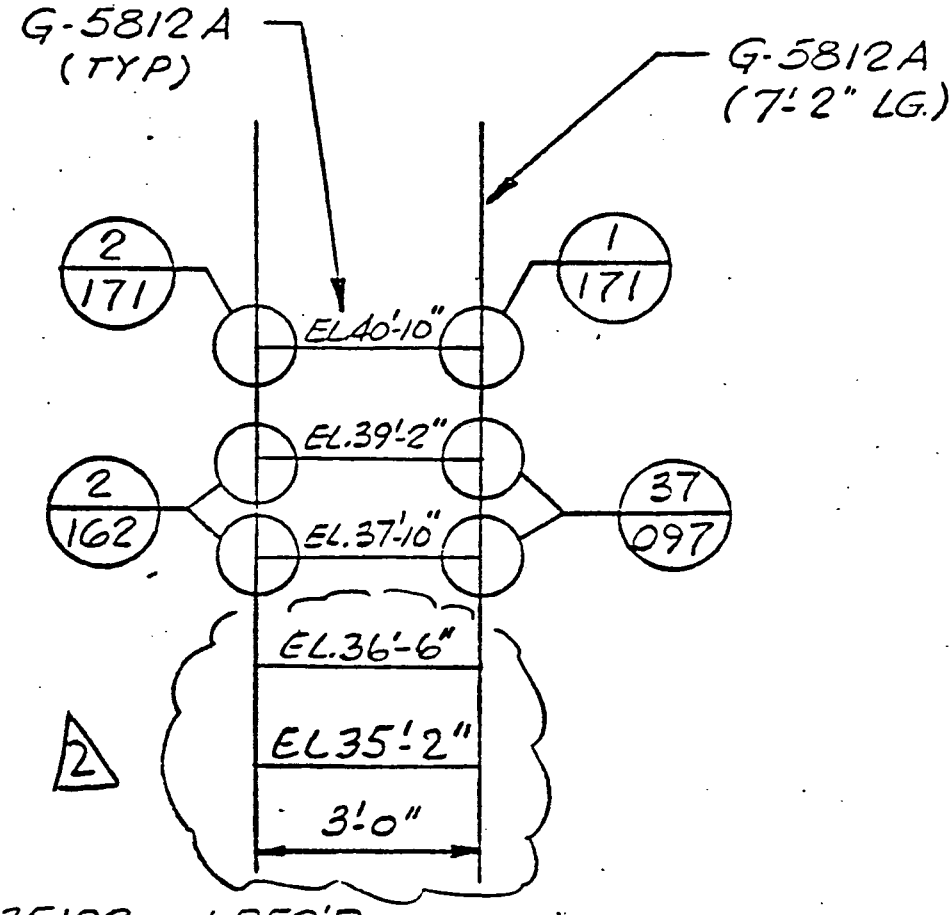
E. GA PROJECT MANAGER

☐ ACCEPT

☐ REJECT

BY: _____ DATE: _____

F029



35102 - 1 REQ'D
35662 - 1 REQ'D

REGISTERED PROFESSIONAL ENGINEER
ROGER W. SMITH
No. 8139
ELECTRICAL
STATE OF CALIFORNIA

How come we have this? It has not been released MD

NOTE: FOR LEGEND AND GENERAL NOTES SEE DWG. #37000

~~SEE SH 1 FOR ASSEMBLY~~

NUCLEAR SAFETY RELATED

C/S CALC. SH # 360-365 (C-270-01-02)

REGISTERED PROFESSIONAL ENGINEER
PAUL J. SPEIDEL
No. 8011
ELECTRICAL
STATE OF CALIFORNIA

NO.	REVISIONS	DATE	DR.	CHK.	E.E.S.	P.E.
2	ADDED SUPPORTS @ EL. 36'-6" & 35'-2"					
1	REVISED NOTE 4 QUALITY CLASS					
0	ISSUED FOR CONSTRUCTION	12-18-15	JE	PJS		

BECHTEL CORPORATION ENGINEERS & CONSTRUCTORS LOS ANGELES, CALIF.			J.O. NO.	SAN ONOFRE NUCLEAR GENERATING STATION
			FILE	TRAY HANGER DWG # 37355
JOB NO. 10079-003	DATE	APPROVED		SOUTHERN CALIFORNIA EDISON COMPANY LOS ANGELES, CALIF.
				SCALE NONE

Sht 5 of 5 37355-2

PFR NO. 2408-PER-[illegible]
REVISION F029

C. REVIEW BY ORIGINAL DESIGN ORGANIZATION — COMMENTS

A review of the drawing and a walkdown at the jobsite demonstrated that the cited Revision 2 to 37185 was never issued nor implemented at the jobsite.

[redacted]e drawing was inadvertently included in the package sent to you in the incomplete [redacted]tate. This condition has now been corrected.

☒ AGREE PF IS VALID

☐ DISAGREE

BY: R. K. Rogers DATE: 2/22/82

D. RECOMMENDATION BY FINDINGS REVIEW COMMITTEE

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

JUSTIFICATION:

[redacted]CLASSIFICATION CRITERION NO. RESULTING IN "FINDING" _____

COMMENT ON "OBSERVATION" CLASSIFICATION

Unauthorized revision to a drawing. However, drawing was not issued or used in the plant.

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

E. TPT PROJECT MANAGER

☒ ACCEPT

☐ REJECT

[redacted]

BY [redacted]. Wiseman DATE: 3/5/82

IMPACT ASSESSMENT

2408PFR NO. F029

AFFECTED ITEM: Cable Tray Hanger Drawing #37185, 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 ?

   In this case, No

5. ARE OTHER SIMILAR DEVIATIONS LIKELY TO EXIST ?

   Yes, but unlikely

6. OTHER COMMENTS:

The Drawing Control Log and the Drawing Control Card File (microfilms) were reviewed at San Onofre on 2/24/82 for evidence that Drawing #37185, Rev. 2 had been received at the jobsite - none was found. Impact - zero.

PREPARED BY: G. T. Lafflin DATE: 3-1-82

COMMENTS: Agree with above

BY: J. Bevill DATE: 3/1/82

2408 PFR NO. F 031

REVISION --

POTENTIAL FINDING REPORT
SONGS 2&3 SEISMIC DESIGN VERIFICATION

PREPARATION BY GA INITIATOR

AFFECTED ITEMS:

Cable Tray Hanger Dwg. #37413, Rev. 4

REQUIREMENT REFERENCE DOCUMENTS:

Bechtel - Project Internal Procedures Manual, Section 14, Paragraph 14.6, Rev. 10, 3/9/81

BASIC REQUIREMENT:

Design Calculations are checked before the associated design drawings are issued for construction.

DESCRIPTION OF POTENTIAL FINDING:

Drawing issued for construction on 4/20/76, Calculation C270-01-02, Sht. 937 - 945 were checked on 11/23/76; Sht. 946 checked on 9/1/76.

PREPARED BY: [signature] DATE: 2-15-82

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 2/15/82

☐ REQUEST RE-REVIEW BY _____ DATE _____

☐ DISAGREE BY _____ DATE _____

☒ REVIEW OF ORIGINAL DESIGN ORGS. COMMENTS BY: [signature] DATE: 3/4/82

PFR NO. F031

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

Drawing issued before calcs. checked. However, because this is an isolated violation and this drawing involves a cable tray hanger which could easily be changed if found necessary during calculation check, this PFR is an Observation

BY: S. A. Kouty DATE: 3/5/82

E. GA PROJECT MANAGER

☒ ACCEPT

☐ REJECT

BY: A. W. Waserman DATE: 3/5/82

2408 PFR NO. F031
REVISION

C. REVIEW BY ORIGINAL DESIGN ORGANIZATION

COMMENTS

It is a correct observation that the drawing was issued for construction prior to completion of checking of the corresponding calculation. However, upon completion of the calculation check, no changes to the calculation were required.

☒ AGREE PF IS VALID However, no impact on design.

☐ DISAGREE

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

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

JUSTIFICATION:

CLASSIFICATION CRITERION NO. RESULTING IN "FINDING" _____

COMMENT ON "OBSERVATION" CLASSIFICATION

BY: _____ DATE: _____

E. TPT PROJECT MANAGER

☐ ACCEPT

☐ REJECT

BY: _____ DATE: _____

IMPACT ASSESSMENT

2408 PFR NO. F031

AFFECTED ITEM: Cable Tray Hanger Drawing #37413, Rev. 4

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, but of all the documentation reviewed this was the only deviation of this kind noted.

6. OTHER COMMENTS:

   Procedural violation, impact - nil.

PREPARED BY: H.A. Lafferty DATE: 3-4-82

COMMENTS: The procedural violation was significant in that the drawing was issued for construction prior to the calculation being checked. In this case, ~~it turned out to be~~ there was no impact because the check was finally done & it confirmed the calculation. This fact, plus the fact that no other similar deviations were noted, combine to minimize the impact of this PF. However this type of violation does have the potential for significant impact on plant safety.

BY: J. Brenal DATE: 3/4/82

PFR NO. 2403-PFR-F032

REVISION -

POTENTIAL FINDING REPORT
SONGS 2&3 SEISMIC DESIGN VERIFICATION

PREPARATION BY GA INITIATOR

AFFECTED ITEMS: Seismic Class I Cable Tray Support No. 37202

REQUIREMENT REFERENCE DOCUMENTS:

1. SONGS FSAR 3.8.3.3
2. Design Criteria for Seismic Class I Cable Tray Supports Page 7 of Bechtel Cal C270-01-02.

BASIC REQUIREMENT:

Loads and load combinations of abnormal/extreme environmental condition for the cable tray hanger design should be D + L + E'.

DESCRIPTION OF POTENTIAL FINDING: Only E' was considered for the vertical loads on p. 427 of Bechtel Cal C270-01-02. Loads of D + L were neglected in the calculation. Please see Attachment No. 1 (Bechtel Cal C270-01-02 Sheets: 427e-427f) for details. On page 427f the equation for f_{bx} contains the factor of 1.5 which represents only the seismic load E' as shown on page 427e for the value of Sv. The correct value should be 2.5 to account for D+L+E'.

PREPARED BY R. T. Sun DATE: 2/1/82

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 [signature] DATE 2/4/82

☐ REQUEST RE-REVIEW BY _____ DATE _____

☐ DISAGREE BY _____ DATE _____

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

PFR NO. 2408-PFR-F032

REVISION -

C. REVIEW BY ORIGINAL DESIGN ORGANIZATION

COMMENTS

The dead loads were not considered in the calculations performed for the cable tray support beam, shown on sheets 427e and 427f, C-270-01-02. Inclusion of this load will increase the interaction factor but its value is less than 1.0 indicating a satisfactory design condition.

This calculation will be revised to document the inclusion of dead loads.

☒ AGREE PF IS VALID

☐ DISAGREE

JWN BY: [signature] DATE: 2/22/82

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

Failed to include all design loads in calculation. However, because of large margin in design, there is no significant impact on the result.

BY: S. L. Koutz DATE: 3/5/82

E. GA PROJECT MANAGER

☒ ACCEPT

☐ REJECT

BY: [signature] DATE: 3/5/82

SIGNATURE Steven Groom DATE 10-25-76 CHECKED [illegible] DATE 10-26-76

PROJECT SONGS 2+3 JOB NO. 10079-003

SUBJECT SEISMIC CLASS I CABLE TRAY SUPPORT SHEET 427f OF 574 SHEETS

2408-PFR-F032

ATTACHMENT NO. 1 PAGE 1/2

CHECK SUPPORT WITHIN THE SAFETY EQUIP. BLDG.

58HD12A:

$S_x = 2.38\ in^3$

$S_y = 1.46\ in^3$

COMBINED BENDING: should use 2.5

$f_{bx} = \frac{(5040\#-11)(1.5)}{2.38} = \frac{3,177}{5,294}\ psi$

$f_{by} = 4,143\ psi$ (p. 427d)

$f_{bx}/F_b + f_{by}/F_b = 3,177/29,700 + 4143/29,700 = 0.25 < 1.0$ O.K.

$= 0.18 + 0.14 = 0.32 < 1.0$

USE 58HD12A @ 6'-0" max SPAN WITHIN SAFETY EQUIP. BLDG.

G5812E: $S_x = 1.26\ in^3$, $S_y = 0.787\ in^3$

$f_{bx} = \frac{2.5}{1.5}(5040) = 6,000\ psi$ ← p. 427e

10,000 psi

$f_{by} = 6048(1/0.787) = 7,685\ psi$

$f_{bx}/F_b + f_{by}/F_b = 6,000/29,700 + 7,685/29,700 = 0.46 < 1.0$ O.K.

$= 0.34 + 0.260 = 0.60 < 1.0$

10000

OK

USE G5812E @ 6'-0" max. SPAN OUTSIDE SAFETY EQUIP. BLDG.

BEAM CONNECTIONS ARE O.K. W/ REFERENCE TO pp. 426-427.

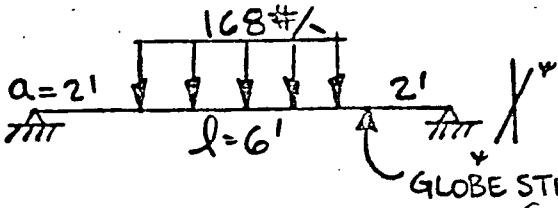
SIGNATURE Steven Gibson DATE 10-25-76 CHECKED W.B. [illegible] DATE [illegible]

PROJECT SONGS 2+3 JOB NO. 10079-003

SUBJECT SEISMIC CLASS I CABLE TRAY SUPPORTS SHEET 427c OF 574 SHEETS

ATTACHMENT NO. 1 PAGE 2/2 2408-PFR-F012

VERTICAL SEISMIC ANALYSIS



$W_V = (56\#/')(6'/2') = 168\#/'$

$$\Delta_V = \frac{W_V(l^2-4a^2)}{384EI_x}(5l^2-4a^2)$$

$$M_x = \frac{168(2)(6+4)(12)}{8} = 5{,}040\ \#\text{-}''$$

$$\Delta_V = \frac{168(12^3)(36-16)(5\times36-4\times4)}{384(2.95\times10^7)I_x} = 0.084/I_x$$

Vertical moment used on fp. 427f

FOR 58HD12A WITHIN SAFETY EQUIP. BLDG. :

$\Delta_V = 0.084/7.43 = 0.011''$

$T_S = 2\pi(0.011/386.4)^{1/2} = 0.034$ sec

$T_T = 1/30.3 = 0.033$ sec (24" TRAY)

$T = (\overline{0.034}^2 + \overline{0.033}^2)^{1/2} = 0.047$ sec

$S_V = 1.5g$ (SK# S023-SK-S-938)

FOR G5812E OUTSIDE SAFETY EQUIP. BLDG. :

$\Delta_V = 0.084/3.06 = 0.027''$

$T_S = 2\pi(0.027/386.4)^{1/2} = 0.053$ sec

$T_t = 0.033$ sec

$T = (\overline{0.053}^2 + \overline{0.033}^2)^{1/2} = 0.062$ sec

$S_V = 1.12g$ @ $T = 0.062$ sec, 5% DAMPING < $1.5g$

REF DBE VERT. ACC. RESP. SPECTRA AT NODE 12A, EL. 85'-0" OF CENT. CONT. AFLA, AUX. BLDG.

USE 1.5g OUTSIDE OF SAFETY EQUIP. BLDG.

IMPACT ASSESSMENT

2408-PFR-F032

PFR NO. _____

AFFECTED ITEM: Seismic Class I Cable Tray Support No. 37202

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

Large design margin exists for this cable tray support. Therefore, I agree with Bechtel's statement that the re-analysis shows negligible impact on the results.

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 ?

The failure of this item could affect the operation of the Safety Injection Pump (P-016) and the reactor-refueling water tank outlet valve (HV.9301).

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

N/A

5. ARE OTHER SIMILAR DEVIATIONS LIKELY TO EXIST ?

Don't know. In the 15 selected Cable tray supports reviewed so far, only this one deviates from the load combination criteria.

6. OTHER COMMENTS:

PREPARED BY: R. T. Sun DATE: 3/2/82

R. T. Sun

COMMENTS:

Agree with impact assessment.

BY: _____ DATE: 3/3/82

2408 PFR NO. F034

REVISION --

POTENTIAL FINDING REPORT
SONGS 2&3 SEISMIC DESIGN VERIFICATION

PREPARATION BY GA INITIATOR

AFFECTED ITEMS:

Containment Shell Seismic Analysis

REQUIREMENT REFERENCE DOCUMENTS:

1) QPM 3.5
2) PIPM 14.4.3

BASIC REQUIREMENT:

1) QPM 3.5 Checking is allowed by the supervisor if justification is documented and approved by next supervisory level.

2) PIPM 14.4.3: The first few pages must list design criteria, assumptions, applicable codes and standards, reference data, and sources of equations.

DESCRIPTION OF POTENTIAL FINDING:

1) Calculation C-257-1.03, Rev. 1 had one person, K. M. Schecter, as the originator on some pages, the checker on some others, and the Engineering Group Leader (supervisor) on the title sheet. Invalid. See attachment B. BJ B 3/2/82

2) Design criteria, assumptions, and references were found scattered throughout the text. Applicable codes and standards, and sources of equations were not found at all. ~~Invalid. See attachment B for reasons.~~ BJB 3/2/82

PREPARED BY: B.J. Baylor DATE: 2/2/82

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

REJECTION OF ORIGINAL DESIGN ORG. COMMENTS BY: B.J. Baylor DATE: Mar. 2, 1982

No. 2 Valid, but see Impact Assessment.

B. REVIEW BY GA TASK LEADER

COMMENTS

Agree PFR should be invalid only with regard to item # 1. ~~SB 2/16/82~~

Item #2 still appears to be valid. Bechtel should be contacted to discuss this point further and request them to explicitly identify the design criteria, assumptions, references, codes + standards within the text. SB 3/1/82

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

☐ REQUEST RE-REVIEW BY _____ DATE _____

☐ DISAGREE BY _____ DATE _____

☒ REVIEW OF ORIGINAL DESIGN ORGS. COMMENTS BY: J. Brevik DATE: 2/26/82

2408 PFR NO. F034
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

Item 1 is invalid. Item 2 is Observation. Procedural violation which has no signif effect on design.

BY: S. A. Kouts DATE: 3/5/82

E. GA PROJECT MANAGER

☒ ACCEPT

☐ REJECT

BY: A. W. Yanman DATE: 3/5/82

IMPACT ASSESSMENT

2408 PFR NO. F034

AFFECTED ITEM: Containment Shell Seismic Analysis

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 ?
   Possibly, because some other calcs. were done 10 yrs ago under procedures different from 1982 procedures.

6. OTHER COMMENTS:

   See attached telecon record. The missing or implicit information was obtained from other documents and sources by the GAC technical reviewer, Teh Lee. Therefore, the impact on the seismic review of this deviation is negligible. See comments by Teh Lee below.

PREPARED BY: F. J. Baylor DATE: Mar. 3, 1982

COMMENTS:

The reviewer who is conducting the containment structure review has been able to obtain the required information from the documents that Bechtel Power Co. has sent GAC on the containment structure. The information needed for the technical review is contained in those parts of the calculational files of BPC. The design criteria and specification parts are given in the FSAR. Therefore, the QA violation is deemed insignificant on the final seismic design of the containment structure.

T. H. Lee 3/4/82

No other comment

BY: J. Bruce DATE: 3/4/82

C. REVIEW BY ORIGINAL DESIGN ORGANIZATION COMMENTS

See attached sheet.

☐ AGREE PF IS VALID

☒ DISAGREE

HNN BY: A.R. Rogers DATE: 2/12/82

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

JUSTIFICATION:

CLASSIFICATION CRITERION NO. RESULTING IN "FINDING" _____

COMMENT ON "OBSERVATION" CLASSIFICATION

BY: _____ DATE: _____

E. TPT PROJECT MANAGER

☐ ACCEPT

☐ REJECT

BY _____ DATE _____

Attachment to
2408-PFR-F034
(Bechtel Response) SB 2/2/82

1. Mr. K. M. Schecter was one of the originators of calculation C-257-1.03 in 1972 when he was a design engineer. He has also checked several calculation sheets in the same capacity. Through the years as he has gained experience in his field he has advanced to the group leader position. After becoming a group leader he has signed the title sheet of the subject calculation. There is no conflict with ANSI 45.2-11.

2. The calculation package C-257-1.03 contains computations for determining the dynamic soil modulus to be used in the seismic analysis using the ASHSD computer model. The basic criteria and methods of analysis are presented in calculation package C-257-1.01. To obtain a better understanding of the total analysis and the complexity involved in presenting such information, each calculation package should be considered as only a portion of the complete analysis. Criteria and assumptions can be found in one set of calculation packages and other packages may refer to a specific calculation number. This set of calculations C-257-1.03 have been performed by various engineers during a time period spanning from 1973 to 1979 where various source materials were used in the analyses. This accounts for some of the referencing methods used. However it is not an uncommon engineering practice to refer to source material in the calculation sheets where such information is used instead of summarizing on one sheet. Also, the governing criteria for containment structure is presented in Civil/Structural section of the Project Design Criteria, in the PSAR, and Sections 3.7 and 3.8 of the FSAR. All applicable codes, standards, and sources of equations are also found in these documents.

   Even though the criteria, assumptions, etc., are not neatly provided on the first pages of the calculation, because of the nature of the calculation, this is not a critical requirement.

2408 PFR F034

ATTACHMENT B – GAC Originator
RJB 3/3/82

1. K. M. Schecter was the originator of some pages of Calc. C-257-1.03 and the checker on some pages other than the ones he originated. Three years later in his career he was engineering group leader and in that capacity signed for the whole package, which by that time included the work of several other engineers. Since this sequence has been justified and approved at a higher level of management, i.e., the Project Engineer, Item 1 of the PFR is invalid.

2. The information missing from Calc. C-257-1.03 has been obtained from other sources. See the impact assessment and the comments of the technical reviewer, Teh Lee.

R. J. Baylor
Mar. 3, 1982

General Atomic Company

QUALITY ASSURANCE DEPARTMENT

Record of Long Distance Telephone Call

2408-PFR F034.
Acc 3/5/82

Party: Called ☐
Calling ☒

Jack Nazarian, Jurgen Hempe
C. E. Mitchhart

Name

Company Bechtel Corp.

Location Whittier, CA

Telephone No: A/C 213 No. 946-1811

Date: March 2, 1982

Time: Completed 11:35 a.m.
Started 11:15 a.m.

On-line 20 min.

Discussion: J. Nazarian, J. Hempe, and C. Mitchhart were answering my request for a discussion of three PFR's:

1. PFR-F034: Calc. C-257-1.03 - Containment Shell Analysis: Jack Nazarian restated that the criteria, assumptions, references, etc. were all in Calc. C-257-1.01, which is considered the beginning part of the entire containment shell analysis and that to repeat all the information in each subsequent package would create unneccessarily large documents. Unfortunately, we do not have the reference calculation, C-257-1.01, and Bechtel refuses to send any more written material to GA pending resolution of a contractual dispute with TPT regarding confidentiality. A GA person may review it at Bechtel, however. (Bechtel thinks we received it, but neither of us can find any reference to it being sent or received here.)

2. PFR-F036: Calc. C-257-1.04 - Containment Shell Analysis: Jack Nazarian maintained that this calculation, which consists of a title sheet plus a report, is actually in a better and more complete technical form than that specified in the procedures, even though it does not follow the Bechtel PIPM. He does not consider this a deficiency.

3. PFR-F035: Design Criteria Revision Requests - C. E. Mitchhart restated the position that the Bechtel procedures would be revised to indicate that SCE is not required to review and comment on the design criteria manual. Therefore there is no impact on the seismic review. No correspondence between Bechtel and SCE other than the letters we already have is available.

Record Made by K. J. Boylan

K. J. Boylan
3/2/82

Distribution: S. Bresnick
2408 File

2408 PFR NO. F035

REVISION --

POTENTIAL FINDING REPORT
SONGS 2&3 SEISMIC DESIGN VERIFICATION

PREPARATION BY GA INITIATOR

AFFECTED ITEMS: Bechtel Design Criteria Manual - Design Criteria Revision Request forms and Log.

REQUIREMENT REFERENCE DOCUMENTS:

1) Bechtel Project Internal Procedures Manual, Section 34.6.2
2) Letter 1: J. D. Houchen, Bechtel, to D. F. Martin, SCE, undated.
3) Letter 2: D. F. Martin, SCE, to J. D. Houchen, Bechtel, July 8, 1974.

BASIC REQUIREMENT:

Design Criteria Revision Requests (DCRRs) are approved by: Engineering Group Supervisor of discipline, Nuclear EGS, Project Engineer, and reviewed and commented on by SCE (PIPM Section 34.6.2).

DESCRIPTION OF POTENTIAL FINDING:

The DCR Log does not show that SCE reviewed and commented on any of the revision requests. See attached letters 1 and 2 for SCE's statement on this matter.

This is still a valid potential finding because no new documentary evidence has been provided to show that either (1) the procedure has been changed, or (2) that SCE refuses to review and comment on the design criteria. J.D. Houchen 2/25/1982

PREPARED BY: D. F. Taylor DATE: 2/2/82

REJECTION OF GA TASK LEADER COMMENTS BY: [illegible] DATE: ____

REJECTION OF ORIGINAL DESIGN ORG. COMMENTS BY: D. F. Taylor DATE: 2-25-82

B. REVIEW BY GA TASK LEADER COMMENTS

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

☐ REQUEST RE-REVIEW BY ____ DATE ____

☐ DISAGREE BY ____ DATE ____

☒ REVIEW OF ORIGINAL DESIGN ORGS. COMMENTS BY: J. Bunnel DATE: 2/26/82

2408 PFR NO. F035

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

Bechtel did not follow its own procedures which require SCE to review + comment on the Bechtel Design Criteria manual. However, the basic criteria for the design of the plant are contained in the PSAR + SCE did review the PSAR.

BY: S. A. Kouts DATE: 3/3/82

E. GA PROJECT MANAGER

☒ ACCEPT

☐ REJECT

BY: A. H. Waxman DATE: 3/5/82

IMPACT ASSESSMENT

2408 PFR NO. F035

AFFECTED ITEM: Design Criteria Manual - Revision Requests

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 ?

   Perhaps

6. OTHER COMMENTS:

SCE approval is not required. Review and comment is required but is expected to have little or no impact on the seismic review. D. J. Baylor, 2/23/82.

PREPARED BY: D. J. Baylor DATE: 2/23/82

COMMENTS: None

BY: D. Brunel DATE: 2/26/82

PFR NO. 2408-PFR-[illegible]
REVISION _____

C. REVIEW BY ORIGINAL DESIGN ORGANIZATION

COMMENTS

The 1974 referenced letter from SCE's D. F. Martin was written two years before the release of Revision 0 of PIPM Section 34 in March of 1976 which required SCE approval. Prior to the 1976 date the Design Criteria were sent to SCE for approval. After receiving the letter, a change to the procedure was inadvertently not initiated. It will be done in the near future. The Design Criteria were developed under a now obsolete procedure, the key elements of which were included in PIPM Section 34 at the time that section was initiated. (File copies of the referenced letters are being included to demonstrate that the date referenced was a typing error and that the letter was dated and logged.)

☐ AGREE PF IS VALID

☒ DISAGREE

BY: A.R. Rogers DATE: 2/12/82

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

JUSTIFICATION:

CLASSIFICATION CRITERION NO. RESULTING IN "FINDING" _____

COMMENT ON "OBSERVATION" CLASSIFICATION

BY: _____ DATE: _____

E. TPT PROJECT MANAGER

☐ ACCEPT

☐ REJECT

BY: _____ DATE: _____

2405-PCR-F035

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

Mr. D. F. Martin, Project Engineer
Southern California Edison Company
2244 Walnut Grove Avenue
Rosemead, California 91770

Subject: San Onofre Nuclear Generating Station, Units 2 & 3
Bechtel Job
Project Design Criteria Manual
File: S023-713-A

Reference: (A) Bechtel letter to SCE dated July 24, 1974, Log BE-686, Subject: Project Design Criteria Manual

Dear Mr. Martin:

Twelve (12) copies of the San Onofre Generating Station, Units 2 and 3, Project Design Criteria Manual were transmitted to you by Reference (A) with the information that "it is being used as the basis for final plant design." Although SCE approval of the document was not requested, in the referenced letter, we would appreciate receiving your confirmation that the design criteria has your approval.

Very truly yours,

BECHTEL POWER CORPORATION

J. D. Houchen
J. D. Houchen
Project Engineer
Los Angeles Division

CEM:lea

cc: Mr. L. D. Hamlin, SCE

2408-PFR-1 C 35
Ltr 3/3/82

Southern California Edison Company
P. O. BOX 800
2244 WALNUT GROVE AVENUE
ROSEMEAD, CALIFORNIA 91770

July 8, 1974

JOB 1803
FILE S023-A
LOG BE-1373

ROUT.		INITIAL
	JUL 11 '74	
	PROJ. MGR.	
	ASST. PROJ. ENG.	
	PROJ. ADMIN.	
	PROJ. ARCH.	
	PROJ. C. E.	
	PROJ. C. S. E.	
	PROJ. E. E.	
	PROJ. M. E.	
	PROJ. PLANT DES	
	PROJ. N. E.	
	PROJ. Q. A.	
	PROJ. C & SCH. E.	
	PROJ. COST E.	
	PROJ. SCH.	
	PROJ. C. A. E.	

Mr. J. D. Houchen
Project Engineer
Bechtel Power Corporation
P. O. Box 60360 - Terminal Annex
Los Angeles, California 90060

Subject: San Onofre Nuclear Generating Station Units 2 and 3
Project Design Criteria Manual
Your File: S023-713-A

Ref.: (a) Bechtel letter to SCE dated July 1, 1974, Log BE-1373, Subject: Project Design Criteria Manual

Dear Mr. Houchen:

In the above-referenced letter you indicated that you would appreciate receiving confirmation that the design criteria has my approval.

I disagree that SCE approval is required and question the significance of such approval. The Manuals you transmitted are now approximately one year old and have not been updated with subsequent revisions. Also, Bechtel has the responsibility of keeping its own design criteria current with the latest CE, GEC and SCE correspondence and SCE has no way of verifying that this is occurring.

SCE, therefore, has no intention of relieving Bechtel of any of its responsibilities by approving its Design Criteria Manual.

Very truly yours,

Duane F. Martin

Duane F. Martin
Project Engineer

[illegible]

bcc: Standard
P. Dragolovich
G. S. C. Wang

PROJECT FILE

July 24, 1973

Mr. D. F. Martin, Project Engineer
Southern California Edison Company
2244 Walnut Grove Avenue
Rosemead, California 91770

Subject: San Onofre Nuclear Generating Station, Units 2 & 3
Bechtel Job 1[illegible]4-503
Project Design Criteria Manual
File: [illegible]23-713-A, Log [illegible]-696

Enclosures: (1) Twelve (12) copies of Project Design Criteria Manual dated June 29, 1973

Dear Mr. Martin:

The enclosures are being transmitted in accordance with your telephone request of July 19, 1973. It is requested that you exercise close control over the distribution of the enclosed document.

The Project Design Criteria Manual is being used as the basis for the final plant design now in progress. It is anticipated that the manual will be updated and revised on a periodic basis throughout the duration of the Project.

Please advise us if we can be of any further assistance.

Very truly yours,

BECHTEL POWER CORPORATION

J. D. [illegible]
Project Engineer
Los Angeles Division

J[illegible]:bjs
Enclosures
cc: Mr. L. D. Hamlin, SCE w/o enclosures

bcc: Standard
F. Dragolovich
G. S. C. Wong
C. E. Mitchhart

PROJECT FILE

July 1, 1974
Log BE-1373

Mr. D. F. Martin, Project Engineer
Southern California Edison Company
2244 Walnut Grove Avenue
Rosemead, California 91770

Subject: San Onofre Nuclear Generating Station, Units 2 & 3
Bechtel Job 10,079-003
Project Design Criteria Manual
File: S023-713-A

Reference: (A) Bechtel letter to SCE dated July 24, 1974, Log BE-686, Subject: Project Design Criteria Manual

Dear Mr. Martin:

Twelve (12) copies of the San Onofre Generating Station, Units 2 and 3, Project Design Criteria Manual were transmitted to you by Reference (A) with the information that "it is being used as the basis for final plant design." Although SCE approval of the document was not requested, in the referenced letter, we would appreciate receiving your confirmation that the design criteria has your approval.

Very truly yours,

BECHTEL POWER CORPORATION

ORIGINAL SIGNED BY
J. D. HOUCHEN

J. D. Houchen
Project Engineer
Los Angeles Division

CEM:lss

cc: Mr. L. D. Hamlin, SCE

2408-PFR-F035
SRK 3/3/82

General Atomic Company

QUALITY ASSURANCE DEPARTMENT

Record of Long Distance Telephone Call

Party: Called ☑
Calling ☐

Date: 3/3/82

Time: Completed 10:50
Started 10:40
On-line 10

Name Jim. Thomas, Hans Richter
Company SCE
Location ROSEMEAD
Telephone No: A/C 213 No. 572-1593 (JT); 1745 (H.R.)

Discussion: I CALLED REGARDING SCE INPUT ON PFR F035.

A) JIM THOMAS
- Described it to Jim. He said he was not the right person to answer. I should call Hans Richter - Proj. Eng. Also SCE has no internal requirement to review BPC Design Criteria Manual.

HANS RICHTER
- Described it to Hans. He said this was I called before his time, but had these comments:

1) SCE has no requirement to review + comment on BPC Manual and never did it.
2) The real Design Criteria for all safety related systems are in the FSAR
3) Changes to FSAR are reviewed + approved by SCE and this is how they control Design Criteria changes.
4) No impact of not reviewing BPC Design Criteria Manual as that is a BPC internal manual.

Record Made by S B Burwell

Distribution: 2408 f.g PFR F035

2408 PFR NO. F036

POTENTIAL FINDING REPORT
REVISION --

SONGS 2&3 SEISMIC DESIGN VERIFICATION

A. PREPARATION BY GA INITIATOR

AFFECTED ITEMS:

Bechtel Containment Shell Analysis - FINEL Computer Analysis

REQUIREMENT REFERENCE DOCUMENTS:

1) PIPM Sections 14.4.3, 14.3, 14.4.4, 14.5.1 on the standard calculational format.
2) EDP 4.36: Verification of computer programs.

BASIC REQUIREMENT:

1) Calculations must be on forms, have a 9-digit number, have each page signed or, initialed, and list the design criteria, assumptions, codes and standards, and references in the first few pages.
2) Computer programs must be verified according to national standards.

DESCRIPTION OF POTENTIAL FINDING:

1) Calculation C-257-1.04, Rev. 0, is not in the required format; it consists of a title page plus a ~~topical~~ report. Invalid for the reasons noted in Attach. B. BJB 3/2/82 BJB 3/2/82
2) The criteria, assumptions, codes and standards are not listed in the first few pages. Valid, but see impact assessment.
3) Documentation on the verification of the FINEL program used at the time the calculation was made cannot be found. Invalid for the reasons noted in attachment B. B.J. Baylor 3/2/82

PREPARED BY: B.J. Baylor DATE: 2/2/82

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

REJECTION OF ORIGINAL DESIGN ORG. COMMENTS BY: B.J. Baylor DATE: Mar. 2, 1982
No. 2 still valid, but see impact assessment.

B. REVIEW BY GA TASK LEADER COMMENTS

Agree PFR should be invalid with regard to item # 1 & 3.
SA 2/26/82.

The PFR still appears to be valid with regard to item # 2. Bechtel should be contacted to discuss this point and to request them to explicitly identify the criteria, assumptions, codes + standards within the text.
SA 3/1/82

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

☐ REQUEST RE-REVIEW BY _____ DATE _____

☐ DISAGREE BY _____ DATE _____

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

2408 PFR NO. F036

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

Item 1 & 3 are invalid. Item 2 is an Observation. Procedural violation which has no significant effect on design.

BY: L. A. Kouts DATE: 3/5/82

E. GA PROJECT MANAGER

☒ ACCEPT

☐ REJECT

BY: [signature] DATE: 3/5/82

IMPACT ASSESSMENT

2408 PFR NO. F036

AFFECTED ITEM: Containment Shell Seismic Analysis

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 ?

   Possibly

6. OTHER COMMENTS:

   See attached telecon record. Although it is agreed that Calc. C-257-1.04 deviates from the standard Bechtel procedures, this will have no impact on the seismic review because all the required information is either present in the report or available to the GAC technical reviewer, Teh Lee, from other documents. See attached comment by Teh Lee below.

PREPARED BY: D. J. Taylor DATE: Mar. 3, 1982

COMMENTS:

The reviewer who is conducting the containment structure review has been able to obtain the required information from the documents that Bechtel Power Co. has sent GAC on the containment structure. The information needed for the technical review is contained in those parts of the calculational files of BPC. The design criteria and specification parts are given in the FSAR. Therefore, the QA violation is deemed insignificant on the final seismic design of the containment structure.

T. H. Lee 3/4/82

No other comment

BY: J Brune DATE: 3/4/82

PFR NO. 2408-PFR-F036

REVISION _____

C. REVIEW BY ORIGINAL DESIGN ORGANIZATION

COMMENTS

See attached sheet.

☐ AGREE PF IS VALID

☐ DISAGREE

HRW

BY: _____ DATE: 2/12/82

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

JUSTIFICATION:

CLASSIFICATION CRITERION NO. RESULTING IN "FINDING" _____

COMMENT ON "OBSERVATION" CLASSIFICATION

BY: _____ DATE: _____

E. TPT PROJECT MANAGER

☐ ACCEPT

☐ REJECT

BY _____ DATE _____

Bechtel Response 2/12/82
FGB 3/3/82

Attachment to
2408-PFR-F036

1. The calculation C-257-1.04, Rev. 0 is in a report form and is entitled "Final Analysis of Containment Structure for San Onofre Nuclear Generating Station Units 2 & 3". The report summarizes the method of analysis used for the containment structure, the computer programs used and includes results of the computer analysis. This report contains a comprehensive presentation of the containment structural analysis. There is not a procedural requirement to use a nine digit number as shown in the example used in PIPM Section 14. The format for calculations provided in the PIPM can not cover all possible formats for calculations; this is not considered a deficiency."

2. It is not the intent of the Project procedures to cite all possible conditions but rather to note directions to be followed in developing and controlling documentation.

   Since this calculation is in a report form, all the required criteria, assumptions, codes and standards are given in the text of the report.

3. A copy of the verification manual for CE801 final program dated 1974, is available in BPC's data processing library.

2408 PFR 036

ATTACHMENT B - GAC Originator DGB 3/3/82

1. It is agreed that requirements regarding calculation page form, 9-digit numbers, and signing of each page do not apply to this calculation. Therefore, this part is invalid.

2. See impact assessment and note by Teh Lee.

3. The FINEL October 29, 1974 verification report was reviewed by me on Feb. 23, 1982, thereby satisfying the basic requirement of verification of computer programs at the time a computer calculation was made.

D. J. Bayless
March 3, 1982

General Atomic Company

QUALITY ASSURANCE DEPARTMENT

2408 PFR - F036
SDC - 3/5/82

Record of Long Distance Telephone Call

Party: **Called** ☐
Calling ☒

Jack Nazarian, Jurgen Hempe
C. E. Mitchhart
Name

Company Bechtel Corp.
Whittier, CA
Location

Telephone No: A/C 213 **No.** 946-1811

Date: March 2, 1982

Time: **Completed** 11:35 a.m.
Started 11:15 a.m.
On-line 20 min.

Discussion: J. Nazarian, J. Hempe, and C. Mitchhart were answering my request for a discussion of three PFR's:

1. PFR-F034: Calc. C-257-1.03 - Containment Shell Analysis: Jack Nazarian restated that the criteria, assumptions, references, etc. were all in Calc. C-257-1.01, which is considered the beginning part of the entire containment shell analysis and that to repeat all the information in each subsequent package would create unneccessarily large documents. Unfortunately, we do not have the reference calculation, C-257-1. 01, and Bechtel refuses to send any more written material to GA pending resolution of a contractual dispute with TFT regarding confidentiality. A GA person may review it at Bechtel, however. (Bechtel thinks we received it, but neither of us can find any reference to it being sent or received here.)

2. PFR-F036: Calc. C-257-1.04 - Containment Shell Analysis: Jack Nazarian maintained that this calculation, which consists of a title sheet plus a report, is actually in a better and more complete technical form than that specified in the procedures, even though it does not follow the Bechtel PIPM. He does not consider this a deficiency.

3. PFR-F035: Design Criteria Revision Requests - C. E. Mitchhart restated the position that the Bechtel procedures would be revised to indicate that SCE is not required to review and comment on the design criteria manual. Therefore there is no impact on the seismic review. No correspondence between Bechtel and SCE other than the letters we already have is available.

Record Made by K. J. Taylor
K. J. Taylor
3/2/82

Distribution: S. Bresnick
2408 File

PFR NO. 2408-PFR-F040

POTENTIAL FINDING REPORT
REVISION _____

SONGS 2&3 SEISMIC DESIGN VERIFICATION

A. PREPARATION BY GA INITIATOR

AFFECTED ITEMS: Low Pressure Safety Injection System
Piping Stress Analysis Package PSG-117

REQUIREMENT REFERENCE DOCUMENTS:

BASIC REQUIREMENT: Proper simulation and consistency of valve instl. modeling.

DESCRIPTION OF POTENTIAL FINDING: Valves 2HV9331 (node 167), 2HV9322 (node 367), and 2HV9325 (node 427) are identical pieces of hardware per valve drawing 74R-008H (Target Rock Corporation). The drawing shows a weight of 992 lbs and C.G. location as indicated on Attachment Sketch Fig. 1. The Input Data Scan for nodes 367 and 427 shows an added weight of 1000 lbs and a C.G. location 1 ft above the up-flow circumferential weld. The lateral offset of 1 3/8", which may be left or right, since the motor operator may be rotated 180° as required, has been ignored. The node 367 and 427 modeling represent a reasonable simulation. However, the C.G. at node 167 is located 1 ft above the midpoint between the up-flow and down-flow circumferential welds. This puts the valve C.G. approximately 1.19 ft too close to support point 160 and may be unconservative for seismic loading. See Att.Fig 2.

PREPARED BY: P. Koelsch DATE: 2/4/82 *see attached sheet

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 C Charman DATE 2-4-82

☐ REQUEST RE-REVIEW BY _____ DATE _____

☐ DISAGREE BY _____ DATE _____

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

PFR NO. 2408-PFR-F040

REVISION

C. REVIEW BY ORIGINAL DESIGN ORGANIZATION COMMENTS

See attached sheet.

☒ AGREE PF IS VALID However, impact is not significant.

☐ DISAGREE

BY: Earl B Mauk DATE: 2/22/82

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

Improper inputs to calculation. However, because of the margin in the design the descrepency is not important.

BY: L. L. Kouts DATE: 3/5/82

E. GA PROJECT MANAGER

☒ ACCEPT

☐ REJECT

BY: A W Cronenberg DATE: 3/5/82

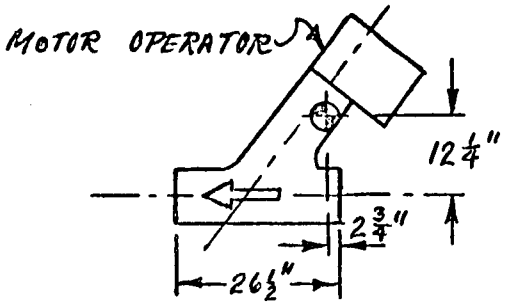
*There also appears to be a discrepancy in the pipe simulation from node 170 to 160 as indicated by dimensions .674' and .404' on Fig. 2.

Response to PFR F040

A seismic computer analysis has been performed with the valve at node 167 accurately modeled to represent that as shown on Fig. 2 of attachment to PFR-F040. Results of this analysis show that the resultant acceleration at the valve C. G. has increased from 0.25G to .54G which is still below the allowable limit of 8.66G.

There was a discrepancy in the piping model simulation from node 170 to 160; however, its effect is negligible and the current geometry was used in the latest analysis.

ATTACHMENT
2408-PFR-F040



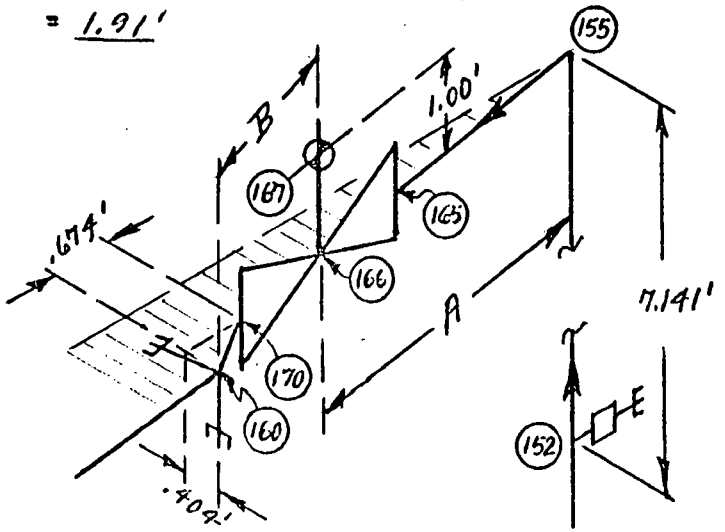
LATERAL C.G. OFFSET = 1⅜" LEFT OR RIGHT (MOTOR OPERATOR MAY BE ROTATED 180° IF REQUIRED).

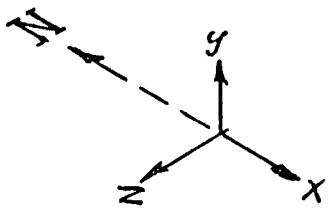
FIG. 1. 74R-008H VALVE DIMENSIONS (INCHES)

D.P. 164 VALVE MODEL
AS PER INPUT DATA SCAN
P03484, DATED 06-26-79

$A = \sqrt{(.39+.18)^2 + (2.46+1.14)^2}$
$= 3.64'$

$B = \sqrt{(.18+.404)^2 + (1.14+.674)^2}$
$= 1.91'$





CORRECT D.P. 164 VALVE MODEL
AS PER ISO 1204-037-3
(CONSISTENT WITH MODELLING
OF DATA PTS 367 & 427)

A = 2.50' (UNIT 2)
2.98' (UNIT 3)
B = 2.31 + .79 = 3.10'

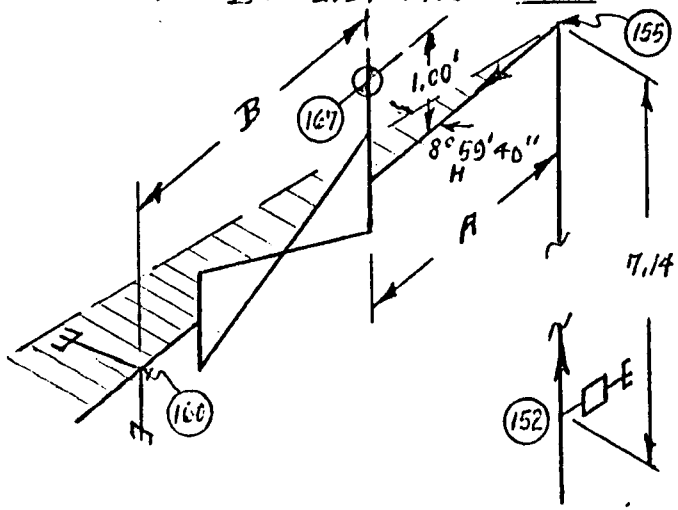


FIG. 2. VALVE INSTL. MODEL COMPARISON. SCALE: ½" = 1 FT.

03 FEB. 1982 Robert L. Johnson

2408-PFR-F040
SHT 3/4/82

IMPACT ASSESSMENT

2408-PFR-F040

PFR NO. _____

AFFECTED ITEM: Piping Stress Analysis Package PSG-117

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

The region of the piping system, that is affected by this PFR, has sufficient safety margins for valve acceleration, anchor loading, and pipe stress to accomodate the change.

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

Not because of this PFR.

3. COULD THE FAILURE OF THIS ITEM DURING AN SSE CREATE A SUBSTANTIAL SAFETY HAZARD ? The reviewer does not have the comprehensive knowledge of redundancies in the overall plant system to adequately address this question.

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

Not applicable

5. ARE OTHER SIMILAR DEVIATIONS LIKELY TO EXIST ?

No other deviation of this nature was found in PSG-117.

6. OTHER COMMENTS:

No

PREPARED BY: Peter L. Koefoed DATE: 3-2-82

Peter L. Koefoed

COMMENTS:

Agree with impact assessment.

BY: _____ DATE: 3/3/82

2408 PFR NO. F042

POTENTIAL FINDING REPORT
SONGS 2&3 SEISMIC DESIGN VERIFICATION

REVISION --

A. PREPARATION BY GA INITIATOR

AFFECTED ITEMS: Specification Change Notice (SCN) #64 (5/26/81)

REQUIREMENT REFERENCE DOCUMENTS:

Bechtel - Project Internal Procedures Manual, Section 11, Rev. 14, 10-15-80, paragraph 11.8.2.2.

BASIC REQUIREMENT:

The Quality Assurance Engineer will sign Class I and Class II SCNs prior to release for distribution.

DESCRIPTION OF POTENTIAL FINDING:

The evidence indicates that SCN #64 (5/26/81) was distributed for use without having been approved or disapproved by the QAE. The required QAE signature was missing from the SCN form.

PREPARED BY: Fred H Lollis DATE: 2-10-82

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. Brevel DATE 2/11/82

☐ REQUEST RE-REVIEW BY _____ DATE _____

☐ DISAGREE BY _____ DATE _____

☒ REVIEW OF ORIGINAL DESIGN ORGS. COMMENTS BY: L. Brevel DATE 3/2/82

9108 PFR NO. P042
REVISION

C. REVIEW BY ORIGINAL DESIGN ORGANIZATION — COMMENTS

Approval by the QAE was obtained at the time the potential finding was discovered. The lack of signature was of no significance because SCN-64 was never issued into the system for use and it was deleted in its entirety by SCN No. M-73.

MK SNE

☒ AGREE PF IS VALID

☐ DISAGREE

BY: David B Musal DATE: 2/22/82

D. RECOMMENDATION BY FINDINGS REVIEW COMMITTEE

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

JUSTIFICATION:

CLASSIFICATION CRITERION NO. RESULTING IN "FINDING" _____

COMMENT ON "OBSERVATION" CLASSIFICATION

Procedure requiring QAE signature on SCN was not followed. However, SCN was not issued or used in the plant.

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

E. TPT PROJECT MANAGER

☒ ACCEPT

☐ REJECT

BY: A. H. Williams DATE: 3/5/82

2408 PRR - 1 of 2 - SDC - 3/2/82

SCN TRANSMITTAL FOR SAN ONOFRE UNITS 2 & 3 PURCHASE SPECS.

SCN NO. M-64 SCN DATE 5-26-81

SPEC. OR B/M NO. 405-6 REV _____ ADDENDUM 2

NO. OF ATTACHED SCN COPIES 1

TO: SUPPLIER: Byron Jackson Pump Div
100 Oceangate, Suite 210
Long Beach, Ca. 90802
Attn: T. O Metz

FROM: SPEC. CONTROL, PROJECT ADMINISTRATION, NORWALK, BLDG. 45 JW Hansen EXT. 220

FILE NO. 405-6 DATE 6/2/81

COPIES TO:

- BECHTEL PROCUREMENT INSPECTION — [X] R. ANDERSON (2); [ ] _____
- BECHTEL EGS — Welsher
- BECHTEL RECORD RETENTION — [X] H. PITTMAN; [ ] _____
- PROJECT QUALITY ENGINEERING — [ ] C. MITCHHART; [ ] _____
- SCE EDMC — [X] R. PRESTON; [ ] _____
- SPEC. CONTROL
- PROJECT FILES

F047

SAN ONOFRE NUCLEAR GENERATING STATION
UNITS 2 & 3

SPECIFICATION CHANGE NOTICE (SCN)

SPECIFICATION NO.	REV. OR ADDENDUM NO.	SCN NO.
SO23-405-6	Add. 2	M-64

DELETED BY SCN M-73

JOB NO. 10079 PAGE 1 OF 1

DATE: 5-26-81 BY: D. Myers

CHANGE REQUESTED BY: ☐ CLIENT ☒ ENGINEERING ☐ FIELD ☐ SUPPLIER/CONTRACTOR

REASON FOR CHANGE: To revise material requirements to accomodate environmental qualification for steam line break environment.

DESCRIPTION OF CHANGE* Add to Specification SO23-405-6 the following:

4.10.4 Motors

4.10.4.1 Seal Rings

Motor bearing seal rings are to be manufactured to the Supplier's standards & dimensions except that the material is to be of 1045 Carbon Steel.

4.10.4.2 Oil Rings

Motor bearing oil rings are to be manufactured to the Supplier's standards & dimensions except that the material is to be of 95-5 aluminum alloy.

5.2.2 Submittal Schedule II

Item 3 motor bearing seal rings (per attached QVDL)
Item 4 motor bearing oil rings

*USE SUPPLEMENT SHEET IF NECESSARY OR ATTACH COPY OF REVISED SPECIFICATION PAGES.

MATERIAL PROCUREMENT RESPONSIBILITY

☒ BECHTEL OFFICE ☐ SUPPLIER/CONTRACTOR
☐ BECHTEL FIELD ☐ NONE REQUIRED

AFFECTED PURCHASE ORDERS: N4140791

BECHTEL ENGINEERING ☐ APPROVED ☒ DISAPPROVED CH 2-4-82

[signature]	6-1-81	N/A	
GROUP SUPERVISOR	DATE	EFFECTED GROUP SUPERVISOR(S) (IF REQUIRED)	DATE
[signature] RLR	6-2-81	[signature]	2/4/82
PROJECT ENGINEER	DATE	QA/QC	DATE

REMARKS

ADDITIONAL DISTRIBUTION ☐ PROJECT PROCUREMENT ☐ COST TREND ENGINEER

1345-9310

F04-

SCN TRANSMITTAL
FOR
SAN ONOFRE UNITS 2 & 3
PURCHASE SPECS.

NO. M-73 SCN DATE 8-5-81

SPEC. OR B/M NO. 405-6 REV _____ ADDENDUM 2

NO. OF ATTACHED SCN COMES 1

TO: SUPPLIER: Mech. Technology Inc
968 Albany - Shaker Rd.
Latham NY 12110
Attn: Martin Cerisoli

FROM: SPEC. CONTROL,
PROJECT ADMINISTRATION,
NORWALK, BLDG. 45

John Fleming EXT. 220

FILE NO. 405-6 DATE 8/19/81

COPIES TO:

- BECHTEL PROCUREMENT INSPECTION [X] R. ANDERSON (2)
- BECHTEL EGS Walneka
- BECHTEL RECORD RETENTION [X] H. PITTMAN
- PROJECT QUALITY ENGINEERING [ ] C. MITCHHART
- SCE EDMC [X] R. PRESTON
- SPEC. CONTROL
- PROJECT FILES

F042

SAN ONOFRE NUCLEAR GENERATING STATION
UNITS 2 & 3

SPECIFICATION CHANGE NOTICE (SCN)

SPECIFICATION NO.	REV. OR ADDENDUM NO.	SCN NO.
5023-405-6	Add. 2	M-73

JOB NO. 10079 PAGE 1 OF 1

DATE: 8-5-81 BY: D. Myers

CHANGE REQUESTED BY: ☐ CLIENT ☒ ENGINEERING ☐ FIELD ☐ SUPPLIER/CONTRACTOR

REASON FOR CHANGE: To revise material requirements to accomodate environmental qualification for steam line break environment

DESCRIPTION OF CHANGE*

This SCN is to delete, in its entirety, SCN No. M-64.

*USE SUPPLEMENT SHEET IF NECESSARY OR ATTACH COPY OF REVISED SPECIFICATION PAGES.

MATERIAL PROCUREMENT RESPONSIBILITY

☐ BECHTEL OFFICE ☐ SUPPLIER/CONTRACTOR
☐ BECHTEL FIELD ☒ NONE REQUIRED

AFFECTED PURCHASE ORDERS	
N 4140791	

BECHTEL ENGINEERING ☑ APPROVED ☐ DISAPPROVED

CHIEF SUPERVISOR	8/5/81 DATE	EFFECTED GROUP SUPERVISOR(S) (IF REQUIRED)	DATE
PROJECT ENGINEER	8/5/81 DATE	CALNE	8/6/81 DATE

REMARKS

ADDITIONAL DISTRIBUTION: ☐ PROJECT PROCUREMENT ☐ COST TREND ENGINEER

12115-911

F042

ADDENDUM NO. 3

QUALITY CLASS II

SPECIFICATION

FOR

AUXILIARY FEEDWATER PUMPS AND DRIVERS

FOR THE

SOUTHERN CALIFORNIA EDISON COMPANY

SAN ONOFRE NUCLEAR GENERATING STATION, UNITS 2 & 3

SAN ONOFRE, CALIFORNIA

SPECIFICATION NUMBER S023-405-6

SCE NUMBER 4079

SEPTEMBER 11, 1981

JOB 10079
BECHTEL POWER CORPORATION
NORWALK, CALIFORNIA

Bechtel Power Corporation
ENGINEERS — CONSTRUCTORS
SAN FRANCISCO LOS ANGELES

1345-9313

F04Y

CERTIFICATION

OF

SPECIFICATION SO23-405-6, ADDENDUM NUMBERS 1, 2 AND 3

QUALITY CLASS II AUXILIARY FEEDWATER PUMPS AND DRIVERS

FOR

SAN ONOFRE NUCLEAR GENERATING STATION, UNITS 2 & 3

SOUTHERN CALIFORNIA EDISON COMPANY

ROSEMEAD, CALIFORNIA

PREPARED BY

BECHTEL POWER CORPORATION
ENGINEERS-CONSTRUCTORS
NORWALK, CALIFORNIA 90650

I, H. W. GILLILAND certify that this Design Specification as amended by Addendum Numbers 1, 2 and 3 covers the requirements as prescribed by the ASME Boiler and Pressure Vessel Code, Section III, 1974 Edition with Addenda through Winter 1974, Subsection NA-3250.

H. W. Gilliland Sept. 15 1975
Signature Date

Stamp

REGISTERED PROFESSIONAL ENGINEER
H. W. GILLILAND
No. 11144
MECHANICAL
STATE OF CALIFORNIA

ADDENDUM NO. 3

September 11, 1981

(Incorporates SCN No. M-64, dated May 26, 1981; SCN No. M-68, dated June 20, 1981; SCN No. M-73, dated August 5, 1981.)

Please refer to Bechtel Power Corporation Specification No. SO23-405-6 for Auxiliary Feedwater Pumps and Drivers, dated October 28, 1974; Addendum No. 1, dated January 11, 1979 and Addendum No. 2, dated September 11, 1980; and incorporate the following changes as part of the specification:

1. Page 4-5, Paragraph 4.8, add to Subparagraph 4.8.1.1 as follows:

   4.8.1.1 ..., 1974 Edition with Addenda through Winter 1974.

2. Page 4-19, Paragraph 4.10, add Subparagraph 4.10.4 as follows:

   4.10.4 Motors

   4.10.4.1 (Deleted per SCN No. M-73)

   4.10.4.2 (Deleted per SCN No. M-73)

   4.10.4.3 Motor Bearings

   Motor sleeve type bearings are to be manufactured to the Supplier's standards and dimensions. The bearing material is to be gray cast iron per ASTM A 48, Class 35.

   4.10.4.4 Motor Shaft

   The motor shaft shall be electrolized on the journal and thrust bearing surfaces in accordance with Federal Specification QQ-C-320, Class 2. Plating thickness is to be per the Processor's standards.

IMPACT ASSESSMENT

2408 PFR NO. F042

AFFECTED ITEM: Specification Change Notice (SCN) #64, 5/26/81

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 ?

   Not likely, but it can happen.

6. OTHER COMMENTS:

   The evidence indicates a procedural violation rather than a system breakdown. Impact assessment - nil.

PREPARED BY: G.H. Lofstus DATE: 3-2-82

COMMENTS: Agree with above.

BY: J. Brenel DATE: 3/2/82

2408 PFR NO. 1045

REVISION --

POTENTIAL FINDING REPORT
SONGS 2&3 SEISMIC DESIGN VERIFICATION

PREPARATION BY GA INITIATOR

AFFECTED ITEMS: Pipe Supports
Calc. No. P450-1.44 and Calc. No. P450-1.50

REQUIREMENT REFERENCE DOCUMENTS:

PIPM Volume I, para. 14.5.1

BASIC REQUIREMENT:

Calcs that require a Professional Engineer's stamp or that support nuclear Quality Class I or II design must be reviewed and approved by the Chief Engineer or his designee.

DESCRIPTION OF POTENTIAL FINDING:

SEE ATTACHMENT I

I agree that this PFR can be considered invalid if PFR NO F023 is processed

This is the same problem described in 2408 PFR NO F023

BC Lauher 2-23-82

PREPARED BY: BC Lauher DATE: 2/5/82

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

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

B. REVIEW BY GA TASK LEADER COMMENTS

This PFR is another example of the same PF described in PFR-F023. I suggest that processing be suspended & this PFR be cross-referenced to PFR-F023. This PFR should be considered invalid, as

S. Brevik 2/23/82

☐ AGREE PF IS VALID BY _____ DATE _____

☒ REQUEST RE-REVIEW BY S Brevik DATE 2/23/82

☐ DISAGREE BY _____ DATE _____

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

C. REVIEW BY ORIGINAL DESIGN ORGANIZATION COMMENTS

☐ AGREE PF IS VALID

☐ DISAGREE

BY: _____ DATE: _____

D. RECOMMENDATION BY FINDINGS REVIEW COMMITTEE

DEFINITION ADEQUACY:	☒ ADEQUATE	☐ INADEQUATE
VALIDITY:	☐ VALID	☒ INVALID
CLASSIFICATION:	☐ OBSERVATION	☐ FINDING

JUSTIFICATION:

CLASSIFICATION CRITERION NO. RESULTING IN "FINDING" _____

COMMENT ON "OBSERVATION" CLASSIFICATION

This problem is covered by PFR F023

BY: S L Kouts DATE: 2/26/82

E. GA PROJECT MANAGER

☒ ACCEPT

☐ REJECT

BY: A L Wennerlund DATE: 3/5/82

2408 PFR NO. F045

ATTACHMENT I

DESCRIPTION OF POTENTIAL FINDING:

This requirement was discontinued by letter dated 6/13/79 by the Chief Engineer, D. L. Kinnsch (copy of letter attached). The applicable paragraph in the PIPM was not revised to reflect this change but should have been in lieu of implementation per letter.

Pipe Support Tag Items affected by Calculation No. P450-1.44 are:

GA Item No.	
24	Tag No. S2-SI-109-H-005
27	Tag No. S2-SI-067-H-002
23	Tag No. S2-SI-059-H-008
30	Tag No. S2-SI-033-H-002 & -008
32	Tag No. S2-SI-002-H-029
21	Tag No. S2-SI-043-H-020
29	Tag No. S2-SI-063-H-003
22	Tag No. S2-SI-059-H-009
31	Tag No. S2-SI-038-H-031
25	Tag No. S2-SI-002-H-020
26	Tag No. S2-SI-004-H-013
28	Tag No. S2-SI-031-H-003

NOTE: Similar Potential Finding was reported on PFR No. 2408 - F023

2408-PFR-F045
2/26/82

Bechtel Power Corporation

Interoffice Memorandum

To R. L. Rogers

Subject Review of Pipe Stress Calculations

Copies to J. E. Dempsey
D. J. Freeland
K. W. Evans
R. P. Ellis
B. R. Gavankar

File No.

Date June 13, 1979

From D. L. Kinnsch

Of Plant Design

At LAPD **Ext.** 4192

A sufficient number of pipe stress calculations (stress summaries) have been reviewed by the Chief Mechanical Engineer's staff to assure that the criteria and methodology utilized on the SONGS 2 and 3 Project is acceptable. As a result, these documents will no longer be reviewed by the Chief except as outlined in the attached memo from J. E. Dempsey dated February 23, 1979. Please revise any applicable Project procedures that may be affected by this change.

D. L. Kinnsch

DLK/DJT

10079
459-G
PE-26525
JUN 13 '79

PROJ MGR
PROJ ENG
PROJ ADMIN
PROJ C E
PROJ C S E
PROJ E E
PROJ M E
PROJ PLANT DES
PROJ N E
PROJ Q A
PROJ C & SCH E

R.

LAO-0400 (STANDARD) 11/78

2408 PFR NO. F053

REVISION A

POTENTIAL FINDING REPORT
SONGS 2&3 SEISMIC DESIGN VERIFICATION

A. PREPARATION BY GA INITIATOR

AFFECTED ITEMS: Southern California Edison Corrective Action Request, S023, F-893, 12/28/79 (Audit Report SCES-05-79), 12/26 -27/79)

3/2/82 ORIGINAL DOCUMENTS, AGAINST WHICH THE FCR's (7) WERE PREPARED, WERE PREPARED BY BPC ENGR. J. Lauer

JB 3/5/82

REQUIREMENT REFERENCE DOCUMENTS:

1. 10CFR Appendix B, Criterion III, Design Control
2. 10CFR Appendix B, Criterion VI, Document Control

BASIC REQUIREMENT: 1) "Design changes, including field changes, shall be subject to design control measures commensurate with those applied to original design and shall be approved by the same organization that performed the original design unless the applicant designates another responsible organization." 2) "Changes to documents shall be reviewed and approved by the same organizations that performed the original review and approval unless the applicant designates another responsible organization.

DESCRIPTION OF POTENTIAL FINDING: Violation of Criteria III & VI: CAR S023 F-893 states, "The following Field Change Requests do not have vendor concurrence recorded in Block 8."

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

SCE Procedure S02 26-8-13 EDM, Item 8, under Action 1, states, "FCRs against vendor drawings or specification shall have vendor concurrence in Block 8."

Failure to obtain vendor concurrence violates that requirement per basic requirement 1) and 2), above. 3/4/82 RECOMMEND WITHDRAWAL. JLL 3/4 BY

PREPARED BY: J. E. Lauer DATE: 2/25/82

FINDING INVALID AS ADDITIONAL INQUIRY SHOWS THAT ALL FCR's REFERENCED WERE PREPARED BY BPC ENGR. (NOT VENDOR PREPARED)

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

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

B. REVIEW BY GA TASK LEADER

COMMENTS

This PFR, as written does not appear to be valid. PFR Who was the "vendor"? Did the vendor do the design? This PFR appears to re-state the CAR report. Is there a problem with the CAR? If the CAR doesn't properly resolve the problem, then that would be the basis for a PFR.

Agree PFR is invalid J. Bruno 3/5/82

- ☐ AGREE PF IS VALID BY _____ DATE _____
- ☒ REQUEST RE-REVIEW BY J. Bruno DATE 2/26/82
- ☐ DISAGREE BY _____ DATE _____
- ☐ REVIEW OF ORIGINAL DESIGN ORGS. COMMENTS BY: _____ DATE: _____

2408 PFR NO. 1053 F053

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. A. Kouty DATE: 3/5/82

E. GA PROJECT MANAGER

☒ ACCEPT

☐ REJECT

BY: [signature] DATE: 3/5/82

2408 PFR NO. F053

REVISION --

POTENTIAL FINDING REPORT
SONGS 2&3 SEISMIC DESIGN VERIFICATION

PREPARATION BY GA INITIATOR

AFFECTED ITEMS: Southern California Edison Corrective Action Request, S023, F-893, 12/28/79 (Audit Report SCES-05-79, 12/26 - 27/79)

REQUIREMENT REFERENCE DOCUMENTS:

1. 10CFR Appendix B, Criterion III, Design Control

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

DESCRIPTION OF POTENTIAL FINDING:

SEE ATTACHMENT 1

PREPARED BY: K. E. Larson 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

It's not clear whether this is a violation of Design Control or Corrective Action. It appears to be the latter. I suggest the PFR be revised to more clearly state the area of concern

→ See attached - JEL

☐ AGREE PF IS VALID BY _____ DATE _____

☒ REQUEST RE-REVIEW BY J. Burwell DATE 2/23/82

☐ DISAGREE BY _____ DATE _____

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

2408 PFR No. F053

ATTACHMENT 1

DESCRIPTION OF POTENTIAL FINDING:

Violation of Criterion III by Inappropriate Corrective Action
Southern California Edison Procedure - Corporate Documentation Services/QA Procedure S02 26-8-13 EDM, Item 8 under Action I states, "FCR's against vendor drawing or specifications shall have the vendors concurrence in Block 8."

The CAR reports that certain FCR's do not have vendor concurrence recorded in block 8.

The Corrective Action (with SCE acceptance and verification of implementation of corrective action) to prevent recurrence was to delete the requirement and revise the procedure accordingly.

Note: The Cause of Condition - as stated - is unacceptable. Specifically, "EDML personnel do not have the technical expertise to determine if the signature in Block 8 is vendor concurrence."

2408 PFR NO. F060

REVISION --

POTENTIAL FINDING REPORT
SONGS 2&3 SEISMIC DESIGN VERIFICATION

A. PREPARATION BY GA INITIATOR

AFFECTED ITEMS: Electrical Penetration Assemblies
Specification #S023-304-1

REQUIREMENT REFERENCE DOCUMENTS:

a) SCE Engineering and Construction Dept. QA Procedure #39-20-3, "Preparation, Review, Approval, Verification and Release of Specifications and Addenda Developed by SCE for SONGS 1, 2 and 3"

b) Corporate Documentation Services Procedure #EDM 37-30-40, "Review and Release of Company Procurement Specifications, Addenda and SONGS 1 Mini-specifications.

BASIC REQUIREMENT:

SEE ATTACHMENT I

DESCRIPTION OF POTENTIAL FINDING:

SEE ATTACHMENT I

PREPARED BY: B. L. Coleman DATE: 2/16/82

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. Bennett DATE 2/18/82

☐ REQUEST RE-REVIEW BY _____ DATE _____

☐ DISAGREE BY _____ DATE _____

☒ REVIEW OF ORIGINAL DESIGN ORGS. COMMENTS BY J. Bennett DATE 2/18

2408 PFR NO. 1060

REVISION ---

C. REVIEW BY ORIGINAL DESIGN ORGANIZATION

COMMENTS

See attachment 2

☒ AGREE PF IS VALID

☐ DISAGREE

BY: K. L. Ridder Proj Engr DATE: 2-24-82

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

Addendum to spec not distributed per procedure. However, in this case, the undistributed addendum did not affect the plant seismic adequacy.

BY: S. A. Kouts DATE: 3/3/82

E. GA PROJECT MANAGER

☒ ACCEPT

☐ REJECT

BY: A. Schwencer DATE: 3/5/82

F060

2408 PFR NO. F060

ATTACHMENT I

BASIC REQUIREMENT:

SCE initiated specifications and addenda are to be submitted to Corporate Documentation Management (CDM) following review and approval. CDM prepares a form 41-95, "Drawing/Document Release" and distributes the specification/addenda with the form 41-95 in accordance with the project distribution matrix. CDM Drawing Control group maintains configuration control of all specifications through the Supplier Drawing Component System (SDCS) Configuration Control Log. This log is to be kept current and distributed on a weekly basis.

DESCRIPTION OF POTENTIAL FINDING:

SCE Specification #SO23-304-1 for Electrical Penetrations has been revised with seven addenda. Addendum #6 was sent to the subcontractor on Change Order #9 to Purchase Order #E4138321. Addendum #7 was sent to the subcontractor on Change Order #16. However, there is no evidence that the addenda were received by CDM for release, distribution and configuration control prior to transmittal to the subcontractor. Forms 41-95 for these addenda could not be located. In addition, the SDCS Configuration Control Log indicates that the specification is still only Revision 5. A telecon check by CDM with the jobsite (2/11/82) revealed that the site Drawing/Document History Card also identifies the specification as only a Revision 5.

2405 PFR-T060

ATTACHMENT 2

1. Corporate Documentation Management (CDM) maintains separate files - one for correspondence and a second file for drawings and engineer-data, including specifications. Addenda 6 and 7 to Specification #SO23-304-1, after the proper reviews, were inadvertently sent to the correspondence file and therefore, were not distributed as prescribed by procedures. The documents were, however, properly incorporated into the purchase order and given to the supplier.

2. Impact - The requirements covered by Addenda 6 and 7 had no impact on the seismic withstand capabilities of the electrical penetrations. Addendum 6 dealt with painting and finishing criteria and the inspection procedures to verify proper coating application. Addendum 7 was issued to incorporate a change in the ASME Code per the summer 1974 Addenda.

   No physical changes in the electrical penetrations for San Onofre were required because of either of these addenda. Seismic criteria and qualifications were not changed from the original specifications.

3. Corrective Action - Forms 41-95 for "Drawings/Document Release" have been prepared and processed by CDM for Addenda 6 and 7 to provide proper distribution.

Prepared by: C.O. Hoppes
C. O. Hoppes, Group Leader
Electrical Engineering

Approved by: H.L. Richter
H. L. Richter
Project Engineer, SONGS 2&3

IMPACT ASSESSMENT

2408 PFR NO. P060

AFFECTED ITEM: Electrical Penetration Assemblies Specification S023-304-1

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 ?

   Possibly

6. OTHER COMMENTS:

   The primary impact of this discrepancy is the lack of configuration control. This can create confusion at the jobsite when supplier equipment is received which does not meet the requirements of the released specification.

PREPARED BY: B. Coleman DATE: 3/2/82

COMMENTS: None

BY: L. Russell DATE: 3/2/82

3405-PFR-F060
SDG 4/5/82

Southern California Edison Company

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

February 25, 1982

J. J. ADRIAN
MANAGER
GENERATION ENGINEERING
AND DESIGN

TELEPHONE
(213) 572-0944

Mr. G. L. Wessman,
Project Manager
Torrey Pines Technology
P. O. Box 81608
San Diego, California 92138

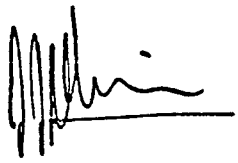
Dear Mr. Wessman:

Subject: Independent Seismic Design Verification and Effectiveness of Quality Assurance Program
San Onofre Nuclear Generating Station
Units 2 and 3

Enclosed is Southern California Edison Company's response to PFR F-060, issued to us.

Please call me if you have any further questions regarding this PFR.

Very truly yours,



2408 PFR NO. E061

REVISION --

POTENTIAL FINDING REPORT
SONGS 2&3 SEISMIC DESIGN VERIFICATION

A. PREPARATION BY GA INITIATOR

AFFECTED ITEMS: #12 Electric Motor Operated Valves, Spec. 507-5
#12 Safety Release Valves, Spec. 507-3

REQUIREMENT REFERENCE DOCUMENTS:

a) Bechtel Power Corporation, Project Internal Procedures Manual, (PIPM) 11.8.2.1
b) Specification S023-507-3
c) Specification S023-507-5

BASIC REQUIREMENT:

All SCNs must be incorporated not later than 120 days following the date when the first outstanding SCN was issued against a specification. Exception to this requirement may be granted by the Project Engineer on an "SCN Extension Request and Authorization" form.

DESCRIPTION OF POTENTIAL FINDING:

SCN J-14 dated 2/27/78 and SCN J-23 dated 2/23/78 were incorporated into specification S023-507-5 addendum 5 dated 9/21/78, a period of time greater than 120 days. No evidence of an "SCN Extension Request and Authorization" was located. SCN J-01 dated 11/16/77 was incorporated into specification S023-507-3, addendum 3 dated 5/10/78, a period of time greater than 120 days. Also no evidence of an "SCN extension request and authorization" could be located.

PREPARED BY: [signature] DATE: 2/15/82

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 2/18/82

☐ REQUEST RE-REVIEW BY _____ DATE _____

☐ DISAGREE BY _____ DATE _____

☒ REVIEW OF ORIGINAL DESIGN ORGS. COMMENTS BY: [signature] DATE: 3/4/82

PFR NO. F061
REVISION

C. REVIEW BY ORIGINAL DESIGN ORGANIZATION

COMMENTS

J-01, SCN J-14 and SCN J-23 were incorporated into the specification on dates greater than 120 days after the SCN date. No "SCN Extension Request and Authorization" was initiated. Since the SCN's provided immediate direction to the Vendors, the existing needs were satisfied with no identifiable impact associated with late revision of the specification.

☒ AGREE PF IS VALID

☐ DISAGREE

SHF

BY: F. B. MARSHALL DATE: 2-25-82

D. RECOMMENDATION BY FINDINGS REVIEW COMMITTEE

DEFINITION ADEQUACY:	☒ ADEQUATE	☐ INADEQUATE
VALIDITY:	☒ VALID	☐ INVALID
~~10 CFR 21:~~	~~☐ NOT APPLICABLE~~	~~☐ APPLICABLE~~ SdK 3/5/82
~~10 CRF 50.55(e):~~	~~☐ NOT APPLICABLE~~	~~☐ APPLICABLE~~
CLASSIFICATION:	☒ OBSERVATION	☐ FINDING

JUSTIFICATION:

CLASSIFICATION CRITERION NO. RESULTING IN "FINDING" _____

COMMENT ON "OBSERVATION" CLASSIFICATION

Procedural violation. However, since the SCN was used to make the vendor aware of change, it is unlikely that there is a significant impact on the design.

BY: S. L. Kouty DATE: 3/5/82

E. TPT PROJECT MANAGER

☒ ACCEPT

☐ REJECT

BY: A H Veerman DATE: 3/5/82

IMPACT ASSESSMENT

2408PFR NO. F061-

AFFECTED ITEM: #12 Valves

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 ?

   No

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

   No

5. ARE OTHER SIMILAR DEVIATIONS LIKELY TO EXIST ?

   Yes

6. OTHER COMMENTS:

   Since the subject SCNs provided immediate information directly to the vendors, the revision of the specification is incidental and has no impact on the design safety.

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

COMMENTS: None

BY: [signature] DATE: 3/4/82

2408 PFR NO. I062

POTENTIAL FINDING REPORT
REVISION - -

SONGS 2&3 SEISMIC DESIGN VERIFICATION

A. PREPARATION BY GA INITIATOR

AFFECTED ITEMS:

#70 Control Panel 2CR57

REQUIREMENT REFERENCE DOCUMENTS:

a) Bechtel Power Corporation, Project Internal Procedures Manual (PIPM) 33.9

b) Supplier Deviation Disposition Request (SDDR) #300

BASIC REQUIREMENT:

When engineering action is required, such as a drawing change, the change shall be made within 120 days after the SDDR is approved.

DESCRIPTION OF POTENTIAL FINDING:

SDDR 300 dated 7/9/76 was not incorporated into the specification addendum #3 until 12/2/77.

PREPARED BY: _____ DATE: 2/10/82

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. Brevard DATE 2/18/82

☐ REQUEST RE-REVIEW BY _____ DATE _____

☐ DISAGREE BY _____ DATE _____

☒ REVIEW OF ORIGINAL DESIGN ORGS. COMMENTS BY J. Brevard DATE: 3/4/82

2408 PFR NO. F062
REVISION

C. REVIEW BY ORIGINAL DESIGN ORGANIZATION

COMMENTS

SDDR 300 was incorporated into the specification on a date greater than 120 days after the SDDR date. Since the return of the approved SDDR provided immediate direction to the vendors, the existing needs were satisfied with no identifiable impact associated with late revision of the specification.

☒ AGREE PF IS VALID

☐ DISAGREE

BY: F.B. Marsh/ASTF DATE: 3/26/82

D. RECOMMENDATION BY FINDINGS REVIEW COMMITTEE

DEFINITION ADEQUACY:	☒ ADEQUATE	☐ INADEQUATE
VALIDITY:	☒ VALID	☐ INVALID
~~10 CFR 21:~~	~~☐ NOT APPLICABLE~~	~~☐ APPLICABLE~~ SAK 3/5/82
~~10 CRF 50.55(e):~~	~~☐ NOT APPLICABLE~~	~~☐ APPLICABLE~~
CLASSIFICATION:	☒ OBSERVATION	☐ FINDING

JUSTIFICATION:

CLASSIFICATION CRITERION NO. RESULTING IN "FINDING" _____

COMMENT ON "OBSERVATION" CLASSIFICATION

Procedural violation. However, since the SCN was used to make the vendor aware of the change, it is unlikely that there is a significant impact on the design.

BY: S. A. Kouts DATE: 3/5/82

E. TPT PROJECT MANAGER

☒ ACCEPT

☐ REJECT

BY: [illegible] DATE: 3/5/82

IMPACT ASSESSMENT

2408 PFR NO. F062

AFFECTED ITEM: #70 Control Panel 2CR57

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 ?

   No

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

   No

5. ARE OTHER SIMILAR DEVIATIONS LIKELY TO EXIST ?

   Yes

6. OTHER COMMENTS:

   Since the vendor is the initiator of an SDDR there is no real need to revise a purchase specification instructing the vendor as to the subject change. The revision of the specification is incidental and has no impact on design safety.

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

COMMENTS: None

BY: [signature] DATE: 3/4/82

2408 PFR NO. F063

REVISION --

POTENTIAL FINDING REPORT
SONGS 2&3 SEISMIC DESIGN VERIFICATION

PREPARATION BY GA INITIATOR

AFFECTED ITEMS:

Generic Problem inherent to system.

REQUIREMENT REFERENCE DOCUMENTS:

a) Bechtel Power Corp. Project Internal Procedures Manual (PIPM) 14.4.3
b) Calculations: E4C-027, C-257-7.04.01, C-259-2.03.14, C-259-5.02.02, C-270-01-02
c) Drawings: 38055-0, 38057-1, 37342-2, 37925-1.

BASIC REQUIREMENT:

PIPM 14.4.3 states when a calculation is used to support a specification, the calculation number must be entered directly above the date in the calc sheet, and the specification number must be entered directly below the subject title.

DESCRIPTION OF POTENTIAL FINDING:

The above listed calculations, ref. b, do not identify the applicable specifications as required by ref. a, nor the drawing number.

There is no established system which cross references calculations, specifications and drawings. Based on additional information obtained in the attached Telecon I concur that this PFR is "invalid". [signature] 3/5/82

PREPARED BY: [signature] / [signature] 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 PFR is invalid. Additional information from BPC should be attached when received SB 3/5/82

☒ AGREE PF IS VALID BY [signature] DATE 2/23/82

☐ REQUEST RE-REVIEW BY ____ DATE ____

☐ DISAGREE BY ____ DATE ____

☒ REVIEW OF ORIGINAL DESIGN ORGS. COMMENTS BY: [signature] DATE: 3/5/82

2408 PFR NO. E063
REVISION

C. REVIEW BY ORIGINAL DESIGN ORGANIZATION

COMMENTS

The objective of calculation E4C-027 is to provide an electrical auxiliary system ground fault protection design which includes the 4600 V buses. This calculation is developed after the equipment has been procured and when the actual parameters of the electrical components (current transformers, circuit breakers, relays, etc.) are available. The intent of the calculation is to support a system design rather than to support a specification used for equipment procurement.

☐ AGREE PF IS VALID

☒ DISAGREE

BY: Frank R Mark DATE: 3/1/82

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 3/5/82

JUSTIFICATION:

CLASSIFICATION CRITERION NO. RESULTING IN "FINDING" _____

COMMENT ON "OBSERVATION" CLASSIFICATION

BY: S. L. Kouts DATE: 3/5/82

E. TPT PROJECT MANAGER

☒ ACCEPT

☐ REJECT

BY: G. H. Weinman DATE: 3/5/82

2408-PFR-F063
LDC 3/5/82

General Atomic Company

QUALITY ASSURANCE DEPARTMENT

Record of Long Distance Telephone Call

Party: Called ☒
Calling ☐

Date: 3/4/82
Time: Completed 3:50
Started 3:39
On-line :11

Name Mr Shelby Freid
Company Bechtel
Location Whittier
Telephone No: A/C 213 No. 946 1811 (x273)

Discussion

PFR F063 - Mr Freid will submit an amended response to this PFR Covering the areas in the finding which were not addressed in his response of 3/1/82, ie C/S Calculations and drawings. In our discussion it was determined that almost all of the Calculations at BPC are not in support of unique specifications and as such are not required to be referenced in the specification or to reference the specification in the Calculation. There are "Performance Calculations" as opposed to "Design Calculations". The only time a BPC Calculation will reference the specification is when a unique item has been designed to be manufactured by a vendor, to BPC's requirements.

Regarding the second sentence in the finding, there is not a procedural requirement to have a system which cross references Calculations, specifications and drawings but he generally agrees that it would be a real advantage to have such a system.

PFR F064 - same as above - The Calculation was not written to support a specification but to support an entire system for which the specification was issued to purchase certain equipment used in the system.

Record Made by [signature]

Distribution:
2408 File PFR F063 F064

2408PFR NO. F064

POTENTIAL FINDING REPORT
REVISION --

SONGS 2&3 SEISMIC DESIGN VERIFICATION

A. PREPARATION BY GA INITIATOR

AFFECTED ITEMS:

4160V. Switchgear. Specification S023-302-2

REQUIREMENT REFERENCE DOCUMENTS:

a) Bechtel Power Corporation, Project Internal Procedures Manual (PIPM)
b) Calculation E4C-027
c) Drawing 30108, Rev. 2

BASIC REQUIREMENT:

Design calculations are "checked" before the associated design drawings are issued for construction or before the associated specification is issued for bid.

DESCRIPTION OF POTENTIAL FINDING:

Calculation E4C-027 was issued 10/7/75. The specification was issued 9/5/73 and drawing 30108-2 was issued on 8/5/74. Both the spec and the drawing were issued prior to the calculation.

Based on additional information obtained in talcon with SAC I Concur that this PFR is invalid. M Carlock 3/5/82

PREPARED BY: M Carlock DATE: 2/15/82

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 SO 3/5/82

☒ AGREE PF IS VALID BY J. Bellah DATE 2/19/82

☐ REQUEST RE-REVIEW BY _____ DATE _____

☐ DISAGREE BY _____ DATE _____

☒ REVIEW OF ORIGINAL DESIGN ORGS. COMMENTS BY: J Bellah DATE: 3/5/82

2408 PFR NO. E064
REVISION _____

C. REVIEW BY ORIGINAL DESIGN ORGANIZATION

COMMENTS

The objective of calculation E4C-027 was to fine tune the electrical auxiliary system ground fault protection scheme including the 4160 V buses. It is usually done after the equipment (switchgear, motors, etc.) has been procured or data available, because it is necessary to know the electrical characteristics such as current transformer rating, accuracy range, circuit breaker clearing time and trip setting, motor data, etc. This calculation was not required to support the switchgear specification S023-302-2 when it was issued for bid nor the switchgear one line drawing 30108 prior to the final revision. The short circuit calculation E4C-008 (used to determine the short circuit available at the switchgear) is required and was completed prior to specification issued for bid.

☐ AGREE PF IS VALID

☒ DISAGREE

BY: Fred B Manck DATE: 3/1/82

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

SAK 3/5/82

NOTIFICATION:

CLASSIFICATION CRITERION NO. RESULTING IN "FINDING" _____

COMMENT ON "OBSERVATION" CLASSIFICATION

BY: L. L. Kintz DATE: 3/5/82

E. TPT PROJECT MANAGER

☒ ACCEPT

☐ REJECT

BY: [illegible] DATE: 3/5/82

2408-PFR-F067
SVC 3/5/82
F064

General Atomic Company

QUALITY ASSURANCE DEPARTMENT

Record of Long Distance Telephone Call

Party: Called ☒
Calling ☐

Date: 3/4/82

Time: Completed 3:50
Started 3:39
On-line :11

Name Mr Shelby Freid

Company Bechtel

Location Whittier

Telephone No: A/C 213 No. 946 1811 (x273)

Discussion

PFR F063 - Mr Freid will submit an amended response to this PFR Covering the areas in the finding which were not addressed in his response of 3/1/82, ie C/S Calculations and Drawings. In our discussion it was determined that almost all of the Calculations at BPC are not in support of unique specifications and as such are not required to be referenced in the specification or to reference the specification in the Calculation. There are "Performance calculations" as opposed to "Design Calculations". The only time a BPC Calculation will reference the specification is when a unique item has been designed to be manufactured by a vendor, to BPC's requirements.

Regarding the second sentence in the finding, there is not a procedural requirement to have a system which cross references Calculations, specifications and Drawings but he generally agree that it would be a real advantage to have such a system.

PFR F064 - same as above - The Calculation was not written to support a specification but to support an entire system for which the specification was issued to purchase certain equipment used in the system.

Record Made by [signature]

Distribution:

2408 File PFR F063 F064

2408 PFR NO. F 068

REVISION

POTENTIAL FINDING REPORT
SONGS 2&3 SEISMIC DESIGN VERIFICATION

PREPARATION BY GA INITIATOR

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

REQUIREMENT REFERENCE DOCUMENTS:

PIPM Section 14.7, Rev. 10 (dated 3/9/81)

BASIC REQUIREMENT:

Revisions must be recorded in the control logs within 15 working days.

DESCRIPTION OF POTENTIAL FINDING:

A check of the Project files showed that the calculations for the above were being revised (Revision 2) and the documentation was not complete. The title sheet for Calc No. P 450-1.44 was not approved for Rev. 2. Also Calc No. P 450-1.50. These calculations include all of the above affected items. Attached are title sheets for -1.44 and -1.50.

Bechtel's comment is accepted. PFR F068 is invalid. Also Bechtel's comment indicates a different violation for which PFR F097 is written. } H C Hopkins Jr 3-3-82

PREPARED BY: H C Hopkins Jr DATE: 2-16-82

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, and related concern is identified in new PFR SA 3/3/82

☒ AGREE PF IS VALID BY J. Bennett DATE 2/19/82

☐ REQUEST RE-REVIEW BY _____ DATE _____

☐ DISAGREE BY _____ DATE _____

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

2408 PFR NO. F068

REVISION

C. REVIEW BY ORIGINAL DESIGN ORGANIZATION COMMENTS

Calculations P-450-1.44 and P-450-1.50 are currently under revision. Upon completion of the revision process Rev. 2 will be recorded in the control logs within 15 working days.

☐ AGREE PF IS VALID

☒ DISAGREE

N/A

BY: Fred B Marsh DATE: 3/1/82

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 3/5/82

JUSTIFICATION:

CLASSIFICATION CRITERION NO. RESULTING IN "FINDING" _____

COMMENT ON "OBSERVATION" CLASSIFICATION

BY: S. L. Kouts DATE: 3/5/82

E. TPT PROJECT MANAGER

☒ ACCEPT

☐ REJECT

BY: A. L. Wayman DATE: 3/5/82

PFR-F068
F068

CALCULATION TITLE SHEET

SHEET 1 OF 4800

PROJECT SONGS UNITS 2 & 3 JOB NO 10079-002 DISCIPLINE PL

SUBJECT PIPE SUPPORTS C/S CALCS SUS & BHA FILE NO. P-450

CALC. NO. P-450-1.44

(1) ORIGINATOR SIG. [signature] DATE 4/3/80 QUALITY CLASSIF. I (1)

(2) CHECKER SIG. S. Kwon DATE 7-3-80 NO. LAST PAGE 771

LEVEL OF REVIEW (1) (2) (3) (4) (5) (6) CHECK AS REQUIRED

P.E STAMP IF REQ'D

24

ORIGINAL ISSUE

	NAME	DATE	SIGNATURE
(3) GROUP LEADER	RUSSELL DALBY	7/3/80	[signature]
(4) EGS	Salah Mohamed	7-3-80	[signature]
(5) SPECIALIST			
(6) CHIEF			
OTHER			

RECORD OF REVISIONS

NO.	REVISION	DATE	ENG.	CKR.	EGL	EGS	SPEC.	CHIEF
1	CORRECTED QUALITY CLASSIF.	5-15-81	SR	SKP	[illegible]			
2	CONFORMED CALC TO PSDL							

FOR CRITERIA & PROCEDURES SEE CALC NO P450-010

THIS CACULATION INCLUDES CALC P450-1.44-1 Thru P-450-1.44-771

Rev 2 includes adding supplements 772 & 773 pipe support sleeve loading

FOR CIVIL/STRUCTURAL VERIFICATION OF THE AS BUILT CONDITION, SEE CALC. NO. P-450-1 109

THIS PACKAGE WAS PICKED UP FROM BECHTEL ON 2/8/1982 IT IS APPLICABLE TO ITEM 21 & 22

CALCULATION TITLE SHEET

SHEET 1 OF 17 II

PROJECT SONGS UNIT 2&3 JOB NO. 10079-000 DISCIPLINE I/D

SUBJECT PIPE SUPPORTS C/S CALCS SUS 2BBB FILE NO. P-450

CALC. NO. P-450-1.50

(1) ORIGINATOR SIG. [signature] DATE 7/3/80 QUALITY CLASSIF. I

(2) CHECKER SIG. S. KWON DATE 7/3/80 NO. LAST PAGE 7

LEVEL OF REVIEW (1) (2) (3) (4) (5) (6) CHECK AS REQUIRED 1 of

P.E STAMP IF REQ'D

ORIGINAL ISSUE

	NAME	DATE	SIGNATURE
(3) GROUP LEADER	RUSSELL DALBY	7/3/80	[signature]
(4) EGS	Salah mohamed	7-3-80	[signature]
(5) SPECIALIST			
(6) CHIEF			
OTHER			

RECORD OF REVISIONS

NO.	REVISION	DATE	ENG.	CKRR	EGL	EGS	SPEC.	CHIEF
1	CORRECTED QUALITY CLASSIF	5-15-81	SH	S. KW	[illegible]	SAM		
	CONFORMED CALCS TO FSDL							

FOR CRITERIA & PROCEDURES SEE CALC P450-010
THIS CACULATION INCLUDES CALC P450-1.50-1 Thru P-450-1.50-335.

Rev. 1 includes re-calc for supplement(s) 7

FOR CIVIL/STRUCTURAL VERIFICATION OF THE AS-BUILT CONDITION, SEE CALC NO. P-450-1.109

2408 PFR NO. F075

REVISION --

POTENTIAL FINDING REPORT
SONGS 2&3 SEISMIC DESIGN VERIFICATION

A. PREPARATION BY GA INITIATOR

AFFECTED ITEMS: Emergency Evacuation Alarm Specification #S023-307-14

REQUIREMENT REFERENCE DOCUMENTS:

a) Project Internal Procedures Manual, Section 11.8, "Changes to Purchase Specifications."

b) Project Internal Procedures Manual, Section 33, "Supplier Deviation Disposition Requests."

BASIC REQUIREMENT: Vendors of safety-related equipment who seek approval from Bechtel to allow the vendor to deviate from a purchase specification must submit a Supplier Deviation Disposition Request to Bechtel. If the request is approved, and a change to the specification is required, Bechtel must change the specification within 120 days of the SDDR approval. The specification addendum which incorporates the change must reference the SDDR.

DESCRIPTION OF POTENTIAL FINDING:

SEE ATTACHMENT I

PREPARED BY: B. L. Coleman 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 J. Bennett DATE 2/22/82

☐ REQUEST RE-REVIEW BY _____ DATE _____

☐ DISAGREE BY _____ DATE _____

☒ REVIEW OF ORIGINAL DESIGN ORGS. COMMENTS BY: J. Bennett DATE: 3/4/82

2408 PFR NO. [illegible] -- F075

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

Procedural violation which has no effect on design

BY: L. L. Kouts DATE: 3/5/82

E. GA PROJECT MANAGER

☒ ACCEPT

☐ REJECT

BY: [signature] DATE: 3/5/82

2408 PFR No. F075

ATTACHMENT I

DESCRIPTION OF POTENTIAL FINDING:

a) Emergency Evacuation Alarm specification #S023-307-14 requires the sirens to be seismically tested with the Type CC adapter plate. The vendor performed the seismic testing without the adapter plate and subsequently submitted SDDR #1694 to Bechtel on 2/15/79 to request a waiver on the adapter plate testing or a decision on whether or not seismic testing would be required with the Type CC adapter plate. Bechtel Engineering approved the waiver request; however, the specification has never been revised to delete the requirement for the Type CC adapter plate, nor to identify its replacement part, if any.

b) SDDRs #1215 and #1784 were incorporated into Addendum 2 and 3, respectively, of specification #S023-307-14; however, neither SDDR is referenced in the addenda. (Ref: PIPM Section 11.8.2.1)

c) SDDR #1784 was approved by Bechtel on 5/7/79, but was not incorporated into Addendum 3 of the specification until 9/21/81.

2408 PFR NO. F075
REVISION _____

C. REVIEW BY ORIGINAL DESIGN ORGANIZATION

COMMENTS

See attached sheet.

☒ AGREE PF IS VALID But there is no impact on design.

☐ DISAGREE

BY: Fred B Maust DATE: 3/1/82

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

TIFICATION:

CLASSIFICATION CRITERION NO. RESULTING IN "FINDING" _____

COMMENT ON "OBSERVATION" CLASSIFICATION

BY: _____ DATE: _____

E. TPT PROJECT MANAGER

☐ ACCEPT

☐ REJECT

BY: _____ DATE: _____

Attachment to
2408-PFR-F075
(Bechtel Response)
SB 3/4/82

1. The design engineer concurred with the vendor that type "CC" adaptors were not required for mounting Seismic I sirens and the seismic testing was accomplished in this manner. Since the disposition of the SDDR provided immediate direction to the vendor and the existing equipment installation matches the design, there is no identifiable impact associated with late revision of the specification. An addendum to specification S023-307-17 will be issued to delete "CC" adaptor plates.

2. The specification was changed to incorporate SDDR's 1215 and 1784. There is no identifiable impact on not referring to the SDDR's in the addenda.

3. SDDR 1784 was incorporated into the specification on dates greater than 120 days. Since the SDDR disposition provided immediate direction to the vendor, the existing needs were satisfied with no identifiable impact associated with late revision of the specification.

IMPACT ASSESSMENT

2408 PFR NO. F075

AFFECTED ITEM: Emergency Evacuation Alarm Specification #S023-307-14

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 ?

   Possibly

6. OTHER COMMENTS:

   The SDDRs were reviewed and approved by the Project Engineer, Engineering Group Supervisor, and QA. Since these individuals would have been the principal reviewers of the specification addendum, it is assumed that the spec change would have been approved had it been initiated.

PREPARED BY: B.L. Coleman DATE: 4 March 82

COMMENTS: None

BY: J. Brend DATE: 3/4/82

2408 PFR NO. F076

REVISION --

POTENTIAL FINDING REPORT
SONGS 2&3 SEISMIC DESIGN VERIFICATION

A. PREPARATION BY GA INITIATOR

AFFECTED ITEMS: Refueling Water Storage Tank Support Structure Calculation

REQUIREMENT REFERENCE DOCUMENTS:

a) EDP 4.36 Computer Program List
b) Calculation C-259-5-02.02

BASIC REQUIREMENT:

Reference (a) states that computer programs used in design calculations appear on the Bechtel "Standard Computer Program List" as Code 1.

DESCRIPTION OF POTENTIAL FINDING:

Reference (b) states that a computer program titled "OPTCON" was used in the Computation of Structural Loading and Design Base Earthquake analysis. The computer code "OPTCON" cannot be found on the "Standard Computer Program List".

OPTCON Computer Code was superseded by BSAP-POST in 1978. This was verified by me on 3/3/82. PFR is "invalid" M Carbonell 3/3/82

PREPARED BY: M Carbonell 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 PFR is invalid. SB 3/3/82

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

☐ REQUEST RE-REVIEW BY _____ DATE _____

☐ DISAGREE BY _____ DATE _____

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

2408 PFR NO. F076
REVISION

C. REVIEW BY ORIGINAL DESIGN ORGANIZATION

COMMENTS

OPTCON is a computer program incorporated as part of BSAP-POST (CE 201), which is listed in the "Standard Computer Program List". The program is a reinforced concrete [redacted]sign module that accepts input either directly from BSAP or from an independent [redacted]ructural analysis via punch cards.

☐ AGREE PF IS VALID

☒ DISAGREE

BY: Fred B. Manuel DATE: 3/1/82

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

SLK 3/5/82

JUSTIFICATION:

[redacted]CLASSIFICATION CRITERION NO. RESULTING IN "FINDING" _____

COMMENT ON "OBSERVATION" CLASSIFICATION

BY: S. L. Kouty DATE: 3/5/82

E. TPT PROJECT MANAGER

☒ ACCEPT

☐ REJECT

[redacted]

BY: [redacted] DATE: 3/5/82